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## NOTES ON MYRIAPODS FROM DOUGLAS LAKE, MICHIGAN.

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The Chilopods and Diplopods here listed and described were all collected near the University of Michigan Biological Station at Lake Douglas, Mich., during July and August, 1913, by Mr. G. F. Sutherland, by whom they were sent to the writer for identification. All the specimens were taken from decaying logs.

The new *Nampabius* is represented by numerous individuals of both sexes. It is the largest known species of the genus and is geographically the most remote from what seems to be the centre for the group. Its habits would seem to correspond with those which I have noted for various other species in the genus, these having similarly been taken in greatest abundance under the bark of decaying logs.

Judging from the number of individuals in the collection, the new *Parajulus* is much the most common species of the genus occurring in the decaying logs at Douglas Lake. It is a strongly marked species, easily distinguishable from others known to occur in the region.

### Class CHILOPODA.

#### 1. *Geophilus rubens* Say.

This widespread species, at once distinguishable from others of the region by the characteristic geminate black stripe along dorsum, is represented in the collection by numerous specimens.

#### 2. *Linotænia chionophila* (Wood).

Also a very common and widespread species in the Northern United States and in Canada. In the collection are three adults and three very young specimens.

#### 3. *Bothiopolys multidentatus* (Newport).

A species common throughout the Middle Western and the Eastern States. Many specimens.

**4. *Nadabius iowensis* (Meinert).**

A species very common in the Middle West. About a dozen specimens.

**5. *Sonibius bius* (Chamberlin).**

Previously known from Saunders in the upper peninsula. Two specimens.

**6. *Nampabius michiganensis*, sp. nov.**

Dorsum from light brownish yellow to brown of dilute chestnut caste, the caudal plates commonly darkest. Head darker, more distinctly chestnut. Antennæ like head; the colour becoming denser and more reddish distad. Prosternum and prehensors somewhat lighter than head, but decidedly darker than venter, which is yellow or brownish yellow and darker caudad or usual. Caudal legs darkest.

Body conspicuously narrowed cephalad from eighth plate. Widths of head and of first, third eighth, tenth and twelfth plates to each other as 47: 41: 45: 56: 55+; 54.

Head slightly wider than long (47:45) comparatively rather wide cephalad. Caudal margin mesally incurved. Two short longitudinal furrows on caudal portion, these moderately diverging cephalad.

Antennæ short, but somewhat longer than in most related species. Uniformly and considerably attenuated distad, the terminal portion slender. Articles freely joined; sides straight; short, decreasing regularly from the second distad. Ultimate article distinctly shorter than the two preceding together.

Ocelli mostly 10 to 12 in 3, or, less commonly, in 4 series; e.g., 1+4, 4, 2; 1+4, 4, 3; 1+1, 4, 3, 2, the ocellus of the top row in this case being at anterior end of patch. Single ocellus much largest, the others decreasing regularly and considerably cephalad. Organ of Törnösvarý in outline small; below anterior end of eye patch.

Prosternal teeth acute, subequal, sides straight, the interval well rounded; line of apices recurved. Sinus wide at bottom as usual; its sides rather long, moderately converging. Sides of anterior portion of prosternum straight or nearly so, slanting directly from spine, 1.47 times wider than long in type. Distance between chitinous spots 2.57 times width at level of bottom of sinus, 4 times the dental line.

First dorsal plate in type 1.64 times wider than long. Eleventh and thirteenth plates, but especially the latter, with posterior angles very slightly produced as usual.

Coxal pores mostly 2, 3, 3, 2; 2, 3, 3, 3 or 3, 3, 3, 3.

Spines of the anal legs,  $\frac{0,0,2,0,0}{0,1,1,1,0}$ ; claws 2; of the penult,  $\frac{0,0,2,0,0}{0,1,1,1,0}$ ; claws 2; of the thirteenth,  $\frac{0,0,2,1,0}{0,0,1,1,1}$ ; of the twelfth,  $\frac{0,0,2,1,1}{0,0,0,1,1}$  or  $\frac{0,0,2,1,1}{0,0,1,1,1}$ ; of the sixth to eleventh,  $\frac{0,0,0,2,1}{0,0,0,1,1}$ ; of the third to fifth,  $\frac{0,0,0,1,1}{0,0,0,1,1}$ ; of the second,  $\frac{0,0,0,0,1}{0,0,0,0,1}$ ; of the first,  $\frac{0,0,0,0,0}{0,0,0,0,0}$ .

Claw of the female gonopods of the usual tripartite form, the teeth acute, the median longest and the lateral subequal. Basal spines decidedly broader than usual, much as in *Tidabius*, those of each pair close together; moderately long. Outer spine longer and broader than the inner; its sides subparallel from base to apical division, which is short and acute, or weakly incurved at middle; edge of apical portion usually finely crenulate. Inner spine of similar shape to that of the outer or with sides sometimes converging from base to apical portion.

Length 7—10 mm.

This species is very distinct from any previously known. It is aberrant in a number of features, such as the large single ocellus and the broad basal spines of the female gonopods. It is the largest known species, and the one farthest from what seems to be the centre of distribution for the genus. The process on the penult legs of the male is much like that of *virginiensis*; but *michiganensis* differs clearly from that species in its much greater length, which is about twice that of *virginiensis*, in the spining of the legs, and in the form of the basal spines of the female gonopods. *N. fungifuopes*, the species that has been taken geographically nearest to it (Western New York), is readily separable from it, as from all others now known, in lacking dorsal spines on the posterior legs; also the form of the process on the penult legs of the male is distinctly different.

Many specimens of this species were taken.

#### Class DIPLOPODA.

#### 7. *Polyzonium rosalbum* (Cope).

One specimen.

8. **Spirobold marginatus** (Say).

One adult and one immature specimen. A widespread form.

9. **Parajulus venustus** (Wood).

A form common in the region. Three specimens.

10. **Parajulus canadensis** (Newport).

A species common in the North-Eastern States and Canada. Six specimens.

11. **Parajulus**, sp. Jr.

Two very young specimens of uncertain species.

12. **Parajulus dux**, sp. nov.

General colour brown, often very light. A distinct longitudinal median dorsal black line which is commonly interrupted. The usual series of black spots over the repugnatorial glands, but each spot embracing one or more light areas, and so often inconspicuous. A dark transverse line across dorsum and connecting the two lateral spots of each segment. Also below the spots a dark line or band is more or less developed; this band is areolated with light spots and is often inconspicuous or scarcely evident. A broad black band across anterior border of first plate, anal scutum often blackish. Eyes black. Antennæ dusky brown to black, the distal article commonly pale. A solid black band between antennæ with a light spot in each end near antennæ. Vertex marked with close network of coarse dark lines. Lower part of head dusky, more or less areolated with light dots, a larger light area below each antennæ and along labial margin, above which and ectad of lateral light areas there is commonly a dark band.

Sulcus of vertex fine, ending near upper level of eyes. A deep setigerous foveola on each side of anterior end of the sulcus, the female sometimes more or less extended laterad.

