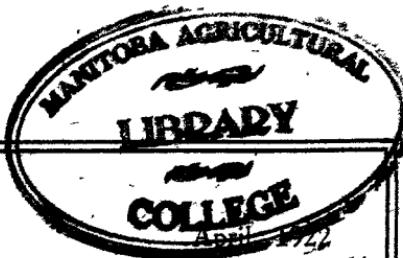


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The Agricultural Experiment Station  
OF THE  
Colorado Agricultural College

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A CONTRIBUTION TO OUR  
KNOWLEDGE OF THE  
SYRPHIDAE OF COLORADO

- Part I. Description, Life Histories and Food Habits.  
Part II. Key to Genera and Species of Syrphidae with  
Citations and Habitat.  
Part III. Catalogue of Known Colorado Syrphidae.

By Chas. R. Jones.



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# The Colorado Agricultural College

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# A CONTRIBUTION TO OUR KNOWLEDGE OF THE SYRPHIDAE OF COLORADO\*

By Chas. R. Jones.

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## PART I. DESCRIPTION, LIFE HISTORIES AND FOOD HABITS.

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The family of flies known as *Syrphidae* is one of the largest in the order *Diptera*, and consists mostly of prettily ornamented or gayly colored insects. The predominant color among them is yellow, which appears in conspicuous cross-bands or yellow spots. A great many of the species show a striking resemblance to wasps, hornets, and bees, and are often mistaken for them. Up to the time of the publication of the "North American Syrphidae" by Dr. Williston, in 1886, over two thousand species were known throughout the world. Since then, considerable systematic work has been done by various entomologists, and we have had many new species added to this list. This may be accounted for by the great number of forms, the attractiveness of the adults, and the economic importance of the larvae. The greater number of representatives of this family are decidedly beneficial, but there is also displayed a considerable range of diversity of larval habits—*Microdon*, living parasitically in nests of ants and wasps, *Xylota* and *Chrysotoxum*, living on decaying wood, *Helophilus* and *Eristalis*, developing in stagnant water, *Volucella* and *Merodon*, living in plant tissue as cacti and bulbous plants, and some *Syritta* breed in horse manure, but the greater number are aphidophagous in habit, and are very instrumental in aphid control. The notes and observations on which the present paper is based, deal principally with the latter class, and the greater portion were made in 1916.

A great deal has been published relative to the systematic aspect of this family, but very little information is available relative to the biologic and economic importance of the larvae. The most extensive publication on this phase is the "Ohio Biological Survey," Bulletin No. 1, by C. L. Metcalfe.

During the past seasons, numerous individuals of this family were collected alive and life-history studies started from the egg, but only a few were successfully carried through. The results of these observations are recorded herewith.

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\*Part of a thesis presented for a master's degree, Colorado Agricultural College, June, 1916.

**EUPEODES VOLUCRIS**—Osten Sacken.

(Plate VI, Fig. I, a, b, c, d, e, and f.)

*EGGS*.—Elongate oval in outline, slightly narrowed and rounded at the large end, somewhat truncated at the other, the truncated end bears the micropyle, flattened ventrally, or on the side of attachment; roughened with semi-corrugate longitudinal dashes. Average length of ten eggs, .97 mm.; width, .35 mm.; width near micropyle, .23 mm.

Eggs laid April 28th, hatched May 2nd. Period of incubation, 4 days.

*LARVAE*—(Plate VI, Fig. I, a.) The full-grown average 9.5 mm. in length and 1.6 mm. in width, light greenish pink, with numerous, not very prominent wrinkles, rather slender, grub-like, semi-cylindrical, pointed anteriorly, with a few short, spine-like projections; two small black, dorso-lateral lines running from anterior to posterior ends, and four blackish, oblique, posterior side spots; heart line at times conspicuous; posterior respiratory appendages brown, about as broad as long, and rather prominent at times; prolegs poorly defined, apparently consisting of body wrinkles.

Larvae hatched May 2nd. Pupated May 13th. Length of stage 11 days.

*PUPAE*—(Plate VI, Fig. I, b.) Pupation takes place in the hardener, slightly inflated, larval skin, rounded anteriorly and dorsally, and tapering gradually, or rounding from just before the middle to the last segment. Posterior breathing appendages apparent; light brownish pink in color, with seven small dorso-lateral side spots, ventral surface almost straight, length 7 mm., width 2.5 mm.

Pupated May 13th. Emerged May 20th. Length of stage, 7 days.

## HABITS.

*Eupeodes volucris* is one of our most common syrphids, and is very abundant at all seasons of the year. The adults are common on all lawns and around any flowers. They deposit their eggs singly and in the near vicinity of a colony of aphids. The eggs hatch in about four days, and the larvae feed ravenously upon aphids. When full grown, the larvae pupate in some fold of a leaf or near the midrib, and here the transformation takes place. Time required from egg to adult, about 22 days.

The larvae are somewhat general feeders, and have been taken in colonies of the following aphids: *Aphis carbocolor* on *Rumex*; *Chaitophorus negundinis* on boxelder; *Pemphigus betae* on beets; *Macrosiphum pisi* on alfalfa; *Aphis viburnicola* on snowball; *Aphis avenae* on cat-tail; and *Aphis helianthi* on dogwood.

**SYRPHUS ARCUATUS**—Fallen.

(Plate VI, Fig. 6, a, and b.)

*EGGS*.—Chalky white, turning bluish as they grow older. Elongate oval in outline, sub-cylindrical, somewhat truncated at micropylar end and rounded at the opposite; the entire surface of egg shows a microscopic, reticulate, sculpturing, without any definite shape, and forming a rather complex net-work over the entire egg. Dorsally, the egg is rounded, and it is somewhat flattened ventrally, or on point of attachment. Average length of 10 eggs, .99 mm.; width, .35 mm.; at micropyle, .14 mm.

Period of incubation in the laboratory, 5 days.

*LARVAE*.—(Plate VI, Fig. 6 a.)—The average length of full-grown larvae is 13.3 mm., width, 2.3 mm.; pale pinkish green, anteriorly somewhat lighter; head and posterior portion pale green; with prominent wrinkles; fat, grub-like, semi-cylindrical.

pointed anteriorly, with numerous short, black spines. respiratory appendages brown, about as broad as long, prominent, each segment with a row of from 7 to 9 white, sharp spines which run around larva; posterior portion of body with three white, transverse lines.

Length of larval stage, 11 days.

*PUPAE*.—(Plate VI., Fig. 6 b.)—Pupation occurs within the somewhat shortened, inflated, larval skin, which is generally attached to a fold in a leaf. General color, dark brownish, with eight lateral, small, blackish, side spots. Dorsally from these spots are short, black spines or hair-like projections. The ventral surface very nearly straight, dorsal surface rounded abruptly from about the first fifth, thence gradually tapering to the last four-fifths where the outline goes almost straight to the breathing appendages. A constriction just back of breathing appendages forms a posterior wart-like projection. Length, 7 mm., width, 3 mm.

Length of pupal stage, 9 days.

#### HABITS.

The adults of *S. arcuatus* resemble in appearance *Eupeodes volucris* and are found from early spring to late fall in common with them.

The eggs are deposited singly on plants infested with aphids.

The larvae are very ravenous feeders, and attain full growth in from 4 to 6 days. They are common on *Aphis viburnicola*; *Myzus cerasi*; *Aphis pomi*; *Chaitophorus negundinis*; *Aphis brassicae* and *Macrosiphum solanifolii*. Several other kinds of aphids were fed the larvae in the laboratory and they developed on all but *Hyalopterus arundinis*.

Pupation takes place in some secluded place or fold in a leaf.

### LASIOPHTHICUS PYRASTRI—Linne.

(Plate VI., Fig. 7, a, b; Plate VIII., Fig. 1, a, b.)

*EGGS*.—Eggs, chalky white when freshly laid, turning bluish later, ovate, elliptical, semi-cylindrical, with a diameter greater at one end than the other; rounded at the large end, and somewhat truncated at the micropylar end, slightly inflated dorsally, and flattened ventrally or on the side of attachment, micropyle dark, entire surface of the egg showing a slightly reticulate sculpturing of no definite shape, but forming a somewhat complex net-work over the surface of the egg. A slight transparent filament extends slightly beyond the egg at the point of attachment to the leaf; this membrane has a somewhat net-like structure. The point of attachment to the leaf is the rounded end. Desposition in the laboratory was almost invariably on the underside of the leaf or blossom. Average length of 10 eggs, 1.2 mm., width, .41 mm., width near micropyle, .14 mm.

Average incubation period, 4 days.

*LARVAE*.—(Plate VI, Fig. 7, a.) Length of full-grown larvae, 16.3 mm., width 3.1 mm., elongate, sub-cylindrical, tapering anteriorly, and truncate posteriorly, except for respiratory appendage. Irregular in outline and very much wrinkled transversely. General color, pale greenish-yellow, a lighter green anteriorly and more yellowish posteriorly, with a narrow dorsal longitudinal white stripe which is more pronounced anteriorly, and ending just behind the respiratory appendage; laterally with a white, interrupted stripe, growing darker posteriorly. Heart line inconspicuous; respiratory appendage brownish; distinct transverse segmental bristles as in *S. acutulus*, but slightly longer. The skin is papillose; prolegs poorly defined, apparently consisting of body wrinkles on ventral surface, body covered with fine, whitish pile.

Average larval stage in the laboratory, 10 days.

*PUPAE*.—(Plate VI, Fig. 7, b.) Length, 8.4 mm., width, 3.3 mm. General color, dark-brown, slightly tinged with pink; semi-transparent; anteriorly inflated, tapering abruptly from beyond the middle to the posterior end, which extends in a slightly rounded protuberance; breathing appendages conspicuous, ventral surface almost straight; before emerging, the adult colors are distinguishable through the pupal case. Puparium rounded dorsally and slightly flattened ventrally.

Average length of pupal stage in the laboratory, 10 days.

#### HABITS.

The adults (Plate VIII Fig. 1, a, b) are rather large flies, closely resembling the genus *Syrphus*, and are quite common around dandelions. They oviposit singly, and the eggs in the laboratory were placed on the underside of the leaf. The smaller or somewhat truncated end of the eggs were slightly elevated, leaving the rounded end as a base. The larvae of this species fed ravenously on several kinds of aphids in the laboratory, but have only been taken outside on *Chaitophorus negundinis*. They have been successfully raised upon *Aphis helianthi*; *Aphis avenae*; *Aphis carbocolor*; *Aphis brassicae*; *Aphis pomi*; *Macrosiphum solanifolii*; *Myzus cerasi*, and *Melanoxanthierium bicolor*.

Time required from egg to adult, 24 days.

In the breeding cages, they exhibited a cannibalistic habit. On several occasions, they were noted feeding upon one another.

### SYRPHUS AMERICANUS—Wiedemann.

(Plate VI. Fig. 2, a, b, c, d.)

*EGGS*.—Chalky white, elongate ovate, average length 1 mm., width in middle, .3 mm. to .35 mm., sub-cylindrical, truncate, and narrowed towards micropylar end, broadest just in front of middle, surface of egg finely sculptured with longitudinal lines which run obliquely around the egg, and have many ramifying projections from them giving a general appearance of fine net-work.

Average incubation period in laboratory and greenhouse, 2 to 3 days.

*LARVAE*. (Plate VI, Fig. 2, a.) Newly hatched larvae are very small, average length, 1.3 mm.; average width, .25 mm. They are enlarged medially, tapering anteriorly, light yellow with greenish tinge in color, very wrinkly, and have a hairy appearance, due to the dorso-lateral spine-like projections; fully matured larvae yellowish, or pinkish, average length, 11 mm., and 2.7 mm. wide, wrinkly, legless, irregular tapering anteriorly, not having the segments definitely outlined, head segments small and indefinite.

Length of larval stage, 9 to 14 days.

*PUPAE*.—(Plate VI. Fig. 2, b.) Pupation occurs within the larval skin after it has shortened and becomes somewhat inflated dorsally and laterally. Average length, 6.5 mm. to 7 mm., average width, 2.5 mm. to 3 mm., general color a dark-brown, slightly tinged with pink, skin apparently semi-transparent; anterior portion strongly inflated, from the middle gradually tapering to the conspicuous posterior breathing appendages; shortly before emerging, the body markings of the adult are discernible through the pupal skin.

#### HABITS.

The adults of *S. americanus* (Plate VI, Fig. 2, c, d) appear in early April, and are quite abundant in midsummer. They feed upon nectar, and

can be found on almost any kind of nectar-bearing flowers. During oviposition, they may be taken around almost any aphid infested plants. The eggs are deposited singly upon the leaves or twigs where the proper food is obtainable. Upon hatching, the young larvæ begin feeding upon the aphids at hand, and it matters not whether the aphid is large or small, it soon succumbs to the persistency of the larvae; when food is plentiful, the larvae of *S. americanus* develop very rapidly. It has been noted that by the end of the third day the larvae have attained the length of 9.5 mm. and a corresponding width. In the laboratory the time noted for a larvæ to devour an aphid was from 2 to 4 minutes, according to the size of the aphid, and 27 aphids were noted to be eaten before the larvæ was apparently satisfied. The larvae have been known to feed upon *Aphis rumicis*, Linn; *Aphis brassicae*, Linn; *Chaitophorus negundinis*; *Macrosiphum pisi*, and *Melanoxantherium smithiae*.

Upon obtaining full growth, the larvae attaches itself to a leaf or twig, and pupation takes place.

### HELOPHILUS LATIFRONS—Loew

(Plate VII, Fig. 10, a, b, c, d; Plate VI, Fig. 8, a, b.)

On June 4th, several adults of the above species were taken from flowers on the campus and placed in a large breeding cage with some dandelion blossoms, upon which had been placed a syrup made from sugar and water. They fed readily up to June 9th, when they deposited eggs. The eggs were laid in clusters, two rows deep, and placed one along beside the other; as many as 150 eggs were found in one cluster. Eggs laid June 9, 4:00 P. M., hatched June 11, 2:00 P. M. They had been previously moistened with a little water. The larvæ were placed in water taken from a small lake west of Fort Collins, together with some decaying vegetable matter and a small amount of grass. The larvae were sluggish and developed slowly, remaining in this water up to September, when they finally all died.

The greatest length obtained was 12 mm.

**EGGS.**—(Plate VII. Fig. 10, c, d.) Chalky white, turning bluish as they grow older. Elongated, oval in outline; sub-cylindrical, somewhat truncated at the micropylar end, rounded at the opposite; the entire surface of egg showing a slightly reticulated sculpturing of no definite shape, but forming a somewhat complex, microscopic net-work over the entire surface. The average dimensions of 10 eggs are as follows: Length, 1.01 mm., width in the middle, .31 mm., near the micropyle, 1.22 mm.

Period of incubation, 2 days.

**LARVAE.**—(Plate VI. Fig. 8, a.) The larvae are aquatic in habit, feeding upon decaying vegetable matter at the bottom of the water, and breathing through a long tail-like appendage which they thrust to the surface. They have been noted to be able to extend their tail-like appendage to the surface from a depth of over two inches. Generally the larvae are buried in the mud and sediment at the bottom of the pool, but they also, at times, swim in, or at the surface of the water. This is accomplished by a side-wise muscular movement of the body.

The larvae of *H. latifrons* closely resembles the larvae of the genus *Eristalis*, in all probability varying only in dimension; in fact, representatives of these two genera have been bred from a lot of larvæ collected from the same pool and from all general appearance, the larvæ seemed to be the same. The exact measurements are very hard to determine, due to the restlessness and various positions assumed by the larvæ while out of the water, but they are approximately 14.3 mm. in length, and 3.3 mm. in width. In general, the larvæ are cylindrical, the anterior portion is truncate, and the posterior tapers rather abruptly to the respiratory organ. This organ is a slender posterior appendage and can be varied in length in accordance with the depth of the water, gradually tapering from the body to its tip.

The larvæ itself is very wrinkly, of a brownish color, and semi-transparent; the intestinal contents may be seen through the body wall. The segments and prolegs are poorly defined, being represented by body folds which give a general appearance of numerous tubercles; these folds give rise to numerous setae.

When ready to pupate, the larvæ leave the water and pupate in the adjacent material; they were noted to burrow a short distance in the soil. As other representatives of this family, they pupate in the old larval skin, but the inflations are not so marked.

*PUPAE*.—(Plate VI, Fig. 8, b.) The puparium is of dark-grayish, drab color, almost bilaterally symmetrical, ovate, the respiratory appendage remaining intact.

Length of pupae, 12 mm., width, 4.1 mm.

#### HABITS.

The adults (Plate VII, Fig. 3, a, b; 10, a, b, c, d) of the species are large, brightly colored flies banded with yellow, and are numerous at almost all seasons, more so in the early spring when rains are frequent. They oviposit in clusters in the vicinity of stagnant water. Such clusters have been noted to contain 150 eggs.

The period of incubation is 2 days in the laboratory.

The entire larval stage is spent in the water. The larvæ feeds upon decaying vegetable matter, and obtains air through the long tube-like appendage which is thrust up through the water to the surface. Pupation occurs in the soil in the old larval skin.

#### **ALLOGRAPTA OBLIQUA**—Say.

*EGGS*.—The eggs of *Allograptta obliqua* are chalky white in color, turning bluish as they grow older, and have the microscopic, reticulate, sculpturing as described in the previous species. Elongate oval in outline, slightly narrowed and rounded at the large end, and somewhat truncated at the micropylar end; flattened on the surface of attachment. Average length of 10 eggs, .9 mm., width, 32 mm.

Period of incubation in the laboratory, 3 days.

*LARVAE*.—Average length of full-grown larvæ, 8.2 mm., width, 2 mm. They are irregular in outline, semi-cylindrical, wrinkly, pointed at the anterior end and truncated at the posterior, of a greenish color, with two longitudinal somewhat whitish stripes;

the breathing tubes quite prominent, heart line or intestinal contents apparent; larvae hatched June 27th, pupated July 3rd and 7th.

Average length of larval stage, 9 days.

*PUPAE*.—Greenish with a slight brown tinge dorsally, translucent, the abdominal colors of the adult appearing in the later part of the stage, breathing tubes quite prominent. Puparium inflated as described in other species. Average length of pupa, 5.34 mm.; width, 2.5 mm. Larva pupated July 3d and 7th, emerged July 11th and 13th.

Average length of pupal stage, 7 days.

#### HABITS.

The adults of *A. obliqua* are, as the other members of this family, pollen and nectar feeders, and are plentyful on any nectar-bearing flowers. The eggs are deposited singly on the surface of a leaf or twig which bears aphids. The larvæ feed ravenously and attain their full growth in about 3 days. They were taken on *Aphis avenae* and *Aphis helianthi* in the field. In the laboratory they were fed and developed on *Chaitophorus negundinis* and *Aphis brassicae*.

When ready to pupate, the larvæ fastens itself to a leaf and pupates in the last larval skin.

### PARAGUS BICOLOR—Fabricius.

(Plate VII, Fig. 4, a, b.)

*LARVAE*.—Length, 8.2 mm., width, 3.27 mm., one specimen, at rest, 6.8 mm. long and 2.4 mm. wide, of a light-greenish and yellowish color, semi-transparent, elongate, oval, truncated posteriorly and flattened dorso-ventrally. The intestinal contents visible dorso-medially through the body wall; body wrinkled.

These larvae were taken with aphids on Dock (*Rumex crispus L.*) and cat-tail. Average length of larval stage, 7 days.

*PUPAE*.—Pupation occurs in the old larval skin which becomes shortened and somewhat inflated anteriorly; length of puparium, 5.4 mm., width, 2.4 mm.; brownish to brownish pink in color, nearly oval in outline, somewhat flattened on ventral surface and rounded dorsally, outer portion slightly elevated, gradually tapering from about the middle to the posterior end, where the breathing tubercles are prominent. Length of pupal stage, 6 to 12 days.

#### HABITS.

The adults are pollen and nectar feeders, and have been taken at various kinds of flowers. The eggs are deposited singly, (in the laboratory no eggs were obtained, but they have been taken with *Aphis avenae* and *Aphis helianthi*). Eggs obtained from dogwood in a colony of *Aphis helianthi* and taken into the laboratory, hatched July 8, and the larvae were fed upon *A. pomi*, *A. avenae*, *A. carbocolor*, and *Chaitophorus negundinis*; developed readily and pupated July 15, emerging as adults July 21.

Length of stage from larvæ to adult, in the laboratory, 20 days.

**PART II. KEY TO GENERA AND SPECIES OF COLORADO  
SYRPHIDAE WITH CITATIONS AND HABITAT.**

Since the writing of the excellent Monograph of North American Syrphidae by Dr. S. W. Williston, which was published in 1886 as Bulletin No. 31 of the U. S. National Museum, several authors have published articles relative to the systematic aspect of this family. These publications are distributed through various entomological papers, such as "Canadian Entomologist", "Entomological News", "Transactions of the American Entomological Society", "Kansas University Quarterly", etc.

Previous to the publication of Dr. Williston's Monograph, our knowledge of this family was very incomplete. The literature was scattered through various publications, and the meager, and often unsatisfactory, descriptions were written in half a dozen languages. The material in the "Monograph of North American Syrphidae" is assembled, and in most cases the descriptions modified as fully and completely as can be expected, thus facilitating the labor involved in determining the species of this group. The aim of the present paper is to further the work that Dr. Williston started, by taking a smaller territory and working along the same line, thus contributing to this well systematized family.

Up to a few years ago, this family, in the collection of the Colorado Agricultural College, had comparatively few specimens determined. The greater part of the first year's work was determining and arranging the specimens in the collection, and all available exchanges were made for material not occurring in our State. The scheme of arrangement outlined by Dr. Aldrich\* was followed, and we now have eleven boxes of authentic specimens in the regular collection, representing over one hundred forty-five different species, and twelve boxes of duplicates.

In general, we have both genera and species of this family universally distributed, there being about forty-two genera and a very great number of species common to North America and Europe. Aldrich\* catalogues this family as being composed, in North America, of sixty-eight genera, embracing upwards of eight hundred species. Of these, forty-two genera and one hundred seventy-six species have been found to occur in Colorado. In addition to this, I have found nineteen species to be new to science, and have named, described and published them in *Annales of The American Entomological Society*, X, 1917.

The original key to genera by Dr. Williston\*\* is used in connection herewith, and the keys to species are modified forms from Dr. Williston, being so arranged as to cover the species occurring in Colorado.

The principal literature consulted is:—*Synopsis North American Syrphidae*, Williston; *British Flies*, Verrall; *Kansas University Quarterly*, Snow; *Canadian Entomologist*, Vols. XXVI, XXVII, Hunter; *Trans. Amer. Ent. Soc.*, XXII, Townsend, and *Catalog North American Diptera*, Aldrich.

This monograph is part of a two years systematic study of the family *Syrphidae*, and includes the various species occurring in the collection of the Colorado State Agricultural College, those collected by the writer on various trips throughout the state, together with the known species from Colorado.

\*Catalog of N. A. Dipt., 244-407.

\*\*Manual of N. A. Dipt., Williston, 252-260.

Several of the previously described forms from this State are now in other collections, and have been reported to me by the various state entomologists, and I wish herein to express my appreciation to my friends and correspondents to whom I am indebted for services rendered in various ways, such as loaning material and furnishing data relative to Colorado species. I wish especially to acknowledge my indebtedness to Dr. L. O. Howard, J. C. Crawford, and Frederick Knab of the Bureau of Entomology and U. S. National Museum; and to Professor Lawrence Bruner of Nebraska, and S. J. Hunter of Kansas; Dr. J. M. Aldrich of Indiana, and Miss M. A. Palmer, illustrator, Colorado Agricultural Experiment Station.

