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## A SYNOPSIS OF THE GENERA IN CHLOROPIDÆ, FOR NORTH AMERICA.

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Having had occasion recently to identify species of North America Chloropidæ, I found some difficulty in placing the specimens in their proper genera by the use of the published keys to the family. The most recent paper on the Chloropidæ is that by Becker,\* which is a rather unsatisfactory one, lacking in many details, though it purports to be a "monographic" treatise. About a dozen North American species are left out of the paper, and the table of genera in the Chloropinæ is so framed that it is not possible to locate specimens generically. I do not purpose criticising Becker's work, believing that criticism alone is seldom beneficial, and offer the following table, which I hope will prove useful to the extent of satisfactorily locating specimens in the genera to which they belong.

I have to thank Dr. S. A. Forbes for permission to publish this paper

### GENERIC SYNOPSIS:

1. Costa reaching to third vein or slightly beyond it . . . . . 2  
Costa reaching distinctly to fourth vein . . . . . 13
2. Outer cross-vein absent . . . . . *Elliponeura* Loew.  
Outer cross-vein present . . . . . 3
3. Hind femur much thickened, hind tibia bent . . . . . 4  
Hind femur not thickened; hind tibia straight, or almost so . . . 5
4. Third joint of antennæ much elongated, about four times as long as broad; veins 2 and 3 but slightly bent forward . . . . . *Neodiploxa*, n. gen.  
Third joint of antennæ but little longer than broad; veins 2 and 3 much bent forward . . . . . *Meromyza* Meigen.

\*Ann. Nat. Mus. Hung., 1912.

5. Mid tibia with the apical spur strong and distinctly bent; male hypopygium large, knob-like, curved back beneath abdomen..... *Cetema* Hendel.
- Mid tibial spur short and straight; male hypopygium not conspicuous..... 6
6. Scutellum flattened on disk, with a distinct marginal rim, the apical scutellar bristles closely approximated; both sexes with an elongated oval, flattened surface (sensory organ) on hind tibia (postero-dorsal surface)..... *Chloropisca* Loew.
- Scutellum convex, not margined, apical bristles not approximated..... 7
7. Sensory organ present on hind tibia, as in  
*Chloropisca*..... *Pseudochlorops*, n. gen.
- Sensory organ absent from hind tibia..... 8
8. Head very distinctly produced in front; ocellar triangle very broad at vertex, carried forward to above antennæ in a broad prolongation, the centre convex, the sides of frons more or less excavated; third joint of antennæ distinctly longer than broad; arista generally appearing flattened through the presence of thick pubescence..... *Ectecephala* Macquart.
- Head only slightly, or not at all, produced in front; frontal triangle triangular, or subtriangular, flat; sides of frons more or less excavated..... 9
9. Cross-veins strongly approximated; veins 2 and 3 bent forward..... *Diplotoxa* Loew.
- Cross-veins not approximated; veins 2 and 3 almost straight..... 10
10. Third antennal joint disc-like; head not produced anteriorly; mesonotum yellow, with black or red stripes, seldom black, and indistinctly punctured or unpunctured..... *Chlorops* Meigen.
- Third antennal joint longer than broad, head at least slightly produced anteriorly; or mesonotum black and strongly punctured..... 11
11. Mesonotum entirely black, coarsely punctured..... *Epichlorops* Becker.

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- Mesonotum not strongly punctured, and with distinct stripes . . . . . 12
12. Head produced anteriorly; third joint of antenna at least  $1\frac{1}{4}$  times as long at base . . . . . \**Parectecephala* Becker.  
 Head not distinctly produced; third joint of antenna but little longer than broad; dull yellow and black, robust species, with black palpi . . . . . \**Anthracophaga* Loew.
13. Hind tibia with a distinct, curved, apical thorn on the anterior side . . . . . 14  
 Hind tibia without such thorn . . . . . 17
14. Frons with distinct orbital setulae . . . . . 15  
 Orbits with, at most, weak hairs . . . . . 16
15. Scutellum elongated, disk flattened; male proboscis with two long apical hairs . . . . . *Prohippelates* Malloch.  
 Scutellum not elongated, convex; male proboscis normal . . . . . *Pseudohippelates* Malloch.
16. Arista flattened, strap-like . . . . . *Ceratobarys* Coquillett.  
 Arista not flattened . . . . . *Hippelates* Loew.
17. Second vein exceptionally short, third costal division much longer than second . . . . . *Siphunculina* Rondani.  
 Second vein not shortened, third costal as long as, or shorter, than second . . . . . 18
18. Arista either broadened and strap-like, or with distinct pubescence . . . . . 19  
 Arista neither thickened nor distinctly pubescent . . . . . 22
19. Arista more or less distinctly flattened, the pubescence very close, giving the arista a knife-like appearance even when the arista itself is but slightly flattened . . . . . 20  
 Arista normal in shape, pubescence rather loose . . . . . 21
20. Scutellum subtriangular, the marginal bristles situated on small warts . . . . . *Crassista* von Roser.  
 Scutellum rounded in outline, the margin without warts . . . . . *Melanochæta* Becker.
21. Scutellum elongated, the disk flattened . . . . . *Gaurax* Loew

\*The line of demarcation between these genera is very unsatisfactory, and though I am rather inclined to reject *Parectecephala* as entitled to generic rank, I have not sufficient material before me to enable me to decide the matter satisfactorily.

- Scutellum rounded, convex . . . . . *Neogaurax*, n. gen.
22. More than two bristles present on posterior part of notapleura . . . . . 23  
 Only two bristles on posterior part of notapleura . . . . . 24
23. Generally four notapleural bristles present; mesonotum with a row of bristles on or near to posterior margin; scutellum with about eight marginal bristles; proboscis not elongated . . . . . *Eugaurax* Malloch.  
 Notapleural bristles very numerous, the whole mesonotum thickly setulose; scutellum subtriangular, disc thickly setulose, apical bristles approximated; proboscis elongated and geniculated . . . . . *Chactochlorops*, n. gen.
24. Outer cross-vein absent . . . . . *Dicraeus* Loew.  
 Outer cross-vein present . . . . . 25
25. Proboscis elongated and geniculated, mouth margin slightly produced and with<sup>1</sup>a hair-like bristle at vibrissal angle . . . . . *Madiza* Fallen.  
 Proboscis fleshy, very slightly or not at all elongated, vibrissal hair absent . . . . . 26
26. Mesonotum with three distinct longitudinal sulci . . . . . *Tricomba* Liog.  
 Mesonotum not sulcate . . . . . *Botanobia* Liog.

From an examination of the material contained in several collections, and the descriptions by many previous authors, I find that in many cases species are placed in wrong genera, and purpose at some future time publishing notes in addition to those presented herewith as a guide to those who may have occasion to identify specimens belonging to this family.

#### NOTES AND DESCRIPTIONS:

##### *Neodiplotoxa*, n. gen.

This genus I have erected for the reception of *Diplotoxa nigricans* Loew. Owing to the fact that this species has the hind femur very much thickened, and the hind tibia bent, it is impossible to locate it except in *Meromyza* by the use of the older keys to the genera. It differs, however, very considerably from *Meromyza* in the structure of the antenna.

Type: *Diplotoxa nigricans* Loew.

**Meromyza flavipalpis**, n. sp.

Similar in coloration to *pratorum* var. *americana* Fitch, the palpi being entirely yellow. It differs from that species as indicated below:

Length of lower cheek margin barely equal to height of anterior profile of head, and barely two-thirds as long as height of head at vertex; face distinctly retreating in profile.....

*flavipalpis*, n. sp.

Length of lower cheek margin about  $1\frac{1}{2}$  times height of anterior profile of head, and slightly more than equal to height of head at vertex; face but slightly retreating, concave in centre.....

*pratorum* Fallice.

In addition to the above *flavipalpis* is considerably larger than *pratorum*, 4.5-5 mm. as against 2.5-3.5 mm.

Locality of specimens of *flavipalpis*: Champaign, Illinois, June 22, 1888, two males (Marten and Hart).

Type: Illinois State Lab. Nat. Hist. collection.

**Chloropisca** Loew.

There is present on the postero-dorsal surface of the hind tibia in the species belonging to this genus an elongate oval, flattened area, which occupies about two-thirds of the length of the tibia. This area is slightly depressed and thickly covered with closely set, short hairs, which leads me to consider that this area is the seat of some sensory organ. I have examined examples of the following genera and find that this organ is present in varying extent in: *Chloropisca*, *Pseudochlorops*, *Crassiseta*, *Melanochæta*, and *Botanobia*, and absent in the species I have examined in *Elliponeura*, *Ectcephala*, *Meromyza*, *Neodiplotoxa*, *Diplotoxa*, *Chlorops*, and *Epi-chlorops*.