Eyes large, subtriangular, but the sides convex. Ocelli mostly between 42 and 52 in 7 to 9 transverse series, e.g.:

7, 7, 7, 6, 6, 5, 3, 1; 9, 9, 8, 7, 6, 5, 3, 1.

First dorsal plate with lateral border rounded, not at all angularly produced. Distinctly but not strongly margined. Two striæ across lateral ends and a number of less deep short ones above these across caudal border.

Second segment deeply striate ventrally and over lower portion of sides, the striæ well separated above, but closer together

ventrally. Succeeding segments also similarly deeply striate, the striae coarse and well separated above, nearer together ventrally, not occurring above level of dark repugnatorial areas.

Repugnatorial pore small, in most segments a considerable distance removed from the suture, which at its level is straight or only slightly and broadly excurved.

Anal tergite with tip acute and spinous, clearly exceeding the valves, distally weakly and evenly decurved, but by no means so strongly or angularly as in *canadensis*.

Anal valves not mesally distinctly margined, at most broadly somewhat raised, the border crossed by transverse striae.

Anal scale with caudal margin widely convex; mesally slightly indented.

Mandibular stipes in male concavely excavated; produced caudad below the excavation.

Promentum of gnathochilarium in male much enlarged as usual; elliptic in outline.

First legs in male strongly enlarged as usual; uncinata; penult article conspicuously crassate proximally, though less so than preceding article, and narrowing much distad, its inner side nearly straight.

Second legs of male with coxae much enlarged and produced mesally into a long linguiform process, which is broadest proximally and narrows distad, though widening a little at very end, which is truncate. Legs reduced as usual.

Anterior division of first gonopods of male broad, clavate, distally rounded, in lateral view concealing wholly, or nearly so, the caudal division, which is somewhat shorter than the anterior and narrows strongly distad except at tip, where it enlarges again a little and is distally subtruncate.

Posterior gonopods in ventral view almost concealed by the first, above which they do not rise. Each curves mesad near level of distal end of first gonopods and then proximad. A semi-membranous pointed blade-like branch arising from base and a little surpassing posterior branch of first gonopods.

Number of segments 44, or near that number.

Length: 25—32 mm.

In the general superficial appearance of the gonopods this species resembles *P. canadensis*; but the posterior division of the

first gonopods is shorter and is distally truncate, while the second gonopods are more decidedly different. *Canadensis* is a darker species which may be at once distinguished in both sexes from the present one by the much longer and more strongly and abruptly decurved spinous tip to the anal scutum. The wide separation of the small repugnatorial pore from the suture is a characteristic of importance.

This species is represented in the collection by numerous specimens.

13. **Polydesmus serratus** Say.

*Polydesmus canadensis* Newport.

This common *Polydesmus* is represented by numerous specimens.

14. **Branneria carinatum** Bollman.

Two specimens; the first to be added to the few specimens in the collection of the author of the species.

### SOME NOTES ON PARASITISM OF CHRYSOPIDS IN SOUTH CAROLINA.

BY E. A. MCGREGOR,

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In 1890 Dr. Howard published notes on "The Parasites of the Hemerobiinæ."\* In this article the author records *Telenomus* sp. as an egg parasite of "either *Chrysopa* or *Hemerobius*." As secondary parasites reared from larvæ or cocoons, † he mentions *Hemiteles hemerobiicola* Ashm., *H. rufiventris* Riley and *Mesochorus* (?) *chrysopæ* Ashm. At that time Doctor Howard prophesied that several species of the proctotrupid *Helorus* would eventually be found to be primary parasites of Chrysopids. This prediction has been substantiated by the present writer's work. Moreover, the two rearings of *Isodromus iceryæ* at Batesburg, as indicated in Table II, add additional proof to Dr. Howard's

\*Proc. Ent. Soc. of Wash., Vol. II, pp. 123-124.

†Since first preparing this paper on Chrysopid parasites, all of which had been bred from cocoons, we have been able to conduct some observations on Chrysopid eggs. In all 93 eggs were collected, and from these were bred 7 parasites—all of the species *Telenomus chrysopæ* Ashm. Computed on the basis of 7 parasitized eggs out of 93, an estimated egg parasitism of 7.5% is found to obtain. The total parasitism, then, from species issuing from the egg (7.5%), and from species issuing from the cocoon (48.4%), is computed to be about 55.9%.

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belief that the species was erroneously described as a parasite of *Icerya purchasi* and is in reality a true parasite of Chrysopids.

Certain studies of red-spider predators were conducted at Batesburg, South Carolina, during the season of 1913, and it was noticed that a considerable percentage of the Chrysopas were parasitized.



Fig. 26—Apical portion of cotton plant, showing the characteristic location of Chrysopid cocoon at C.

In order to determine the approximate percentage of parasitism of these very beneficial insects Mr. F. L. McDonough, of the Bureau of Entomology, and the writer, collected a large series of cocoons from cotton plants growing in the fields. Adults from these cocoons were reared in the laboratory under conditions as nearly normal as possible.

It is worth recording, since we have never noticed it in print, that the Chrysopas in cotton fields pupate very characteristically in the apical buds at the very terminal portion of the stalk. The pubescence of the nascent foliage at this point is densely concentrated and of a grayish appearance, thus approximating the texture of the cocoon and affording considerable protection for it. This is shown in the accompanying figure. Of course, occasional cocoons are found in other locations, as, for example, within the involucre bracts of "squares" or in the convolutions of leaves. These are exceptions.

All of the several lots of Chrysopid cocoons collected were observed daily until they either produced adults or parasites, or until they clearly indicated that they were not going to give issue to anything. The final summary of results from this detailed study—in the case of the largest lot—is shown in Table I.

TABLE I.—Estimated Parasitism of Chrysopids.

Chrysopid cocoons observed.....	99
Cocoons yielding Chrysopids.....	51
Cocoons yielding parasites.....	48
Percentage of parasitism.....	48.4%

A lot of about 100 bred Chrysopids were determined by Mr.

Nathan Banks, and it developed that there were three species present: *Chrysopa rufilabris* Banks, *C. nigricornis* Burm., and *C. oculata* Say. The great majority of the specimens were *rufilabris*, while but a few individuals of *oculata* and *nigricornis* were present. The superficial appearance of the three species is much alike, and undoubtedly the habits and life histories are likewise in the main the same.

Mr. J. C. Crawford, who has kindly determined the parasite material, states that the collection, which embraces several hundred specimens, is the most extensive that has been obtained from lace-winged flies. He has also determined that three of the species are new to science, and that their descriptions are now in the course of preparation by him. The following table lists the species in the relative order of abundance and indicates the maximum and average number of individuals issuing from a *Chrysopa* cocoon in the case of each species.

TABLE II.—Relative Abundance of Parasites.

Number of lots.	SPECIES.	Maximum No. per lot.	Average No. per lot.
20	<i>Chrysophagus compressicornis</i> Ashm .....	20	10
15	<i>Perilampus</i> sp.....	1	1
10	<i>Goniocerus</i> sp.....	18	9
2	<i>Isodromus iceryae</i> M.....	3	3
2	<i>Orthizema atriceps</i> Ashm. (1).....	1	1
1	<i>Helorus</i> sp .....	1	1

(1) Ichneumonid determined by R. A. Cushman.