#### WILLISTON'S KEY TO GENERA.

1. Antennae with a terminal style (Pl. V, fig. 11a.) ..... 2
- Antennae with a dorsal (rarely subterminal) arista ..... 4
2. Antennae cylindrical, the first two joints elongated; posterior cell with a stump of a vein (*SPHYXIMORPHA CERIA*) First two joints of the antennae short ..... 3
3. Eyes bare; small species ..... *PELEOCERA*  
Eyes pilose; larger species ..... *CALLICERA*

#### —B—

4. Marginal cell of the wings closed and petiolate (Pl. III, fig. 9a) ..... 48
- Marginal cell open ..... 5
5. Anterior cross-vein of the wings distinctly before the middle of the discal cell; almost always rectangular ..... 6
- Anterior cross-vein near or beyond the middle of the discal cell, usually oblique (Pl. IV, figs. 6a, 8) ..... 55

#### —C—

6. Antennae elongate (If arista plumose, see 56) (Pl. I, figs. 3a, 4a, 5a) ..... 7
- Antennae short (Pl. I, Figs. 6, 7) ..... 14
7. Mesonotum with yellow lateral stripes; large species, the abdomen always with distinct yellow bands ..... *CHRYSOTOXUM*  
Mesonotum not with distinct yellow lateral stripes or margins ..... 8
8. Face rounded, not tuberculate, pilose; oral margin not projecting (Pl. I, fig. 9a) ..... 9  
Face not evenly arched; tuberculate or the oral margin projecting (Pl. I, figs. 13a, 14) ..... 12
9. Moderately large to large species; scutellum flattened, often with spines or tubercles on its border; a stump of a vein in the first posterior cell from the third longitudinal vein ..... 10  
Small species; scutellum without spines; no stump of vein in first posterior cell ..... *PIPIZA*
10. Abdomen much narrowed at the base ..... 11  
Abdomen not or but little narrowed at base ..... *MICRODON*
11. Face swollen and prominent below ..... *RHOPALOSYRPHUS*  
Face not swollen and prominent below ..... *MIXOGASTER*

12. Body clothed with sparse tomentum; all the femora thickened and with spinous bristles below ..... (*LEPROMYIA\**) *LEPIDOSTOLA*  
 Body not clothed with flattened tomentum; the femora not thickened with spinous bristles below..... 13
13. Face partly or wholly yellow, tuberculate below, the epistoma not projecting, face and front not wrinkled (Pl. I, figs. 11, 12.) ..... *PARACUS*  
 Front and face wholly black in ground color (*CHRYSOGASTER RHYSOPS*) ..... 19
14. Face black in ground color ..... 15  
 Face more or less yellow or yellowish in ground color..... 26
15. Abdomen with only four visible segments, very convex, the venter excavated; first two joints of the antennae very short, the third large, subquadrate, with a short subterminal arista ..... *NAUSICASTER*  
 Abdomen with more than four segments ..... 16
16. Hind femora distinctly thickened ..... 17  
 Hind femora but little or not at all thickened..... 18
17. Scutellum unusually large, nearly square; males dichoptic..... *CHALCOMYIA*  
 Scutellum usually large, considerably broader at its base; males holoptic and with a facial tubercle ..... *MYIOLEPTA*
18. Face rounded, not tuberculate, the oral margin not projecting (Pl. I, fig. 9a.) ..... *PIPIZA*  
 Face tuberculate or the oral margin projecting..... 19
19. Epistoma projecting; small, black species..... 20  
 Face tuberculate, the oral margin not projecting..... 21
20. Front in the female and usually the face in both sexes with transverse wrinkles; spurious vein obsolete; antennae short or long (Pl. I, fig. 8, a) ..... *CHRYSOGASTER*  
 Front and face not wrinkled; face pilose ..... *PSILOTA*
21. Metallic green, metallic green and black, or black species; facial orbits separated by a slender parallel groove ..... *CHILOSIA*  
 Black with more or less metallic green or blue, with yellow, yellowish or metallic cross-bands on the abdomen; face not with orbital grooves..... 22
22. Face with transverse grooves in the middle (antennae elongate) .... *RHYSOPS\*\**  
 Face not with transverse grooves or wrinkles ..... 23
23. Wings not longer than the abdomen; ocellar tubercle large; abdomen depressed, long elliptical, somewhat narrowed toward its base, the markings ferruginous or orange yellow..... *PYROPHENA*  
 Wings longer than the abdomen, abdomen with yellow or greenish-yellow, or shining metallic cross-bands; usually elongate species ..... 24
24. Front tibiae distally and the tarsi of the male dilated, those of the female slightly widened (Pl. II, figs. 6, 6a.) ..... *PLATYCHEIRUS*  
 Front tibiae and tarsi slender in both sexes..... 25

\*The name *LEPIDOSTOLA* MIK has slight priority over *LEPROMYIA*.  
 \*\**MELANOSOMA*, *SCITULUM*, *RUGONASUS*, *MELANOCERUM*.

- |     |   |  |
|-----|---|--|
| 25. | Rather large, blackish species, with a large flat, elliptical abdomen.....  | <i>XANTHANDRUS VERRALL*</i>            |
|     | .....   |  |
|     | More elongate and slender species; abdomen not elliptical in outline.....   | <i>MELANOSTOMA</i>                     |
| 26. | Abdomen narrowed toward the base, distinctly club-shaped or spatulate in outline (Pl. II, fig. 1).....  | 27                                     |
|     | Abdomen oval or slender, not spatulate or club-shaped in outline .....  | 30                                     |
| 27. | Third longitudinal vein bent deeply into the first posterior cell (Pl. IV, fig. 6a.) .....  | <i>SALPINGOCASTER</i>                  |
|     | Third longitudinal vein straight or gently curved .....   | 28                                     |
| 28. | Hind femora slender; front of female long, narrowed above; the cheeks very narrow below the eyes; abdomen often very slender (Pl. II, figs. 1, 2) .....   | <i>BACCHA</i>                          |
|     | Hind femora thickened; front not usually long in female.....  | 29                                     |
| 29. | Epistoma produced anteriorly, the face in profile deeply concave from antennae to tip; third joint of antennae rounded .....  | <i>SPHEGINA</i>                        |
|     | Epistoma produced more downward, in profile gently concave; third joint of antennae not rounded.....  | <i>NEOASCIA</i>                        |
| 30. | Front long, much narrowed above in the female; cheeks very narrow, the eyes approaching each other at the lower third of the head; wings usually with dark picture; abdomen more or less elongate (compare <i>BACCHA</i> when in doubt as to shape of abdomen)..... | <i>OXYPTAMUS</i>                       |
|     | Flies not having the above assemblage of characters.....  | 31                                     |
| 31. | Mesonotum with distinct yellow lateral margins .....  | 38                                     |
|     | Mesonotum not with yellow lateral margins .....   | 32                                     |
| 32. | Abdomen with definite yellow cross-bands .....  | 33                                     |
|     | Abdomen not with definite yellow cross-bands .....  | 42                                     |
| 33. | Hind femora extraordinarily thickened .....   | <i>SYRITTA</i>                         |
|     | Hindfemora slender .....  | 34                                     |
| 34. | Sixth abdominal segment in the male as long as the two preceding together, cylindrical; fifth segment of the female one-half as long as the preceding (Pl. II, fig. 10) .....   | <i>EUPEODES</i>                        |
|     | Sixth abdominal segment of the male not peculiar; the fifth segment of the female one-third or one-fourth as long as the preceding.....   | 35                                     |
| 35. | Front very convex; eyes of male with an area of enlarged facets above (Pl. II, fig. 12) .....   | ( <i>SCAEVA</i> ) <i>LASIOPHTHICUS</i> |
|     | Front not remarkably convex .....   | 36                                     |
| 36. | Third longitudinal vein with distinct curvature into the first posterior cell; third joint of antennae elongate oval .....  | <i>DIDEA</i>                           |
|     | Third longitudinal vein straight or gently curved; epistoma not produced (if produced snout-like, <i>RHINGIA</i> ) .....  | 37                                     |
| 37. | Males holoptic (Pl. II, figs. 13a.) .....   | <i>SYRPHUS</i>                         |
|     | Males broadly dichoptic; arista more or less thickened ....   | <i>CHAMAESYRPHUS</i>                   |
| 38. | Mesonotum with medium cinereous line; ocelli usually remote from the vertex .....   | 39                                     |

\**MELANOSTOMA BUCEPHALUS*—Wied

- Mesonotum not with a median cinereous linear stripe ..... 40
39. Hind femora in the male thickened and arcuate, the tibiae dilated at the tip ..... *TOXOMERUS*  
Hind femora simple and straight; the tibiae not dilated at tip ..... *MESOGRAMMA*
40. Eyes of male with an area of enlarged facets above; fourth segment of abdomen with two median yellow stripes and oblique side spots ..... *ALLOGRAPTA\**\*  
Eyes of male not with an area of enlarged facets above; fourth abdominal segment not so marked ..... 41
41. Face projecting below; slender species, the hypopygium often large ..... *SPHAEROPHORIA*  
Face receding; abdomen oval ..... *XANTHOCRAMMA*
42. Thickly pilose species; the abdomen black, the basal part light yellow ..... *LEUCOZONA*  
Thinly pilose species; abdomen not so marked ..... 43
43. Hind femora thickened ..... 44  
Hind femora slender ..... 47
44. Species wholly or chiefly reddish or lutescent ..... 46  
Black species, sometimes with luteous spots on face, humeri and basal angles of abdomen ..... 45
45. Scutellum unusually large, nearly square in outline; males dichoptic ..... *CHALCOMYIA*  
Scutellum oval; males holoptic ..... *MYIOLEPTA*
46. Face carinate; abdomen more elongate ..... *HAMMERSCHMIDTIA*
47. Epistoma produced into a long porrect snout ..... *RHINGIA*  
Epistoma not produced (compare *PARACUS* sp. if small); facial orbits limited by a slender groove (Pl. I, fig. 15) ..... *CHILOSIA*

## B.

48. Third vein bent deeply into the first posterior cell ..... 51  
Third vein not bent deeply into first posterior cell; third antennal joint elongate ..... 49
49. Arista very densely plumose, appearing as a solid mass, the arista itself also thickened (Pl. III, 8a) ..... *COPESTYLOM*  
Arista featherly plumose ..... 50
50. Hairs of arista retrorse; males dichoptic (Pl. III, fig. 9) ..... *MEGAMETAPON*  
Hairs of arista not retrorse; males holoptic ..... *VOLUCELLA*
51. Hind femora with a sharp tooth-like projection below near distal end; sixth vein beyond anal cell strongly curved; large species ..... *MILESIA*  
Hind femora without such tooth ..... 52
52. Frontal triangle of male strongly protuberant; rather large dark-colored species (*PRIOMERUS*, *DOLIOSYRPHUS*) ..... *ERISTALIS*  
Frontal triangle not protuberant ..... 53
53. Epistoma produced into a long porrect snout, ..... *LICASTRIRHYNCHA*  
Epistoma not produced ..... 54
54. Thorax with distinct yellow markings; hind femora thickened; hypopygium enlarged ..... *MEROMACRUS*

\*Feebly characterized genera.

Thorax not with distinct yellow markings, sometimes white-fasciate; femora sometimes thickened; hypopygium not conspicuously prominent.....*ERISTALIS*

## —C—

55. Arista plumose .....	56
Arista bare or pubescent .....	60
56. Antennae elongate, the third joint more than twice as long as wide ( <i>PHALACROMYIA GLAUROTRICHA</i> ) .....	<i>VOLUCELLA</i>
Antennae short, the third joint not more than twice as long as wide; third vein nearly straight, or gently or considerably curved into first posterior cell .....	57
57. Thinly pilose; abdomen with yellow bands .....	58
Thickly pilose; abdomen not with yellow bands .....	59
58. Third vein straight or moderately curved .....	<i>SERICOMYIA</i>
Third vein considerably curved* .....	<i>CONDIDEA COQ.</i>
59. Eyes pubescent **.....	<i>PYRITIS</i>
Eyes bare (Pl. IV, fig. 4) .....	<i>ARCTOPHILA</i>
60. Third longitudinal vein deeply curved into the first posterior cell .....	61
Third vein only gently curved .....	70
61. Hind femora thickened .....	63
Hind femora slender .....	62
62. Abdomen elongate, narrowed at base, spatulate in outline .....	<i>SALPINGOGASTER</i>
Abdomen oval, with yellow, interrupted bands; mesonotum with yellow margins; antennae elongate (Pl. I, figs. 3a, 4a) .....	<i>CHRYSOTOXUM</i>
63. Face carinate or subcarinate; hind femora with an angular protuberance or spur below at outer end:	
Face protuberant in profile (Pl. IV, fig. 8a).....	<i>TROPIDIA</i>
Face concave in profile, subcarinate; spur of femore bifid .....	<i>SENOCASTER</i>
Face tuberculate or arched, not keeled .....	64
64. Abdomen much narrowed at base, club-shaped .....	<i>CERIOGASTER</i>
Abdomen not at all pedunculate or basally narrowed .....	65
65. Antennae elongate; eyes pubescent; wings colored anteriorly .....	
..... "PLATYNOCHAETUS" <i>NIGER</i> ***	
Antennae not elongate.....	66
66. Third joint of antennae broad; mesonotum not vittate .....	68
Third joint of antennae oval.	
Males holoptic; femora with protuberance below .....	<i>MERODON</i>
Males dichoptic; femora not with protuberance.....	67
67. Ocelli remote from each other; mesonotum not vittate .....	<i>ASEMOSYRPHUS</i>
Ocelli not remote from each other; mesonotum vittate.....	<i>HELOPHLIUS</i>
68. Thickly pilose species .....	<i>MELLOTA</i>
Thickly pilose .....	69

\*This character is found in some of the species of ARCTOPHILA, TROPIDIA, ETC., but is not considered generic.

\*\*Ocular pubescence alone is not of general value; I do not know the genus.

\*\*\*This is perhaps not a true PLATYNOCHAETUS. The terminal expansion of the arista is a male character. I do not know it.

69. Hind tibiae of male with an internal spur (compare *MALLOTA* sp).... *TEUCHOCNEMIS*\*  
 .... Hind tibiae of male not with such spur (*TRIDONTA*, *POLYDONTA*) ..... *PTERALLASTES*
70. Thorax with distinct yellow markings other than on the humeri; wasp-like flies ..... 81  
 Thorax not with distinct yellow markings of the ground color other than rarely on the humeri ..... 71
71. Hind femora swollen and with a protuberance or spur below distally; face carinate or subcarinate ..... 72  
 Hind femora not with such protuberance or spur ..... 73
72. Face concave in profile; femore spur bifid ..... *SENOCASTER*\*\*  
 Face protuberant in profile; femoral protuberance not spur-like. (Pl. IV, fig. 8a) ..... *TROPIDIA*
73. Abdomen narrowed basally; slender species (see 27).  
 Abdomen in no wise club-shaped ..... 74
74. Face transversely arched, not produced, not tuberculate, abdomen more or less elongate and nearly bare ..... 75  
 More or less thickly pilose species; often large ..... 76
75. Hind femora extraordinarily thickened; anterior cross-vein rectangular, and before the middle of discal cell ..... (SYRITTA)  
 Hind femora distinctly thickened, but the cross-vein distinctly oblique, and near or beyond middle of discal cell ..... *XYLOTA*\*\*\*
76. Scutellum, margin of thorax and pleurae with distinct bristles, femora slender (*CHRYSOCHLAMYS*) ..... *FERDINANDEA*  
 No bristles anywhere on body ..... 77
77. Face short, not produced, concave from antennae to oral margin, not tuberculate; hind femora thickened ..... 78  
 Face produced, long ..... 79
78. Abdomen elongate ..... *BRACHYPALPUS*  
 Abdomen very broad; thorax densely pilose; middle femora of male sometimes (*HADROMYIA*) with a stout, basal, inferior spur ..... *POCOTA*
79. Face produced forward, pointed, concave from antennae to tip, not tuberculate; hind femora thickened ..... *CRIORPORA*\*\*\*\*  
 Face not evenly concave in profile, but tuberculate or convex ..... 80
80. Third joint of antennae produced above into an anteriorly directed conical process, terminating in the thickened arista ..... *MERAPIOIDUS*  
 Third joint of antennae obliquely oval; hind femora rarely thickened *CRIORHINA*
81. Hind femora with a conical, tooth-like protuberance below near distal end; antennae more or less elongated; sixth vein directed obliquely outward beyond anal cell (Pl. V, figs. 10, 10a) ..... *SPILOMYIA*  
 Hind femora without much protuberance; sixth vein beyond anal cell not unusual ..... 82

\*Of doubtful validity; I think that both this and *POLYDONTA* should be united with *PTERALLASTES*.

\*\*Of doubtful occurrence in the United States.

\*\*\**XYLOTA* may be confounded with *BRACHYPALPUS*. The nearly bare abdomen of the one, rather thickly pilose of the other, will distinguish them.

\*\*\*\**C. ARCTOPHILOIDES* is a *CRIORHINA*.

82. Antennae inserted low down, near middle of head in profile, the face not longer than front ..... *TEMNOSTOMA*  
 Antennae inserted on a conical process; front short, the face much produced downward; antennae long or short. .... *SPHECOMYIA*

### MICRODON—Meigen.

Key to Species.

- |   |                       |
|---|-----------------------|
| 1. Hind metatarsi but slightly incrassate.....  | 2                     |
| Hind metatarsi strongly incrassate .....  | 4                     |
| 2. Scutellum distinctly emarginate, with a tooth-like projection on each side.....  | 3                     |
| Scutellum rounded, black, no tooth-like projections .....   | <i>similis.</i>       |
| 3. Thorax bronze black, scutellum greenish; angle formed by the first posterior and discal cell rounded .....   | <i>tristis.</i>       |
| Thorax purplish black, with rosy or coppery tints on the disc; the angle formed by the first posterior and discal cell a little more than a right angle.... | <i>tristis</i> (var.) |
| 4. Scutellum rounded, not emarginate, pile of the thorax fox-red.....   | <i>coloradensis.</i>  |
| Scutellum emarginate, small obtuse tubercles present; pile of the thorax golden .....   | <i>megalogaster.</i>  |
- (See also *pallipennis*.)

### MICRODON—Meigen.

1. *M. COLORADENSIS* Cockerell and Andrews. Three specimens, Boulder, Colorado.

2. *M. GLOBOSUS* Fabr. Habitat: Colorado, Virginia, Florida, Texas, New York and New Jersey.

3. *M. MEGALOGASTER* Snow. Habitat: Colorado, New Jersey and Pennsylvania.

4. *M. TRISTIS* Loew. (Plate VIII, Fig. 7) Habitat: Colorado, Virginia, Connecticut, Oregon, Montreal, Washington and New York.

5. *M. TRISTIS*, variety *Cockerelli*, Cockerell and Andrews. Two specimens, Boulder, Colorado.

6. *M. SIMILIS* Jones. (Plate I, Figs. 1, 1a, 1b, 1c.) Two specimens, Poudre Canon, Colorado, C. S. Mead, Collector.

7. *M. pallipennis* Snow. Type in collection at Kansas University. (No reference or description could be found.)

### CALLICERA—Panzer.

8. *C. MONTENSIS* Snow. Habitat: Colorado, 9,000 ft., New Mexico, 9,500 ft. Six specimens, Snow.

**CHYSOTOXUM—Meigen.**

Key to Species.

1. Lateral margin of the third abdominal segment yellow ..... 2  
Lateral margin not yellow ..... 3
2. Black on the fifth abdominal segment shaped like an inverted V ..... *laterale*.  
The black has the two posterior branches arcuate, and widely separated at the tips ..... *ypsilone*.
3. Arcuate bands of the abdomen entire. The black on the fifth segment is elongated and narrow, with the branches nearly parallel ..... *integre*.  
Arcuate bands interrupted ..... 4
4. Abdominal fasciae moderately wide, narrowly interrupted ..... 5  
Abdominal fasciae rather narrow, the first broadly separated from the lateral margin ..... *derivatum*
5. Black spot on fifth abdominal segment inverted Y shaped ..... *ventricosum*.  
Black spot on fifth abdominal segment inverted V shaped ..... *pubescens*.

**CHYSOTOXUM—Meigen.**

9. *C. DERIVATUM* Walker. (Plate I, Fig. 3, 3a, 3b. Plate VII, Fig. 12.) Habitat: Colorado, Happy Hollow, three specimens, 7,000 ft., C. S. Mead; Canada, Alaska, Hudson Bay Ty., Oregon, Wyoming, Nebraska and New Mexico.

10. *C. INTEGRE* Williston. (Plate VII, Fig. 1.) Habitat: Colorado, four specimens, Happy Hollow, 7,000 ft., C. S. Mead; Mexico, New Mexico and Arizona.

11. *C. LATERALE* Loew. (Plate I, Figs. 4, 4a, 4b.) Habitat: Colorado, two specimens. Estes Park, Chas. Fluke; Nebraska, New York and Mexico.

12. *C. PUBESCENS* Loew. Habitat: Colorado, Illinois, New York, Michigan, Virginia and New Jersey.

13. *C. YPSILON* Williston. Habitat: Colorado and New Mexico.

**CHYSOGASTER—Meigen.**

Key to Species.

1. Legs wholly black, last section of fourth vein curved or bent ..... 4  
Legs in part yellow, or yellowish red; last section of fourth vein rectangular ..... 2
2. Eyes with linear markings ..... *bellula*.  
Eyes unicolor ..... 3
3. Abdomen broadly oval; wings with brownish clouds ..... *pictipennis*.  
Cross veins of wings not clouded ..... *pulchella*.
4. Third joint of the antennae nearly rounded ..... 5  
Third joint of the antennae short, ovate ..... *nigrovittata*.
5. Front of female lightly rugose ..... *lata*.  
Front of female strongly rugose ..... *nigripes*.

**CHYSOGASTER—Meigen.**

14. *C. BELLULA* Williston. (Plate I, Figs. 5, 5a.) Habitat:

Colorado, Fort Collins; Washington and New Mexico.

15. *C. LATA* Loew. (Plate I, Fig. 6. Plate VII, Fig. 11.)  
Habitat: Colorado, seven specimens, Denver and Fort Collins; Oregon and British Nort America.

16. *C. NIGRIPES* Loew. (Plate I, Figs. 8, 8a.) Habitat: Colorado, Fort Collins; New York, New Jersey, North Carolina and Quebec.

17. *C. NICROVITTATA* Loew. (Plate I, Fig. 7.) Habitat: Colorado, Fort Collins, Garland; California and Washington.

18. *C. PICTIPENNIS* Loew. Habitat: Colorado, Fort Collins, one specimen; New Jersey, New York, Nebraska, Connecticut and Montral.

19. *C. PULCHELLA* Williston. Habitat: Colorado, New Hampshire, Connecticut, Michigan and Canada.

### **PIPIZA—Fallen.**

#### Key to Species.

- 1. Abdomen with a basal interrupted yellow fascia; wings with a brown spot in the middle ..... *festiva*
- Abdomen uniformly black ..... 2
- 2. Third joint of antennae at least twice as long as wide ..... 3
- Third joint scarcely twice as long as wide, o rrounded ..... 4
- 3. Third joint of antennae elongate; hind matatarsi much thickened, last section of fourth vein bent in its middle ..... *pulchella*.
- Third joint eliptical, hind metatarsi but slightly thickened; last section of the fourth vein bent at its antepenultimate third ..... *pistica*.
- 4. Chiefly white pilose, wings with a brownish cloud ..... 5
- Wings without a cloud ..... *pisticooides*.
- 5. Abdomen chiefly with short white pile ..... *modesta*.
- Abdomen black pilose, except on anterior angle and margins of segments ..... *puella*.

### **PIPIZA—Fallen.**

20. *P. FESTIVA* Meigen. (Plate I, Figs. 9, 9a.) Habitat: Colorado, Europe, Canada; two specimens, which agree very closely with the description.

21. *P. MODESTA* Loew. Habitat: Colorado, Fort Collins; New York, New Mexico and Canada.

22. *P. PISTICOIDES* Williston. Habitat: Colorado, numerous Fort Collins; New Hampshire, New York, Maine, and Alaska.

23. *P. PISTICA* Williston. Habitat: Colorado, Fort Collins, Estes Park, 9,000 ft.; Connecticut, Sherbrooke; Quebec, Montreal.

24. *P. PUELLA* Williston. Habitat: Colorado, 9,000 ft.; and New Hampshire.

25. *P. (PIPIZELLA) PULCHELLA* Williston. Habitat: Colorado, 8,000 ft.; Connecticut, Massachusetts and Florida.