The amount of material available to me at present is not such that I can form any distinct idea of the significance of this organ in the classification, nor do I know what the organ may have as its function; but it is not improbable that it may prove of considerable value in classifying this rather closely allied group. It appears rather strange to me that *Chloropisca*, which has very much the general habitus of, and is very similar in food habits to *Chlorops*, should have this organ well developed, whereas the latter

genus so far as I have discovered, should not possess the organ. Possibly the examination of more material, and living examples, may throw more light upon this matter.

***Chloropisca obtusa*, n. sp.**

Female shining yellow. Frontal triangle glossy, brownish black; basal joints of antennæ brown, upper margin of third joint blackened, the lower part yellow; face and cheeks yellow; proboscis palpi, and clypeus yellow; arista brown, yellow at base. Mesonotum with the three glossy black stripes very broad, the area between them suffused with black, giving the disk the appearance of being entirely black, the narrow black stripes before wing base separated from the sub-dorsal stripes except anteriorly; mesopleura with a small black spot; the mark on sternopleura reddish yellow, scutellum yellow; postnotum glossy black. Abdomen with a broad, black, foremarginal band on each segment. Legs yellow; apical three joints of fore tarsi and apical joint of other tarsi blackened; sensory organ not differing from colour of hind tibia. Wings clear, veins brown, last section of fourth vein less distinct than the other veins. Halteres whitish yellow.

Frontal triangle occupying about three-fourths the width of frons at vertex, carried forward of almost equal width for almost two-thirds the length of frons, then gradually tapering to just above antennæ, the apical third leaf like, the sides slightly convex, surface unpunctured, smooth; third joint of antennæ about  $1\frac{1}{4}$  times as long as broad; arista about as long as width of frons at anterior margin; face slightly receding; cheek about one-fifth as high as eye; eye distinctly, but not greatly, higher than long. Scutellum distinctly broader than long, not so noticeably sub-triangular as in *glabra* Meigen, the apical bristles present. Legs slender, the fore tarsi not thickened; sensory organ occupying about three-fifths the length of the hind tibia. Wing with discal cell narrow, inner cross-vein well before end of first vein; penultimate section of fourth vein distinctly longer than basal section of third, longer than last section of fifth and about half as long as last section of fourth.

Length: 3.5 mm.

Locality: Champaign, Illinois, "swept from amongst grass and weeds," May 30, 1889 (Marten).

Type: Illinois State Lab. Nat. Hist. collection.

This species may be separated from any previously described form by the obtuse frontal triangle. It is most closely allied to *glabra* Meigen.

**Chloropsis glabra**, var. **clypeata**, n. var.

This variety may be separated from the type form by being larger, 3 mm., in having the third antennal joint  $1\frac{1}{4}$  times as long as broad, the clypeus yellow, instead of black as in *glabra*, and the sternopleura without the black spot.

Localities: Algonquin, Illinois, September 21, 1894 (W. A. Nason), Urbana, Illinois, swept from catalpa, June 21, 1883 (Marten); Urbana, Illinois, July 15, 1887, in woods (C. A. Hart).

This form may really be a distinct species, but colour alone is not a reliable guide to the separation of species in this genus, and till I see more material, I consider it best to give the form varietal rank only.

**Pseudochlorops**, n. gen.

The type species of this genus is *Chlorops unicolor* Loew. It differs from *Chlorops* in having a distinct sensory area on the hind tibia, and from *Chloropsis* in having the scutellum convex.

**Prohippelates** Malloch (Pr. U. S. N. M., 1913).

The type of this genus is *Hippelates pallidus* Loew. This genus and its allies, *Hippelates*, *Pseudohippelates* and *Ceratobarys*, have been dealt with in a paper which I have now in the press.

**Pseudohippelates** Malloch (Pr. U. S. N. M., 1913).

The type of this genus is *Pseudohippelates capax* Coquillett.

**Siphunculina** Rondani.

To this genus belongs *Siphonella reticulata* Loew.

**Neogaurax**, n. gen.

The type of this genus is *Gaurax montanus* Coquillett. It differs, as indicated, in the foregoing table, from *Gaurax* in the

shape of the scutellum and is more closely allied to *Botanobia* than to *Gaurax*, differing from it principally in the distinctly pubescent arista.

**Chaetochlorops**, n. gen.

The type of this genus is *Siphonella inquilina* Coquillett. The characters given in the foregoing table should suffice for its identification. This is the only species I know which is referable to this genus.

The other changes in generic names I have already dealt with in the Canadian Entomologist, 1913, p. 175.

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A PHALANGID DRINKS MILK.

I generally have a cup of milk placed in my room, which I drink after I have finished my nocturnal rounds of my treecled trees.

The other night I saw a very fine specimen of a Harvestman (Phalangid) in the saucer. Wondering what brought him there, I managed to remove the cup without disturbing him, and found that a small quantity of milk had been spilt into the saucer and that the spider was taking a drink.

He first anchored his fourth pair of legs on the rim of the saucer; then gradually—very slowly—lowered his body till it was nearly touching the liquid. It was then tipped forward and downwards, until the mouth was in contact with the milk. After about a minute he raised himself to his ordinary standing height and began to clean his mouth, opening and shutting his mandibles (or whatever they are) like a pair of compasses. I was surprised at their size—far larger and more formidable looking than one expects from the size of the creature. Then he raised one or other of his second pair of legs and used the claw to finish the cleaning process. This done to his satisfaction he took another drink. This he did three successive times, and then, satisfied I suppose, took his departure. I noticed he was most careful to keep his feet out of milk.—E. FIRMSTONE HEATH,

The Hermitage, near Cartwright, Man.

September 6th, 1913.



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A NOTE UPON THE FOOD HABITS OF ADULT  
TENTHREDINIDÆ.

Whilst collecting insects on the 13th of May, 1913, I was interested to observe an adult *Tenthredo variegatus* engaged in feeding upon the remains of a small Dipterous insect, and was fortunately able to secure the specimen alive and unharmed.

I kept it in confinement for some days and was able to make some observations upon the feeding habits of this species.

It was found to feed greedily upon house flies, which were seized with great violence as soon as they were introduced into the jar in which the *Tenthredo* was confined. A wound was then made in the body, into which the mouth parts were introduced and the contents of the body consumed.

On some occasions an attempt was made to drag the fly from the forceps, which were used to place it in the jar, the saw-fly shewing great excitement, constantly dashing about and jerking its legs and wings in the manner of certain predaceous wasps.

The above note is offered as a contribution to a subject upon which I believe little is at present definitely known.

E. P. VENABLES, Vernon, B.C.

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NEW OR LITTLE KNOWN SPECIES OF APHIDIDÆ.

BY JOHN J. DAVIS, BUREAU OF ENTOMOLOGY, WASHINGTON, D.C.

(Continued from Page 87.)

***Myzus circumflexum*** (Buckton).

(*Siphonophora circumflexa* Buckton).

(*Myzus vinæ* Gillette).

This beautiful *Myzus* was first reported in this country by Mr. F. A. Sirrine,\* who found it attacking calla lily, cyclamen "dusty miller" (*Senecio cineraria*) and *Spiraxis* in greenhouses, it being especially troublesome to the calla. Prof.

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\*14th Ann. Rept. N.Y. Agric. Expt. Station, 1896, p. 603.

April, 1914

C. P. Gillette has reported it from liliaceous plants, asparagus fern, *Aquilegia*, *Rumex* sp., and *Vinca* in greenhouses, while the writer has found it common and often injurious to such greenhouse plants as *Vinca*, Asparagus fern, *Adiantum hybridum*, and calla lily, at Chicago, Ill. Specimens of this aphidid have been received from Prof. R. H. Pettit, who collected it on calla lily and *Freesia* in greenhouses at East Lansing, Mich. Recently (February 1, 1913) the writer found this species very common on sprouts of various plants in the cold plant room of the Botany Department of the Purdue Agricultural Experiment Station at La Fayette, Ind. Here it was found breeding abundantly on the following plants: *Anemone cylindrica*, *Aquilegia canadensis*, *Arabis*, *Artemisia dracunculoides*, *Aster dumosus*, *A. multiflorus*, *A. paniculatus*, *Carduus floeridianii*, *Malvastrum coccineum*, *Polymnia canadensis*, *Rumex obtusifolius*, *Sambucus canadensis*, *Senecio (foliosa) serra* (?) (so labeled), *Steironema lanceolatum*, *Viola nuttallii*. It was also breeding on the following, but not so abundantly: *Aquilegia flavescens* (so labeled), *Ranunculus acris*, *Rutbeckia laciniata*, and *Solidago missouriensis*. From this it will be seen that this species is capable of living and breeding on a large variety of plants, and in this respect, as well as in its habits, it resembles *Myzus persicae* (in greenhouses) and, in fact, the two species are not infrequently found intermingled in the same colonies. Even in the cold plant room just mentioned, where during the past winter the temperature was often as low as 40° F., no sexual forms were observed.