It is of interest in this connection to record that *Chrysophagus compressicornis*, in addition to being reared frequently from Chrysopids, was reared upon one occasion from an undetermined *Syrphid* pupa. Likewise, from this same *Syrphid* species, were reared the Chalcidoid flies—*Pachyneuron allograpta* Ashm., and *Syrphophagus mesograpta* Ashm.



# A REVIEW OF THE WORK ON THE POISONED BAIT SPRAY, DRY METHOD AND MIXED TREATMENT OF CONTROLLING FRUIT FLIES (TRYPETIDÆ).

BY HENRY H. P. SEVERIN, PH. D., MILWAUKEE, WIS.

(Continued from p. 284).

## Mixed Treatment.

The mixed treatment is a combination of the spray and a dry method of control. The object of this method is to reduce the number of applications of the spray. One sac was placed in every fifth tree. Two applications of the spray were made during the entire season. The following formula was used:

Molasses ..... 100 kilogr.  
Sodium arsenate ..... 2 ..

This stock solution was diluted by adding 100 liters of water to 15-20 kilogrammes of the poisoned molasses. About 1 pint of this solution was applied to a tree. The cost of the mixed treatment amounted to \$2.00 per tree. This method was carried on during three successive seasons and the results are recorded in table VIII.

TABLE VIII.

	Number of trees.	Olives infested in treated orchard.		Olives infested in untreated orchard.	
		%	%	%	%
1909	550	2.5	2.0	45.0	69.0
1909	140	60.66		97.34	
1910	1200	22.85	22.29	86.8	62.0
1910	140	20.4		48.7	
1911	400	57.5		81.5	90.0

The difference in favour of the mixed treatment is apparent, but not satisfactory in all cases. The authors state that the poisoned bait is not so effective in olive gardens containing cultivated shrubs or where the olive grove is near a wood, for the olive fly probably secures shelter and nourishment from the nectar of flowers and sweetened exudation of herbaceous organs. On the other hand, in localities where the orchard is isolated and contains only olive trees, the fly is content with its shelter and seeks nourishment here, and the poisoned bait then produces its maximum effect.

Table VIII shows the effect produced by omitting the treatment for one year. In 1909, from 2 to 2.5% of the olives were maggoty from 550 trees which had received the mixed treatment. In 1910, the same 550 trees which are now included in the 1,200

trees again received the mixed treatment, and from 22.29 to 22.85% of the olives were infested. In 1911, the 550 trees were used as a check or control and 81.5% were infested.

#### **Mexican Fruit Fly** (*Anastrepha ludens* Loew).

While working on the control of the Mexican or Morelos orange worm, Betanzos (1) discovered the usefulness of a common poisonous Mexican herb (*Haplophyton cimidum*). A decoction was made by boiling about two pounds of the herb cut fine in 3 gallons of water. After the herb was thoroughly boiled, about 2 pounds of sugar was added, and the whole was then strained and used as a spray. Rangel (1) obtained very satisfactory results from the use of this preparation in combatting the Mexican fruit fly.

#### **Apple Maggot** (*Rhagoletis pomonella* Walsh).

O'Kane (16) used a mixture of arsenic, molasses and water to control the apple maggot in New Hampshire. He writes: "Through the co-operation of growers this plan of spraying was tried at several different points. In most the results were negative. It seems probable that in these instances the possible value of the treatment was obscured by the proximity of other infested trees not so treated. Also owing to the pressure of other work the grower was unable to apply the spray as often as would be needed in order to keep the poisoned sweet ready for the flies throughout their egg-laying season. In one instance, however, the treated tree stood alone, and this tree was given repeated sprayings as primarily planned. The variety was August Sweet, and the fruit had been worthless for years. This tree yielded this season practically perfect fruit.

"There is sufficient reason, therefore, for making further tests of this treatment next season. To this end certain trees or blocks of trees have been selected, and the proper conditions provided to insure definite tests next season."

In 1911 experiments were conducted at the Maine Agricultural Experiment Station to control the apple maggot. Johannsen and Patch (8) write: "Our own experiments made this season upon two Talman sweet apple trees, using a spray of arsenate of lead and brown sugar in solution, gave discouraging results."

In 1912, Illingworth (6) published his results obtained with

the poisoned bait spray to control the apple maggot in New York. In 1911, he used the following "fly destroyer" as given by Merck to control the apple maggot.

	Parts.
Syrup.....	4 or 4 pts.
Potassium arsenate.....	1 or 1 lb.
Water.....	45 or 45 pts.

Two applications of the bait were made on July 22 and 26, about a pint being sprayed to the lower branches of a 20-year-old apple tree. In a table the author gives a daily record of windfalls from a treated tree and the number of larvæ which bored out of the fallen fruit. All the windfalls collected under the baited tree after August 15 to the end of the season were absolutely free from larvæ. From an untreated tree of the same variety in another orchard, 180 drops were gathered on August 23; from these apples larvæ emerged during September, while 115 drops of the same date from the treated tree failed to show a trace of a single maggot. The author concludes, "Hence it is quite evident that the flies deposited no eggs in the fruit of the sprayed tree after the application of July 26."

In 1912, Illingworth used the following formula:

Molasses.....	1 lb. or 25 lb.
Arsenate of lead.....	3 oz. or 5 lb.
Water.....	4 gall. or 100 gall.

Five applications of the spray were made. The author states, "In the spraying experiments during 1912 most gratifying results were obtained." No mention is made of the number of trees treated and no data are given as to the per cent. of fruit infested of the treated and control trees.

The author's observations indicate that the codling-moth spray of arsenate of lead alone may control the apple maggot if applied thoroughly to the fruit.

Ross (17) tested two spray mixtures, one composed of arsenate of lead, glycerine and molasses, and the other Paris green, glycerine and molasses, but neither yielded satisfactory results in the control of the apple maggot in Ontario.

### Cherry Fruit Flies (*Rhagoletis cingulata* Loew. and *Rhagoletis fausta* O. S.).

In the season of 1912 Illingworth (7) adopted similar control measures against the cherry fruit flies. The orchard was four

rows wide and sixteen long, and had never been sprayed before. For several years the cherries in this orchard had been badly infested, and the previous year the fruit was not picked at all, due to the serious infestation of the pest. The following formula was used:

Molasses.....	1 pt. or	3 gall.
Arsenate of lead.....	3 oz. or	5 lb.
Water.....	4 gall. or	100 gall.

Two applications of the bait were made on June 10 and 24. Eleven rows were sprayed and five rows were used as a check. The fruit of the unsprayed trees showed an infestation of fully one-third of the crop, while only one-sixth of 1% was wormy on the treated trees. The sprayed fruit showed also a noticeable lack of brown-rot and of curculio injury.

As in the case of the apple maggot, there is some evidence that arsenate of lead alone, without sweetening, may prove effective against the cherry fruit flies. "Fruit free from the pest resulted in one orchard from merely making two applications of the codling-moth strength (4-100) during the period when the flies were emerging. Although this experiment is not very conclusive, since no checks were left, it indicates clearly the value of spraying cherries."