### PARAGUS—Latreille.

#### Key to Species.

1. Scutellum with a yellow border, face of male without a black medial stripe; front of female narrowed above. .... *bicolor*.  
Scutellum without yellow border; face of both sexes with a black medial stripe; front in female of equal width; vertical triangle large in male, abdomen more or less red ..... *tibialis*.

### PARAGUS—Latreille.

26. *P. BICOLOR* Fabricus. (Plate I, Fig. 11. Plate VII, Fig. 4.) Habitat: Colorado, numerous Fort Collins, Denver; Europe, New York and Quebec.

27. *P. TIBIALIS* Fallen. (Plate I, Fig. 12. Plate VII, Fig. 5.) Habitat: Colorado, Cherokee, Estes Park, numerous; California and Europe.

### CHILOSIA—Meigen.

#### Key to Species.

1. Eyes pilose ..... 2  
Eyes bare ..... 7
2. Legs black ..... *aldrichi*.  
Tibia at least more or less light colored ..... 3
3. Third joint of the antennae light reddish-yellow or yellow ..... 4  
Third joint of the antennae black or reddish-brown ..... 5
4. Scutellum with marginal bristles, arista brown, abdomen opaque ..... *petula*.  
Scutellum without marginal bristles, tibiae largely red; arista bare, yellow at apex ..... *punctulata*.
5. Third antennal joint quadrate ..... 6  
Third antennal joint rounded, shining portion of the abdomen metallic-green, pile of front black ..... *occidentalis*.
6. Face produced considerably below the eyes; in profile almost vertical below the antennae ..... *lasiophthalma*.  
Face strongly concave below the antennae ..... *baroni*.
7. Legs black; at most lighter at knees ..... 8  
Tibia at least yellow ..... 10
8. Third antennal joint black ..... 9  
Antennae moderate in size, third joint brown; arista plumose; general color blackish ..... *willistoni*.
9. Scutellum with bristle-like hair ..... *laevis*.  
Scutellum destitute of such hairs ..... *lucta*.
10. Scutellum without marginal bristles ..... 11  
Scutellum with marginal bristles ..... 12

11. Abdomen entirely shining in both sexes ..... *comosa*.  
 Abdomen in large part opaque, at least in the male; pile of front black; four anterior tibia yellow at base and apex ..... *tarda*.
12. Arista briefly pubescent; femora dark-colored; dorsum of thorax with a black pile ..... *sororcula*.  
 Abdomen of the male largely opaque; posterior femora yellow at base and apex; scutellum yellow except the narrow base ..... *pallipes*.

### CHILOSIA—Meigen.

28. C. *ALDRICHI* Hunter. Habitat: Colorado, Pike's Peak; and Idaho.

29. C. *BARONI* Williston. Habitat: Colorado, California and Washington.

30. C. *CHRYSOCHLAMYS* Williston. Habitat: Colorado.

31. C. *COMOSA* Loew. (Plate I, Fig. 15.) Habitat: Colorado, Winnipeg, Quebec.

32. C. *LAEVIS* Bigot. Habitat: Colorado, Pike's Peak, and Washington.

33. C. *LASIOOPHTHALMUS* Williston. Habitat: Colorado, Ute Creek, Snow; Alaska; and New Hampshire.

34. C. *LUCTA* Snow. Habitat: Colorado, Manitou, 8,500 ft., July.

35. C. *OCCIDENTALIS* Williston. (Plate I, Figs. 13, 13a.) Habitat: Colorado, Ute Pass; Alaska, California, Quebec and New Mexico.

36. C. *PALLIPES* Loew. Habitat: Colorado, Washington, Oregon, California, New Hampshire and Montreal.

37. C. *PARVA* Williston. (Plate I, Fig. 14.) Habitat: Colorado and Oregon.

38. C. *PELULCA* Williston. Habitat: Colorado, Washington and New Hampshire.

39. C. *PUNCTULATA* Hunter. Habitat: Colorado, 6,000 ft.; and Nebraska.

40. C. *SORORCULA* Williston. Habitat: Colorado and New Mexico.

41. *C. TARDA* Snow. Habitat: Colorado, C. P. Gillette, Fort Collins.

42. *C. WILLISTONI* Snow. Habitat: Colorado and California.

### BACCHA—Fabricius.

Key to Species.

1. Abdomen elongate distinctly narrowed towards the base, more or less club-shaped or spalulate ..... 2  
Abdomen shorter than the wings; either broadest toward the base, or with parallel sides; not cylindrical or clubbed ..... (*Ocyptamus*)
2. Third joint of antennae elongate oval, obtusely pointed, face very prominent. .... *clavata*.  
Third antennal joint short, oval, obtusely rounded, face, not prominent ..... 3
3. Wings cinerous hyaline, without distinct dark markings, abdomen very slender ..... *obscuricornis*.  
Wings more or less brownish or blackish ..... 4
4. Wings hyaline with brownish incomplete cross-band between the first and fifth veins scutellum translucent yellowish brown with a metallic reflection. .... *lemur*.  
Wings with a triangular hyaline space behind the outer end of the third vein, axillary portion more or less sub-hyaline ..... *fuscipennis*.

### BACCHA—Fabricius.

43. *B. CLAVATA* Fabr. (Plate II, Fig. 1.) Habitat: Colorado, Rocky Mountains; Georgia, Florida, Arizona, California, Mexico, New Mexico, Jamaica, New Jersey, West Indies and Guadeloupe.

44. *B. FUSCIPENNIS* Wiedemann. Habitat: Colorado, Connecticut, Massachusetts, Indiana, New York, Wyoming, Ottawa and Quebec.

45. *B. LEMUR* Osten Sacken. (Plate II, Figs. 2, 2a.) Habitat: Colorado (numerous), California, Wyoming and New Mexico.

46. *B. OBSCURICORNIS* Loew. Habitat: Colorado, California and Alaska.

### OCYPTAMUS—Marcquart.

47. *O. FUSCIPENNIS* Say. (Plate II, Fig. 3.) Habitat: Colorado, Connecticut, Florida, Kansas, Vera Cruz, Mexico, Jamaica, San Domingo, Guadeloupe.

### PYROPHAEA—Schiner.

48. *P. GRANDITARSUS* Forster. (Plate II, Figs. 4, 4a.) Habitat: Colorado, General North American and Europe.

**PLATYCHIRUS—St. Fargeau and Serville.**

Key to Species.

1. Front tibia in the male gradually dilated from the base, the tarsi gradually decreasing in width from the base to the tip, profile of the face only gently concave above the tubercle, the later small; cheeks convex below ..... 2  
Front tibia of the male slender, suddenly dilated at the tip, metatarsi much dilated, the remaining joints but slightly so; the front femora in the male with a thick row of pile on the posterior side, face in both sexes with a conspicuous tubercle; cheeks concave below ..... *peلتatus*.
2. Front tibia of the male, on the inner side towards the end, somewhat concave, the outer angle produced into a lappet-like process; legs yellow ..... 3  
Front tibia of the male gently or evenly convexed on the inner side; the outer process less conspicuous ..... 4
3. Yellow spots of the abdomen of both sexes very large, leaving only a median stripe and crown-band; hind femora and tibia yellow, front femora without bristles ..... *quadratus*.  
Second and third abdominal spots leave only a narrow hind border and median stripe; hind femora and tibia with a brown spot near the middle; front femora with a row of five or six long black bristles. .... *palmulosus*.
4. Front tibia of the male with a row of bristles ..... 5  
Front tibia without such bristles; second abdominal spots in both sexes small, rounded; fifth segment of the male without yellow ..... *hyperboreus*.
5. Abdominal spots of the second segment large ..... 6  
Abdominal spot of the second segment small, front femora with long white bristles, behind at the base and a few long black hairs at the tip ..... *clypeatus*.
6. Abdominal spots in the male dark, base of the front femora behind with a long silky split hair, thence a long tangle of black hairs, separated into two clusters, these are followed at wide intervals with three solitary black hairs ..... *albimanus*.  
Abdominal spots yellow, fifth segment with a small yellow spot; front femora of the male with a row of five to seven long bristly hairs ..... *chaetopodus*.

**PLATYCHIRUS—St. Fargeau and Serville.**

49. *P. ALBIMANUS* Fabr. Habitat: Colorado, 7,000 ft.; New Hampshire, Alaska and England.
50. *P. CLYPEATUS* Meigen. Habitat: Colorado and Europe.
51. *P. CHAETOPODUS* Williston. Habitat: Colorado and Washington.
52. *P. HYPERBOREUS* Staeger. Habitat: Colorado, Pennsylvania, New Hampshire, New York, Montreal and Greenland.
53. *P. PALMULOSUS* Snow. Habitat: Colorado.
54. *P. PELTATUS* Meigen. (Plate II, Figs. 5, 5a.) Habitat:

Colorado (numerous), New York, Pennsylvania, New Hampshire, Alaska and Northern Europe.

55. *P. QUADRATUS* Say. (Plate II, Figs. 6, 6a, 6b.)  
Habitat: Colorado (numerous), Estes Park, Cherokee Park, U. S. in general, Alaska, Montrea and Quebec.

### MELANOSTOMA—Schiner.

#### Key to Species.

- |   |                         |
|---|-------------------------|
| 1. Legs quite slender; the metatarsi of the male not, or but very slightly, thickened; abdomen of the male with three pairs of reddish yellow spots.....  | 2                       |
| Hind metatarsi of the male always somewhat thickened; bands of the abdomen metallic or greenish, not reddish-yellow .....   | 6                       |
| 2. Tubercl of the face not at all prominent, indistinct; abdomen not elongate, not broadest at the tip of fourth segment, spots quadrate; in the female oval, with four pairs of triangular spots ..... | <i>mellinum</i>         |
| Tubercl of the face large .....   | 3                       |
| 3. Tubercl flattened .....  | 4                       |
| Tubercl rounded .....   | 5                       |
| 4. Tubercl compassed, epistoma not prominent; abdomen not narrow, first yellowish spots small, rounded; spots of the third and fourth segments large and square .....                                   | <i>kelloggi</i>         |
| Tubercl depressed; face yellowish; sides of the abdomen nearly parallel .....   | <i>cherokeenensis</i> . |
| 5. Abdominal spots rectangular reaching the lateral margin .....  | <i>monticolo</i> .      |
| Abdominal spots sub-ovate and do not reach the lateral margin.....  | <i>johsoni</i> .        |
| 6. Pollen of the face leaves small circular confluent spots, ripple-like, of the ground color; second abdominal segment distinctly broader behind .....   | <i>stegnum</i> .        |
| Pollen of the face uniform, or if somewhat ripple-like, not composed of circular spots .....  | 7                       |
| 7. Pollen of the face uniform; pile of the thorax whitish; abdomen slender; second abdominal segment with a pair of small yellowish spots near its middle .....   | <i>coerulescens</i> .   |
| Second abdominal segment without the lateral yellowish spots .....  | <i>concinnum</i> .      |

### MELANOSTOMA—Schiner.

56. *M. CHEROKEENENSIS* Jones. (Plate II, Fig. 8) Habitat: Cherokee Park, 7,600 ft., Colorado. Two males, one female, C. S. Mead, Collector, July 30, 1913.

57. *M. COERULESCENS* Williston. Habitat: Colorado, 7,800 feet.

58. *M. CONCINNUM* Snow. Habitat: Colorado up to 10,000 ft., New Mexico.

59. *M. JOHNSONI* Jones. Habitat: Denver, Colorado, two females, S. A. Johnson, collector, April 4, 1902.

60. *M. KELLOGGI* Snow. Habitat: Colorado, Windy Gulch, Fort Range, near Estes Park, 11,000 ft. June 25,, Prof. V. L. Kellogg, collector.

61. *M. MELLINUM* Linne. Habitat: Colorado, North American and Europe.

62. *M. MONTICOLO* Jones. (Plate II, Figs. 9, 9a.) Habitat: Cherokee Park, six females, Estes Park and Carbondale, Colorado; C. S. Mead and J. C. Bradley, collectors, July, 1913; July 12, 1908.

63. *M. RUFIPES* Williston. Habitat: Colorado and Washington.

64. *M. STEGNUM* Say. (Plate II, Fig. 7. Plate VII, Fig. 9.) Colorado (numerous), California, Arizona, Mexico, Alaska, Brazil, Argentina, Chili.

### LEUCOZONA—Schiner.

65. *L. LUCORUM* Linne. Habitat: Colorado, Washington, Alaska, Canada and Europe.

### EUPEODES—Osten Sacken.

#### Key to Species.

1. Abdominal spots attain the lateral margin ..... 2  
Abdominal spots do not attain the lateral margin..... *volucris*.
2. First, second and third abdominal spot attain the lateral margin..... *weldoni*.  
First abdominal spots only, reaching the lateral margin; second and third do not ..... *braggi*.

### EUPEODES—Osten Sacken.

66. *E. BRAGGI* Jones. Habitat: Grand Junction, two males and five females, Fort Collins, Colorado, L. C. Bragg and G. P. Weldon, collectors.

67. *E. VOLUCRIS* Osten Sacken. (Plate II, Fig. 10. Plate VI, Figs. 1, a, b, c, d, e, f.) Habitat: Colorado (numerous), general in U. S.

68. *E. WELDONI* Jones. (Plate VIII, Figs. 12, a, b.) Habitat: Three female specimens, Grand Junction, Fort Collins, Colorado, G. P. Weldon, collector.

### DIDEA—Macquart.

69. *D. FASCIATA FUSCIPES* Loew. (Plate II, Figs. 11, 11a. Plate VIII, Figs. 11, a, b.) Habitat: Colorado, Pennsylvania, Con-

necticut, South Dakota, New Mexico, New Jersey, New Hampshire, Quebec and Europe.

### LASIOPHTHICUS—Rondani.

70. *L. PYRASTRI* Linne. (Plate II, Figs. 12, 12a. Plate VIII, Figs. 1, a, b.) Habitat: Colorado, Kansas, Wyoming, Washington, Oregon, Utah, Arizona, England, Germany, France, Italy, Canary Islands, Algiers, Chile.

### SYRPHUS—Fabricius.

#### Key to Species.

1. Three principal bands of the abdomen entire ..... 27  
Three principal bands interrupted ..... 2  
The first cross-band interrupted, the other entire ..... 13
2. Eyes pubescent or pilose ..... 3  
Eyes bare ..... 7
3. Abdominal spots arcuate or crescentic ..... 4  
Abdominal spots straight or transverse; third antennal joint scarcely longer than broad; face with a black stripe; second and third spots do not reach the lateral margin ..... *sodalis*.
4. Abdominal spots do not attain the lateral margin ..... 5  
Abdominal spots reach quite to the lateral margin, or, if not, the spots are but little oblique; emarginated in front often broken up into smaller spots ..... 6
5. Face yellow with a greenish tinge, middle and oral margin black; cheeks brownish-yellow with a broad black stripe ..... *creper*.  
Face yellow; with a broad median stripe, not reaching the antennae; cheeks shining black, front of female broad ..... *pauxillus*.
6. Face dingy brownish-yellow, with a broad brown median stripe; cheeks black, with greenish reflection; oral border, antennae, and vertex, black; the third and fourth segments with a pair of lunate spots, club-shaped on the inner, and truncate on the outer margins ..... *amalopsis*.  
Face brownish yellow, with a broad black median stripe, abbreviated before the antennae, and narrower than yellow portions of the face on each side of it; the third and fourth abdominal segment with a pair of deeply lunate spots, club-shaped at both ends ..... *intrudens*.
7. Abdominal spots of the third and fourth segment distinctly arcuate ..... 10  
Abdominal spots straight, transverse ..... 8
8. Face with a black median stripe, all abdominal spots of nearly equal width ..... *umbellatum*.  
Face without a black median line ..... 9
9. First pair of abdominal spots small, second and third large, nearly square, all three pairs of abdominal spots distinctly separated from the lateral margin. cheeks black ..... *disjectus*.  
First pair of abdominal spots rather large, rounded. Second and third sub-rectangulate, all spots attenuated, and reaching the lateral margin; cheeks yellow ..... *similis*.

10. Face yellow with a black median stripe ..... 11  
 Face yellowish; no such facial stripe ..... 12
11. First abdominal band transversely oblique, attenuated, and reaching the lateral margin; second and third arcuate and do not reach the lateral margin; cheeks bluish black; legs yellowish, base of femora black; abdomen but little shining ..... *marginalus*.  
 First abdominal band transverse, elongate-oval, separated from the lateral margin; cheeks shining green; legs yellowish-red; abdomen principally shining ..... *arcualus*.
12. Face brownish yellow, cheeks greenish black; arcuate bands do not attain the lateral margin; segments four and five shining ..... *montivagus*.  
 Face bluish yellow; oral margin shining black; cheeks black; first abdominal spots semi-ovate, attenuated, and reaching margin at extreme tip; second and third abdominal spots coma-shaped, attenuated, and reaching the lateral margin; sides of abdomen nearly parallel ..... *flukei*.
13. Abdomen narrow, with nearly parallel sides; face yellow, bluish reflection, sometimes brown in middle; legs yellow; wings of female with a brownish shade at apex, often obsolete in males ..... *diversipes*.  
 Abdomen distinctly oval ..... 14
14. Femora black at base ..... 15  
 Femora yellow ..... 24
15. Second and third abdominal cross-bands attain the lateral margins ..... 22  
 Second and third bands do not reach the lateral margin ..... 16
16. Eyes bare ..... 17  
 Eyes pubescent; the spots on the second segment separated from lateral margin; second and third bands bilaterally oblique ..... *lotus*.
17. Cheeks black; second cross-band does not reach the lateral margin ..... *americanus*.  
 Second abdominal spots attain the lateral margin ..... 18
18. Cheeks black ..... 19  
 Cheeks wholly yellow; the first abdominal spots reaching the lateral margin *opinator*.
19. Face with median black stripe, which does not reach the antennae ..... 21  
 Face yellow, no median stripe ..... 20
20. Cheeks and oral margin black, abdomen principally opaque, second and third abdominal bands sub-interrupted, and do not reach the lateral margin ..... *ruficauda*.  
 Second abdominal spots attain lateral margin at the apex only; face without a brown stripe; tubercle sometimes brown ..... *abbreviatus*.
21. Second and third arcuate bands sub-interrupted; hind femora black except apex, front femora black about one-third their length ..... *meadii*.  
 Second and third bands entire, not reaching the lateral margin; hind femora yellowish-brown on distal half ..... *americanus*.
22. Eyes pubescent, face and cheeks yellow; yellow spots of the second abdominal segment elliptical, attenuated, touching the lateral margin ..... *torvus*.  
 Eyes bare ..... 23
23. Abdominal cross-bands attenuated and touching the lateral margins at their tips ..... *ribesii*.  
 Abdominal cross-bands reaching the lateral margin in nearly their full width ..... *grossulariae*.

24. Second and third abdominal cross-bands attain the lateral margin ..... 25  
     Second and third cross-bands do not reach the lateral margin ..... 26
25. Second and third cross-bands attenuated at their tips; face and cheeks yellow ..... *ribesii*.  
     Second and third bands broad, not distinctly narrowed; attaining the margin at their full width ..... *xanthostomus*.
26. Cheeks black; first pair of abdominal spots narrowly separated from margin ..... *americanus*.  
     Cheeks wholly yellow; first pair of abdominal spots quite reach the margin. .... *opinator*.
27. Face yellow; second and third cross-bands attain the lateral margin. .... *abbreviatus*.  
     Face with a black median stripe ..... 28
28. Second and third cross-bands do not attain the lateral margin; cheeks black ..... *americanus*.  
     Second and third abdominal cross-bands attain the lateral margin; cheeks brown ..... *medius*.

(See preplexus.)

### SYRPHUS—Fabricius.

71. *S. ABBREVIATUS* Zetterstedt. Habitat: Colorado (numerous), Massachusetts, Connecticut, Montreal and Europe.

72. *S. AMALOPIS* Osten Sacken. Habitat: Colorado (rare), New Hampshire, New Mexico, New Jersey and Alaska.

73. *S. AMERICANUS* Wiedemann. (Plate II, Figs. 13, 13a. Plate VI, Figs. 2, a, b, c, d.) Habitat: Colorado (numerous), New York, Delaware, Virginia, Michigan, Mexico, Quebec and New Mexico.

74. *S. ARCUATUS* Fallen. (Plate VI, Figs. 6, a, b.) Habitat: Colorado, common generally throughout United States, Europe, Hudson Bay and Nova Scotia.

75. *S. ARCUATUS* var. *Lappincus* Zetterstedt. Four specimens, Fort Collins, Colorado.

76. *S. CREPER* Snow. Habitat: Colorado, Estes Park, 7,500 to 9,500 ft.

77. *S. DISJECTUS* Williston. Habitat: Colorado, Washington and New Hampshire.

78. *S. DIVERSIPES* Macquart. Habitat: Colorado, Washington, New Hampshire, New York, Alaska, Newfoundland and Lake Superior.

79. *S. GLOSSULARIAE* Meigen. Habitat: Colorado, New England, Washington, Middle States and Quebec.

80. *S. FLUKEI* Jones. (Plate VIII, Figs. 6, a, b.) Habitat: Fort Collins, Colorado, One specimen, May 8, 1915, on plum blossom, Chas. Fluke, collector.

81. *S. INTRUDENS* Osten Sacken. Habitat: Colorado, California, New Mexico, Alaska, Hudson Bay Territory.

82. *S. LOTUS* Williston. Habitat: Colorado and Arizona.

83. *S. MARGINATUS* Jones. Habitat: Fort Collins, Colorado, Two males, L. C. Bragg, collector.

84. *S. MEADI* Jones. Habitat: Fort Collins, Colorado. Eight specimens, seven females and one male, C. S. Mead, collector.

85. *S. MEDIUS* Jones. Habitat: Fort Collins, Colorado, one specimen, L. C. Bragg, collector.

86. *S. MONTIVAGUS* Snow. Habitat: Colorado above timber-line, Estes Park, August, 11,000 to 12,000 ft.

87. *S. OPINATOR* Osten Sacken. Habitat: Colorado, California, New Mexico, Oregon and Washington.

88. *S. PAUXILLUS* Williston. Habitat: Colorado and New Mexico.

89. *S. PERPLEXUS* Osburn. Habitat: Colorado, California, Washington, Massachusetts, New York, Pennsylvania, New Hampshire, Alberta, British Columbia and Quebec.

90. *S. RIBESII* Linne. Habitat: Colorado, general throughout United States, Alaska and Montreal.

91. *S. RUFICAUDA* Snow. Habitat: Colorado and New Mexico.

92. *S. SIMILIS* Jones. (Plate VIII, Figs. 10, a, b.) Habitat: Estes Park, Colorado, One specimen, female, 7,600 ft., July 15, 1912. G. P. Weldon, collector.

93. *S. SODALIS* Williston. Habitat: Colorado.

94. *S. TORVUS* Osten Sacken. (Plate VIII, Fig. 9, a, b.) Habitat: General throughout United States, Canada and Europe.

95. *S. UMBELLATARUM* Fabr. Habitat: Colorado, Arizona, New Hampshire, Europe, Quebec and Nova Scotia.

96. *S. XANTHOSTOMA* Williston. Habitat: Colorado, Pennsylvania and Quebec.

96a. *S. TRIANGULIFER* Zetterstedt. (Plate VI, Figs. 4, a, b, c, d.) Habitat: Fort Collins. Two specimens, bred from *Chitophorus Populifolii*. These species agrees with *Verrall's* descriptions.

### **ALLOGRAPTA—Osten Sacken.**

97. *A. OBLIQUA* Say. (Plate II, Figs. 14, 14a.) Habitat: Colorado, common even above timberline, general in U. S., Mexico, Quebec and Argentina.

### **XANTHOGRAMMA—Schiner.**

98. *X. HABILIS* Snow. Habitat: Colorado and New Mexico.

### **MESOGRAMMA—Loew.**

Key to Species.

1. Hind femora in male thickened and arcuate, tibiae dilated at tips ..... *geminata*.  
Hind femora in male simple, scutellum, legs, except hind tarsi, and lateral margins of third to fifth abdominal segments yellow ..... *marginata*.