We have recently received specimens of this species from Dr. Albert Tullgren of Sweden, and are able to identify our American forms as the same as the European. It has, so far as we are able to learn, always been referred to the genus *Macrosiphum* by European students of Aphididæ, but it is without doubt a typical member of the genus *Myzus*.

For a complete description of this species see Prof. Gillette's paper on "New Species of Colorado Aphididæ, with notes upon their life-habits," in the Canadian Entomologist, volume 40, page 19, 1908.

**Myzus lycopersici** (Clarke)*(Macrosiphum lycopersici* Clarke.)

This species was first identified by Mr. H. F. Wilson as *Macrosiphum lycopersici* Clarke, from specimens collected on wheat and tomato in Montana, sent him by Prof. R. A. Cooley. The Clarke collection of Aphididæ, which contained all his type specimens, was destroyed in the San Francisco earthquake and fire, and consequently it was not possible positively to identify the species. The fact that the original description of this species agrees fairly well with the species here described, that it was found not uncommon on tomato, the type host, and that it has been found by Mr. Wilson in Oregon, where the fauna is not unlike that of the northern half of California, tend to establish the identity of this species beyond little doubt.

*Wingless viviparous female.*

(Pl. V, fig. 26.)

Entire body pale lemon-yellow, the head usually whitish yellow, with a more or less distinct longitudinal dorsal median line of pale green colour; also, an area at base of cornicles of a deeper yellow is usually discernible, and often one or more of the red eyes of the young within show through the body wall. Antennæ having segments I and II concolorous with head; the remaining segments whitish semitransparent, excepting a faint duskiess at tips of III and IV, the tips of V and of base of VI and the distal third of filament of VI blackish; segments III and filament of VI subequal; total length less than that of the body; one or two circular sensoria near base of segment III and the usual distal ones on V and base of VI. Eyes very dark reddish brown, apparently black under hand lens. Beak not quite reaching to coxæ of second pair of legs. Legs whitish, the tips of tibiæ brownish and the tarsi dusky to blackish. Cornicles whitish yellow and semitransparent; cylindrical, and reaching a little beyond tip of cauda. Cauda pale yellow or greenish yellow, paler than body colour.

Average measurements from 8 individuals, alive and in balsam, as follows: Length of body, not including cauda, 1.90 mm.;

length, including cauda, 2.05 mm.; width, 0.83 mm.; length of cornicle 0.42 mm.; cauda 0.26 mm.

Antennal measurements as follows:

Locality, Date, Etc.	I. mm.	II. mm.	III. mm.	IV. mm.	V. mm.	VI. (base) mm.	VI. (fil.) mm.	Total mm.
La Fayette, Ind. (Idaho specimens*) Wheat, Aug. 23, 1912	0.104	0.069	0.504	0.330	0.332	0.148	0.522	2.000
La Fayette, Ind. (Idaho specimens*) Wheat, Aug. 23, 1912	.104	.069	.539	.348	.313	.148	.522	2.043
La Fayette, Ind. (Idaho specimens) Wheat, Aug. 24, 1912	.....	.....	.495	.313	.278	.130	.....	.....
La Fayette, Ind. (Idaho specimens) Wheat, Aug. 24, 1912	.104	.078	.504	.304	.261	.139	.487	1.877
La Fayette, Ind. (Idaho specimens) Wheat, Aug. 24, 1912	.....	.....	.470	.304	.243	.139	.435	.....
La Fayette, Ind. (Idaho specimens) Wheat, Aug. 24, 1912	.....	.....	.487	.261	.226	.139	.444	.....
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912	.096	.069	.495	.330	.269	.139	.495	1.893
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912	.....	.....	.504	.296	.278	.130	.504	.....
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912	.096	.069	.461	.261	.261	.139	.452	1.739
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912	.087	.069	.478	.269	.269	.139	.470	1.781
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912	.096	.069	.487	.296	.296	.148	.504	1.896
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912	.069	.069	.487	.304	.296	.148	.487	1.887
New Richmond, Ind., Oats, Nov. 9, 1912, Female producing	.104	.069	.504	.365	.296	.139	.539	2.016
New Richmond, Ind. Oats, Nov. 9, 1912, Female producing	.104	.069	.522	.382	.313	.139	.574	2.103
New Richmond, Ind. Oats, Nov. 9, 1912, Female producing	.....	.....	.487	.330	.278	.139	.495	.....

\* Measurements from living specimens.

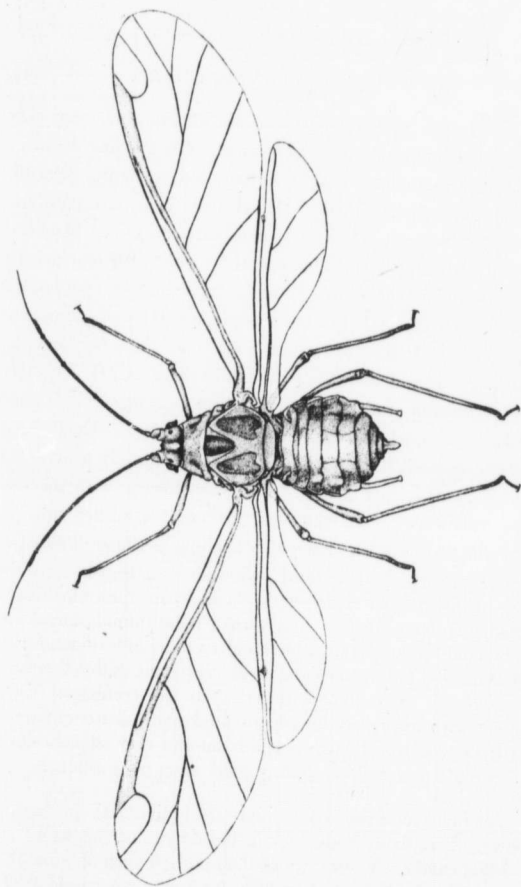


FIG. 14.—*Myzus lycopersici*, winged viviparous female.

*Winged viviparous female.*

(Fig. 14 and Pl. V, figs. 27-30).

Head pale yellow, with a slight dusky tint near posterior border; the antennal tubercles typical of the genus *Myzus*. Antennae with segments I and II whitish with a slight yellowish tint, II sometimes faintly dusky, III with extreme base pale and the remainder blackish, IV and V pale with dusky to blackish tips, base of VI blackish and filament of VI pale with blackish tip (in some specimens the entire antenna excepting segments I, II and extreme base of III is blackish); segments III and filament of VI subequal, sometimes the one and sometimes the other being larger; total length less than that of the body; segment III with 18 to 26 circular sensoria, and the usual distal ones on segments V and base of VI. Eyes dark reddish brown, almost black. Ocelli bordered with conspicuous dark wings. Beak reaching only a little beyond coxae of the first pair of legs. Thorax yellowish, with the thoracic plates yellowish brown and their apices of a darker tint. Wing veins pale brownish and narrow, branching as shown in illustration. Femora whitish, with a faint yellowish or greenish tint, the tip dusky; tibiae pale brownish with blackish tip; tarsi blackish. Abdomen pale lemon-yellow and with a longitudinal, dorsal median line of a pale green colour, which is often more or less inconspicuous; sometimes the fall forms show three very faint dull-yellowish spots on each side of abdomen, anterior to the cornicles. Cornicles whitish, with a faint yellowish tint and semitransparent, reaching a little beyond tip of cauda, cylindrical and very slightly flaring at tip. Cauda pale yellow, slightly paler than body colour.