#### **Currant or Gooseberry Fruit Fly (*Epochra canadensis* Loew).**

Lovett (10) attempted to control the currant or gooseberry fruit fly with Mally's formula (Table I, 1908) of the poisoned bait spray. No conclusive results were obtained, but the following brief summary of the season's trials is given:

1. The sweetened poison does attract the fly.
2. Frequent rains during the period of experimentation made numerous applications necessary.
3. "Granulated sugar is rather expensive; it crystallizes quickly and is not so satisfactory as a cheaper brown sugar would probably be."
4. "The crop was injured one half in many localities, and in a few cases the fruit, due to the maggot's attack, was not worth gathering."

#### **Imported Onion Fly (*Pegomya cepetorum* Meade).**

We have experimented with the poisoned bait spray to control the imported onion fly under Wisconsin conditions. Sodium

arsenite was used instead of arsenate of lead. Different quantities of a number of brands of arsenate of lead were used, but many onion flies were still alive at the end of a week, even though the bait was renewed daily. The following formula was used:

Molasses .....	¼ pt.	
Sodium arsenite.....	¼ oz.	(dissolved in boiling water).
Water.....	1 gall.	

The results obtained against the second brood of the pest were most encouraging in a somewhat isolated onion field. As the season's work was started too late to test the effectiveness of the poisoned bait against the first brood of the pest, which is probably more difficult to combat on account of the frequent spring rains which wash off the spray, no definite conclusions can be drawn from the good showing that the spray has made against the second brood.

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### A NEW JULUS FROM CALIFORNIA.

BY RALPH V. CHAMBERLIN, CAMBRIDGE, MASS.

Specimens of the new *Julus* here described have been received for identification from Assistant Secretary Leroy Childs, of the California State Commission of Horticulture. Mr. Childs states that it is very common in the southern part of California and that it is reported as inflicting serious injury to tender vegetables, such as young lettuce. The writer has taken it near Santa Barbara. The types are from Los Angeles.

#### *Julus hesperus*, sp. nov.

This species has the size and, to some extent, the general appearance of *J. virgatus* Wood, though it is less slender and lacks the conspicuous median dorsal black line so characteristic of the latter species.

The paler individuals are brown, with the usual series of black spots along each side. Specimens in full colour have the



FIG. 27.—*Julius hesperus*, male, left leg of first pair, mesoventral view.



FIG. 28.—*Julius hesperus*, male, gonopods, cetal view.

background typically darker brown or obscure chestnut, with the sides dusky or black, excepting the head and several anterior segments, which are usually light brown, as the last several segments may also be; the wide dark lateral bands embracing the rows of spots leave between them a narrow median dorsal light stripe.

Head with sulcus across vertex sharply impressed, the sulcus terminating anteriorly in a broader, shallow transverse furrow on a level with the dorsal edges of the two eyes. Setigerous foveolae not evident.

Antennae slender, clavate, a little shorter than width of body.

Eyes distinct, subtriangular. Ocelli in types from 17 to 20 in 5 or less commonly 4 series, e.g., 5, 5, 5, 3, 2; 5, 5, 4, 3, 1.

First dorsal plate with lower caudal corner rounded or weakly obtusely angular on ventral side; striate below. Other segments striate above and below cephalad to suture; striae distinct, moderately spaced. Repugnatorial pore circular; tangent to suture, which is not at all angulate.

Anal scutum obtusely angular, simple. Valves not at all or only very obscurely margined. Anal scale simple, with the caudal margin convex.

First legs in male small, strongly bent or hamate, as shown in the accompanying figure.

Gonopods of male concealed. The two pairs widely divergent; anterior ones moderately short; those of the posterior pair contiguous, bilobate. Flagellum very long (see figure 28).

Segments in types 35 to 41.

Length, 11—15 mm.

SYNOPSIS OF THE NORTH AMERICAN SPECIES OF THE  
GENUS *CAPITONIUS* BRULLE.\*

BY S. A. ROHWER, WASHINGTON, D. C.

The North American species which are here placed in the genus *Capitonius* have been referred to a number of genera, as may be seen from the bibliography of the species which follows.

Szepligeti (Gen. Insectorum, Braconidæ) states that all our species belong to the genus *Cenocoelius* Westwood. According to the type species, as indicated by Viereck, Bull. 83, U. S. Nat. Mus., *Cenocoelius* Westwood is founded on *flavifrons*, which is not yet characterized, but *Cænocoelius* Marshall is synonymous with *Capitonius*. *Capitonius* having priority is used for our species. It may be possible by comparison with the type of *Capitonius* to differentiate the North American species into a different generic group, if certain Neotropical species are typical *Capitonius* of the Neotropical region, but sufficient material is not available for such study. From the material and notes available it is evident that the species of the genus *Capitonius* are parasitic on wood or bark boring Coleoptera, and from the notes it seems that they are all internal parasites pupating after destroying the host within a cocoon in the larval gallery. The following host relations seem to be thoroughly established for the North American species:

*Liopus alpha* and *Liopus fascicularis* in sumach—Parasitized by *Capitonius ashmeadii* and *Capitonius provancheri*.

*Leptostylus* (either *macula* or *collaris*) in chestnut—Parasitized by *Capitonius leptostyli*.

*Lepturgus facetus* in chestnut—Parasitized by *Capitonius provancheri*.

*Goes oculata* in *Oxydendrum arboreum*—Parasitized by *Capitonius nigrisoma*.

*Micrasis* in hickory—Parasitized by *Capitonius provancheri*.

*Synoxylon* in hickory—Probably parasitized by *Capitonius caryæ*.

*Saperda candida* in elm—Parasitized by *Capitonius saperdæ*.

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\*Contribution from the Branch of Forest Insects, Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.



*Table to the Species.*

- Abdomen rufous; head and thorax black.....1.  
 Abdomen and thorax black.....4.
1. First tergite smooth, the embossed area only indicated  
 basally ..... *erythrogastra* Rohwer.  
 First tergite more or less striate and with a rather well-defined  
 embossed area.....2.
  2. Embossed area of the first tergite not well defined; the striæ on  
 the first tergite not extending beyond the  
 middle..... *caryæ* Rohwer.  
 Embossed area of the first tergite defined by strong carinæ,  
 which extend beyond the middle of the tergite.....3.
  3. Notauli not foveolate..... *sanguiniventris* Ashmead.  
 Notauli strongly foveolate..... *saperdæ* Ashmead.
  4. First tergite entirely without sculpture.....5.  
 First tergite usually strongly sculptured and always with some  
 sculpture at the base.....6.
  5. Legs uniformly pale testaceous; median depression of the  
 anterior portion of the prescutum well defined, but without  
 defining lateral carinæ..... *leptostyli* Rohwer.  
 Legs black or piceous; the median depression on the prescutum  
 broader and shallow and with well-defined lateral  
 carinæ..... *nigrisoma* Rohwer.
  6. Prescutum sculptured like the scutum; first tergite with strong  
 carinæ basally, without other sculpture. *tenuicornis* Rohwer.  
 Prescutum more closely sculptured than the scutum; first  
 tergite not so.....7.
  7. First tergite with strong carinæ, which reach the apex of the  
 segment, but with no predominating median  
 rugæ..... *ashmeadii* (D. T.)  
 First tergite with the striæ laterally which never reach the  
 apex of the segment and with a predominating median stria  
 or shining median area separating off a subembossed  
 area..... *provancheri* Rohwer.