### **MESOGRAMMA—Loew.**

99. *M. GEMINATA* Say. (Plate III, Figs. 1, 1a.) Habitat: Colorado, general in United States and Canada.

100. *M. MARGINATA* Say. Habitat: Colorado, United States common, Mexico, Montreal and Quebec.

### **SPHAEROPHORIA—St. Fargeau and Serville.**

Key to Species.

1. Abdominal bands entire ..... 2  
Abdominal bands interrupted, a yellowish spot on the thorax next to the scutellum ..... *interrupta*.
2. Hypopygium large with a tuft of yellow pile below the globular part in front.  
The yellow thoracic margin distinct only to the suture ..... *cylindrica*.  
Large species 10 to 12 mm. yellow. Thoracic margin entire, i. e. it reaches the scutellum, abdominal cross-band emarginate ..... *scripta*.

### **SPHAEROPHORIA—St. Fargeau and Serville.**

101. *S. CYLINDRICA* Say. (Plate III, Figs. 2, 2a.) Habitat: Colorado, common in United States and Quebec.

102. *S. SCRIPTA* Linne. Habitat: Colorado, Canada, Nova Scotia and Europe.

103. *S. INTERRUPTA* Jones. (Plate III, Fig. 3.) Habitat: One female, Happy Hollow, Colorado, C. S. Mead, collector.

### SPHEGINA—Meigen.

104. *S. INFUSCATA* Loew. (Plate III, Figs. 4, 4a.) Habitat: Colorado, Oregon, Alaska and New Hampshire.

### NEOASCIA—Williston.

#### Key to Species.

- Antennae red, brownish on the upper border; front and middle femora black at the base ..... *distincta*.
- Antennae blackish, third joint on the lower part red; front and middle femora black, except at the tip and base ..... *globosa*.

### NEOASCIA—Williston.

105. *N. DISTINCTA* Williston. Habitat: Colorado and Massachusetts.

106. *N. GLOBOSA* Williston. (Plate III, Figs. 5, 5a.) Habitat: Colorado, New England, New York, Oregon, New Jersey, Quebec and Montreal.

### RHINGIA—Scopoli.

107. *R. NASCIA* Say. (Plate III, Figs. 6, 6a.) Habitat: General in United States, Montreal, Columbia and Mexico.

### HAMMERSCHMIDTIA—Scheimmel.

108. *H. FERRUGINEA* Fallen. Habitat: Colorado, Washington, Manitoba and Northern Europe.

### BRACHYOPA—Meigen.

#### Key to Species.

- 1. Face and front brownish; abdomen principally brown; scutellum brownish yellow ..... *vacua*.
- Face, front and abdomen reddish ..... 2
- 2. Second abdominal segment with circular spots, segments three and four with elliptical spots ..... *cynops*.
- Second, third and fourth abdominal segments with a narrow, posterior, transverse brownish band ..... *rufiabdominalis*

### BRACHYOPA—Meigen.

109. *B. CYNOPS* Snow. Habitat: Colorado.

110. *B. RUFIAABDOMINALIS* Jones. (Plate III, Figs. 7, 7a, 7b., Plate VIII, Figs. 8, a, b.) Habitat: Two male specimens, C. R. Jones, collector, Rist Canon, Colorado, on wild plum.

111. *B. VACUA* Osten Sacken. Habitat: Colorado Manitou Park, August; Canada, California and Pennsylvania.

### COPESTYLOM—Macquart.

112. *C. MARGINATUM* Say. (Plate III, Figs. 8, 8a, 8b.) Habitat: Colorado, Texas, Arizona, Montana, Mexico and Zenezneta.

### VOLUCELLA—Geoffroy.

#### Key to Species.

1. Thorax and abdomen very thickly furry, more or less yellowish pilose. Face greatly excavated below the antennae; arista long and densely plumose; second segment of the abdomen yellow on the sides; wings with a dark brown spot; large species ..... 2  
Thorax and abdomen not thickly pilose ..... 4
2. Face black or chestnut; yellowish pilose, dorsum of thorax and pleurae wholly yellowish pilose ..... *evecata*.  
Face yellow, or yellowish chestnut, thick yellow pile; cheeks black; dorsum of thorax and pleurae black pilose; or only with small tuft of yellow pile near the base of the wing ..... 3
3. Second abdominal segment black ..... var. *faciales*.  
Second abdominal segment with two reddish dorso-median spots ..... *rufomaculata*.
4. Deep black, green, violet, or coppery colored species; cheeks not light colored.... 5  
Prevailing color light, cheeks wholly yellow or with a black stripe ..... 7
5. Face much produced downwards into an acute cone; third joint of antennae elongate ..... 6  
Face obtuse below not produced downward, in the middle with an obtuse tubercle; third joint of antennae very short, triangular ..... *obesa*.
6. Face and front wholly black ..... *comstocki*.  
Face and front, except the cheeks, deep reddish yellow ..... *victoria*.
7. Face yellow ..... 8  
Face with black stripe, wings subfasciate ..... 9
8. Wings with a slightly conspicuous brown spot; third antennal joint rather short ..... *satur*.  
Wings with a distinct, though small, brown spot; third joint of the antennae elongate ..... *lau*.
9. Arista about one-half longer than the third antennal joint, thickly pilose above.... 10  
Arista slightly longer than the third antennal joint, loosely plumose ..... 11
10. Cheeks shining black; legs blackish, basal half of all tibiae yellowish ..... *fax*.  
Cheeks with a yellow stripe; middle tibiae with more than half yellow ..... *inops*.
11. Wings distinctly fasciate with brown, pleurae with two yellow spots; yellow band of the abdomen interrupted ..... *pusilla*.  
Wings less distinctly fasciate; pleurae with five or six yellow spots; yellow abdominal bands entire ..... *fasciate*.

**VOLUCELLA—Geoffroy.**

113. *V. COMSTOCKI* Williston. Habitat: Colorado, Arizona, New Mexico and Mexico.

114. *V. ERECTA* Walker. (Plate III. Figs. 9, 9a.) Habitat: United States in general, New Foundland, British possessions.

115. *V. FACIALIS* (Var. of *erecta*) Williston. Habitat: Colorado. C. P. Gillette, Colorado.

116. *V. FASCIATA* Macquart. Habitat: Colorado, Texas, Carolina, New Jersey, Kansas and Mexico.

117. *V. FAX* Townsend. Habitat: Colorado, Fort Collins, C. P. Gillette, collector.

118. *V. INOPS* Townsend. Habitat: Fort Collins, Colorado, C. P. Gillette, collector.

119. *V. ISABELLINA* Williston. (Plate VII, Figs. 6. a, b.) Habitat: Colorado, Arizona, New Mexico and Mexico.

120. *V. OBESA* Fabr. Habitat: Colorado (reported by L. A. Lowett, Oregon, expt. sta.), Florida, New Mexico, Brazil, Asia, S. A., Madagascar, E. Indies, Porto Rico, Jamaica.

121. *V. RUFOMACULATA* Jones. (Plate IV, Figs. 1, 1a.) Habitat: One male, one female, C. R. Jones and C. S. Fluke, collectors, Estes Park and Poudre Canon, Colorado.

122. *V. PUSILLA* (?) Macquart. Habitat: Colorado, Fort Collins, one specimen; Porto Rico.

123. *V. SATUR* Osten Sacken. (Plate IV, Figs. 2, 2a.) Habitat: Colorado, Utah, Kansas and New Mexico.

124. *V. TAU* Bigot. Habitat: Colorado, California and New Mexico.

125. *V. VICTORIA* Williston. Habitat: Colorado, 8,000 ft.; New Mexico, 8,500 ft.

**SERICOMYIA—Meigen.**

126. *S. MILITARIS* Walker. (Plate IV, Figs. 3, 3a. Plate VIII, Figs. 2, a, b.) Habitat: Colorado (numerous), New Mexico, New Hampshire, Hudson Bay, Nova Scotia, New York, Minnesota and Montreal.

**ARCTOPHILA—Schiner.**

127. *A. FLAGRANTS* Osten Sacken. (Plate IV, Figs. 4, 4a, 4b.) Habitat: Colorado, New Mexico (up to 10,000 ft.), South Dakota and Alaska.

**ERISTALIS—Latreille.**

## Key to Species.

1. Third segment of abdomen wholly shining without opaque spots or bands ..... 2  
Third segment with opaque markings ..... 4
2. Pile of the eyes mostly confined to a vertical stripe, abdomen wholly shining, large species ..... 3  
Pile of the eyes not confined to a vertical stripe; the black of the second abdominal segment at least, in part opaque ..... 9
3. Honey-bee like in appearance, moderately pilose, base of tibia yellowish, posterior tarsi blackish; arista nearly bare ..... *tenax*.  
Bumble-bee like in appearance; thorax and abdomen with thick long pile (on the dorsum of thorax sometimes blackish pilose, var *melanostomus*); Arista plumose, hind tarsi red ..... *flaviceps*
4. Thorax with one or more distinct light transverse dusky bands; front in female narrow above; hind femora slender, arista briefly pilose, the opaque black extends nearly the whole width of the front border ..... *transversus*.  
'Thorax without such bands ..... 5
5. Thickly pilose species, second, third and fourth segments of abdomen broadly reddish yellow on the sides, leaving a narrow black stripe which is wholly opaque on the second segment, and in front, at least, on the third segment; eyes narrowly separated in male ..... *montanus*.  
Moderately pilose species ..... 6
6. Third segment of abdomen broadly and conspicuously yellow on the sides, joining the yellow of the second segment, the black of the second segment wholly opaque, not extending outward on the sides behind; the third segment with an opaque spot in front, and an abbreviated cross-band behind; fourth segment metallic; eyes briefly contiguous in male ..... *meigenii*.  
Third segment not conspicuously yellow, the posterior opaque fascia of second segment reaching towards the lateral margins; eyes broadly contiguous in the male ..... 7
7. Front of female narrow; deep bluish black; scutellum but very little lighter; second segment of the abdomen with inconspicuous side spots; third and fourth segment with a narrow anterior velvety fascia ..... *saxorum*.  
Front of female broad, dorsum of thorax not shining steel blue ..... 8
8. Light markings of the abdomen usually quite distinct, third and fourth segments with a small, elongate, opaque black spot in front ..... *temporalis*.  
Light markings of the second segment distinct, of the third obscure brownish red near the basal corners, hind margin orange; stigma black; wings with a dark picture across the middle ..... *rupium*.
9. Pile of the dorsum yellowish; wings tinged only slightly with brown ..... 10  
Pile of the dorsum reddish on the sides, more obscure in the middle; wings with the basal two-thirds in front with brown; second segment of the abdomen with reddish side spots ..... *compactus*.

10. Second segment of the abdomen with yellow lateral triangles, and posterior, interrupted, or sub-interrupted velvety crossband; posterior margin of segments two and four yellowish white with a fringe of golden pile ..... *latifrons*.  
Second segment except the obsolete or metallic side spots, which extend the whole length of the segment, velvety black; third usually with a velvety triangle in front; the fourth with similar, but very much smaller; the yellowish white hind fringe less conspicuously with light colored pile ..... *meigenii*.

### ERISTALIS—Latreille.

128. *E. COMPACTUS* Walker. (Plate IV, Figs. 5, 5a.)  
Habitat: Colorado, one specimen; H. Bradley, collector; New Hampshire, Connecticut, Canada and Alaska.

129. *E. FLAVIPES* Walker. (Plate IV, Figs. 6, 6a.) Habitat: Colorado (numerous), New England, Washington, Minnesota, Alaska and Montreal.

129a. *E. FLAVIPES* (var. *Melanostomus*) Walker. (Plate VIII, Figs. 5, a, b.) One specimen, Fort Collins, Colorado.

130. *E. LATIFRONS* Loew. Habitat: Colorado (numerous), California, Kansas, Arizona, New Mexico, Texas, South Dakota and Mexico.

131. *E. MONTANUS* Williston. Habitat: Colorado (common), Wyoming, 7,000 ft.; Idaho and Nebraska.

132. *E. MEIGENII* Wied. Habitat: Colorado (numerous), New Hampshire, South Dakota, Utah, New England, Idaho, Wyoming, Alaska, South America and Montreal.

133. *E. OESTRACAE* Linne. Habitat: Colorado. Fort Lupton; Hudson Bay Territory. Specimen in National Museum, (Osburn det.)

134. *E. RUPIUM* Fabr. Habitat: Colorado, one specimen.

135. *E. SAXORUM* Wied. Habitat: Colorado, Georgia, Massachusetts, Connecticut, North Carolina and Pennsylvania.

136. *E. TEMPORALIS* Thomson. Habitat: Colorado (common), Washington, Oregon, California and Kansas.

137. *E. TENAX* Linne. (Plate IV, Fig. 7.) Habitat: General in United States, Montreal and Mexico.

138. *E. TRANSVERSUS* Wied. Habitat: Colorado, Atlantic States, Kansas, Illinois, Florida, Michigan, Va., Montreal, Canada and Quebec.

**TROPIDIA—Meigen.**

## Key to Species.

- Face only gently convex in profile; dorsum of thorax with two, narrowly separated, rather distinct median pollinose stripes; scutellum yellow along the border; femora of front and middle legs, on the basal half, black, reddish yellow elsewhere ..... *quadrata*.  
 Face distinctly concave in profile; dorsum of the thorax without the median pollinose stripes; scutellum shining black; femora of the front and middle legs, yellowish only at the apex ..... *incana*.

**TROPIDIA—Meigen.**

139. *T. INCANA* Townsend. Habitat: Colorado, Fort Collins, Longmont and Delta.

140. *T. QUADRATA* Say. (Plate IV, Figs. 8, 8a, 8b. Plate VII, Figs. 13, a, b.) Habitat: Colorado, Pennsylvania, Connecticut, Washington and Montreal.

**HELOPHILUS—Meigen.**

## Key to Species.

1. Face jutting forward into a cone, obtusely conic, abdomen with parallel sides ..... *hamatus*.  
 Face not conically produced forward ..... 2
2. Sixth longitudinal vein distinctly sinuous ..... 3  
 Sixth longitudinal vein straight or only gently curved ..... 5
3. Dark colored species; dorsum of thorax with two slender whitish-yellow stripes, narrowly interrupted at the suture and reaching about half way from the suture to the scutellum; scutellum light yellow; second abdominal segment with two large yellow triangular spots, extending the whole width of the segment ..... *dychei*.  
 Light colored species. Stripes of thorax distinct ..... 4
4. Front of female black pilose; front of male narrowed above ..... *similis*.  
 Front of female black pilose only near the ocelli; front of male broad ..... *latifrons*.
5. Antennae dark, third joint more or less reddish; abdomen with yellow bands ..... *obscurus*.  
 Antennae reddish yellow ..... 6
6. Abdomen elongate, cylindrical in the male; hind coxae of the male with a stout process below ..... *chrysostomus*.  
 Abdomen oval, face yellow, dorsum with distinct light-colored stripes ..... 7
7. Abdomen distinctly banded ..... *leatus*.  
 Third segment, except a small spot in front, and fourth, shining sub-metallic black ..... *bilinearis*.

**HELOPHILUS—Meigen.**

141. *H. BILINEARIS* Williston. Habitat: Colorado.

142. *H. CHRYSOSTOMUS* Wied. Habitat: Colorado, Georgia, New England, New York and Montreal.

143. *H. DYCHEI* Williston. Habitat: Colorado, New Mexico and Alaska.

144. *H. HAMATUS* Loew. Habitat: Colorado, Ute Pass, Hudson Bay Territory.

145. *H. LAETUS* Loew. (Plate VII, Figs. 7, a, b.) Habitat: Colorado, Connecticut, New York, Wisconsin, Illinois and Michigan.

146. *H. LATIFRONS* Loew. (Plate VII, Figs. 10, a, b, c, d.) Habitat: United States in general, Mexico, Montreal and Alaska.

147. *H. OBSCURUS* Loew. Habitat: Colorado.

148. *H. SIMILIS* Macquart. (Plate IV, Figs. 9, 9a, 9b.) Habitat: Colorado, Mexico, England, Canada, Indiana, Kansas, California, Montreal and New England.

### **ASEMOSYRPHUS—Bigot.**

149. *A. MEXICANUS* Macquart. (Plate V, Figs. 1, 1a, 1b.) Habitat: Colorado, Mexico, California, South Dakota and Washington.

### **MALLOTA—Meigen.**

#### Key to Species.

Legs wholly black, pile on the tip of the abdomen golden ..... *flavoterminata*.  
Hind tibiae and tarsi brownish, abdomen with brown spots ..... *palmerae*.

### **MALLOTA—Meigen.**

150. *M. FLAVOTERMINATA* Jones. (Plate V, Figs 2, 2a.) Habitat: Fort Collins, Colorado, Two specimens, one male, C. S. Mead, Poudre Canon, Colorado, 1913. Longmont, Colorado, One female, A. C. Maxson, on beet blossom.

151. *M. PALMERAЕ* Jones. (Plate V, Figs. 3, 3a.) Habitat: Fort Collins, Two males, one, C. S. Mead, collected on buckwheat, Platteville, Colorado, C. R. Jones, one male, taken on *Dichrocephala marginatum*.

### **TRIDONTA—Macquart.**

152. *T. CURVIPES* Wied. (Plate V, Figs. 4, 4a.) Habitat: Colorado, New England, California and Nova Scotia.

### **SYRITTA—St. Fargeau and Serville.**

153. *S. PIPiens* Linne. (Plate V, Figs. 5, 5a, 5b.) Habitat: General throughout United States at all seasons, one of our most common species.

**XYLOTA—Meigen.**

Key to Species.

1. Legs wholly black ..... 2  
Legs not wholly black ..... 3
2. Hind femora much thickened, abdomen chiefly red; the second segment with a basal black triangle; wings nearly hyaline ..... *pigra-rubbiginigaster*.  
Thorax with light marking, abdomen black, second and third segment with an opaque spot on each side ..... *metallifera*.
3. Second and third abdominal segment (at least) red ..... 4  
Second and third segment wholly black or with yellow spots ..... 6
4. Abdomen wholly red except the first segment; hind coxae of the male without a tooth below ..... *bicolor*.  
Abdomen except the first segment not wholly red ..... 5
5. Hind coxae of the male with a spur below ..... *flavitibia*.  
Hind coxae of the male without a spur below ..... *motha*.
6. Front and middle legs and a large part of the hind femora yellow; large species ..... 7  
Front and middle legs in a large part black ..... 8
7. Coxae black; thorax shining black ..... *curvipes*.  
Coxae yellow; thorax brownish bronze ..... *vecors*.
8. Abdomen with two pair of yellow spots ..... 9  
Abdomen wholly black ..... 12
9. Hind femora much thickened, small species, arista yellow at base ..... *fraudulosa*.  
Hind femora only moderately thickened ..... 10
10. Dorsum of thorax a greenish metallic black, a sericeous spot at the inner side of each humerus ..... 11  
Dorsum of thorax bronze; humeri dusky white; fourth and fifth segment bordered with pale yellow; legs black; base of tibias red; wings hyaline .. *coloradensis*.
11. Fourth abdominal segment brilliant bronze; third longitudinal vein gently curved ..... *analis*.  
Fourth abdominal segment black, third vein quite straight ..... *ejuncida*.
12. Abdomen shining bluish black, white pile ..... 13  
Abdomen sub-opaque, black, second and third segment with a large sub-triangular shining metallic spot, with white pile ..... 14
13. Legs black; hind femora thickened, hind tibiae arcuate, cinerous at apex; wings with a dark spot surrounding the anterior cross-vein ..... *nigromaculata*.  
Legs black, hind femora not thickened. Front tibia reddish-brown ..... *barbata*.
14. Arista wholly black, no white spot near the humeri ..... *obscurus*.  
Arista yellowish at base, humeri sericeous pollinose ..... *anthreas*.

**XYLOTA—Meigen.**

154. *X. ANALIS* Williston. Habitat: Colorado, California, New Mexico and Nebraska.

155. *X. ANTHREAS* Walker. Habitat: Colorado, New Hampshire and Montreal.

156. *X. BICOLOR* Loew. Habitat: Colorado (National Museum), Pennsylvania and Illinois.

157. *X. BARBATA* Loew. Habitat: Colorado, Washington, Oregon and California.

158. *X. COLORADENSIS* Bigot. Habitat: Colorado.

159. *X. CURVIPES* Loew. Habitat: Colorado, New Hampshire, New York, Minnesota, California, Central Europe and Canada.

160. *X. EJUNCIDA* Say. (Plate V, Figs. 8, 8a.) Habitat: United States in general, Alaska and Canada.

161. *X. FLAVITIBIA* Williston. (Plate V, Figs. 7, 7a.) Habitat: Colorado and California.

162. *X. FRAUDULOSA* Loew. Habitat: Colorado, New York, New Hampshire, Washington, Illinois, Wisconsin and Nebraska.

163. *X. METALLIFERA* Bigot. Habitat: Colorado.

164. *X. NICROMACULATA* Jones. Habitat: Fort Colins, Colorado. Three specimens, two females and one male. The male was taken by S. A. Johnson, on apple blossoms, and the two females were reared from pupae, taken from an old decaying stump by E. C. Hotchkiss, April 21, 1903.

165. *X. NOTHA* Williston. Habitat: Colorado.

166. *X. OBSCURA* Loew. Habitat: Colorado, Oregon, California, Red. R. of the North, Nebraska.

167. *X. PIGRA* Fabricius. (Plate V, Figs. 6, 6a.) Habitat: United States in general, Mexico, Germany and Canada.

168. *X. RUBIGINIGASTER* Bigot. Habitat: Colorado.

169. *X. VECORS* Osten Sacken. Habitat: Colorado, New Hampshire and Montreal.

#### **CHRYSOCHLAMYS—Rondani.**

170. *C. CROESUS* Osten Sacken. Habitat: Colorado, common, July and August, 7,000 to 9,500 ft.; New Mexico, California, Washington and Utah.

#### **BRACHYPALPLUS—Macquart.**

171. *B. PARVUS* Williston. Habitat: Colorado.

**CRIOPRORA, Osten Sacken**

## Key to Species.

- Dorsum of thorax clothed with thick yellow, or reddish-yellow pile, on the pleurae black; wings with brownish clouds along the veins. Front in female clothed with black pile; hind femora thickened, in male much more so and curved ..... *femorata*.  
 Dorsum of thorax clothed with long grayish, or yellowish gray pile, on the pleurae yellowish-white; abdomen deep bluish metallic ..... *cyanogaster*.

**CRIOPRORA—Osten Sacken.**

172. *C. CYANOGASTER* Loew. Habitat: Colorado, 8,000 ft.; Pennsylvania and Montreal.

173. *C. FEMORATA* Williston. (Plate V, Figs. 9, 9a.) Habitat: Colorado, Oregon and Washington.

**SPILOMYIA—Meigen.**

## Key to Species.

- Cross band yellow; first, third, and fifth interrupted or sub-interrupted; pleurae with five yellow spots besides the humeral and subalar ones; front of female with a black stripe ..... *interrupta*.  
 Cross band yellow, first and fifth interrupted, pleurae with only four spots besides the humeral and subalar ones; front of female yellow across the middle; scutellum with a yellow, disconnected spot on each side ..... *liturata*.

**SPILOMYIA—Meigen.**

174. *S. INTERRUPTA* Williston. (Plate V, Figs. 10, 10a. Plate VII, Figs. 2, a, b.) Habitat: Colorado and Washington.

175. *S. LITURATA* Williston. Habitat: Colorado and New Mexico.

**TEMNOSTOMA—St. Fargeau and Serville.**

176. *T. AEQUALIS* Loew. Habitat: Colorado, New England, British N. A.

**CERIA—Fabricius.**

## Key to Species.

- Antennal process slender, longer than the first joint of the antennae; second abdominal segment shorter than the third; third longitudinal vein bent deeply into the first posterior cell ..... *abbreviata*.  
 Antennal process as in *abbreviata*; second and third abdominal segments of nearly equal lengths ..... *tridens*.

**CERIA—Fabricius.**

177. *C. ABBREVIATA* Loew. (Plate V, Figs. 11, 11a, 11b.) Habitat: Colorado, New England, Virginia, Florida, Pennsylvania, Connecticut and Kansas.