Average measurements from 15 individuals in balsam as follows: Length of body, not including cauda, 1.8 mm.; length, including cauda, 1.9 mm.; width 0.66 mm.; length of wing 3.6 mm, width 1.3 mm.; length of cornicle 0.43 mm., of cauda 0.22 mm. Antennal measurements as follows:

Locality, Date, Etc.	I.	II.	III.	IV.	V.	VI.	VI. (filaments)	Total.
703. Bozeman, Mont., celery Aug. 30, 1911, J. R. Parker.	mm. 0.104	mm. 0.087	mm. 0.696	mm. 0.539	mm. 0.493	mm. 0.165	mm. 0.591	mm. 2.582
709. Bozeman, Mont., celery Aug. 30, 1911, J. R. Parker.	.104	.087	.713	.487	.417	.165	.574	2.547
707. Bozeman, Mont., wheat Aug. 26, 1912, H. F. Dietz.	.104	.078	.661	.417	.365	.156	.556	2.337
707. Bozeman, Mont., wheat Aug. 26, 1912, H. F. Dietz.	.104	.087	.643	.439	.391	.156	.574	2.355
709. Bozeman, Mont., tomato Aug. 30, 1911, J. R. Parker.	.....	.087	.643	.470	.383	.156	.651	.....
709. Bozeman, Mont., tomato Aug. 30, 1911, J. R. Parker.	.....	.....	.626	.487	.383	.153	.613	.....
707. Bozeman, Mont., wheat Aug. 26, 1912, H. F. Dietz.	.104	.087	.748	.522	.435	.165	.637	2.748
707. Bozeman, Mont., wheat Aug. 26, 1912, H. F. Dietz.	.104	.087	.765	.530	.443	.165	.721	2.815
Shoshone, Idaho, oats, July 18, 1912, T. H. Parks.	.104	.087	.539	.499	.348	.156	.....	.....
Shoshone, Idaho, oats July 18, 1912, T. H. Parks.	.....	.....	.594	.348	.296	.148	.539	.....
La Fayette, Ind. (Idaho specimens), Wheat, Aug. 9, 1912.....	.036	.070	.522	.356	.304	.156	.548	2.052
La Fayette, Ind. (Idaho specimens) Wheat, Aug. 9, 1912.....	.036	.078	.522	.348	.287	.148	.556	2.035
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 10, 1912.....	.104	.087	.574	.499	.365	.156	.574	2.269
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 10, 1912.....	.104	.087	.591	.435	.365	.165	.609	2.347
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 10, 1912.....	.104	.078	.635	.417	.374	.156	.591	2.364
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 10, 1912.....	.104	.078	.643	.499	.365	.153	.582	2.346
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 11, 1912.....	.104	.087	.699	.435	.383	.165	.609	2.383
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 11, 1912.....	.036	.078	.582	.461	.499	.156	.574	2.347
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 11, 1912.....	.....	..	.622	.443	.383	.165	.699	.....
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 11, 1912.....	.....	.....	.591	.435	.383	.156	.591	.....

Locality, Date, Etc.	I.	II.	III.	IV.	V.	VI. (base)	VI. (fila- ments)	Total.
La Fayette, Ind. (Idaho specimens) Wheat, October, 1912.....	mm. .113	mm. .078	mm. .696	mm. .513	mm. .400	mm. .174	mm. .643	mm. 2.617
La Fayette, Ind. (Idaho specimens) Wheat, October, 1912.....	.....	.....	.748	.508	.417	.165	.626	.....
La Fayette, Ind. (Idaho specimens) Wheat, October, 1912.....	.121	.087	.713	.522	.365	.165	.643	2.616
La Fayette, Ind. (Idaho specimens) Wheat, October, 1912.....	.113	.078	.730	.504	.383	.165	.600	2.583
La Fayette, Ind. (Idaho specimens), Wheat, Oct., 1910, female producing oviparous females.....	.104	.087	.591	.400	.339	.148	.533	2.208
La Fayette, Ind. (Idaho specimens), wheat, Oct., 1910, female producing oviparous females.....	.104	.078	.591	.417	.348	.148	.530	2.216
La Fayette, Ind. (Idaho specimens), wheat, Oct., 1910, female producing oviparous females.....	.026	.078	.522	.348	.313	.148	.522	2.027
La Fayette, Ind. (Idaho specimens), wheat, Oct., 1910, female producing oviparous females.....	.104	.078	.504	.356	.313	.148	.522	2.025

*Pupa of Male:*

Entire body pale yellowish or cream colour, the abdomen with a faint pink tint in the ground colour. Neck with a decided pink tint. Abdomen with a longitudinal dorsal median area of deep pink, the anterior end of which terminates in a diffused pink area, this extending on to the thorax. Antennae whitish, excepting V, base of VI and filament of VI (except central area of this segment), which are dusky to blackish. Eyes dark red. Legs whitish, excepting tarsi, which are blackish. Cornicles whitish.

*Winged male.*

(Fig. 15, Pl. V, fig. 31.)

Head pale at anterior portion, becoming dusky to brownish posteriorly. Antennae with segments I and II whitish with a slight duskiness, the remaining segments blackish to black; from 48 to 59 circular sensoria, irregularly placed, on III, none on IV, 6 to 10 on V, not including the usual distal one, more or less in a row and



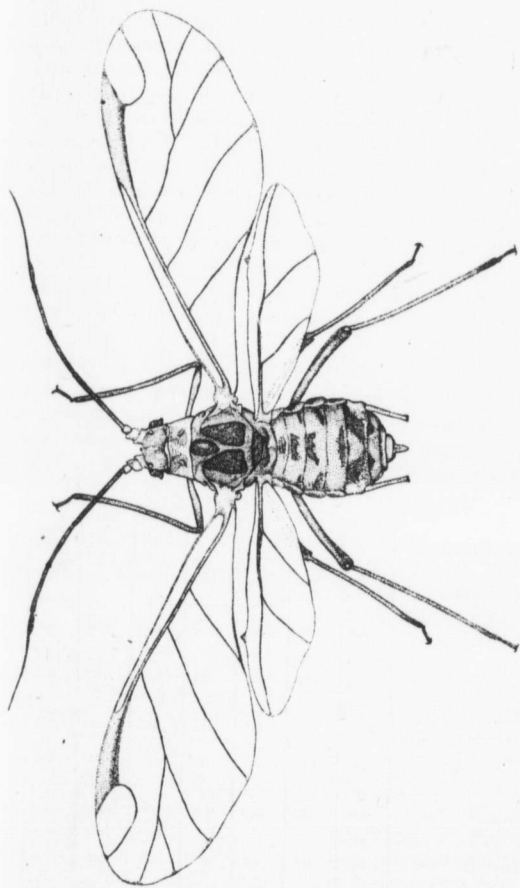


FIG. 15.—*Mesochorus foveolatorius*, winged male.

usually on distal half of segment, the usual distal ones on base of segment VI; segments III and filament of VI subequal, the latter usually being slightly the longer; total length greater than that of the body. Eyes dark red; ocelli marked with dark rings. Thoracic lobes brownish or olive brown. Wings with fine blackish veins, the venation as for the viviparous female. Legs pale, excepting tips of femora, bases and extremities of tibiae, and the tarsi, which are dusky to black. Abdomen pale pinkish, with the longitudinal dorsal median area darker and rather conspicuous; the area at base of cornicles yellowish; on each side, anterior to the cornicles, not visible from the dorsal aspect, are three dark spots. Cornicles whitish, semitransparent, with a yellowish tint basally, cylindrical, reaching to or slightly beyond tip of cauda. Cauda pale yellow or cream colour.

Average measurements from 9 individuals mounted in balsam: Length of body, not including cauda, 1.63 mm.; length, including cauda, 1.80 mm., width 0.59 mm.; length of wing 3.6 mm, width 1.35 mm.; length of cornicle 0.36 mm.; length of cauda 0.17 mm. Antennal measurements as follows:

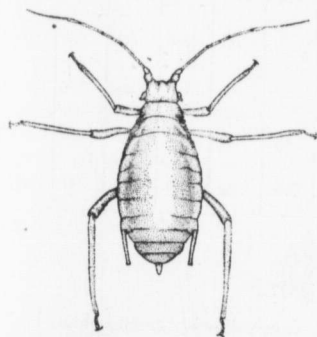
Locality, Date, Etc.	I.	II.	III.	IV.	V.	VI. (base)	VI. (filament)	Total.
New Richmond, Ind., oats Nov. 15, 1912. ....	mm. 0.104	mm. 0.087	mm. 0.714	mm. 0.539	mm. 0.487	mm. 0.191	mm. 0.730	mm. 2.852
New Richmond, Ind., oats, Nov. 15, 1912. ....	.069	.087	.678	.452	.407	.165	.661	2.546
New Richmond, Ind., oats, Nov. 15, 1912. ....	.096	.087	.661	.452	.435	.165	.669	2.565
New Richmond, Ind., oats, Nov. 15, 1912. ....	.096	.070	.591	.424	.383	.156	.678	2.398
New Richmond, Ind., oats, Nov. 15, 1912. ....	.096	.070	.591	.417	.372	.165	.626	2.337
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 21, 1912. ....	.104	.070	.650	.435	.435	.156	.678	2.528
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 21, 1912. ....	.104	.078	.591	.417	.407	.165	.609	2.371
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 21, 1912. ....	.104	.078	.591	.435	.407	.156	.652	2.423

Locality, Date, Etc.	I.	II.	III.	IV.	V.	VI. (base)	VI. (fila- ment)	Total.
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 21, 1912.....	mm. .087	mm. .070	mm. .617	mm. .389	mm. .383	mm. .148	mm. .626	mm. 2.319
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 1, 1912.....	.087	.070	.685	.459	.435	.174	.696	2.606
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 1, 1912.....	.087	.070	.678	.452	.435	.156	.696	2.574
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 1, 1912.....	.087	.070	.643	.383	.400	.156	.635	2.374
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 1, 1912.....	.096	.070	.626	.400	.365	.156	.626	2.339
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 15, 1912.....	.104	.070	.730	.522	.495	.191	.748	2.860
La Fayette, Ind. (Idaho specimens) Nov. 15, 1912.....	.104	.070	.713	.522	.495	.....	.....	.....