**Capitonius erythrogastra**, new species.

*Female*.—Length 5 mm. Head broad as the thorax; posterior orbits broad; median portion below the antennæ with distinct

punctures which are separated by about twice the width of a puncture; the clypeus, the sides, the front and occiput shining, impunctate or with very sparse, separated punctures; third antennal joint but little longer than the fourth; mesonotum shining, practically impunctate; notauli strongly foveolate; the suture between the scutum and scutellum with three strong rugæ; propodeum strongly reticulate, the dorsal surface with two narrow, transverse impressions; first tergite without sculpture. Black; head and thorax densely clothed with long white hair; legs rufous, the bases of the four anterior femora and the posterior tibiae piceous; abdomen rufous; wings dusky hyaline, venation black.

Morgantown, West Virginia. Described from two females (one type) collected by A. D. Hopkins, and recorded under W. Va. Agricultural Experiment Station Number Hopk. W. Va. 7790*b*, and from one female (paratype) from Tryon, North Carolina, collected by W. F. Fiske, and recorded under Bureau of Entomology Number Hopk. U. S. 1645*c*.

*Type*.—Cat. No. 18277, U. S. N. M.

**Capitonus caryæ**, new species.

*Female*.—Length 5.5 mm. Closely allied to *erythrogastra*, but may be distinguished from that species by the characters in the foregoing table, in having the propodeum rufous, the legs black except the rufous hind femora.

Tryon, North Carolina. Described from two females recorded under Bureau of Entomology Number Hopk. U. S. 3654*j*, which refers to a note stating that this species is probably parasitic on *Synoxylon* in hickory, material collected and reared by W. F. Fiske.

*Type*.—Cat. No. 18278, U. S. N. M.

**Capitonus sanguiventris** (Ashmead).

*Promachus sanguiventris* Ashmead—Proc. U. S. Nat. Mus., 1888, Vol. II, p. 653.

**Capitonus saperdæ** (Ashmead).

*Promachus saperdæ* Ashmead—Proc. U. S. Nat. Mus., 1888, Vol. II, p. 652. (A brief reference with a negative description.)

*Promachus saperdæ* Riley manuscript.

Riley—Ins. Life, Vol. III, 1890, p. 59.

*Bracon populator* Say—Long's Exped. to St. Peter's River, Vol. II, 1824, p. 323. (The original description will apply to many species in a number of different subfamilies in the Braconidæ.)

This species may be differentiated from the other species of the group by the foregoing table; the propodeum may or may not be rufous; the legs are entirely rufous.

*Type*.—Cat. No. 18279, U. S. N. M.

**Capitonus rugosus** (Provancher).

*Syngastre rugosus* Provancher—Addit. Fauna Ent. Hym. Can., 1886, p. 122.

*Capitonus rugosus* Provancher—Addit. Faun. Hym. Can., 1888, p. 378.

From the original description this species belongs near *sanguiniventris* Ashmead and allies, but none of the species agree with the original description in having the second segment aciculate. If this is true of Provancher's species it is undoubtedly distinct.

**Capitonus leptostyli**, new species.

*Male*.—Length 4 mm. Head fully as wide as the widest portion of the thorax, uniformly sparsely punctured, the posterior orbits not as wide as the diameter of the eye; third antennal joint subequal in length with the fourth; prescutum with large, well-defined punctures; scutum polished, shining, with a few small widely-scattered punctures; notauli strongly foveolate; the suture between the scutum and scutellum with five strong rugæ; scutellum sculptured like the scutum; propodeum strongly reticulate without any transverse areas dorsally; abdomen shining without sculpture; the embossed area of the first tergite defined at the extreme base only. Black; head and thorax with long gray hair; palpi pale testaceous; scape and legs pale testaceous; wings hyaline, venation pale brown, costa and base of stigma light brown.

Tryon, North Carolina. Described from five males collected by W. F. Fiske, and recorded under Bureau of Entomology Num-

bers Hopk. U. S. 3072*o* (type), 3072*i*, 3028*b*, 1495*h*; also a paratype from Ballston (Veitch), Virginia, collected by T. E. Snyder, and recorded under Bureau of Entomology Number Hopk. U. S. 9688*o*<sup>1</sup>. The paratypes indicated with this species may have the head black, piceous or rufous. The notes for this species, made by W. F. Fiske, indicate that it is an internal parasite, which in the last stage becomes external, on *Leptostylus* in chestnut (either *Leptostylus macula* or *Leptostylus collaris*). The cocoons are made in the larval galleries of the host.

*Type*.—Cat. No. 18280, U. S. N. M.

**Capitonus nigrisoma**, new species.

*Female*.—Length 6 mm. Head as broad as the widest portion of the thorax; the posterior orbits narrower than the shortest diameter of the eye; head immediately below the antennæ with the punctures about a puncture width apart; remaining portion of the front with the punctures more widely separated; the posterior orbits and occiput with the punctures very widely separated; third antennal joint one-fifth longer than the fourth; prescutum shining with a few large, well-defined, separate punctures; notauli poorly foveolate; scutum with the punctures more widely separated than those of the prescutum; the suture between the scutum and scutellum with many strong rugæ; scutellum shining, impunctate; propodeum strongly reticulate; dorsal lateral part with reticulations tending to transverse areas bounded by carinæ; tergites shining, without sculpture. Black; head below the antennæ and thorax with long white hair; wings hyaline, venation dark brown.

*Male*.—Length 5 mm. Agrees well with the above description of the female, except in having the head rufo-piceous.

Tryon, North Carolina. Described from two females and one male, recorded under Bureau of Entomology Number Hopk. U. S. 3658*b* and *c* (type, allotype and paratype); paratypes under Hopk. U. S. 1552*f*. Material collected and reared by W. F. Fiske. The notes under 3658*b* state that specimens were reared from dead pine infested with Cerambycidae and Buprestidae. The notes under No. 1552*f* state that this species is a parasite on *Goes oculata* in hickory.

*Type*.—Cat. No. 18281, U. S. N. M.

**Capitonius tenuicornis**, new species.

*Female*.—Length 4 mm. Head hardly as wide as the width of the thorax at the tegulae, posterior orbits narrower than the shortest diameter of the eye; face shining with a few widely-separated punctures; posterior orbit and occiput shining, impunctate; third antennal joint slightly longer than the fourth; pre-scutum and scutum similarly punctured; the notauli strongly foveolate; the suture between the scutum and the scutellum with ten longitudinal rugae; scutellum sculptured like the scutum; propodeum reticulate, on the median basal dorsal portion one of the reticulations is larger and roughly diamond-shaped; first tergite with an embossed area on the basal third, which is defined laterally by strong carinae, otherwise without carinae or sculpture. Black; antennae dark piceous; legs dark piceous, but becoming darker basally; head and thorax sparsely clothed with long gray hair; wings hyaline, venation pale brown.