178. *C. TRIDENS* Loew. Habitat: Colorado, California, Washington and New Mexico.

### NEW SPECIES OF COLORADO SYRPHIDAE.

*Microdon similis* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Two specimens, Poudre Canon, Colorado, C. S. Mead, collector.

*Melanostoma cherokeenensis* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Two males, one female, C. S. Mead, collector, Cherokee Park, 7,600 ft., July 30, 1913.

*Melanostoma johnsoni* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Denver, Colorado, Two females. S. A. Johnson, collector, April 4, 1902.

*Melanostoma monticola* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Cherokee Park, Estes Park, and Carbondale, Colorado. Six females. C. S. Mead and J. C. Bradley, collectors. July 12, 1908; July, 1913.

*Eupeodes braggi* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Seven specimens, two male, five female, Grand Junction, Fort Collins, Colorado, L. C. Bragg and G. P. Weldon, collectors. September 8, 1908.

*Eupeodes woldoni* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Grand Junction, Fort Collins, Colorado. Three specimens (females). G. P. Weldon, collector, August 14, 1909.

*Syrphus flukei* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Fort Collins, Colorado. One specimen. May 7, 1915. On plum blossom. Chas. Fluke, collector.

*Syrphus marginatus* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Fort Collins, Colorado. Two males. L. C. Bragg, collector. May 10, 1911.

*Syrphus meadii* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Fort Collins, Colorado. Eight specimens, seven females and one male. C. S. Mead, June 12, 1913.

*Syrphus medius* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Fort Collins, Colorado, one specimen. L. C. Bragg, collector, August 22, 1911.

*Syrphus similis* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Estes Park, 7,600 ft. One specimen, female, July 15, 1912, G. P. Weldon, collector.

*Sphaerophoria interrupta* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Happy Hollow, Colorado. One female. C. S. Mead, collector. August 13, 1913.

*Brachyopa rufiabdominalis* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Rist Canon, Colorado. Two male specimens. C. R. Jones, collector, on wild plum. May 12, 1915.

*Volucella rufomaculata* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Ectes Park and Poudre Canon, Colorado. One male, one female, C. R. Jones and C. S. Fluke, collectors, August, 1915.

*Mallota flavoterminata* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Fort Collins, Colorado. Two specimens, one male, C. S. Mead, Poudre Canon, 1913; Longmont, Colorado, one female, A Maxson, on beet blossoms.

*Mallota palmerae* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Fort Collins, Colorado, two males, one female, C. S. Mead, collected on buckwheat; Platteville, Colorado, C. R. Jones, taken on *Dichrophyllum marginatum*, June and August, 1915.

*Xylota nigromaculata* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Fort Collins, Colorado. Three specimens, two females, and one male. The male was taken by S. A. Johnson at apple blossoms and the two females were reared from pupae taken from an old decaying stump, by E. C. Hotchkiss, April 21, 1903.

Genus *Microxylota* Jones. Type of genus *Microxylota robii*.

*Microxylota robii* Jones. (Annals Entomological Society of America, Vol. X, 1917.) Habitat: Fort Collins, Colorado. Two specimens, males, collected by C. S. Mead, June and August, 1915.

### PART III. CATALOG OF KNOWN COLORADO SYRPHIDAE.

Since the publication of the Synopsis of North American Syrphidae by Dr. S. W. Williston, in 1886, numerous authors have published various articles relative to this family. This may be accounted for by the economic importance of these insects, the great number or forms and the attractiveness of the adults. As a whole, this family is decidedly beneficial because of the aphidivorus habits of the larvae.

The taxonomy of all the North American species up to 1886, has been fully discussed by Dr. Williston\*, Dr. W. A. Snow\*\*, Mr. W. D. Hunter\*\*\*, and C. H. Townsend\*\*\*\* have also contributed considerable knowledge to the species occurring in Colorado; therefore, it is only necessary to incorporate the forms previously described from Colorado with those that have been found to be new.

It require some degree of assurance on the part of the student to publish a species as new when he reflects upon the manner in which this country has been scoured in every direction by entomologists in quest of new forms. Colorado presents such a variation of climatic conditions and altitudes that there seem to be parts as yet a wilderness to the collector.

The present paper is a part of the results of a two-years study in the preparation of a Monograph of Colorado Syrphidae for a Master's Degree. This includes the various species of the family Syrphidae occurring in the collection of the Colorado State Agricultural College at Fort Collins, those collected by the writer on different trips throughout the State, and other known species from Colorado, and is to contribute to the knowledge of this well-systematized family.

In instances where a second reference is given, the original description could not be cited. The species prefixed with an asterisk occur in the Colorado Agricultural College collection. All other species occurring from Colorado, have, as far as possible, been located and the collection mentioned. Species not represented in the College collection, were, wherever possible, borrowed for examination. I wish to express my appreciation to my friends and correspondents to whom I am indebted for services rendered, such as the loan of material and furnishing of data relative to Colorado species.

#### MICRODON.

MEIGEN, Illig. Mga., II, 275, 1803; Syst. Beschr., III, 162, 1882.

LATREILLE, Hist. Nat. Crust. et Ins., XIV, 358, 1805 (*Aphritis*).

WIEDEMANN, Auss. Zweifl., II, 79, 1830 (*Ceratophya*).

MACQUART, Hist. Nat. Dipt. I, 486, 1834, (*Chymophila*) (O. S.)

NEWMAN, Ent. Mag., V, 372, 1838 (*Dimeraspis*).

WALKER, List. IV, 1157, 1849 (*Mesophila*); Dipt. Saund., 217, 1856 (*Ubristes*).

SCHINER, Fauna Austr., I, 249, 1862.

WILLISTON, Synop. N. A. Syrph., 3, 1886, def. and table of species; Biologia. Dipt., III, 2, 1891, syn. etc.

\*Bulletin U. S. Nat. Mus., No. 31, 1886.

\*\*Kans. Unive. Quart. I, 1, 33, 38; III, 4, 225, 262, 1892, 1895.

\*\*\*Canad. Ent. XXVIII, 227, 233; XXIX, 6, 121, 144, 1896-97.

\*\*\*\*Trans. Amer. Ent. Soc., XXII, 33, 55, 1895.

GIGLIO-TOS, Boll. Mus. Zool., VI, No. 108, 4, 1891; Ditt. del Mess. I, 38, 1892  
 (both *Omegasyrphus*). (Will.)

WHEELER, Psyche, July, 1901, larva in nest of *Pseudomyrmex* in Mex.

VERRALL, Brit. Flies, VIII, 658, 1901.

CHAGNON, Et. Prelim. les Syrph., 13, 190, tables of Quebec species 1901.

*M. coloradensis* Cockerell and Andrews,

Type Nat. Mus.; paper in press Nat. Mus., 1916.

*M. globosus* Fabricius, Syst. Ant., 185, (*Mulio*); Williston, Synop.

N. A. Syrph., 4, pl. I, f. 1, (fuscipennis Macq.) one specimen; Manitou Park, Colorado, Aug., (Snow); (Kans. Univ. Quart., III, 225, 1895.)

*M. megalogaster* Snow, Kans. Univ. Quart., I, 34, 1892; one specimen, Colorado. (Aldrich, Cat. N. A. Dipt., 346.)

\**M. tristis* Loew, Cent., V, 45; Williston, Synop. N. A. Syrph., 6, pl. I, f. 3; one specimen; Fort Collins, Colo.

*M. tristis* var. Cockerel and Andrews.

Type Nat. Mus.; paper in press Nat. Mus., 1916.

\**M. similis* Jones.

Two specimens; Poudre Canon, Fort Collins, Colorado.

*M. pallipennis* Snow.

Type in collection at Kans. Univ. (No reference or description could be found.)

#### CALLICERA.

PANZER, Fauna Germanica, CIV, 1806.

MEIGEN, Syst. Beschr., III, 155, 1822.

SCHINER, Fauna Austr., I, 248, 1862.

SNOW, Kans. Univ. Quart., I, 33, 1892

VERRALL, Brit. Flies, VIII, 655, 1901.

*C. montensis* Snow, Kans. Uni Quart., I, 34, pl. VII, f. 4, 1892; three specimens; Colorado, 9,000 ft.; Manitou Park; in Kans. Univ. collection

#### CHRYSOTOXUM

MEIGEN, Illig. Mag., II, 259, 1803; Syst. Beschr., III, 166, 1822.

SCHINER, Fauna Austr., I, 252, 1862.

WILLISTON, Synop. N. A. Syrph., 13, 1886, table of species, etc.

CHAGNON, Et. Prelim. les Syrph., 73, 1901.

VERRALL, Brit. Flies, VIII, 641, 1901.

\**C. derivatum* Walker, List III, 542; Williston, Synop. N. A. Syrph., 16, pl. I, f. 5; two specimens; Fort Collins, Happy Hollow, Colorado; Nat. Mus.

\**C. intregre* Williston, Synop. N. A. Syrph., 16; five specimens; Fort Collins, Happy Hollow, Delta, Colorado.

\**C. laterale* Loew, Cent. 42; Williston, Synop. N. A. Syrph., 14; two specimens; Estes Park, 7600 ft., Colorado.

\**C. pubescens* Loew, Wien. Ent. Monatschr., IV., 84; Williston, Synop. N. A. Syrph., 15; eight specimens; Poudre Canon, Happy Hollow, Ft Collins, Cherokee Park, Colorado.

\**C. ypsilon* Williston, Synop. N. A. Syrph., 14; one specimen, 17 mm. long; 7000 to 8500 ft., Colorado.

### CHRYSGASTER

- MEIGEN, Illig. Mag., II, 274, 1803; Syst. Beschr., III, 265, 1822.  
 MACQUART, Hist. Nat. Dipt., I, 563 (*Orthoneura*), 1834.  
 BIGOT, Rev. et Mag. Zool., 1859, 3 (*Cryptineura*).  
 SHINER, Fauna Austr., I, 266 and 271 (*Chrysogaster* and *Orthoneura*), 1862.  
 WILLISTON, Synop. N. A. Syrph., 31, 1886, table of species. etc.  
 VERRALL, Brit. Flies, VIII, 185, 186, 1901 (*Chrysogaster* and *Orthoneura*).  
 CHAGNON, Et. Prelim. les Syrph., 16, 1901, table of Quebec species.  
*C. bellula* Williston, Synop. N. A. Syrph., 36, pl. II, f. 6; three specimens in Kans. Univ. collection; Colorado Springs, Colo., August.  
 \**C. lata* Loew, Cent., IV, 59; Williston, Synop. N. A. Syrph., 37; six specimens, Fort Collins, Denver, Colorado.  
 \**C. nigripes* Loew, Cent., IV, 60; Williston, Synop. N. A. Syrph., 33, pl. II, f. 10; one specimen, Fort Collins, Colo.  
 \**C. nigrovittata* Loew, Zeitscher, fur Ges. Naturwiss., 378, 1876; Williston, Synop. N. A. Syrph., 34, pl. II, f. 11; one specimen; Cameron Pass, 12,000 ft., Colorado., C. P. Gillette, Collector.  
 \**C. pictipennis* Loew, Cent., IV, 58; Williston, Synop. N. A. Syrph., 37; one specimen; Fort Collins, Colorado.  
 \**C. pulchella* Williston, Synop. N. A. Syrph., 35, pl. II, f. 9; one specimen; Nat. Mus.

### PIPIZA

- FALLEN, Syrphidi, 58, 1816.  
 MEIGEN, Syst. Beschr., III, 241, 1822.  
 LOEW, Oken's Isis, 1840, 512 (*Triglyphus*).  
 RONDANI, Dipt. Ital. Prod., I, 53, 1856, (*Henringia*); II, 185, 1857, (*Pipizella*).  
 EGGER, Verh. Zool.-Bot. Ges., XV, 573, 1865, (*Cnemodon*).  
 PHILLIPPI, Verh. Zool-Bot. Ges., XV, 1865, 741 (*Penium*)  
 SCHINER, Fauna Austr., I, 261, 1862.  
 WILLISTON, Synop. N. A. Syrph., 22, def. and table of species, 1886; Biologia, Dipt., III, 6, bibl.  
 VERRALL, Brit. Flies, VIII, 161, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 18, 1901.  
 \**P. festiva* Meigen, Syst. Beschr., III, 243, 2; Williston, Synop. N. A. Syrph., 27, pl. II, f. 4; two specimens; Fort Collins, Colorado.  
*P. modesta* Loew, Centur. IV, 62; Williston, Synop. N. A. Syrph., 24; one female, Leadville, in Collection of Lafayette, Ind., J. A. M.  
 \**P. pisticoides* Williston, Synop. N. A. Syrph., 29, eighteen specimens; Fort Collins, Estes Park, Colorado.  
 \**P. pistica* Williston, Synop. N. A. Syrph., 29; two specimens; Fort Collins, Manitou, Colorado.  
*P. puella* Williston, Synop. N. A. Syrph., 27, pl. II, f. 3; one specimen; Colorado, Mts., 9000 ft.; Nat. Mus.  
*P. pulchella* Williston, Synop. N. A. Syrph., 29, pl. II, f. 1; Nat. Mus. and Kansas Univ. collection.

### PARAGUS

- LATREILLE, Dict. D'Hist. Nat., XXIV, 1804; Hist. Nat. Crust. et Ins. XIV, 358, 1804.  
 MEIGEN, Syst. Beschr., III, 176, 1822.

SCHINER, Fauna Austr., I, 256, 1862.

WILLISTON, Synop. N. A. Syrph., 17, 1886, def. and table of species.

VERRALL, Brit. Flies. VIII, 149, 1901.

CHAGNON, Et. Prelim. les Syrph., 21, 1901.

\**P. bicolor* Fabricius, Ent. Syst., IV, 297; Williston, Synop. N. A. Syrph., 18, pl. I, f. 7, 9; forty-three specimens; Fort Collins, Delta, Pueblo, Colorado.

\**P. tibialis* Fallen, Syrphidi, 60; Williston, Synop. N. A. Syrph., 19; twenty-five specimens; Cherokee Park, Fort Collins, Estes Park, Delta, Colorado.

### CHILOSLA

MEIGEN, Syst. Beschr., III, 296, 1822.

SCHINER, Fauna Austr., I, 273, 1862.

WILLISTON, Synop. N. A. Syrph., 38, 1886, table of species; Biologia III, 8, 1891, table of Central Am. spp.

BIGOT, Annales, 1883, 230, (Cartosyrphus). (Will.)

HUNTER, Canad. Ent., XXVIII, 229, 1896, table and catalogue of species; XXIX, 1897, table of new species.

VERRALL, British Flies, VIII, 205, 1901.

CHAGNON, Et. Prelim. les Syrph. 21, 1901.

(Note: The great work on this genus is the monograph by Theodor Becker Halle, 1894, with 13 plates. This includes only the palaearctic fauna, not that of North America.)

*C. aldrichi* Hunter, Canad. Ent., XXVIII, 229; Pike's Peak, Colorado, in Nebr. Univ. collection.

\**C. baroni* Williston, Synop. N. A. Syrph., 40; two specimens; Fort Collins, Rist Canon, Colorado.

*C. chrysolamys* Williston, Biologia, Dipt., III, 8, pl. I, f. 4; Ute Pass, Colorado, in Nebr. Univ. Collection.

\**C. comosa* Loew, Cent. IV, 66; Williston, Synop. N. A. Syrph., 44; two specimens; Fort Collins, Colorado.

*C. laevis* Bigot, Annales, 553, 1884; Williston, Synop. N. A. Syrph., 292; Pike's Peak, Colo., in Nebr. Univ. Collection.

\**C. lasiophthalmus* Williston, Proc. Amer. Phil. Soc., XX, 306, 1882; Synop. N. A. Syrph., 40, pl. III, f. 2; one specimen; Cherokee Park, Colorado.

*C. lucta* Snow, Kans. Univ. Quart., III, 228. Type in Kans. Univ. Collection; Manitou, Colorado, July.

*C. occidentalis* Williston, Proc. Amer. Phil. Soc., XX, 305; Synop. N. A. Syrph., 41, pl. III, f. 1. Ute Pass, Colo. in Nebr. Univ. Coll.

\**C. pallipes* Loew, Cent. IV, 70, Williston, Synop. N. A. Syrph., 41, pl. III, f. 5; one specimen; Cherokee Park, Colorado.

\**C. parva* Williston, Proc. Amer. Phil. Soc., XX, 307; Synop. N. A. Syrph., 45, pl. II, f. 13; one specimen, Delta, Colorado.

*C. petulca* Williston, Synop. N. A. Syrph., 39, pl. II, f. 15; specimens in Kans. Univ. Collection; Fort Collins, Colorado.

*C. punctulata* Hunter, Canad. Ent., XXIX, 129, fig. 6, a; Colorado, 6000 ft.; Nat. Mus.

\**C. sororcula* Williston, Biologia Dipt., III, 9; one specimen; Fort Collins, Colorado.

*C. tarda* Snow, Kans. Univ. Quart., III, 228. Type Kans. Univ. Collection; Fort Collins, Colorado.

\**C. willistoni* Snow, Kans. Univ. Quart., III, 228; one specimen; Type Kans. Univ. collection; Steamboat Springs, Colorado.

**BACCHA**

- FABRICIUS, Syst. Antl., 199, 1805.  
 MEIGEN, Syst. Beschr., III, 196, 1822.  
 SCHINER, Fauna Austr., I, 323, 1862.  
 WILLISTON, Synop. N. A. Syrph., 116, 1886, def. and table of species; Biologia, Dipt., III, 1891, 31, table of Central American spp.  
 CHAGNON, Et. Prelim. les Syrph., 41, 1901.  
 VERRAL, Brit. Flies, VIII, 455, 1901.  
 \**B. clavata* Fabricius, Ent. Syst., IV, 298; Williston Synop. N. A. Syrph., 117, pl. IV, f. 9 (*babista*); three specimens; Fort Collins, DeBeque, Colorado.  
*B. fascipennis* Wiedemann, Auss. Zweifl., II, 96; Williston, Synop. N. A. Syrph., 120, pl. IV, F. 7, *aurinota* (Harris Walker).  
 \**B. lemur* Osten Sacken, West. Dipt., 331; Williston, Synop. N. A. Syrph., 121; sixteen specimens; Fort Collins, Delta, DeBeque, Colorado.  
*B. obscuricornia* Loew, Cent., III, 26; (Reported in Williston, Synop. N. A. Syrph., 123).

**OCYPTAMUS**

- MACQUART, Hist. Nat. Dipt., I, 554, 1834.  
 WILLISTON, Synop. N. A. Syrph., 116, 1886, combines with *Baccha*; Manual, 86, 1896, reinstates.  
 O. *fuscipennis* Say, Jour. Acad. Sci. Phil., III, 100; Williston, Synop. N. A. Syrph., 119, pl. IV. f. 8, (*Baccha*). Two specimens, Colorado; Nat. Mus.

**PYROPHAEA**

- SCHINER, Wien. Ent. Monatsch., IV, 213, 1860; Fauna Austriaca, I, 297, 1864.  
 WILLISTON, Synop. N. A. Syrph., 54, def. and table of species, 1886.  
 VERRALL, Brit. Flies, VIII, 299, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 29, 1901.  
 P. *granditarsus* Foster, Ins. Cent. I, 199; Williston, Synop. N. A. Syrph. 55, pl. III, f. 13; two specimens; Nat. Mus., Colorado, 8000 ft.

**PLATYCHIRUS**

- ST. FARGEAU et SERVILLE, Encycl. Meth., X, 513, 1825 (*Platycheirus*)...  
 SCHINER, Fauna Austr., I, 292, 1862.  
 WILLISTON, Synop. N. A. Syrph., 56, def. and table of species, 1886.  
 VERRALL, Brit. Flies, VIII, 262, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 28, 1901.  
 P. *Albimanus* Fabr., Spec. Ins. II, 434, reported from Colorado; Williston, Synop. N. A. Syrph. (60 *ciliatus*) and by Snow, Kans. Univ. Quart., III, 247.  
 P. *clypeatus* Meigen, Syst. Beschr., III, 335; Verrall Brit. Flies, VIII, 293, 1901.  
 P. *chaetopodus* Williston, Synop. N. A. Syrph., 59; 1 specimen from Fort Collins, Colorado, in Kans. Univ. Coll.  
 \*P. *hyperboreus* Staeger, Groenl. Antl. 362; Williston, Synop. N. A. Syrph., 57, pl. III, f. 12; eight specimens from Fort Collins, Colorado; also in Kans. Univ. Collection.  
 P. *palmulosus* Snow, Kans. Univ. Quart., III, 231; type Colorado; Kans. Univ. Collection.  
 \*P. *peltatus* Meigen, Syst. Beschr., III, 334, *Syrphus*; Williston, Synop. N. A. Syrph.,

58, pl. III, f. 11. One specimen Green Mt. Falls, Colorado, July; in Kans. Univ. Collection.

\**P. quadratus* Say, Jour. Acad. Sci. Phil., III, 90; Williston, Synop. N. A. Syrph., 57, Pl. III, f. 10; sixteen specimens, Fort Collins, Denver, Estes Park, Colorado.

### MELANOSTOMA

SCHINER, Wien. Ent. Monatsch., IV, 213, 1860; Fauna Austr., I, 289, 1862.

WILLISTON, Synop. N. A. Syrph., 46, def and table of species; Biologia Dipt. III, 9, table of central American spp., 1891.

VERRALL, Brit. Flies, VIII, 303, 1901.

CHAGNON. Et. Prelim. les Syrph., 25, 1901.

\**M. cherokeenensis* Jones, three specimens Cherokee Park, 7600 ft.

\**M. coerulescens* Williston, Synop. N. A. Syrph., 49; five specimens 7800 ft., Estes Park, Ward, Fort Collins, Colorado.

*M. concinnum* Snow, Kans. Univ. Quart. III, 229, Colorado up to 10,000 ft.; type in Kans. Univ. Collection.

\**M. johnsoni* Jones, two females. Denver, Colo.

*M. kelloggi* Snow, Kans. Univ. Quart. III, 230; type Kans. Univ. Collection; Estes Park up to 11,000 ft.

*M. mellium* Linne, Syst., 10th ed., 594; Williston. Synop. N. A. Syrph., 49, pl. III, f. 9; four specimens.

\**M. monticola* Jones, six female, Cherokee and Estes Park, Colorado, 7600 ft.

*M. rufipes* Williston, Proc. Amer. Phil. Soc., XX, 306; Synop. N. A. Syrph., 47; two specimens, Colorado Nat. Mus.

\**M. stegnum* Say, Jour. Acad. Sci. Phil., VI, 163; Williston, Synop. N. A. Syrph., 47, pl. III, f. 8. (*tigrinum*) ten specimens, Fort Collins, Estes Park. Happy Hollow, Colorado up to 8000 ft.

### LEUCOZONA

SCHINER, Wien. Ent. Monatsch., IV, 214, 1860; Fauna Austr., I, 298, 1862.

WILLISTON, Synop. N. A. Syrph., 61, 1886.

MIK, Wien. Ent. Zeit., XVI, 62, notes, 1897.

VERRALL, Brit. Flies, VIII, 319, 1901.

*L. lucorum* Linne Syst. Nat., 10th ed., 591, (*Musca*). Reported by Williston, (Colorado); Synop. N. A. Syrph. 62.

### EUPEODES

OSTEN SACKEN, West. Dipt., 328, 1877.

WILLISTON, Synop. N. A. Syrph., 64, 1886.

\**E. braggi* Jones. Two males, five females, Fort Collins and Grand Junction. Colorado.

\**E. volucris* Osten Sacken, West., Dipt., 329; Williston, Synop. N. A. Syrph., 66, pl. III, f. 14. Over 200 specimens from all parts of Colorado.

\**E. weldoni* Jones, three females, Grand Junction and Fort Collins, Colorado.

### DIDEA

MACQUART, Hist. Nat. Dipt., I, 508, 1834.

MEIGEN, Syst. Beschr., VII, 140, 1838, (*Enica*).

SCHINER, Fauna Austr., I, 313, 1862.

WILLISTON, Synop. N. A. Syrph., 89, 1886.