*Wingless oviparous female.*

(Fig. 16, Pl. V, fig. 32, and Pl. VII, fig. 33.)

Head and prothorax white, remainder of body a pale cadmium yellow, the last two abdominal segments paler yellow. Antenna

FIG. 16.—*M. lycopersici*, wingless oviparous female.

having segments I and II concolorous with head, the remaining segments whitish transparent, excepting tips of IV, V, base of VI and distal third of filament of VI, which are dusky; filament of segment VI the longest, being invariably longer than III; total length less than that of the body; segment III with 1 or 2 circular sensoria near base (some specimens appear to have this segment

bare of sensoria) and the usual distal ones at tips of V and at base of VI. Eyes blackish. Beak just reaching to coxæ of second pair of legs. Legs whitish transparent, excepting tips of tibiæ, which are dusky, and the tarsi, which are blackish. Hind tibiæ swollen and bearing 75 or more irregularly placed circular sensoria. Cornicles whitish transparent, not quite reaching to tip of cauda in fully matured individuals. Cauda pale to whitish green.

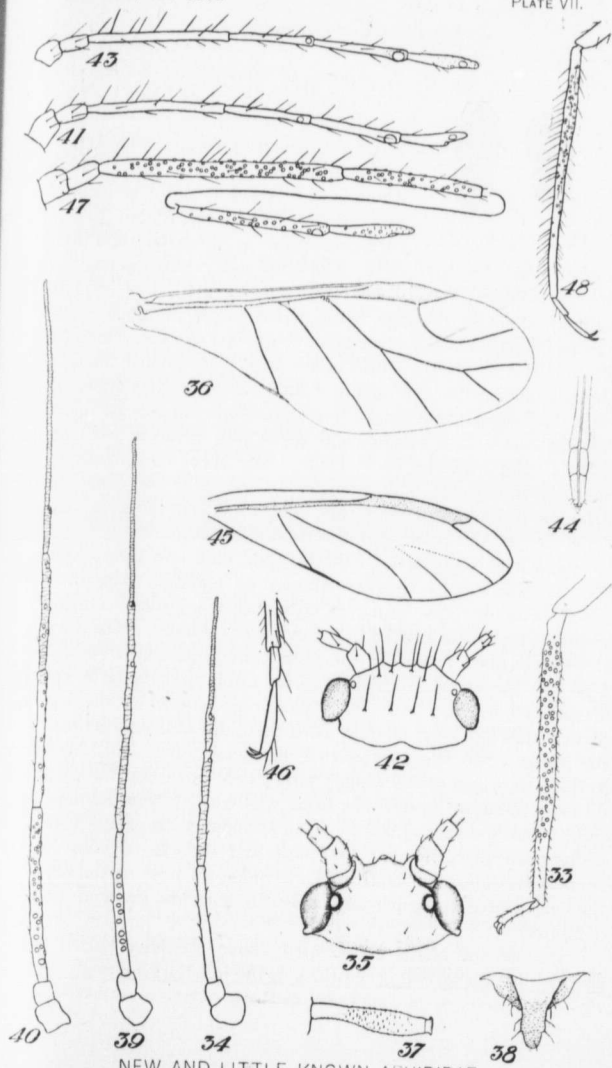
Average measurements from 5 individuals mounted in balsam: Length of body, not including cauda, 1.38 mm.; length to tip of cauda 1.48 mm.; width 0.61 mm.; length of cornicle 0.295 mm.; length of cauda 0.16 mm. Antennal measurements as follows:

Locality, Date, Etc.	I.	II.	III.	IV.	V.	VI. (base)	VI. (fila- ment)	Total.
La Fayette, Ind. (Idaho specimens) Wheat, Dec. 2, 1912 .....	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
	.....	.....	0.313	0.174	0.165	0.122	0.339	.....
La Fayette, Ind. (Idaho specimens) Wheat, Dec. 2, 1912 .....	.087	.070	.296	.191	.191	.113	.391	1.339
La Fayette, Ind. (Idaho specimens) Wheat, Dec. 2, 1912 .....	.087	.070	.296	.290	.200	.113	.490	1.366
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 20, 1912 .....	.087	.061	.333	.243	.209	.113	.383	1.435
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 20, 1912 .....	.087	.061	.356	.243	.209	.113	.409	1.478
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 20, 1912 .....	.087	.061	.278	.209	.226	.104	.374	1.339
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 20, 1912 .....	.087	.061	.287	.191	.217	.122	.400	1.365
New Richmond, Ind. Wheat, Nov. 9, 1912 .....	.087	.061	.348	.252	.209	.113	.417	1.487

*Egg:*

(Fig. 17.)

The egg when first laid is pale yellowish green colour, later changing to jet black. It measures 0.0678 mm. by 0.3304 mm.



NEW AND LITTLE KNOWN APHIDIDAE

During oviposition, which requires 14 minutes for the deposition of a single egg, the female holds the cauda perpendicular to the body.



FIG. 17.—*M. lycopersicæ*  
egg.

This interesting species was first received from Mr. T. H. Parks, of this Bureau, who found it quite common on oats, first at Shoshone, Idaho, July 18, 1912, and later at Blackfoot and Idaho Falls, Idaho, August 7, 1912. The same species was received from Mr. E. J. Vosler, who collected it on oats at Salt Lake City, Utah. Later in the year (October 8) the writer found the pupæ of viviparous females, as well as wingless viviparous females, which were giving birth to the beautiful and conspicuous pinkish males, in abundance on volunteer oats near an elevator at New Richmond, Ind. Specimens collected at Bozeman, Mont., in August of 1911 and 1912 on wheat, tomato, and celery were received from Prof. R. A. Cooley and Mr. H. F. Dietz. Mr. Dietz informs me that they also found the pinkish males on wheat at the same time, although it was not known then that they and the pale yellow forms on the same plant were specifically identical.

In rearing cages at La Fayette, Ind., pink and yellow young were obtained from wingless viviparous females. The former became winged males, while the latter became winged viviparous females, which in turn gave birth to oviparous females. The winged males were quite restless in the cages containing wheat plants, as were also the sexuparæ, and it was only rarely that the latter could be induced to give birth to an oviparous female on the wheat plants, although most of those born there did feed and mature on the wheat. Mr. Dietz states that in August, at the time his collections were made, the winged forms were apparently migrating to some unknown host. The same was true at New Richmond, Ind., where the species was found in abundance on oats. Thus it seems quite probable that the males and the winged viviparous females (sexuparæ) migrate to some unknown host in the fall of the year, where the oviparous females are born and the winter eggs deposited.

Besides the plants enumerated above, we have reared this species through several generations in the insectary on rye.

(To be continued.)

## MEETINGS OF THE TORONTO BRANCH.

During the first part of the present season, up to the end of the year, the Toronto Branch of the Entomological Society of Ontario has made good progress. Four new members have been elected, and there has been a distinct increase in the attendance at the meetings. Three meetings have been held at which very interesting papers have been presented. A little variety has been given by the fact that two of the papers have not been confined strictly to entomology, but have been of a somewhat wider character.

At the October meeting of the Branch, Dr. A. Cosens read a paper upon "Some Captures of the Season," exhibiting a number of specimens taken during the past summer. A considerable number of species of galls had been obtained which Dr. Cosens had not found before.

This paper was followed by an account by Dr. E. M. Walker of a peculiar insect which he found at Banff last summer. Two female specimens had been obtained, which were shown to those present, and which represent not only a new species and genus, but a new family of the Orthoptera, and appear to be of a more primitive type than any of the members of the order known hitherto.\*

At the November meeting, Mr. E. Horne Craigie gave a paper entitled, "Summer Work in Scotland." He showed specimens of several species of galls obtained in Scotland during the past season, along with some specimens of similar Canadian species, which were kindly lent by Dr. Cosens. He then went on to describe the work on S. S. "Goldseeker," the scientific cruiser of the Fishery Board for Scotland, on which he spent some time this summer, working in the North Sea and the Faroe, Shetland Channel. The paper was illustrated by lantern slides and specimens.