Fort George, Florida. Described from one female from the Ashmead collection and with the Ashmeadian manuscript name, *tenuicornis*.

*Type*.—Cat. No. 18282, U. S. N. M.

**Capitonius ashmeadii** (Dalla Torre).

*Promachus rubriceps* Ashmead—Proc. U. S. Nat. Mus., Vol. II, 1888, p. 653 (nec Ratzeburg or Provancher).

*Cenocoelius ashmeadii* Dalla Torre—Cat. Hym., Vol. V, 1898, p. 72.

Both males and females of this species are in the collections, and can be readily differentiated by the foregoing table. The species is a primary parasite of *Liopus alpha* and *fascicularis* in Sumach.

**Capitonius provancheri**, new name.

*Capitonius rubriceps* Provancher—Addit. Faun. Ent. Hym. Canad. 1886, p. 135 (nec Ratzeburg).

This species is closely allied to *ashmeadii*, but from the specimens available can be readily distinguished from that species by the characters in the foregoing table. It, as well as *ashmeadii*, varies in having the head rufous, rufo-piceous or black. Specimens

of this species have been reared as primary parasites on either *Neoclytus erythrocephalus* or *Agrilus egenus* in locust, by A. D. Hopkins in West Virginia, data recorded under W. Va. Experiment Station Number Hopk. W. Va. 6040a; have been reared from the pupal cells of *Liopus alpha* in sumach at Tryon, North Carolina, by W. F. Fiske, data recorded under Bureau of Entomology Number Hopk. U. S. 1514c; have been reared as an internal parasite of *Lepturgus facetus* in chestnut at Tryon, North Carolina, by W. F. Fiske, data recorded under Bureau of Entomology Number Hopk. U. S. 3012a; have been reared as a parasite on *Micrasis* in hickory at Tryon, North Carolina, by W. F. Fiske, data recorded under Bureau of Entomology Number Hopk. U. S. 3192d. It has also been reared as a parasite of *Liopus fascicularis* in sumach by Dimmock.

### THE DESTRUCTIVE INSECTS OF NEW JERSEY.

BY HARRY B. WEISS, NEW BRUNSWICK, N. J.

Considering the fact that there are 10,385 species of insects listed as occurring in New Jersey, it is surprising how small a proportion of this number is destructive enough to warrant the application of insecticides. The following list, compiled from Smith's "Insects of New Jersey," gives the number of species in each Order which occur in sufficient numbers to be considered destructive and against which measures of control must be directed at various times. It is to be remembered, of course, that there are numerous other species which are classed as injurious, but these do not occur in numbers large enough to make their presence felt, or they confine their attentions to unimportant plants and are therefore not included in the list.

	Number of species —listed	Number of species —destructive.	Percentage of species destructive.
Coleoptera .....	3092	50	1.6%
Lepidoptera .....	2120	58	2.7 "
Hymenoptera .....	1980	9	0.4 "
Diptera .....	1661	28	1.6 "
Hemiptera .....	504	8	1.5 "
Homoptera .....	479	28	5.8 "
Orthoptera .....	154	5	3.2 "

Of the entire number of species in New Jersey 10,385, which includes all Orders, only 1.7 per cent. is really destructive. Of the entire number of species in the above seven Orders, 1.8 per cent. is destructive. As to the individual Orders, Homoptera has

the largest percentage and Hymenoptera the smallest. This is not strange, considering the fact that all species of the Homoptera are plant-feeders, while the Hymenoptera consists of both beneficial and injurious forms, with the beneficial ones largely in the majority.

The Orthoptera, with its 3.2 per cent of destructive species, also contains a large majority which feed upon vegetation. While most Lepidopterous larvæ feed upon foliage, yet the fact that many feed upon plants and trees not under cultivation by man, or occur in small numbers, brings the percentage down to 2.7.

The Hemiptera are plant feeders, with numerous exceptions; predatory and injurious forms are abundant in the Coleoptera, while the Diptera contains predacious and beneficial species and feeders upon animal and vegetable tissues. In these three Orders the percentages of destructive species are nearly the same.

While the number of species affecting one kind of plant is often large—for instance, Folsom gives 200 attacking Indian corn, 400 the apple, and the oaks 1,000—yet it may be safely said that the insect losses in the State of New Jersey, running as they do well into the millions, are due to the pernicious activities of 186 species, some of which are and any one of which may become notably abundant.

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#### SYNONYMICAL NOTES ON NORTH AMERICAN SCIOMYZIDÆ.

J. R. MALLOCH, URBANA, ILLINOIS.\*

##### **Sepedon macropus** Walker

This species is identical with *S. nigriventris* v. d. Wulp, so that the latter name must be dropped as a synonym. I have examined a number of specimens from Brownsville, Texas, and Tampico, Mexico, which agree with the description given by Walker and that given by van der Wulp so closely that there is no reason to consider them as other than the same species. The specimens which I have examined are in the collection of the Illinois State Laboratory of Natural History. The Brownsville specimens were collected by C. A. Hart.

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\*Contribution from Illinois Laboratory of Natural History.  
September, 1914

**Sciomyza apicata** Loew.

This species is a synonym of *S. nigrimana* Meigen. The specimens in the Illinois State Lab. Nat. Hist. collection, from Algonquin, Ill., are in all particulars identical with this European species, which is well described by Schiner, *Fauna Austriaca*, Vol. II, p. 45. The species bears a close resemblance to *glabricula* Fallen, which has been recorded by Coquillett from Alaska, but the latter has short, narrow wings, and the fore tarsi are entirely black.

**Sciomyza strigata** v. d. Wulp.

This species is a synonym of *S. trabeculata* Loew. I have examined seven specimens in the above-mentioned collection from Tampico, Mexico, December 29, 1908. Van der Wulp obtained his specimens from Mexico City and Vera Cruz, while Loew obtained his from Texas. The species is close in general appearance to *nana* Fallen, differing noticeably in the wing markings. In *nana* the submarginal cell has only one transverse brown mark near the apex, while in *trabeculata* there are five or six distinct fasciæ in this cell. There is also in the latter species a small appendiculate vein, on the posterior surface of the fourth vein, at about the middle of the last section, which I have not seen in any specimen of *nana*.

**Tetanocera lineata** Day.

This species belongs to the genus *Hidroneura* Handel and is synonymous with *H. rufa* Panzer of the European fauna. Members of *Hidroneura* may be distinguished from other genera in Tetanocerinae by their possession of the following characters: Antennæ projecting straight forward, second joint not longer than third, the latter obtuse at apex and without apical hairs; arista thickened, bare; frontal and thoracic bristles comparatively weak; outer cross vein biangulate.

I have before me three specimens belonging to this species from Algonquin, Ill., Nason, taken on July 20, October 3 and 16; one specimen, Urbana, Ill., May 27, 1889, taken at light, C. A. Hart, and one specimen, Lake Geneva, Wisconsin, taken by sweeping along shore, west end, September 2, 1892, C. A. Hart.



## A NEW MESEMBRINE FLY.

BY FREDERICK KNAB,

Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.