VERRALL, Brit. Flies, VIII, 325, 1901.

\**D. fasciata* var. *fuscipes* Loew, Cent., IV, 82; Williston, Synop. N. A. Syrph., 89. One specimen, Colorado, in Nat. Museum. One specimen, Ft. Collins, Colo. W. P. Yetter, Collector.

### LASIOPHTHICUS

RONDANI, Dipt. Ital. Prod., I, 51, 1856; II, 137, 1857.

OSTEN SACKEN, West. Dipt., 325, 1877; Cat. 1878, 244 (both *Catabomba*).

BIGOT, Bull. Soc. Ent. France, 1882, No. 2, p. 20, syn.

WILLISTON, Synop. N. A. Syrph., 62, 1886 (*Catabomba*).

VERRALL, Brit. Flies, VIII, 333, 1901 (id.).

\**L. pyrastri* Linne, Syst. Nat., 10th ed., 594; Williston, Synop. N. A. Syrph., 63. pl. IV, f. 1; 26 specimens, Fort Collins, Grand Junction, Delta, Gunnison, Denver, Longmont, Colorado in general.

### SYRPHUS

FABRICIUS, Syst. Ent. 762, 1775; Syst. Antl., 248, 1805 (*Scaeava*)

MEIGEN, Syst. Beschr., III, 274, 1822.

SCHINER, Fauna Austr., I, 300, 1862.

OSTEN SACKEN, Boston Soc. Nat. Hist. XVIII, 1875, 135-153.

BIGOT, Bull. Soc. Ent. France, 1882, No. 6 (*Ischyrosyrphus* and *Ancyclosyrphus*); Annales, 1883, 251, 256, (id.).

WILLISTON, Synop. N. A. Syrph., 66, def. and table of species; Biologia, Dipt., III, 15, table of Central American species, 1891.

GIRSCHNER, III. Wochenschr. f. Ent., II, 569.

VERRALL, Brit. Flies, VIII, 321, and 338, 1901 (*Ischyrosyrphus* and *Syrphus*.)

CHAGNON, Et. Prelim. les Syrph., 30, 1901, with table of Quebec spec.

\**S. abbreviatus* Zetterstedt, Dipt. Scand., VIII, 3136 (*Scaeava*); Williston, Synop. N. A. Syrph., 81; 2 specimens, Fort Collins, Colorado.

*S. amalopis*, Osten Sacken, Proc. Bost. Soc. Nat. Hist., XVIII, 148, 175; Williston, Synop. N. A. Syrph., 69; one specimen, Nat. Museum.

\**S. americanus* Weidemann, Auss. Zweifl., II, 129; Williston, Synop. N. A. Syrph., 82; 40 specimens, Fort Collins, Estes Park, Longmont, Greeley, Denver, Boulder, Gunnison, Montrose, Manitou, up to 9500 ft., Delta, Colorado, seems to be general.

\**S. arcuatus* Fallen, Syrphici 42 (*Scaeava*); Williston, Synop. N. A. Syrph., 68; thirty specimens, Fort Collins, Greeley, Longmont, Denver, Delta, Manitou Park, General.

\**S. arcuatus* var. *lappincus* Zetterstedt, four specimens, Fort Collins, Colorado.

*S. creper* Snow; Kans. Univ. Quart., III, 234; 13 specimens, type in Kans. Univ. Collection, Deer Mt., Estes Park, August, 7500 to 9500 ft.

\**S. disjectus* Williston, Proc. Amer. Phil. Soc., XX, 314, (*disjunctus* Macq) Synop. N. A. Syrph., 72; 2 specimens, Fort Collins, Colorado.

\**S. diversipes* Macquart, Dipt., Exot., Suppl., IV, 155; Williston, Synop. N. A. Syrph. 76; five specimens, Fort Collins, Longmont, Colorado.

\**S. flukei* Jones, one specimen, Fort Collins, Colorado.

\**S. grossulariae* Meigen, Syst. Beschr., III, 306; Williston, Synop. N. A. Syrph., 80. pl. IV, f. 2, (*lesueurii*); five specimens, Cherokee Park and Fort Collins, Colorado.

\**S. intrudens* Osten Sacken, West. Dipt., 326; Williston, Synop. N. A. Syrph. 70; two specimens, Happy Hollow, Fort Collins, Colorado.

- \**S. lotus* Williston, Synop. N. A. Syrph., 75; two specimens, Fort Collins, Colorado.
- \**S. marginatus* Jones, two specimens, Fort Collins, Colorado.
- \**S. meadii* Jones, eight specimens, C. S. Mead, Coll., Fort Collins, Colorado.
- \**S. medioides* Jones, one specimen, Fort Collins, Colorado.
- S. montivagus* Snow, Kans. Univ. Quart., III, 236; Mt. Hallett, Estes Park, Colorado, August, above timberline, 11,000 to 12,000 ft.
- \**S. opinator* Osten Sacken, West. Dipt., 327; Williston, Synop. N. A. Syrph. 83; fifty specimens, Fort Collins, Grand Junction, Ward, Colorado.
- \**S. pauxillus* Williston, Synop. N. A. Syrph., 74; four specimens, Cherokee Park, Ward, Fruita and Fort Collins, Colorado.
- \**S. perplexus* Osborn, Jour. N. Y. Ent. Soc., XVIII, 55, pl. I, f. 4, 5, 6, 8; Williston, Synop. N. A. Syrph., 69, (*S. arcuatus* var. *arcuatus*) seven specimens, Fort Collins, Colorado.
- \**S. ribesii* Linne, Syst. Nat. 10th ed. 593 (*Musca*); Williston, Synop. N. A. Syrph., 77; twenty specimens, Grand Junction, Colorado, Fort Collins, Colorado.
- S. ruficauda* Snow, Kans. Univ. Quart., I, 36, pl. VII, fig. 3. Four specimens Colorado, in collection of Kans. University.
- \**S. similis* Jones, one specimen, Estes Park, Colorado.
- S. sodalis* Williston, Synop. N. A. Syrph. 74, Type from Colorado, three specimens, Nat. Mus.
- \**S. torvus* Osten Sacken, Proc. Bost. Soc. Nat. Hist., XVIII, 139; Williston, Synop. N. A. Syrph., 79; twenty specimens, Fort Collins, Denver, Colorado.
- \**S. umbellatarum* Fabricius, Ent. Syst., IV, 307; Williston, Synop. N. A. Syrph., 85; nine specimens, Fort Collins, Colorado, Happy Hollow and Hotchkiss, Colorado.
- S. xanthostoma* Williston, Synop. N. A. Syrph. 86; three specimens, Fort Collins, Colorado, and Arkins, Colorado.

### ALLOGRAPTA

- OSTEN SACKEN, Bull. Buffalo Soc. Nat. Hist., III, 49, 1876; Cat. 246, 1878.  
 WILLISTON, Synop. N. A. Syrph., 96, 1886.  
 CHAGNON, Et. Prelim. les Syrph., 37, 1901.
- \**A. obliqua* Say, Jour. Acad. Sci. Phil., III, 89, (*Scaeva*); Williston. Synop. N. A. Syrph., 96; one hundred specimens, general through Colorado, very common.

### XANTHOGRAMMA

- SCHINER, Wein. Ent. Monatsch, IV, 215, 1860; Fauna Austr., I, 318, 1862.  
 WILLISTON, Synop. N. A. Syrph., 91, def. and table of species, 1886.  
 MIK, Wien. Ent. Zeit., 1897, 65.  
 HUNTER, Canad. Ent., XXIX, 130, 1897.  
 VERRALL, Brit. Flies, VIII, 447, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 74, 1901.  
*X. habilis* Snow. Kans. Univ. Quart., III, 238; six specimens, Colorado; Nat. Mus.

### MESOGRAMMA

- LOEW, Cent., VI, 47, 1865; in Centuries, vol. II, p. 290, Loew proposes to change this name to *Mesograpta*, on account of *Mesogramma* having been used in botany; this would not now be a valid change.

- MACQUART, Dipt. Exot., Suppl., V, 93, 1855, (*Toxomerus*).  
 WILLISTON, Synop. N. A. Syrph., 98, 1886 (*Mesograpta*); Biologia Dipt., III,  
     24, 1891, def. and table of Central American species.  
 CHAGNON, Et. Prelim. les Syrph., 38, 1901.  
 \**M. germinata* Say, Jour. Acad. Sci. Phil., II, 92 (*Scaeva*); Williston, Synop. N. A.  
     Syrph., 102, pl. IV, f. 5; one specimen, Fort Collins, Colorado.  
 \**M. marginata* Say, Jour. Acad. Sci. Phil., II, 92 (*Scaeva*); Williston, Synop. N. A.  
     Syrph., 100, 294 (*Mesograpta*); over one hundred specimens; Fort Collins, Estes  
     Park, Pueblo, Gunnison, Montrose, Delta; a most common species.

### SPHAEROPHORIA

- ST. FARGEAU et SERVILLE, Encyl. Meth., X, 513, 1825.  
 MACQUART, Dipt. du Nord de la France, 1827, 216; Hist. Nat. Dipt., 551,  
     1834.

- LOEW, Oken's Isis, 1840, 573 (*Melithreptus*).  
 WALKER, Ins. Brit. Dipt., III, XXI (*Melitrophus*). 1856.  
 SCHINER, Fauna Austr., I, 315, (*Melithreptus*). 1862.  
 WILLISTON, Synop. N. A. Syrph., 104, def. and table of species, 1886;  
     Biologia, Dipt., III, 20, notes and table of species, 1891.  
 VERRALL, Brit. Flies, VIII, 426, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 40, 1901.

- \**S. cylindrica* Say, Amer. Ent., I, pl. XI; Williston, Synop. N. A. Syrph., 105,  
     pl. IV, f. 16; over a hundred specimens; Fort Collins, Estes Park, Cherokee Park,  
     Delta; very general.  
 \**S. scripta* Linne, Syst. Nat., 10th ed., 594, (*Musca*); Williston, Synop. N. A. Syrph.,  
     107; two specimens, Happy Hollow, Fort Collins. These two approach the des-  
     cription in that the abdominal bands are emarginate.  
 \**S. interrupta* Jones, one female, Happy Hollow, Colorado.

### SPHEGINA

- MEIGEN, Syst. Beschr., III, 193, 1822.  
 SCHINER, Fauna Austr., I, 322, 1862.  
 WILLISTON, Synop., N. A. Syrph., 113, def. and table of species, 1886.  
 VERRALL, Brit. Flies, VIII, 463, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 43, 1901.

- S. infuscata* Loew, Cent. III, 23; Williston, Synop. N. A. Syrph., 114, pl. IV,  
     f. 12; specimens in Collection of Univ. Nebr., Ute Pass, Colo.; Nat. Mus.; three  
     specimens.

### NEOASCIA

- WILLISTON, Synop. N. A. Syrph., III, def. and change of name 1886.  
 MEIGEN, Syst. Beschr., III, 185, 1822 (*Ascia*, preoc.).  
 SCHINER, Fauna Austr., I, 320, (id.), 1862.  
 VERRALL, Brit. Flies, VIII, 467, 1901, does not admit preoc. of *Ascia*, and re-  
     tains it.  
 CHAGNON, Et. Prelim. les Syrph., 44, 1901.

- N. distincta* Williston, Synop. N. A. Syrph., 112; five specimens, Colorado, Nat. Mus.  
*N. globosa* Walker, List, III, 546 (*Ascia*); Williston, Synop. N. A. Syrph. III, pl. IV,  
     f. 10, 10a; two specimens; Colorado, Nat. Mus.

### RHINGIA

- SCOPOLI, Ent. Carniol., 358, 1763.  
 MEIGEN, Syst. Beschr., III, 257, 1822.  
 SCHINER, Fauna Austr., III, 325, 1862.  
 WILLISTON, Synop. N. A. Syrph., 129, 1886.  
 VERRALL, Brit. Flies, VIII, 477, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 45, 1901.  
 R. *nascia* Say, Jour. Acad. Sci. Phil., III 94; Williston, Synop. N. A. Syrph., 130, pl. V, f. 3; one specimen, Manitou Park, in Kansas Univ. Collection.

### HAMMERSCHMIDTIA

- SCHUMMEL, in Oken's Isis, 1834, 740; reprinted by Roeder, 1888.  
 RONDANI, Dipt. Ital. Prod., II, 170, (*Exocheila*), 1857.  
 WILLISTON, Canad. Ent., XIV, 80, 1882 (*Eugeniamyia*); Proc. Amer. Phil. Soc., XX, 309, 1882, (id.); Synop. N. A. Syrph., 130, 1886 (id.).  
 VERRALL, Brit. Flies, VIII, 475, 1901, notes; scarcely distinct from *Brachyopa*.  
 H. *ferruginea* Fallen, Syrphici, 34 (*Rhingia*); Williston, Synop. N. A. Syrph., 131 (*Eugeniamyia*); specimen in collection at Kansas Univ. and Nebr. Univ. collection; Pike's Peak, Colorado.

### BRACHYOPA

- MEIGEN, Syst. Beschr., III, 260, 1822.  
 SCHINER, Fauna Austr., I, 326, 1862.  
 WILLISTON, Synop. N. A. Syrph., 131, def. and table of species, 1886.  
 VERRALL, Brit. Flies, VIII, 474, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 45, 1901.  
 B. *conops* Snow, Kans. Univ. Quart., I, 37, pl. VII, f. 2; type from Colorado in collection of Kansas University.  
 \*B. *rufiabdominalis* Jones, two specimens; Rist Canon, Colorado.  
 B. *vacua* Osten Sacken, Bull. Buff. Soc. Nat. Sci., III, 68; Williston, Synop. N. A. Syrph., 133; specimen in the collection of the Kansas University.

### COPESTYLOM

- MACQUART, Dipt. Exot., Suppl. I, 124. 1846.  
 WILLISTON, Synop. N. A. Syrph., 191, 1886.  
 \*C. *marginatum* Say, Juor. Acad. Sci. Phil., VI, 167; Williston, Synop. N. A. Syrph., 151, pl. VII, f. 1; four specimens; Fort Collins and Platteville, Colorado.

### VOLUCELLA

- GEOFFROY, Hist. Ins. Env. de Paris, II, 540, 1764.  
 ST. FARGEAU et SERVILLE, Encyl. Meth., X, 786, 1825, (*Temnocera* and *Ornidia*).  
 MACQUART, Dipt. Exot., II, 2, 26 (*Temnocera*), 1842.  
 SCHINER, Fauna Austr., I, 328, 1862.  
 BIGOT, Bull. Soc. Ent. France, 1882, No. 12 (*Atemnocera*); Annales, 1883, 64, table of species.  
 WILLISTON, Synop. N. A. Syrph., 134, def. and table of species, 1886; Biologia. Dipt., III, 43, table of Cent. Amer. species, 1891.

- GIGLIO-TOS, Boll. R. Univ. Torino, VI, No. 117, 1892 (*Camerania*); Ditt. del Mess., I, 45, 1892 (id.).
- TOWNSEND, Annals and Mag. Nat. Hist., XX, 26, table of species of *amethystina* group.
- VERRALL, Brit. Flies, VIII, 482, 1901.
- CHAGNON, Et. Prelim. les Syrph., 47, 1901.
- V. comstocki* Williston, Synop. N. A. Syrph., 138, pl. VI, f. 9; three specimens; Nat. Mus.; Colorado, up to 8000 ft.
- V. erecta* Walker, Dipt. Saund., 251; Williston, Synop. N. A. Syrph., 136, pl. VI, f. 6; three specimens in collection at Kans. Univ.
- V. fasciata* Macquart, Dipt. Exot., II, 2, 22, pl. V, f. 2; Williston, Synop. N. A. Syrph. 145, pl. VI, f. 4; four specimens in collection at Kans. Univ.; Manitou Park, Colorado.
- V. fax* Townsend, Trans. Amer. Ent. Soc. XXII, 42; type from Fort Collins, Colorado; C. P. Gillette, collector.
- V. fascialis* (Var. of *erecta*), Williston Proc. Amer. Phil. Soc., XX, 316; Synop. N. A. Syrph., 137; Specimens collection of Univ. of Nebraska; Pikes Peak, Ute Pass and Sierra Blanco, Colorado.
- V. inops* Townsend, Trans. Amer. Ent. Soc. XXII, 43. Type from Fort Collins, Colorado, C. P. Gillette, collector.
- \**V. isabellina* Williston, Synop. N. A. Syrph. 140; one specimen, Fort Collins, Det. Babcock.
- V. obesa* Fabricius, Syst. Ent. 763 (*Syrphus*); Williston, Synop. N. A. Syrph.. 143, pl. V, fig. 9. Reported by A. L. Lovett and in collection at Corvallis, Ore.
- \**V. rufomaculata* Jones. Two specimens, Fort Collins and Estes Park, Colo.
- \**V. satur* Osten Sacken, West. Dipt., 333; Williston. Synop. N. A. Syrph. 142, pl. VI, fig. 2; numerous specimens Fort Collins, Boulder, Estes Park, Colorado.
- V. tau* Bigot, Annales, 1883, 84; Williston Synop. N. A. Syrph., 143, pl. VI, fig. 13; one male, Colo. (Snow, Kans. Univ. Quart., III, 241.)
- V. victoria* Williston, Synop. N. A. Syrph., 145; one specimen in collection of Nat. Mus.; Morr. Coll. C. V. Riley.

### SERICOMYIA

MEIGEN, Illig. Mag., II, 274, 1803; Syst. Beschr., III, 342, 1822.

SCHINER, Fauna Austr., I, 330, 1862.

WILLISTON, Synop. N. A. Syrph., 153, 1886, def. and table of species.

VERRALL, Brit. Flies, VIII, 634, 1901.

CHAGNON, Et. Prelim. les Syrph., 48, 1901.

\**S. militaris* Walker, List, III, 595; Williston, Synop. N. A. Syrph., 155, pl. VII, fig. 3; three specimens, Cherokee Park, Happy Hollow, Colorado.

### ARCTOPHILA

SCHINER, Wien. Ent. Monatsch., IV, 215, 1860; Fauna Austr., I, 331, 1862.

WILLISTON, Synop. N. A. Syrph., 157 1886.

VERRALL, Brit. Flies, VIII, 1631, 1901.

\**A. flagrans* Osten Sacken, Bull. Buff. Soc. Nat. Sci., III, 69; Williston, Synop. N. A. Syrph., 158, pl. VII, f. 5; twelve specimens, Longmont, Happy Hollow, 7000 ft., Colorado.

### ERISTALIS

LATRIELLE, Dict. d'Hist. Nat., 1804; Hist. Nat. Crust. et Ins., XIV, 363, 1804.  
MEIGEN, Syst. Beschr., III, 381, 1822.

RONDANI, Dipt. Ital. Prod., II, 40, 1857 (*Eristalinus* and *Eristalomyia*).  
SCHINER, Fauna Austr., I, 332, 1862.

WILLISTON, Synop. N. A. Syrph., 158, def. and table of species, 1886; Biologia, Dipt., III, 56, 1891, table of Central American spp.

MIK, Wien. Ent. Zeit, XVI, 113, 1897, divides into five genera.

VERRALL, Brit. Flies, VIII, 493, 1901, adopts five subgenera.

CHAGNON, Et. Prelim. les Syrph., 50, 1901.

- \**E. compactus* Walker, List, III, 619; Williston, Synop. N. A. Syrph., 169 pl. VII, f. 9; one specimen, Field Rocky Mts. July 1, '08. Baily, Collector, 4800 ft.
- \**E. flavipes* Walker, List, III, 633, Williston, Synop. N. A. Syrph., 168; Four specimens Fort Collins, Rifle, Longmont, Colorado.
- \**E. flavipes* var. *Melanostomus* Loew, Cent., VI, 69; one specimen, Spring Canon, Fort Collins, G. Gillispie, Col.
- \**E. latifrons* Loew, Cent., VI, 65, Williston, Synop. N. A. Syrph., 164, over one hundred specimens general thruout the state, very common.
- \**E. meigenii* Weidmann, Auss., Zweifl. II, 177; Williston, Synop. N. A. Syrph., 165, 166. (*Brousi*); over one hundred specimens, general thruout the state, very common.
- \**E. montanus* Williston, Proc. Amer. Phil. Soc., XX, 322; Synop. N. A. Syrph., 166; forty specimens general through the state.
- E. oestracea*, Austin. Ent. Mo. Mag., 2nd S. XXII, 1911 (oc. in Amer.); one specimen, Fort Lupton, Colorado, in Nat. Mus. Osburn, Det.
- E. ruprium* Fabricius, Ant., 241; Verrall, Brit. Flies, 516. f. 356, 357, 1901; one specimen; Hall Valley, Colorado, July 24, 1898, E. J. Oslar, Coll. (Det. R. C. Osburn.)
- E. saxorum* Weidemann, Auss. Zweifl., II, 158; Williston, Synop. N. A. Syrph. 163; specimens in Coll. at Univ. Nebr., Pike's Peak, Colorado.
- E. temporalis* Thomson, Eugen. Resa, 490, Williston, Synop. N. A. Syrph., 162, (*hirtus*); Ute Creek, Russell, Colorado, specimens in Coll. at Univ. of Nebr.
- \**E. tenax* Linne Syst. Nat., 10th ed., 591, (*Musca*); Williston, Synop. N. A. Syrph. 160, pl. VII, f. 7, over a hundred specimens, general throughout the state, very common in fall at Fort Collins, Colorado.
- E. transversus* Weidemann, Auss. Zweifl., II, 188; Williston, Synop. N. A. Syrph., 170, pl. VII, f. 8, specimens in Coll. of the Univ. of Kans., Manitou Park, Colorado.

### TROPIDIA

MEIGEN, Syst. Beschr., III, 346, 1822.

SCHINER, Fauna Austr., I, 348, 1862.

WILLISTON, Synop. N. A. Syrph., 206, def. and table of species, 1886.

HUNTER, Ent. News, VII, 215, 1896, table of species.

VERRALL, Brit. Flies, VIII, 567, 1901.

CHAGNON, Et. Prelim. les Syrph., 60, 1901.

*T. incana* Townsend, Trans. Amer. Ent. Soc., XXII, 52, only one female (type), Fort Collins, Colorado, C. P. Gillette, Coll.

\**T. quadrata* Say, Amer. Ent., I, pl. VII, Compl. Works, I, 14 (*Xylota*); Williston, Synop. N. A. Syrph., 207, p. IX, f. 2; twelve specimens, Fort Collins, Delta, Colorado.

**HELOPHILUS**

- MEIGEN, Illig. Mag., II, 274, 1803 (*Elophilus*); Syst. Beschr., III, 368, 1882.  
 SCHINER, Fauna Austr., I, 337, 1862.  
 BIGOT, Bull. Soc. Ent. France, 1883, No. 2 (*Eurhomyia*); Annales, 1883, 242 (id.).  
 WILLISTON, Synop. N. A. Syrph., 183, 295, def. and table of species, 1886.  
 VERRALL, Brit. Flies, VIII, 523, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 56, 1901.  
*H. bilinearis* Williston, Synop. N. A. Syrph., 295; one specimen, from Colorado (Type) Nat. Mus.  
 \**H. chrysostoma* Weidemann, Auss. Zweifl., II, 174 (*Eristalis*); Williston Synop. N. A. Syrph., 190, pl. VIII, f. 5; one specimen, Nat. Mus.; Colorado, Coll. of Coquillette, one specimen, Fort Collins, Colorado.  
*H. dychei* Williston, in Hunter's Article, Canad. Ent., XXIX, 136. Two specimens from Colorado, (Type) Nat. Mus., in Coll. of C. V. Riley.  
*H. hamatus* Loew, Cent. IV, 79; Williston, Synop. N. A. Syrph., 195; Ute Pass, Colorado, in Coll. of Univ. of Nebr.  
 \**H. laetus* Loew, Cent., IV, 77; Williston, Synop. N. A. Syrph., 189, pl. VIII, f. 6; one specimen, Fort Collins, Colorado; Colorado Springs, in Coll. of Univ. of Nebr.  
 \**H. latifrons* Loew, Cent., IV, 73; Williston, Synop. N. A. Syrph., 188; over one hundred specimens, various parts of the state, very common.  
*H. obscura* Loew, Cent., IV, 74; Williston, Synop. N. A. Syrph., 196. Type from Colorado, specimens in Cambridge.  
 \**H. similis* Macquart, Dipt. Exot., II, 2, 64; Williston, Synop. N. A. Syrph., 189, pl. VII, f. 2; two specimens, Estes Park, Gunnison, Colorado.