At the December meeting Mr. Kenneth F. Auden gave an address upon "Arthropoda of the Bahamas," illustrating his remarks by specimens which he had brought from the Bahamas this summer. About one hundred insects and a large number of crustaceans, etc., were exhibited.

Dr. E. M. Walker then addressed the meeting upon the subject of "Primitive Insects," pointing out just what the term implied, and describing some of the primitive characters of certain of the

\**Grylloblatta campodiformis* Walk., Can. Ent., 46, pp. 93-99.

Thysanura and Collembola, particularly of the genera *Machilis* and *Japyx* of the Thysanura. These were compared with *Scolopendrella*, the typical genus of the class Symphyla, and the closest living relative of the insects. Specimens of these forms were shown, in which most of the features referred to were pointed out.

The Branch was favoured with the presence at this meeting of Mr. Arthur Gibson, Chief Assistant Entomologist of the Division of Entomology, Ottawa, who gave an interesting outline of the work of the Division both at Ottawa and in the field. He stated that since the new Division had been established in 1908, under the direction of Dr. Hewitt as Dominion Entomologist, the work had increased very rapidly. This was largely due to the finding of nests of the Brown-tail Moth in importations of nursery stock from Europe, which necessitated the passing by Parliament of the Destructive Insect and Pest Act (under the provisions of which nursery stock entering Canada is inspected by inspectors of the Division) and the establishment of Field Stations in the different Provinces. The field work in Nova Scotia and New Brunswick in connection with the Brown-tail Moth was discussed and many questions asked by members present. Mr. Gibson spoke of his own and Mr. Strickland's work in Alberta in the control of a Cutworm (*Porosagrotis orthogonia*) which during the past three years had devastated many wheat fields. A preliminary report on the investigation was presented at the recent meeting of the Association of Economic Entomologists. E. HORNE CRAIGIE, Sec.-Treas.

#### CANADIAN ENTOMOLOGICAL SERVICE.

Mr. R. Neil Chrystal, B.Sc., of the University of Edinburgh, has been appointed a Field Officer for Forest Insect Investigations in the Entomological Branch of the Department of Agriculture, Ottawa. Mr. Chrystal, who is the son of Dr. Chrystal, Professor of Mathematics in the University of Edinburgh, graduated in forestry, including entomology, and afterwards studied forestry methods in Germany. During the last year he has been specializing on forest insects under Dr. R. Stewart MacDougall at Edinburgh University and Prof. Maxwell Lefroy of the Imperial College of Science, London. He will be detailed for work in British Columbia during the coming summer.



NEW GENERA AND SPECIES OF TENTHREDINIDÆ:  
A FAMILY OF HYMENOPTERA.\*

BY ALEX. D. MACGILLIVRAY, UNIVERSITY OF ILLINOIS, URBANA, ILL.

(Continued from page 108).

**Astochus aldrichi**, n. sp.—Female: Body black with the antennæ, a short, fine line on the inner orbits, the legs below the trochanters, and the abdomen beyond the basal plates, rufous; the following parts: the labrum, a spot on each side of the labrum, a narrow interrupted band on the edge of the pronotum, the tegulæ, an ovate spot on the mesopleura, a spot above the posterior coxæ, the front coxæ beneath, the hind coxæ beneath and at sides, the trochanters, and the stigma in great part, yellowish white; the ocellar basin elevated at sides and concave at middle; the frontal furrow deep and broad, extending to the supraclypeal area; head and thorax polished; postocellar area broader than long, with a deep median furrow, interrupting the posterior margin of the head; the wings slightly infuscated; the saw-guides convex above and below, convergent toward apex, obliquely truncated at apex. Length, 8 mm.

Habitat.—Juliaetta, Idaho.

This specimen was collected by Professor J. M. Aldrich, for whom the species is named.

**Kincaidia**, n. gen.—Front wings with the radial cross-vein, the radio-medial cross-vein, the free part of  $R_5$  and  $R_4$  present; the medio-cubital cross-vein joined to  $R+M$  some distance before the origin of  $M$ ;  $\mathcal{S}c_1$  wanting; the free part of  $R_5$  and the transverse part of  $M_2$  not interstitial; the free part of the second anal vein short, erect, transverse; the contraction of the third anal vein indicated; the hind wings with the free part of  $R_4$  and the transverse part of  $M_2$  present; the first anal cell almost as long as the one in front of it; antennæ with nine segments; compound eyes with the inner margins parallel and distant; the basal plates divided; the claws cleft. Type, *Tenthredopsis ruficornis* MacG.

This genus is related to *Astochus*. It is named for Professor Trevor Kincaid, from whom I have received many interesting species of sawflies from the Pacific Coast.

\* Contributions from the Entomological Laboratories of the University of Illinois, No. 37.

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**Neopus** MacG.—Front wings with the radial cross-vein, the radio-medial cross-vein, the free part of  $R_4$  and  $R_5$  all present; the medio-cubital cross-vein joined to  $R_4+M$  a considerable distance before the origin of  $M$ ;  $Sc_1$  obsolete on its costal half, located near the medio-cubital cross-vein; the free part of the second anal vein short, erect, and transverse; the contraction of the third anal vein indicated; hind wings with the free part of  $R_4$  and the transverse part of  $M_2$  wanting; antennæ with nine segments; the clypeus emarginate; compound eyes with their inner margins straight and parallel and distant; the basal plates divided; the claws cleft. Type, *Tenthredopsis 14-punctatus* Norton.

This genus is related to *Tenthredopsis*. This name was first used in Smith's Report of the Insects of New Jersey, 1910, p. 585, where it is properly accredited. Mr. S. A. Rohwer, in a paper on the genera of the Tenthredinoidea, has accredited this name and some others by the writer, used for the first time in this list, to Mr. H. L. Viereck. It is unfortunate that such references should have been used in a paper of this sort. Mr. Rohwer's conclusions in respect to the authority for these names is discussed by Mr. Viereck in the Proceedings of the Entomological Society of Washington, Vol. 13, 1911, p. 94.

**Tenthredo neoslossoni**, n. sp.—Female: Body black, with the following parts yellowish white: the clypeus, the labrum, mandibles at base, spot on the supra-clypeal area, the collar, the scutellum, a spot above the posterior coxæ, the sides of the basal plates, and the tarsi, yellow; the following parts rufous: the antennæ, a minute spot on each inner orbit, the tegulæ, the front femora beneath, the front and middle tibiæ, the basal three-fourths of the hind tibiæ, and abdominal segments two to four; antennæ with the third segment distinctly longer than the fourth; the clypeus deeply emarginate; the head and thorax roughened; the wings yellowish, the veins, including the costa and stigma brownish; the saw-guides bluntly rounded at apex. Length 10 mm.

Habitat.—Franconia, New Hampshire, Mrs. Annie Trumbull Slosson, Collector, for whom the species is named.

This species belongs to the mellina and redimacula group.

**Macrophya melanopleura**, n. sp.—Female: Body black, with the following parts yellowish white; the clypeus, the labrum, the basal segment of the antennæ, the collar broadly, the tegulæ, the scutellum, the postscutellum, the basal plates, the front and middle legs, the hind coxæ except the part beneath, the hind trochanters, the basal half of the hind femora, a broad ring on the hind tibiæ, and the hind tarsi; the third segment of the antennæ longer than the fourth; the head and thorax coarsely and densely punctured; the saw-guides with the upper and lower margins straight, subparallel, the apex obliquely truncated with the angles rounded. Length 9 mm.

Habitat.—Massachusetts. Received from the Hatch Experiment Station, Amherst, Massachusetts, through Professor H. T. Fernald.

A species related to *fascialis* Nort. and *varia* Nort. from which it is differentiated by having well-developed vertical furrows.

**Macrophya confusa**, n. sp.—Female: Body black, with the clypeus, the labrum, the mandibles, the collar, the tegulæ, a band on the pleuræ, a spot above the hind coxæ, the front and middle legs except a spot on the apex of their femora beneath and the apices of their tibiæ, the hind coxæ and trochanters, the basal half of the hind femora, a ring on the hind tibiæ, and the hind tarsi except the apices of the segments; the antennæ with the third segment longer than the fourth; the head finely punctured; the wings hyaline, the veins and stigma brownish; the saw-guides obliquely, bluntly rounded. Length 9 mm.

Habitat.—Pennsylvania. Received through Professor C. F. Baker.

This species is related to *pulchella* Klg., from which it differs in the amount and coarseness of the punctuation on the mesopleura.