The closest allies of the fly here described generally have been included in the genus *Mesembrina*. In 1908 Townsend divided the old genus, dismembering it into *Mesembrina*, *Metamesembrina* and *Eumesembrina*, with the following species as respective types: *M. mystacea* L., *M. meridiana* L., *M. latreillei* Rob.-Desv. (Smiths. Misc. Colls., vol. 51, p. 124). In 1911 Schnabl and Dziedzicki, without knowing Townsend's work, separated *M. mystacea* and *M. meridiana* generically, proposing for the latter the generic name *Neomesembrina* (Die Anthomyiden. Nova Acta, Kais.-Leop.-Car. Deutsch. Akad. d. Naturf., vol. 95, p. 226). *M. meridiana* having been already designated as the type of *Mesembrina* by Westwood in 1840, *Metamesembrina* Towns, and *Neomesembrina* Schnabl and Dziedz. fall as synonyms. Townsend, having discovered the error in nomenclature, in 1912 proposed the generic name *Hypodermodes* with *M. mystacea* as the type (Proc. Ent. Soc. Wash., vol. 14, p. 46). The following new species is congeneric and closely related with *Hypodermodes mystacea* (L.) of Europe, and apparently still nearer the Asiatic *H. decipiens* of Loew (Beschr. europ. Dipt., vol. 2, p. 239; 1871).

***Hypodermodes solitaria*, new species.**

Female.—Head black, the frons about one-third the width of the head; parafacials yellowish-silvery pruinose. Antennæ black at base, the second joint ferruginous, the third deep brown, reddish at base; thickened portion of arista ferruginous. Palpi ferruginous yellow, with numerous short black bristles and a few long ones interspersed.

Mesonotum and scutellum clothed entirely with dull reddish yellow pile, the discal macrochætæ also yellowish, the peripheral ones black. Pleuræ black, the vestiture black, one specimen with some yellowish hairs below wing-base. Sternopleural bristles: 1 - 0.1.

Abdomen black, the proximal portion covered with short black pile, the last two segments above and beneath with long reddish

yellow pile, somewhat brighter coloured than that on the mesonotum and scutellum.

Legs entirely black; claws ferruginous on the thickened basal portion, black distally; pulvilli yellowish brown.

Wings with the venation similar to *H. mystacea*, the apical cell at extreme tip of wing. Last section of the fourth vein very slightly less upward bent than in that species. Basal portion of the wing to the tip of the subcostal vein and the base of the apical cell bright yellow, the veins in that portion ferruginous yellow; portion beyond light grey, clouded with brown in the costal region and along the veins, the veins themselves black. Tegulae yellow, with deep yellow margin and yellow ciliation.

Length: Body about 14 mm., wing 12.5 mm.

Two specimens: High River, Alberta (T. Baird); Glacier Park, Montana, June 28, 1912 (J. R. Parker). Type and paratype in the collections of the U. S. National Museum and the Montana Agricultural College.

The specimen recorded by Prof. Hine from Lake Timagami, Ontario, under the name *Mesembrina mystacea* (Can. Ent., vol. 39, p. 98; 1907), evidently belongs to the species here characterized. The present form differs from *mystacea* particularly in the coloration of the thoracic vestiture and of the tegulae, that species having the vestiture on the posterior part of the mesonotum and on the scutellum black, and furthermore dark brown tegulae with black ciliation. *H. solitaria* agrees much more closely with *H. decipiens*. That species also has the mesonotum and scutellum clothed entirely with yellowish pile and the tegulae yellow. In *decipiens* the last two abdominal segments are clothed with yellowish white pile and the hairs on the cheeks are dirty white. The whitish abdominal hairs, as against their deep yellow colour in our form, can hardly be considered a specific character, since Loew (1. c.) has already pointed out that the colour of this pile is variable in *H. mystacea*; the difference in the colour of the cheek vestiture, being black in our species, must, however, be considered specific.

## NOTES ON THE HYMENOPTERA TRICHOGRAMMATIDÆ AND MYMARIDÆ.\*

BY A. A. GIRAULT, NELSON, N. Q., AUSTRALIA.

1. *Trichogramma australicum* Girault.

Herr P. van der Goot of Pasoeroean, Java, sent me a large number of both sexes of this species labelled "Pasoeroean, April 25, 1913. Aus *Chilo infuscatellus* Eiern." This is the first known host of the species, though in Queensland it attacks native Lepidoptera.

A female of this species was captured at Nelson, North Queensland, by sweeping jungle, June 16, 1913 (A. P. Dodd).

In another lot sent by Van der Goot, reared from the eggs of "ocler djagoén," an unknown tortricid and dated "Pasoeroean, 2 May, 1913," one of the males bore a single cilium in the cephalic line of the hind wings; no trace of this cephalic line could be found in any of the others. The colour in these two lots varied considerably. Thus in some specimens there were two broad bands of black across the abdomen, one at the tip, the other at base. In others the abdomen was wholly blackish, while in still others it was wholly jet black, the usual bright golden yellow of the thorax very dull and hardly contrasting. These variants were all females.

2. *Paranagrus optabilis* Perkins.

A single male of this species was included within the second lot of the *Trichogramma australicum* noted above. It is probably not from the Lepidopterous eggs.

3. *Trichogrammatoidea nana* (Zehnter).

Herr P. van der Goot also sent me a number of both sexes of this species labelled "Pasoeroean, April 25, 1913. Aus *Diatraea striatalis* Eiern." All of these specimens were pale yellow, with a dusky black band across the base of the abdomen and the extreme tip of the abdomen dusky.

4. *Anagrus armatus* (Ashmead).

This cosmopolitan mymarid I have recently received from Van Dine in Porto Rico through the continued kindness of Dr. L. O. Howard. The two slides bore both sexes, labelled "208—

\*Contribution No. 14, Entomological Laboratory, Bureau of Sugar Exp. Stations, Bundaberg, Queensland.

1911. From egg clusters of *Delphax saccharivora* in cane leaves. Collected Dec. 19, 1911. Rio Piedras, Porto Rico. Thos. H. Jones." Both the locality and the host are new. Also a female, with the following new variety:

5. **Aphelinoidea semifuscipennis** Girault, variety *allipes* nova.

Female.—Like *semifuscipennis*, but the antennæ and legs are pallid and the colour more yellowish; also the fore wings differ in details hard to describe, but the marginal cilia are finer and shorter and the discal cilia appear denser.

Two slides from Van Dine through Dr. Howard bearing three females and one male, five females respectively, labelled "126—1912. From egg clusters of a leaf-hopper. Rio Piedras, Porto Rico. Collected Feb. 1, 1912. Thos. H. Jones." The male did not differ from the female. *Types* (of *allipes*) in the U. S. National Museum, Washington, D. C., U. S. A. (Three females on the second slide; the one male and two remaining females practically destroyed.)

6. **Ufens niger** (Ashmead).

Two females from Van Dine mounted on a slide with the *Oligosita* following, labelled "335—1912. From leaf-hopper eggs in cane, collected April 20, 1912. Rio Piedras, Porto Rico. Thos. H. Jones." The species, heretofore, has been known only from the United States. It is associated with commercial crop plants.