**ASEMOSYRPHUS**

- BIGOT, Bull. Soc. Ent. France, 1882, CXXVIII; Annales, 1883, 228.  
 GIGLIO-TOS, Ditt. del Mess., II, 18. 1893.  
 \**A. mexicanus* Macquart, Dipt. Exot., II, 2, 64, pl. XI, f. 2, (*Helophilus*); Williston, Synop. N. A. Syrph., 186, pl. VIII, f. 7 two specimens, Gunnison, Colorado.

**MALLOTA**

- MEIGEN, Syst. Beschr., III, 337, 1822.  
 MACQUART, Dipt. Exot., II, 2, 67, 1842 (*Imatismus*).  
 SCHINER, Fauna Austr., I, 342, 1862.  
 WILLISTON, Synop. N. A. Syrph., 201, def. and table of species, 1886.  
 VERRALL, Brit. Flies. VIII, 551, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 55, 1901.  
 \**M. flavoterminata* Jones, two specimens, female, Poudre Canon; male, Longmont, Colorado.  
 \**M. palmerae* Jones, two specimens females, Fort Collins; male, Platteville, Colorado.

**TRIODONTA**

- WILLISTON, Bull. Brooklyn Ent. Soc., VII, 1885; Synop. N. A. Syrph., 205, 1886.  
 MACQUART, Dipt. Exot., Suppl. IV, 144, 1850 (*polydonta*, preoc.)  
 \**T. curvipes* Wiedmann, Auss. Zweifl., II, 149, (*Merodon*); Williston, Synop. N. A. Syrph., 206, pl. IX, f. 1; five specimens, Fort Collins, Delta, Longmont, Colorado.

### SYRITTA

- ST. FARCEAU et SERVILLE, Encyl. Meth., X, 808, 1825.  
 MACQUART, Hist. Nat. Dipt., I, 525, 1834.  
 MEIGEN, Syst. Beschr., VII, 113, 1838.  
 ZETTERSTEDT, Ins. Lapp., 584, 1838 (*Coprina*); Dipt. Scand., II, 881, 1843.  
 WALKER, Ins. Drit., Dipt., I, 253, 1851.  
 RONDANI, Arch. Zool., III, 9 (*Planes*).  
 SCHINER, Fauna Austr., I, 357, 1862.  
 WILLISTON, Synop. N. A. Syrph., 239, 1886,  
 VERRALL, Brit. Flies, VIII, 611, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 61, 1901.  
 \*S. *pipiens* Linne, Syst. Nat., 10th ed.; 594 (*Musca*); Williston, Synop. N. A. Syrph., 240, over two hundred specimens from all parts of the state, very common at all seasons.

### XYLOTA

- MEIGEN, Syst. Beschr., III, 211, 1822.  
 SCHINER, Fauna Austr., I, 354, 1862.  
 WILLISTON, Synop. N. A. Syrph., 224, 1886, def. and table of species; Biologia, Dipt. III, 71, 1891, table of Central Amer. species.  
 VERRALL, Brit. Flies, VIII, 596, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 62, 1901.  
 X. *analis* Williston, Synop. N. A. Syrph., 226; five specimens, Nat. Mus., Colorado, up to 8000 ft.  
 X. *anthreas* Walker, List., III, 556; Williston, Synop. N. A. Syrph., 235; five specimens, Colorado, 9000 ft. Nat. Mus., Ute Pass, in Univ. Nebr.  
 X. *barbata* Loew, Cent. V, 40; Williston, Synop. N. A. Syrph., 233; specimens in Coll. at Univ. of Nebr., Pike's Peak, Colorado.  
 X. *bicolor* Loew, Cent., V, 39; Williston, Synop. N. A. Syrph., 229; three specimens, Colorado, Nat. Mus.  
 X. *coloradensis* Bigot, Annales, 1884, 544, type from Colorado, specific locality not given.  
 X. *curvipes* Loew, Neue Beitrage, II, 19; Williston, Synop. N. A. Syrph., 232, specimens in Coll. of Univ. of Nebr., Sierre Blanca, Colo.  
 \*X. *ejuncida* Say, Amer. Ent., I, pl. VIII; Compl. Works, I, 15; Williston, Synop. N. A. Syrph., 229, pl. XI, f. 8; one specimen Estes Park, Colo., Pike's Peak. Ute Pass, Colo., in Coll. at Univ. of Nebr.  
 \*X. *flavitibia* Bigot, Annales, 1884, 546; Williston, Synop. N. A. Syrph., 228, pl. XI, f. 6; ten specimens, Fort Collins, Denver, Rocky Ford, Colorado.  
 X. *fraudulosa* Loew, Cent., V, 41; Williston, Synop. N. A. Syrph., 230; specimens in Coll. at Univ. of Nebr., Ute Pass, Colo.  
 X. *metallifera* Bigot, Annales, 1884, 545; Williston, Synop. N. A. Syrph., 236; type of species from Colorado, no specific locality given.  
 X. *nigromaculata* Jones, three specimens, Fort Collins, Colorado.  
 X. *notha* Williston, Synop. N. A. Syrph., 228, Type from Colorado; specimens in Coll. at Univ. of Nebr., Ute Pass, Colorado.  
 \*X. *obscura* Loew, Cent., VI, 55; Williston, Synop. N. A. Syrph., 233; one specimen, Ward, Colorado.  
 \*X. *pigra* Fabricius, Ent. Syst., IV, 295 (*Syrphus*); Williston, Synop. N. A. Syrph.,

- 227, pl. XI, f. 7; one specimen, Happy Hollow, Colorado, up to 9000 ft. Nat. Mus.  
*X. rubiginigaster* Bigot, Annales, 1884, 544; Type from Colorado.  
*X. vecors* Osten Sacken, Bull. Buff. Soc. Nat. Sci., III, 69; Williston, Synop. N. A. Syrph., 232; one specimen, Colorado, 9,000 ft., Nat. Mus.

### CHRYSOCHLAMYS

- RONDANI, Walker's Ins. Brit., Dipt., I, 279, 1851, change of name.  
 RONDANI, Ann. Sci. Nat. Bologna, 1844 (*Ferdinandea*); Dipt. Ital. Prod., II, 145, 1857.  
 SCHINER, Fauna Austr., I, 363, 1862.  
 WILLISTON, Synop. N. A. Syrph., 240, def. and table of species, 1886.  
 VERRALL, Brit. Flies, VIII, 623, 1901.  
 C. *croesus* Osten Sacken, West. Dipt., 341; Williston, Synop. N. A. Syrph., 241; seven specimens, Colorado, 9000 ft. Nat. Mus., four specimens Hop Canon, Colorado, in Coll. at Univ. of Nebr.

### BRACHYPALPUS

- MACQUART, Hist. Nat. Dipt., I, 523, 1834.  
 SCHINER, Fauna Austr., I, 353, 1862.  
 WILLISTON, Synop. N. A. Syrph., 221, def. and table of species, 1886.  
 VERRALL, Brit. Flies, VIII, 592, 1901.  
 CHAGNON, Et. Prelim. les Syrph., 64, 1901.  
 B. *parvus* Williston, Synop. N. A. Syrph., 222; type from Colorado.

### CRIOPRORA

- OSTEN SACKEN, Cat., 251, 1878.  
 BIGOT, Annales, 1883, 356 (*Romaleosyrphus*).  
 WILLISTON, Synop. N. A. Syrph., 217, 1886, def. and table of species; Biologia, Dipt., III, 72, 1891, syn.  
 C. *cyanogaster* Loew, Cent., X, 51, (*Brachypalpus*); Williston, Synop. N. A. Syrph., 218; two specimens, Colorado, 8,000 ft., Nat. Mus.; specimens in Univ. of Nebr., coll. from Pike's Peak, Colorado.  
 C. *femorata* Williston, Proc. Amer. Phil. Soc., XX, 329; Synop. N. A. Syrph., 219, pl. X, f. 5, specimens in Coll. of Univ. of Nebr., from Sierra Blanca Mts., Colorado.

### SPILOMYIA

- MEIGEN, Illig. Mag., II, 273, 1803.  
 MACQUART, Hist. Nat. Dipt., I, 491, 1834 (*Mixtemyia*).  
 RONDANI, Dipt. Ital. Prod., I, 47, 1856 (*Calliprobola*).  
 SCHINER, Fauna Austr., I, 364, 1862.  
 WILLISTON, Synop. N. A. Syrph., 244, def. and table of species, 1886.  
 CHAGNON, Et. Prelim. les Syrph., 67, 1901.  
 \*S. *interrupta* Williston, Proc. Amer. Phil. Soc., XX, 327, Synop. N. A. Syrph., 246, pl. XII, f. 4; four specimens, Manitou, Happy Hollow, Delta, Colorado.  
 S. *liturata* Williston, Synop. N. A. Syrph., 245, three specimens, Colorado, 9000 ft., Nat. Mus.

### TEMNOSTOMA

- ST. FARGEAU et SERVILLE, Encyl. Meth., X, 518, 1825.

- WILLISTON, Synop. N. A. Syrph., 249, 1886; ref. and table of species.  
VERRALL, Brit. Flies, VIII, 628, 1901.  
CHAGNON, Et. Prelim. les Syrph., 69, 1901.  
*T. aequalis* Loew, Cent., V, 36; Williston, Synop. N. A. Syrph., 253; Williston gives habitat as Colorado.

### CERIA

- FABRICIUS, Syst. Ent., IV, 277, 1774; Syst. Antl., 173, 1805.  
MEIGEN, Illig. Mag., II, 271, 1803; Klassif., I, 281, 1804; Syst. Beschr., III, 158, 1822.  
LATREILLE, Hist. Nat. Crust. et Ins., XIV, 356, 1804; Gen. Crust., IV, 327, 1809.  
FALLEN, Syrphici, 6, 1816.  
MACQUART, Hist. Nat. Dipt., I, 484, 1834.  
ZETTERSTEDT, Dipt. Scand., II, 631, 1842.  
RONDANI, Ann. Soc. Ent. France, ser. 2, VIII, 211, 212 (*Ceriooides* and *Sphiximorpha*), 1850; Dipt. Ital. Prod., I, 55, 1856 (*Ceria* and *Sphiximorpha*); II, 212, 214, 1857 (id.).  
LOEW, Neue Beitr., I, 1853.  
SCHINER, Fauna Austr., I, 368, 1862.  
WILLISTON, Synop. N. A. Syrph., 259, def. and table of species, 1886; Biologia, Dipt., III, 75, 1891, table of Mex. species.  
VERRALL, Brit. Flies, VIII, 664, 1901.  
CHAGNON, Et. Prelim. les Syrph., 72, 1901.  
\*C. abbreviata Loew, Cent., V, 48; Williston, Synop. N. A. Syrph., 261, Six specimens, Fort Collins, Colorado.  
C. tridens Loew, Cent., X, 57; Williston, Synop. N. A. Syrph., 263; Specimens reported by C. W. Johnson, Ent. News, IV, 95, from Denver, Colorado.



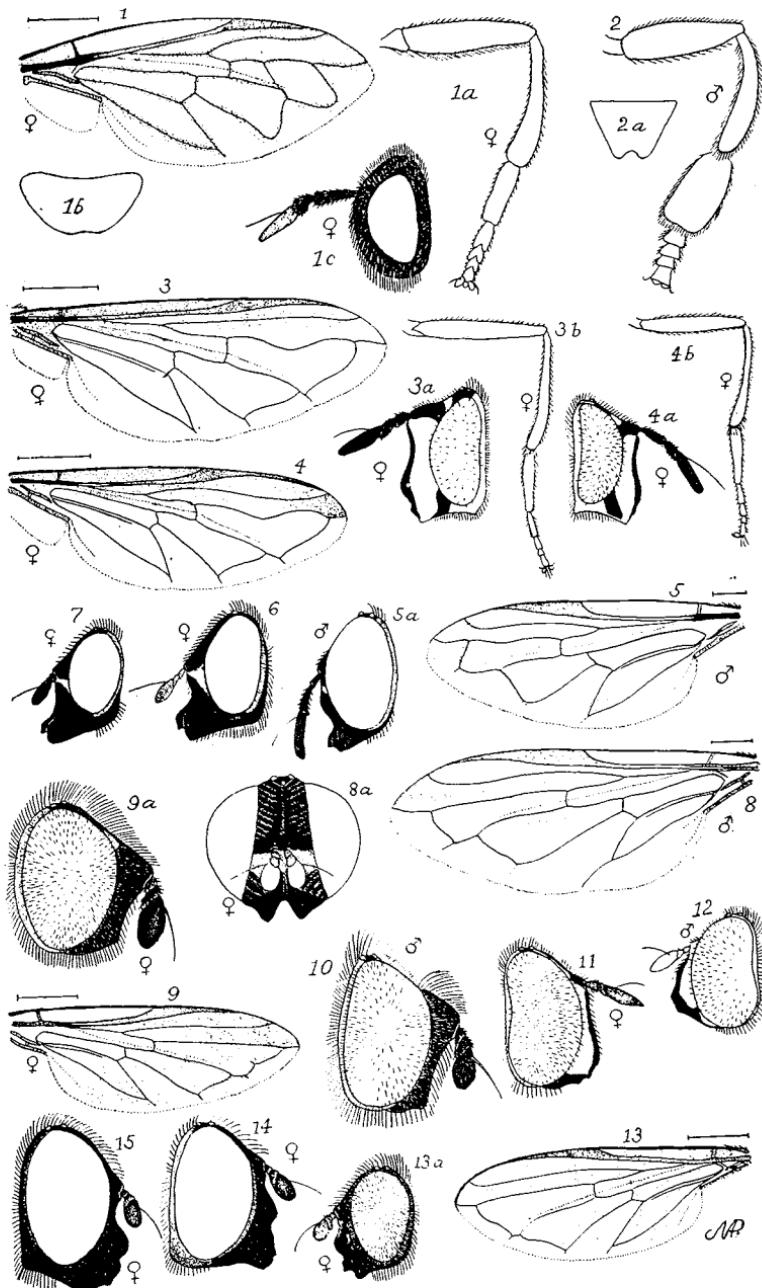
**EXPLANATION OF PLATES.**

(All figures are from nature, except those indicated.)

**PLATE I.**

1. *MICRODON SIMILIS* Jones, wing; 1a, left hind leg female; 1b, scutellum; 1c, head. (x5)
2. *MICRODON FUSCIPENNIS* Macq., hind leg of male; 2a, scutellum. (After Williston)
3. *CHRYSOTOXUM DERIVATUM* Walker, wing; 3a, head of female; 3b, hind leg of female. (x5)
4. *CHRYSOTOSUM LATERALE* Loew, wing; 4a, head of female, 4b, hind leg of female. (x5)
5. *CHRYSOGASTER BELLULA* Williston, wing of male; 5a, head of male. (x 10)
6. *CHRYSOGASTER LATA* Loew, head of female. (x 10)
7. *CHRYSOGASTER NIGROVITTATA* Loew, head of female. (x 10)
8. *CHRYSOGASTER NIGRIPES* Loew, wing of male; 8a, head of female. (x 10)
9. *PIPIZA FESTIVA* Meigen, wing of female, (x5); 9a, head of female, (x10)
10. *PIPIZA* sp.; head of male. (x10)
11. *PARAGUS BICOLOR* Fabr., head of female. (x 10)
12. *PARAGUS TIBIALIS* Fallen, head of male. (x 10)
13. *CHILOSIA OCCIDENTALIS* Williston, wing; 13a, head of female. (x5)
14. *CHILOSIA PARVA* Williston, head of female. (x 10)
15. *CHILOSIA COMOSA* Loew, head of female. (x 10)

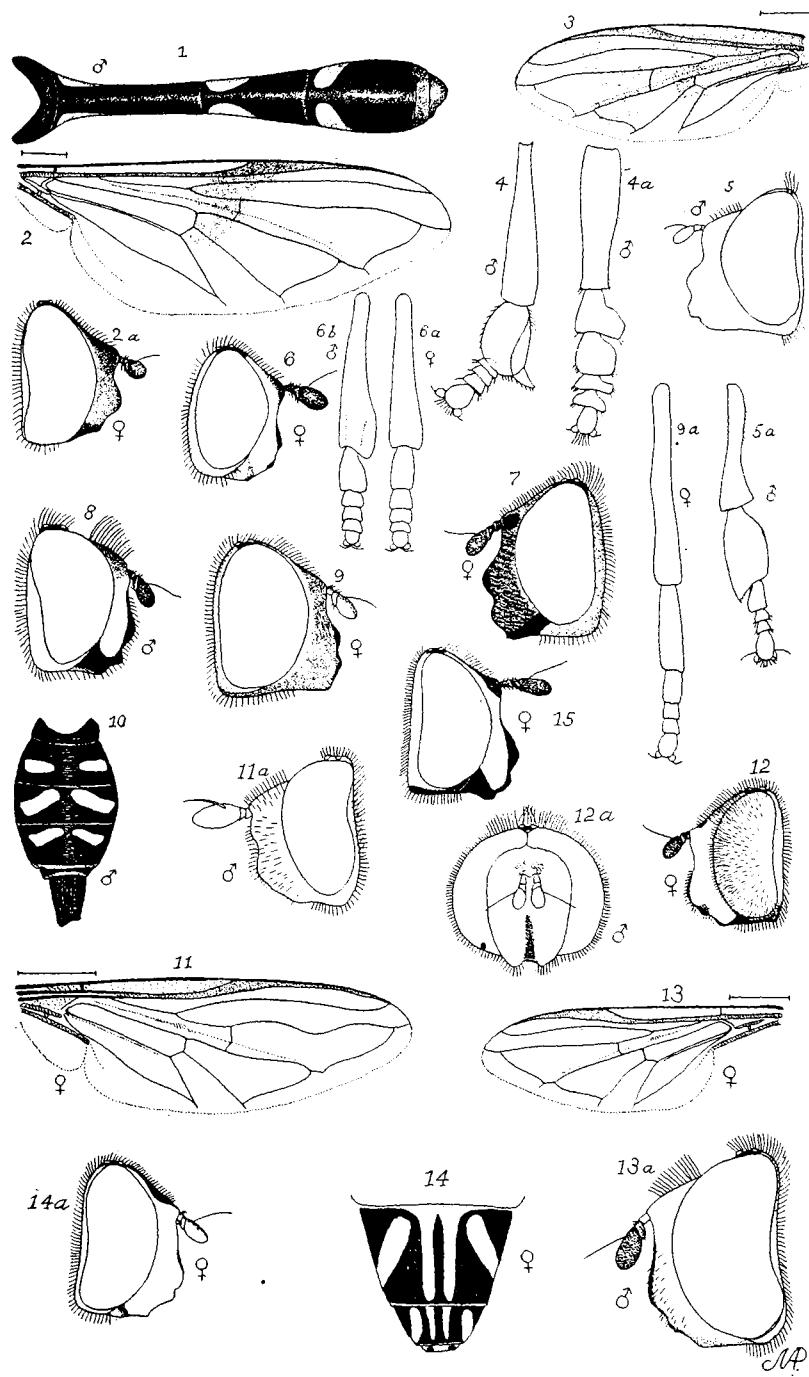
## PLATE I.



## EXPLANATION OF PLATE II.

1. *BACCHA CLAVATA* Fabr., abdomen of male. (x 8)
2. *BACCHA LEMUR* Osten Sacken, wing; 2a, head of female. (x 10)
3. *OCYPTAMUS FUSCIPENNIS* Say, wing. (x 5)
4. *PYROPHAENA GRANDITARSUS* Walker, right front tibia and tarsus of male; 4a, left hind tibia and tarsus of male. (After Williston)
5. *PLATYCHIRUS PELTATUS* Meigen, head of male; 5a, front leg of male. (After Williston)
6. *PLATYCHIRUS QUADRATUS* Say, head of female, (x 10); 6a, right front leg; 6b, right front leg of male. (x 10)
7. *MELANOSTOMA STEGNUM* Say, head of female. (x 10)
8. *MELANOSTOMA CHEROKEENENSIS* Jones, head of male. (x 10)
9. *MELANOSTOMA MONTICOLA* Jones, head of female, (x 10); 9a, leg of female. (x 20)
10. *EUPEODES VOLUCRIS* Osten Sacken, abdomen of male. (x 5)
11. *DIDEA FUSCIPES* Loew, wing of female; 11a, head of male. (x 5) (After Metcalfe)
12. *LASIOPHTHICUS PYRASTRI* Linne, head of female; 12a, head of male. (x 5)
13. *SYRPHUS AMERICANUS* Wied., wing of female, (x 5); 13a, head of male. (x 10)
14. *ALLOCRAPTA OBLIQUA* Say, tip of abdomen of female; 14a, head of female. (x 10)
15. *MELANOSTOMA JOHNSONI* Jones, head of female. (x 10)

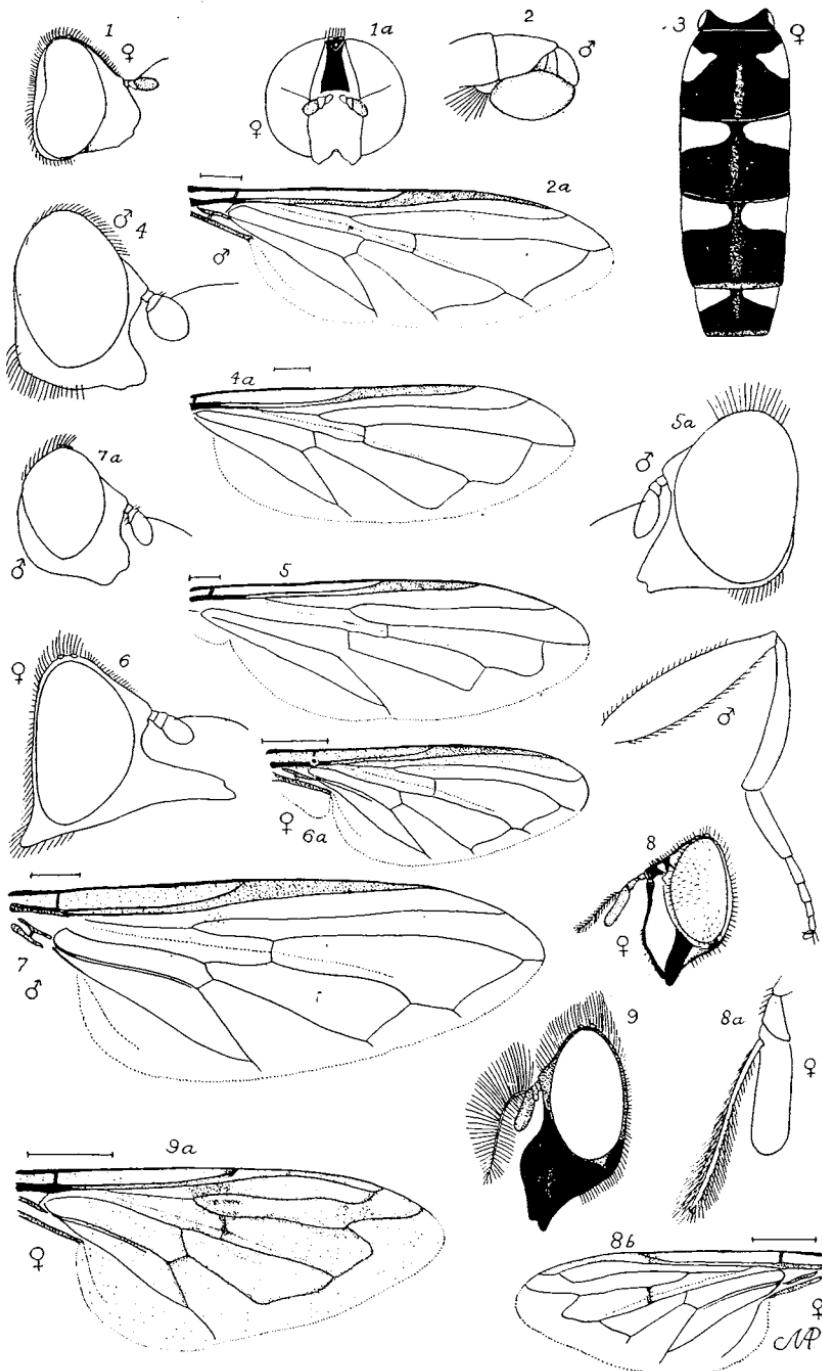
## PLATE II.