**Macrophya ornata**, n. sp.—Female: Body black, with the following parts white: the clypeus, the labrum, the mandibles, the collar, the tegulæ, the scutellum, the front legs except a fuscous line on the tibiæ at apex above, the middle legs except a ring on the apex of the tibiæ, the apical half of the hind coxæ, the hind trochanters, the basal one-third of the hind femora, a ring on the hind

tibiae, and the hind tarsi beyond the middle of the first segment; the abdomen except the saw-guides rufous beyond the basal plates; the third segment of the antennae distinctly longer than the fourth; the head finely punctured; the wings slightly infuscated, the veins, including the costa and stigma, brownish; the saw-guides bluntly rounded at apex. Length 8 mm.

Habitat.—Ithaca, New York.

This species is related to *nidonea* from which it differs in the colour of the abdomen.

NOTES ON THE WINTER AND EARLY SPRING  
COLEOPTERA OF FLORIDA, WITH DE-  
SCRIPTIONS OF NEW SPECIES.

BY W. S. BLATCHLEY, INDIANAPOLIS, IND.

(Continued from Page 92.)

6611. **Bassaricus croceipennis** Lec.—Quite frequent at Sanford and Ormond on oak in blossom. March 28–April 13.

6621. **Cryptocephalus bivius** Newm.—Three examples of this large and handsome species were beaten singly from oak at Dunedin, Eustis and Sanford. March 21–April 7.

**Cryptocephalus sanfordi** Bl.—Three additional specimens were taken at Sanford and one at Dunedin. March 29–April 9.

6638. **Cryptocephalus incertus** Oliv.—Quite frequent at Dunedin and at various points along the Kissimmee River on flowers of the Ericad—*Andromeda nitida* Bart. January 21–March 21.

6644. **Cryptocephalus tinctus** Lec.—One example from the same Ericad. Istokpoga Creek, February 26.

6645. **Cryptocephalus lateritius** Newm.—Three specimens at Dunedin from the same shrub. January 15–March 19.

6668. **Pachybrachys limbatus** Newm.—Six specimens beaten from oak at Ormond. April 3–April 14.

April, 1914

6890. *Diabrotica vincta* Lec.—Two examples beaten from a tall ragweed (*Ambrosia sp.?*) near the mouth of Taylor's Creek on Lake Okeechobee, March 3.

6932c. *Edionychus concinne* Fab.—A half dozen or more beneath boards and other cover along the margins of shallow fresh water lakes just east of Dunedin. February 7–March 24. One also at Ormond, April 6. I regard this as a distinct species, and not a variety of *vians* Ill., as listed. Aside from the differences in colour, it is much more finely and indistinctly punctate than *vians*.

*Haltica schwarzi*, sp. nov.—Oblong-oval, feebly convex. Above, uniform piceous, strongly bronzed or brassy; joints 4–10 of antennæ piceous, finely pubescent, the three basal joints dark reddish; under surface and legs piceous. Eyes large, coarsely granulate. Thorax one-third wider than long, sides feebly rounded, ante-basal impression entire; disc convex, feebly constricted near the apex, finely and very sparsely punctate. Elytra at base nearly one-half wider than thorax, sides parallel for three-fourths their length, then broadly rounded into apex; disc very finely alutaceous, distinctly but sparsely punctate, the punctures ending to form regular rows; a broad and shallow impression behind the scutellum; umbone not prominent. Under surface finely and closely punctate. Length 4.2–4.5 mm.; width 2.3 mm.

Frequent on semi-aquatic plants along the shores of Lake Okeechobee. March 3–March 7. Larger than *H. ignita* and uniform in colour, as described. Umbone less prominent, its inner limiting depression obsolete. Elytra relatively longer, less convex, and more distinctly punctate. Of it Mr. E. A. Schwarz (to whom, for his many favours, I dedicate the species) says: "This is one of the various (at least four) good species which we lump in collections under the name *Haltica ignita*."

***Longitarsus cotulus*, sp. nov.**

Oblong, narrowly oval, slender, apterous. Upper surface uniform pale yellowish testaceous, finely but distinctly alutaceous; under surface dusky. Antennæ slender, two-thirds as long as body, outer joints dusky, the second, third and fourth joints subequal in length. Thorax not wider than long, sides broadly rounded, disc-

very finely and sparsely punctate. Elytra one-fourth wider at base than thorax, rather convex, umbone obsolete, sides parallel from just behind humeri two-thirds or more to apex, thence gradually converging to tips; disc finely and sparsely punctate, the punctures a little coarser than those of thorax. Wings absent. Length 1.7-2 mm.

Described from seven specimens swept from herbage at Kissimmee, Dunedin, Eustis and Sanford. February 16-April 7. According to Schwarz it is "very common in Florida on Mayweed or dog-fennel (*Anthemis cotula* L.), whence the specific name.

Allied to *testaceus* Melsh, but body distinctly smaller, more slender and more parallel; inner wings and umbones absent and elytra much more finely and indistinctly punctate.

7031. **Phyllotreta robusta** Lec.—Taken in large numbers at Sanford by sweeping herbage along borders of cypress swamps. Described from Garland, Colorado, and recorded elsewhere only from Lake County, Indiana.

10,467. **Psyllobora elegans** Horn.—Three specimens taken by sweeping—one at Sanford, two at Ormond. April 3-14.

7075. **Chalepus scapularis** Oliv.—Three examples of this species and about a dozen of the more handsome *C. bicolor* Oliv., were taken by sweeping low herbage along the border of a cypress swamp at Sanford. April 5-9.

7095. **Porphyraëpis cyanea** Say.—Mention is made of this rather common species to record the taking of several black specimens along the Kissimmee River. It occurs only on the leaves of the Saw palmetto, *Serenoa serrulata* Hook, which is probably the most common shrub in Florida.

7400. **Merinus laevis** Oliv.—A single specimen of this large Tenebrionid was taken\* from beneath pine bark near Ormond on March 24. Horn, in his "Tenebrionidæ of America," records it from the "Eastern and Middle States and more rarely in Canada." It is uncommon in Indiana, and I can find no previous record of its occurrence in Florida.

7408. **Glyptotus cribratus** Lec.—Four specimens were beaten from large bunches of Spanish moss near Dunedin. March 18-27

7426. **Opatrinus aciculatus** Lec.—This appears to be far more common in Central and Southern Florida than *O. notus* Say. Numerous specimens were taken at Dunedin and on the Kissimmee River trip. It occurs beneath cover in moist sandy localities. January 20–March 24.

7487. **Eutochia crenata** Lec.—Sifted one specimen from a dead fungus near Dunedin. January 23.

**Platydema subquadratum** Mots. — One example, so named for me by Mr. Schwarz, was taken from an oak tree fungus near Dunedin, March 16. It is 7.5 mm. in length, shining black, with legs and basal joints of antennæ pale, and with elytral rows of punctures very small, close-set and unimpressed.

7535. **Hypophlæus thoracicus** Mels.—Three examples from beneath bark of dead pine in open woods. Sarasota, January 28.

7575. **Talanus (Dignamptus) langurinus** Lec.—Quite common on the custard apple (*Anona glabra* Dunal) and a wild cucumber (*Melothria pendula* L.) along the borders of Lake Okeechobee and the lower stretches of the Kissimmee River. March 1–7. All the specimens taken were a shining dark chestnut brown, not black as described. Length 3.5–7 mm.

I fully agree with Dr. John Hamilton (Can. Ent., XXVII, 321) that *T. stenochinus* and *langurinus* are only different sizes of the same species, the latter and smaller perhaps being the male. He states that Dr. Horn had come to the same conclusion and that the name *langurinus* should be given to both.

**Talanus okeechobensis**, sp. nov.

Elongate, subcylindrical, robust. Dark chestnut brown, shining; antennæ and legs slightly paler. Antennæ as long as head and thorax, the joints gradually stouter, the 8th, 9th and 10th wider than long. Head finely and rather densely punctate. Thorax slightly longer than wide, feebly narrowed at base; apex rounded, base truncate; hind angles small, rectangular, acute, disc convex, rather coarsely, closely and unevenly punctate. Elytra very distinctly wider than thorax, strongly convex, deeply striate, the striæ rather finely serrate punctate; intervals convex, minutely punctulate. Abdomen finely and very sparsely punctate. Front tibia with a strong tooth one-third from apex. Length 6–6.5 mm.

Two specimens beaten from custard apple at Lake Okeechobee. March 6. In *langurinus* the body is much more slender, thorax longer than wide, elytra much narrower, scarcely striate, intervals flat, front tibiae not toothed.

7590. *Allecula atra* Say.—One, beaten from oak. Eustis, April 5.

*Hymenorus granulatus* Bl.—A female, 9 mm. in length, was taken at Ormond, April 14.

*Isomira ignora*, sp. nov.

Elongate, narrowly oval, convex. Uniform pale rufo-testaceous, shining; sparsely clothed with very short fine prostrate yellowish hairs. Head small, half the width of thorax, finely and densely rugosely punctate; eyes small, separated by twice their own diameters; antennae slender, scarcely half the length of body, second joint half as long as third, the latter equal to fourth. Thorax at base two-thirds wider than long, sides nearly straight and parallel on basal half, thence converging and rounding into apex, disc punctate like the head. Elytra at base scarcely wider than thorax, sides parallel for three-fourths their length, thence gradually rounding into apex; disc very finely and rather sparsely punctate the punctures in places tending to form short transverse strigae. Length 5 mm.; width 2.5 mm.

Nine specimens beaten from oak. Dunedin, March 15-24; Sanford, March 29; Ormond, April 3. Paler and much narrower than *I. quadristriata* without trace of sutural strigae.

7610. *Isomira valida* Schwarz.—Two specimens beaten from oak near Eustis, April 6. A robust species, 7-8 mm. in length.

10,710. *Eustrophus repandus* Horn.—One from woody fungus near Dunedin, in company with *E. bicolor*, the latter common. March 16.

*Chrysanthia repanda* Horn.—Common on the flowers of the farkleberry at Sanford and Ormond. March 28-April 14. Taken on no other plant. The elytra of all were a very handsome purple in hue.

8060. *Macrobasis torsa* Lec.—Three from flowers of thistle. Sarasota, March 28.

(To be continued.)



## SUNFLOWERS AS A LURE FOR THE PLUSIIDÆ

This season most of my sunflowers, being self-sown, were in bloom a good two weeks earlier than usual and were in greater profusion. They also lasted well into the fall.

I had noticed in previous years, when I had a good show of the flowers, that quite a number of species were attracted; consequently this year, with such a quantity out at once, and so early, I was particularly on the watch for things moving at dusk in that part of my garden.

Early "sugaring" having proved a failure, I had fallen back on collecting "at light" on suitable evenings when I could manage it, with a preliminary stroll around the flower beds with my net. Many good evenings were missed early in August, owing to other engagements or occupations, but during the latter part of the month, and the first two weeks of September, I was able to make a round nearly every evening, when the weather was favorable.

The list of species taken is as follows:

- 2475.—*Plusia aeroides* Grote. Aug. 3rd (1). Half a dozen specimens were also taken at light in July this year. I never took *aeroides* in Victoria, and but a single specimen during the previous seven years of my residence on Quamichan Lake.
- 2477.—*Plusia metallica* Grote. Aug. 30th to Sept. 13th (3). One of them my small daughter, Phyllis, netted off the flowers in the afternoon. I have always found the species rare.
- 2479.—*Euchalcia putnami* Grote. Aug. 21st to 24th (3). Also one at light on July 24th. I think this species may be double brooded with us, for I have taken it earlier in the year. I have always found it rare, however.
- 2481.—*Eosporopteryx thyatiroides* Guenée. Aug. 10th (1). I have captured this rarely in previous years off a small species of sunflower, coming into bloom earlier. I took the species one season in Elm Park, Winnipeg (Aug. 18th) off a species of wild sunflower, when I was out sugaring.

- 2492.—*Autographa californica* Speyer. Aug. 21st to Sept. 16th. Not abundant like *celsa*, and, while in beautiful condition, most were allowed to go. The species is double brooded here.
- 2505.— “ *rectangula* Kirby. Aug. 4th to 29th. In all seven specimens.
- 2509.— “ *selecta* Walker. Aug. 23rd to Sept. 12th (3 or 4).
- 2514.— “ *celsa* Hy. Edw. Aug. 20th to Sept. 15th. This was by far the most plentiful species coming. Several nights I bottled as many as two dozen, all in good condition, and captured altogether, I dare say, considerably over 150 specimens. It shows quite a wide range of variation in the silver Y, or markings, and in size and colour, some individuals being almost black on the primaries. This species is a bit of a day-flier also.
- 2515.— “ *epigæa* Grote. Aug. 25th to Sept. 15th. About a dozen were taken.
- 2517.— “ *ampla* Walker. Aug. 22nd (2). This species is usually fairly abundant at light a little earlier in the season.
- 2524.— “ *corrusca* Strecker. Sept. 5th to 16th. About half a dozen. This species can generally be taken freely at light early in July, and from the above late catch (the specimens being fresh) it would appear to be double brooded here.

As several (3) 2482, *Autographa mappa*, G. and R., were taken at light early in July, the season would seem to have been a good one for this class of noctuids.

Off the sunflowers these moths were very easily “bagged.” I used a quart “economy” jar, charged with cyanide, the same as I use for “sugaring.” It was quite easy to bottle them off the flower heads, sometimes two at a time, and few were missed; no net was required at all; in fact, one was rather in the way.

Other species taken or attracted were *Noctua l'ryja*, *Feltia herilis* (common) and *subgothica*, *Paragrotis vetusta* (1), *Mamestra stricta* and *pensilis* (1), *Dargida procinctus* (3), *Heliophila roseola* (1), a few

*Geometridæ*, and *Phlyctænia ferrugalis* and *profundalis*; these two kinds in abundance.

I can recommend this method of collecting to anyone interested in the *Plusiida*; the moths come freely, preferring sunflowers to any other kind of flower that I have grown for this purpose, they are easily taken, and with a minimum of rubbing. Moreover, the seed is cheap and the plants very easily grown anywhere.

A. W. HANHAM,\* Quamichan Lake, Duncan, B.C.

### BOOK REVIEWS.

THE LIFE STORY OF INSECTS. By Prof. G. H. Carpenter (Cambridge Manuals of Science and Literature), 134 pp., 23 figs. Cambridge University Press. Price, one shilling.

Notwithstanding the existence of numerous entomological books of an elementary character, the treatment of the subject in the present little volume makes it peculiarly suitable to place in the hands of a person having no knowledge of insect life. It does not attempt to accomplish more than "an outline sketch of the facts and meaning of insect transformations," and, in the modest words of its author, the "humble volume will best serve its object if its reading should lead fresh observers to the brookside and woodland." We feel that its object will frequently be served, for it cannot fail to stimulate an interest in an enquiring mind in the study of insect life in its varied forms and it is sure to be the means of directing many a wayfarer's steps into the fascinating paths of entomological enquiry.

After describing the form and growth of insects, the life-histories of certain sucking insects, such as the aphids, are given. The author then passes on to a consideration of the adaptations and transformations of aquatic insects. This leads him to a discussion of the internal changes which accompany metamorphosis. A most readable account of the different larval forms and their adaptations constitutes the longest chapter in the book and the well-chosen illustrations contribute greatly to its clearness. A consideration of the varied pupal forms and their modifications naturally follows. A chapter on the life-story of insects in relation to the seasons succinctly portrays the varied life-cycles in relation to the seasons of the year and to seasonal conditions. The book concludes with an interesting chapter on the past history of insect life. In this the

author takes up the different views regarding the development of the insects of to-day and the manner in which the evolution of the highly developed insect with a complete metamorphosis may have taken place. A short bibliography will guide the student to further reading. We heartily congratulate Prof. Carpenter on the pleasing results of what has been by no means a light task, and we feel sure that it will serve to add many new recruits to our ever-increasing army.

C. GORDON HEWITT.

A SYNOPSIS OF ECONOMIC ENTOMOLOGY. By W. Lochhead, Professor of Biology, Macdonald College, Ste. Anne de Bellevue, P. Que. 113 pages.

This work, which has evidently been prepared by the author as a basis for his lectures on Entomology, will be found very useful by others with similar duties to fulfil and especially by science teachers in High Schools and Collegiate Institutes, who are unable to devote much time to the study of insects. Owing, however, to the entire absence of illustrations and the use of terms which are not explained, it will require to be supplemented by some such guide as Comstock's "Manual for the Study of Insects." For these reasons also it can hardly be recommended as a text-book for students.

The author might well have enlarged the title to a Synopsis of Systematic as well as Economic Entomology, as the book is nearly equally occupied by the consideration of both these aspects of the subject.

The work is divided into four parts. The first describes the external and internal anatomy of insects and their metamorphoses, the losses due to them, and an account of those that may be termed beneficial. Part 2 contains keys to insects injurious to farm, garden and orchard crops, including small fruits. These are arranged under the headings of attacks upon roots, trunks or branches, leaves and fruit. Part 3 occupies more than half the volume and is devoted to "a classification and description of common insects" given in the form of keys to orders and families, followed in each case by brief descriptions of the more important species from an economic standpoint. Part 4 describes the various methods, both cultural and artificial for the control of insects.—C. J. S. B.