**EXPLANATION OF PLATE III.**

1. *MESOGRAMMA GEMINATA* Say, head of female, side view, 1a, head of female, front view. (x 10)
2. *SPHAEROPHORIA CYLINDRICA* Say, tip of abdomen of male; 2a, wing of male. (x 10)
3. *SPHAEROPHORIA INTERRUPTA* Jones, abdomen of female. (x 10)
4. *SPHEGINA INFUSCATA* Loew, head of male, 4a, wing. (After Williston)
5. *NEOASICA GLOBOSA* Walker, wing; 5a, head of male. (After Williston)
6. *RHINGIA NASICA* Say, head of female, (x 10); 6a, wing of female. (x 5)
7. *BRACHYOPA RUFIABDOMINALIS* Jones, wing of male; 7a, head of male, 7b, hind leg of male. (x 10)
8. *COPESTYLUM MARGINATUM* Say, head of female. (x 5); 8a, antennae of female, (x 20); 8b, wing of female. (x 5)
9. *VOLUCELLA ERECTA* Walker, head of female; 9a, wing of female. (x 5)

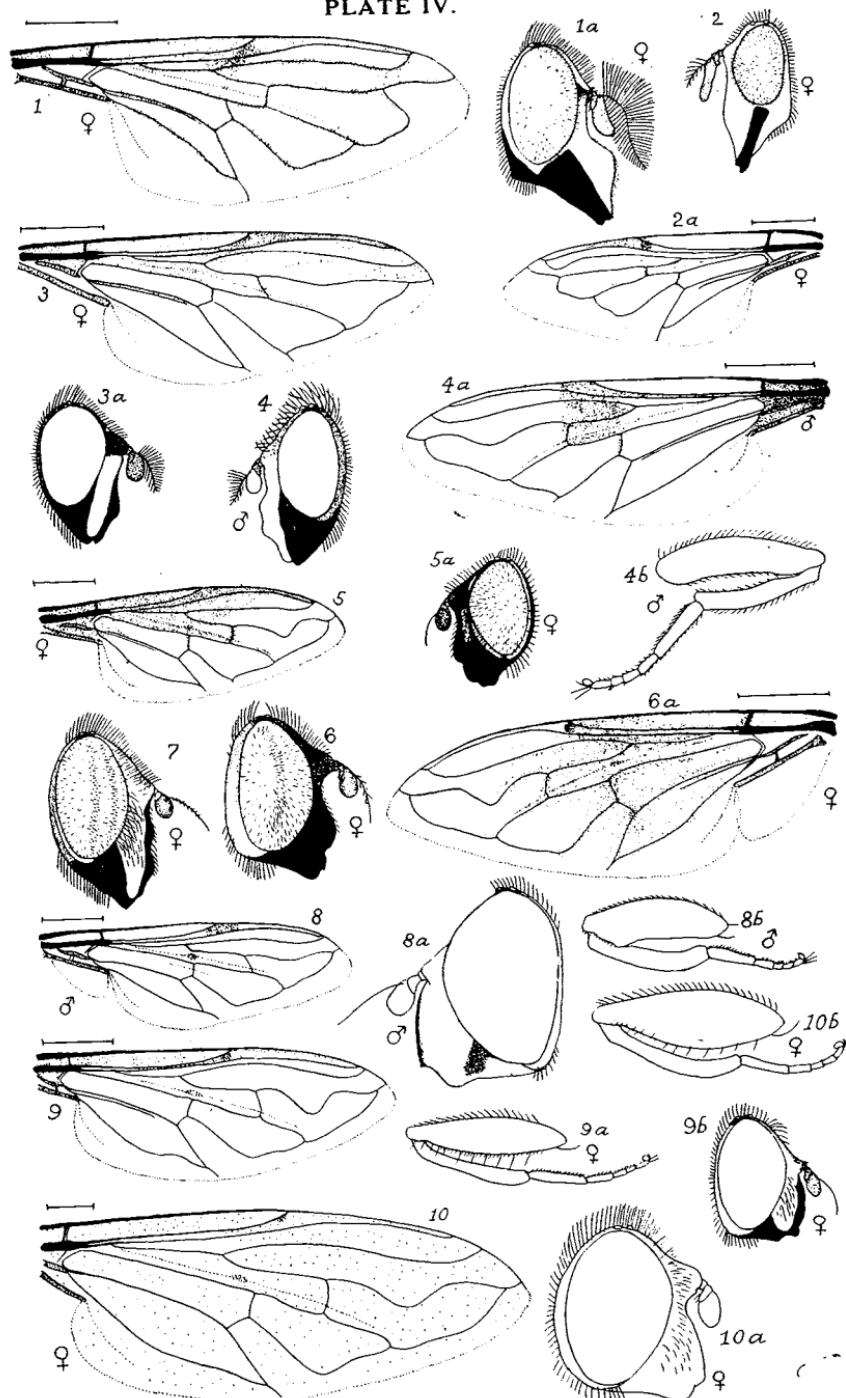
## PLATE III.



**EXPLANATION OF PLATE IV.**

1. *VOLUCELLA RUFOMACULATA* Jones, wing of female; 1a, head of female.  
(x 5)
2. *VOLUCELLA SATUR* Osten Sacken, head of female; 2a, wing of female.  
(x 5)
3. *SERICOMYIA MILITARIS* Walker, wing of female; 3a, head of female.  
(x 5)
4. *ARCTOPHILA FLAGRANS* Osten Sacken, head of male; 4a, wing of male;  
4b, hind leg of male. (x 5)
5. *ERISTALIS COMPACTUS* Walker, wing of female; 5a, head of female. (x 5)
6. *ERISTALIS FLAVIPES* Walker, head of female; 6a. wing of female. (x 5)
7. *ERISTALIS TENAX* Linne, head of female. (x 5)
8. *TROPIDIA QUADRATA* Say, wing of male, (x 5); 8a, head of male, (x 10);  
8b, hind leg of male, (x 5)
9. *HELOPHILUS SIMILIS* Macq., wing; 9a, hind leg; 9b, head of female. (x 5)
10. *HELOPHILUS INTEGER* Loew, wing of female; 10a, head of female, (Arista  
missing)

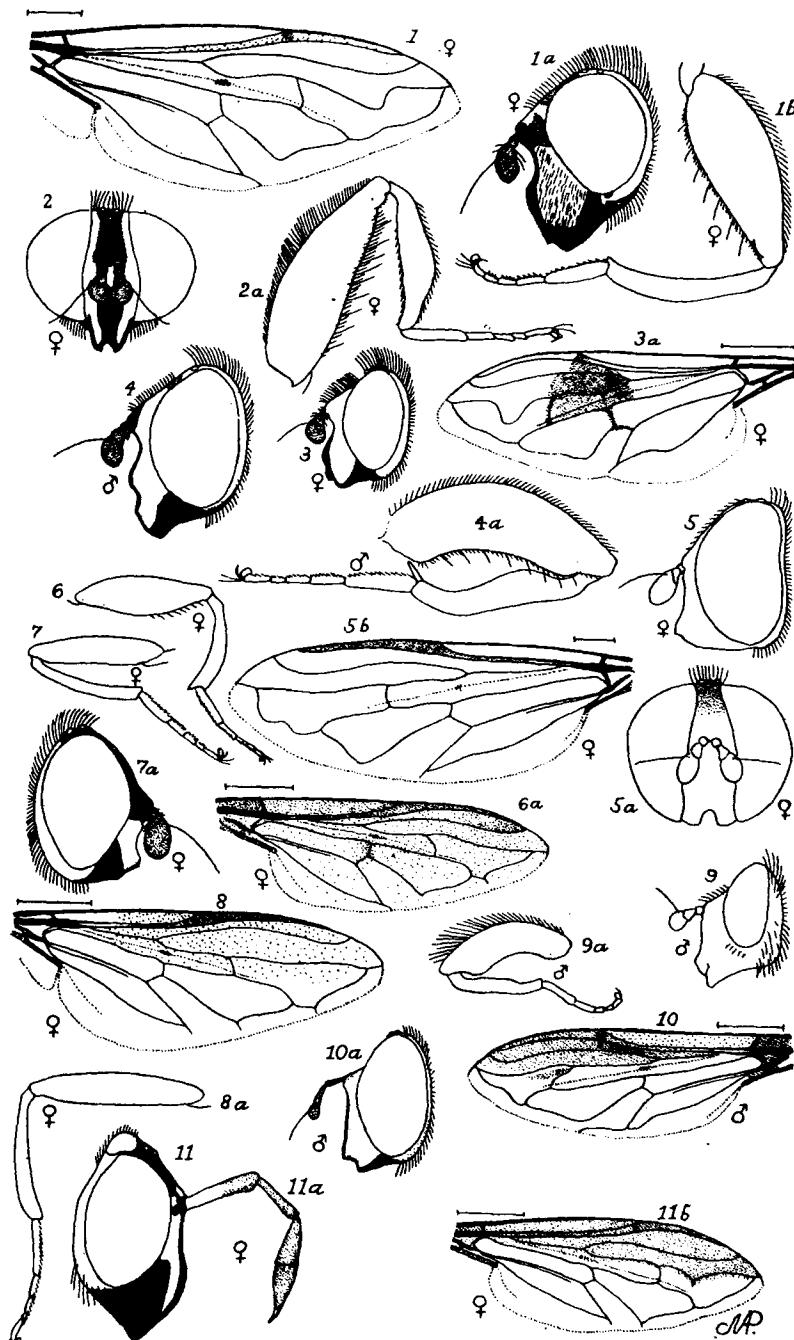
## PLATE IV.



**EXPLANATION OF PLATE V.**

1. *ASEMOSYRPHUS MEXICANUS* Macq., wing of female; 1a, head of female; 1b, hind leg of female. (x 8)
2. *MALLOTA FLAVOTERMINATA* Jones, head of female; 2a, hind leg of female. (x 5)
3. *MALLOTA PALMERAЕ* Jones, head of female; 3a, wing of female. (x 5)
4. *TRIDONTA CURVIPES* Wied., head of female; 4a, hind leg of female. (x 8)
5. *SYRITTA PIPIENS* Linne, head of female, side view; 5a, front view; 5b. wing of female. (x 10)
6. *XYLOTA PICRA* Fabricius, hind leg of female; 6a, wing of female. (x 5)
7. *XYLOTA FLAVITIBIA* Williston, hind leg of female, (x 5); 7a, head of female. (x 8)
8. *XYLOTA EJUNCIDA* Say, wing of female; 8a, hind leg of female. (x 8)
9. *CRIOPRORA FEMORATA* Williston, head of male; 9a, hind leg of male. (After Williston)
10. *SPILOMYIA INTERRUPTA* Williston, wing of male, (x 5); 10a, head.
11. *CERIA ABBREVIATA* Loew, head of female, (x 5); 11a, antennae; 11b, wing of female. (x 5)

## PLATE V.



## EXPLANATION OF PLATE VI.

Fig. 1 *EUPEODES VOLUCRIS* O. S.

- a Larva feeding upon aphid ( $\times 3\frac{1}{3}$ )
- b Pupa case ( $\times 3\frac{1}{3}$ )
- c Head of female ( $\times 3\frac{1}{3}$ )
- d Tip of abdomen of male ( $\times 3\frac{1}{3}$ )
- e Profile of head ( $\times 3\frac{1}{3}$ )
- f Adult female ( $\times 3\frac{1}{3}$ )

Fig. 2 *SYRPHUS AMERICANUS* Weid.

- a Larvae ( $\times 3\frac{1}{3}$ )
- b Pupa case ( $\times 3\frac{1}{3}$ )
- c Adult female ( $\times 2\frac{2}{3}$ )
- d Profile of head ( $\times 2\frac{2}{3}$ )

Fig. 3. *CHILOSIA BARONI* Williston

- a Larva feeding on an aphid ( $\times 3\frac{1}{3}$ )
- b Breathing tubes ( $\times 15$ )
- c Pupa case ( $\times 3\frac{1}{3}$ )
- d Adult female ( $\times 3\frac{1}{3}$ )
- e Profile of head ( $\times 3\frac{1}{3}$ )
- f Antenna ( $\times 15$ )
- g Top view of head of male ( $\times 3\frac{1}{3}$ )

Fig. 4 *SYRPHUS TRIANGULIFER* (?) Zett.

- a Pupa ( $\times 3\frac{1}{3}$ )
- b Larva ( $\times 3\frac{1}{3}$ )
- c Adult male ( $\times 3\frac{1}{3}$ )
- d Profile of head ( $\times 6\frac{2}{3}$ )

Fig. 5 *SYRPHUS* larva feeding upon *Lachnus palmerae* Gill, taken on *P. engelmannii* ( $\times 3\frac{1}{3}$ )Fig. 6 *SYRPHUS ARCUATUS* Fall.

- a Larvas ( $\times 2\frac{1}{3}$ )
- b Pupa ( $\times 2\frac{1}{3}$ )

Fig. 7. *LASIOPHTHICUS PYRASTRI* Linn.

- a Larva and aphid ( $\times 2\frac{1}{3}$ )
- b Pupa ( $\times 2\frac{1}{3}$ )

Fig. 8. *HELOPHILUS LATIFRONS* Loew.

- a Rattail larva ( $\times 2\frac{1}{3}$ )
- b Pupa case ( $\times 2\frac{1}{3}$ )

COLORADO EXPERIMENT STATION  
PLATE VI.

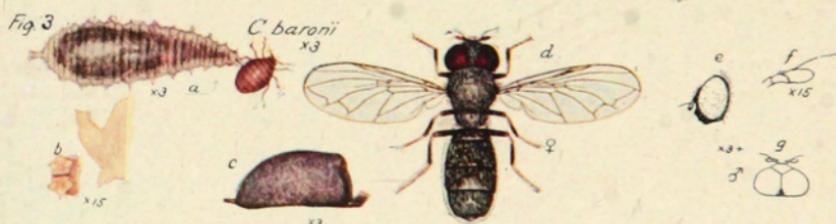
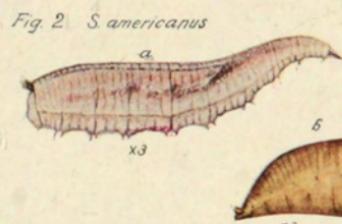
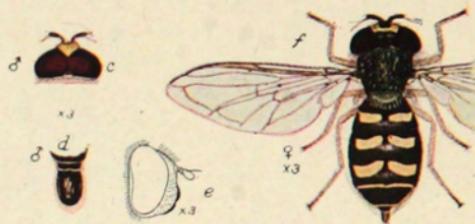
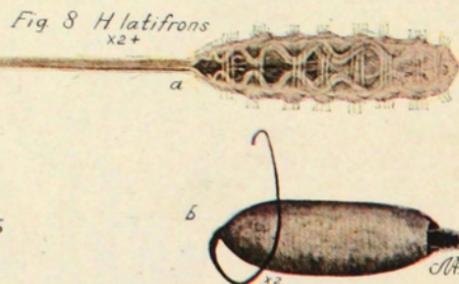
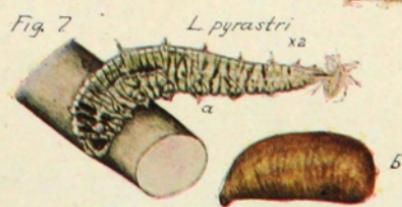
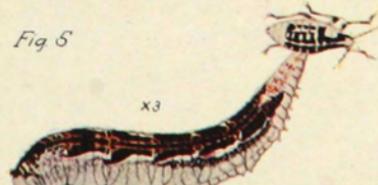


Fig. 4. *S. triangulifera*?



COLORADO EXPERIMENT STATION  
PLATE VII.

Fig. 1 *C. integre*

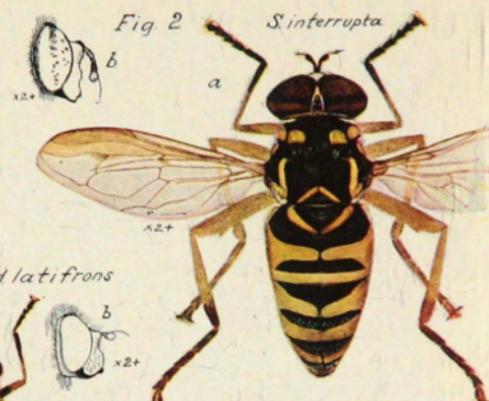
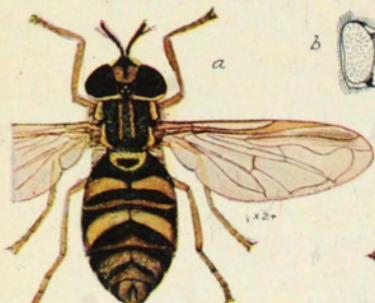


Fig. 4 *P. bicolor*



Fig. 6 *V. visabellina*



Fig. 9 *M. stegnum*



Fig. 3 *H. latifrons*

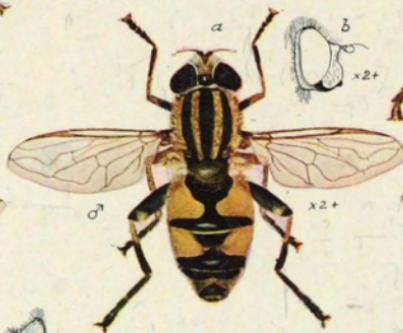


Fig. 7 *H. aetus*

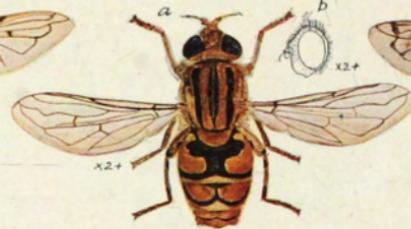


Fig. 5 *P. tibialis*



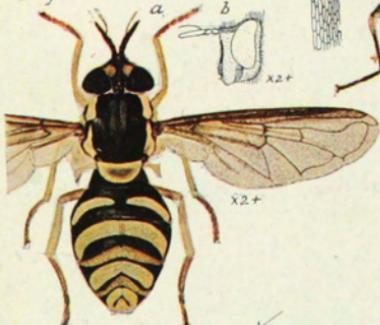
Fig. 8 *V. pusilla*



Fig. 11 *C. clata*

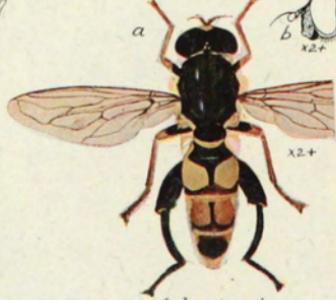


Fig. 12 *C. derivatum*



Caroline M. Palmer

Fig. 13 *T. quadrata*



InK drawings by  
M.A.Palmer

**EXPLANATION OF PLATE VII.**

Fig. 1 *CHRYSOTOXUM INTECRE* Williston.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 2 *SPILOMYIA INTERRUPTA* Williston

- a Adult ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 3. *HELOPHILUS LATIFRONS* Loew.

- a Adult male ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 4 *PARAGUS BICOLOR* Latr.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 4\frac{1}{3}$ )

Fig. 5 *PARAGUS TIBIALIS* Meigen

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 4\frac{1}{3}$ )

Fig. 6 *VOLUCELLA ISABELLINA* Williston.

- a Adult male ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 7. *HELOPHILUS LAETUS* Loew.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 8 *VOLUCELLA PUSILLA* Macq.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 9 *MELANOSTOMA STEGNUM* Say.

- a Adult male ( $\times 2\frac{1}{3}$ )

Fig. 10 *HELOPHILUS LATIFRONS* Loew.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )
- c Egg mass ( $\times 2\frac{1}{3}$ )
- d Magnified surface of egg ( $\times 53$ )

Fig. 11 *CHRYSOGASTER LATA* Loew.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 4\frac{1}{3}$ )

Fig. 12 *CHRYSOTOXUM DERIVATUM* Walker.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 13 *TROPIDIA QUADRATA* Say.

- a Adult male ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

**EXPLANATION OF PLATE VIII.**

Fig. 1 *LASIOPHTHICUS PARASTRI* Linn.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 2 *SERICOMYIA MILITARIS* Walk.

- a Adult male ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 3 *MICROXYLOTA RÖBII* Jones.

- a Adult male ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 4\frac{2}{3}$ )

Fig. 4 *ARCTOPHILA FLAGRANS* O. S.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 5 *ERISTALIS FLAVIPES* Var. *MELANOSTONUS* Loew.

- a Adult male ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 6 *SYRPHUS FLUKEI* Jones.

- a Adult male ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 4\frac{2}{3}$ )

Fig. 7 *MICRODON TRISTIS* Loew.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 8 *BRACHYOPA RUFOABDOMINALIS* Jones.

- a Adult male ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 4\frac{2}{3}$ )

Fig. 9 *SYRPHUS TORVUS* O. S.

- a Adult male ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 10 *SYRPHUS SIMILIS* Jones

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 11 *DIDEA FASCIATA* Loew.

- a Adult male ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 2\frac{1}{3}$ )

Fig. 12 *EUPEODES WELDONI* Jones.

- a Adult female ( $\times 2\frac{1}{3}$ )
- b Profile of head ( $\times 4\frac{2}{3}$ )

COLORADO EXPERIMENT STATION  
PLATE VIII.

Fig. 1. *L. parastri*



Fig. 2. *S. militaris*



Fig. 3. *M. robii*



*A. elegans*

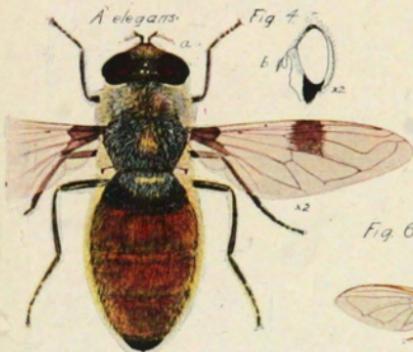


Fig. 4.



Fig. 6. *S. flukei*

Fig. 5.

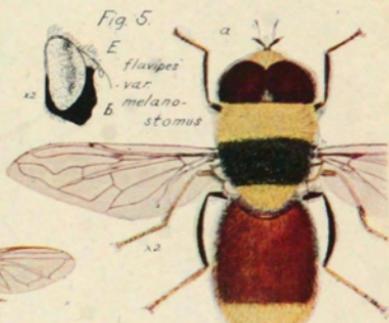


Fig. 7. *M. tristis*



Fig. 9. *S. torvus*

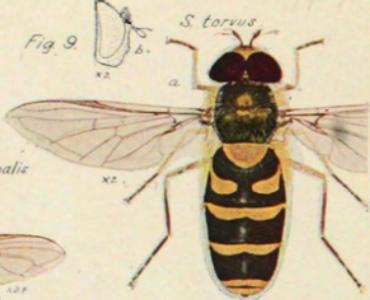


Fig. 10.



*L. similis*

Fig. 11.

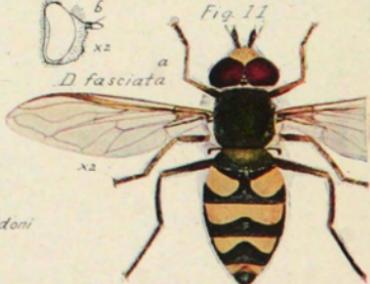
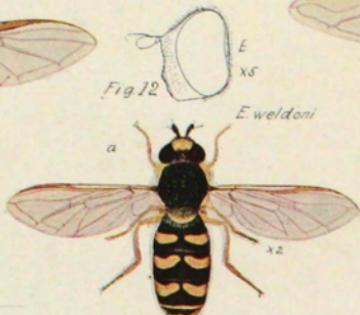


Fig. 12.



MP