7. **Oligosita comosipennis** Girault.

One female with the *Ufens* just noted. The species is connected with commercial crops, and thus is probably widely distributed. The locality is totally new.

8. **Brachistella prima** (Perkins).

Two females on the slide with the preceding two species. This insect was recently described from Mexico, where it was reared from jassid eggs in sugar cane. The spot from the stigmal vein in these specimens crosses to the caudal wing margin; the "irregularly smoky" of the basal part of the wing in the original description forms in these West Indian specimens a first or proximal band across the fore wing at the bend of the submarginal vein. The species is thus characterized by the two-banded fore wings. The specimens agree with the original description otherwise,

except that they bear three lines of discal cilia on the hind wing (visible distad, at least) and the accented part of the second or stigmal stripe of the fore wing is not on the stigmal vein, but just beneath (caudad of) it and is somewhat larger than it. There is no short oblique line of cilia back from the sessile stigmal vein. The discal ciliation is denser than with *Abbella subflava*, while the fore wings are narrower than those of *Brachistella acuminata*.

9. **Brachistella** Girault = *Abbella* Girault.

When arranging the genera of the Trichogrammatidæ, I reduced the value of the arrangement of the discal ciliation of the fore wing to a generic basis and upon this principle *Brachistella* was separated from *Abbella*. However, I am convinced in this case that the characteristic will not hold and that the two are identical. From *Iltys* Girault, *Abbella* differs in bearing a short sessile stigmal vein and a funicle which is shorter than the pedicel. Moreover, *Abbella* is much less robust.

10. **Trichogramma minutum** (Riley).

Dr. L. O. Howard sends me a microscopic mount with six specimens of this cosmopolitan species (three of each sex) bearing the label, "Reared from eggs of *Diatræa saccharalis*. F. W. Urich. Santa Lucrecia, Vera Cruz, Mexico. Ent. Ac. No. of D. L. Van Dine. 180—1913." Locality new.

Also two other slides labelled respectively, "Parasites from egg clusters of *Diatræa saccharalis*. Audubon Park, New Orleans, La., Sep. 13, 1912. G. E. Bodkin and T. E. Holloway," bearing seven females; "Parasites from eggs of *Diatræa saccharalis*. Donna, Texas, Oct. 1, 1912. T. E. Holloway," bearing one male, three females. Both localities are new.

All specimens in both of these lots were orange yellow, the abdomen two-banded, one broad stripe across the base and a narrow one across the apex; the male, however, bore a black abdomen nearly to tip, the latter yellow.

A vial of alcohol bearing nineteen females, many coloured as those of the two preceding slides, but others with the abdomen wholly black; also received through Dr. Howard the specimens labelled "311—1913. March 28, 1913. J. R. Bovell, Bridgetown, Barbadoes, B. W. I." The letter accompanying the speci-

mens gave this data. "From G. N. Wolcott, I have received Porto Rico accession 3011—1913. Egg parasite of *Diatræa saccharalis* Fabr." The number 3011 is doubtless a misprint for the number on the specimens, namely, 311. The locality is new.

Another vial of alcohol bearing one male, twenty-three females and the label, "Reared from eggs of *Diatræa saccharalis*, Trinidad, B. W. I., November, 1912. F. W. Urich. Ac. No. of D. L. Van Dine 181—1913." In several of these specimens the posterior line of discal cilia in the hind wings was quite complete and six cilia in the oblique line from the stigmal vein rather common. The abdomen was dusky, with a darker stripe across the base.

A third vial bearing a large number of both sexes of *minutum* and these labels "Ac. No. of D. L. Van Dine 182—1913. Parasites bred from the egg-masses of *Diatræa saccharalis*. G. E. Bodkin, Georgetown, British Guiana, July 20, 1912." In these specimens the abdomen was dusky or else concolorous. The locality new.

And a fourth vial containing two males, twenty-six females, bearing the labels "Reared from eggs of *Diatræa saccharalis*. Ac. No. 172—1913. D. L. Van Dine. Porto Rico." The exact locality was Guanica and the collector Mr. H. Bourne. The date March 4, 1913; parasites issued four days later.

It is interesting to be able to record this parasite from the same host at the same time from such widely separated localities.

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#### FIELD NOTES AND QUESTIONS.

##### *Early Appearance of Pontia Rapæ.*

On February 24th, of this year, a freshly emerged specimen of the "imported white butterfly" flew into an open window of a house in this city. It was promptly captured, and turned out to be *P. rapæ* var. *marginalis*, which is the early spring form of *rapæ* in this district. This is the earliest record that we have in Victoria—the nearest to it being March 28, 1903, recorded by Mr. E. M. Anderson. Perhaps a few dates of the Lepidoptera that have appeared during March may be of interest to our Eastern collectors:

*Xylomiges candida*, March 7th.

*Xylomiges hiemalis*, March 17th.

- Xylomiges simplex*, March 18th.  
*Graphiphora hibisci*, March 14th.  
*Mesoleuca gratulata*, March 17th.  
*Mesoleuca vasiliata*, March 20th.  
*Eupithecia limnata*, March 20th.  
*Nyctobia nigroangulata*, March 20th.  
*Rheumaptera rubrosuffusata*, March 17th.  
*Trichochlamys lacteata*, March 10th.  
*Incisalia mossi*, March 17th and 20th.

E. H. BLACKMORE, Victoria, B.C.

*Gynandromorphous Lepidoptera.*

At a meeting of the Montreal Branch reference was made to certain specimens of Lepidoptera exhibiting the characters of both sexes in the one individual, and these, as well as the references at hand in North American literature, indicated that the right side was male and the left side female. The question was raised as to whether this was invariably the case or merely chance in the few on record. Mr. Gibb kindly offered to ask the members of the South London Ent. Society, and the following reply has been received:—

"In answer to the question of the right side being always the male, it has often been so asserted; but I find that one gets it both ways, as the following list will show:

	RIGHT SIDE	LEFT SIDE
<i>Euchloe cardamines</i>	♂	♀
<i>Lycæna ægon</i>	♀	♂
<i>Lycæna icarus</i>	♂	♀ (2 examples)
<i>Lycæna icarus</i>	♀	♂
<i>Lycæna corydon</i>	♂	♀
<i>Smerinthus populi</i>	♂	♀
<i>Smerinthus populi</i>	♀	♂
<i>Endromis versicolor</i>	♀	♂
<i>Eugonia quercinaria</i>	♀	♂
<i>Coremia ferrugata</i>	♀	♂

In the last four species (moths) the antennæ show stronger sexual differences than the wings.

F. E. ADKIN, F.E.S., London, England."

*The occurrence of Rhyncholophus sp. on Lepidoptera, observed at Kaslo, B. C.*

The occurrence of small ticks on the bodies of specimens of Lepidoptera has often been brought to my attention when examining freshly captured specimens.

I submitted some of the specimens to Dr. C. Gordon Hewitt, who wrote me that they were a species of *Rhyncholophus*, a mite which attaches itself to insects upon which it feeds. All the family are predacious and wander over plants and soil in search of prey.

My records of their occurrence during last spring show a wide range of host; specimens were taken from the following list. The number after the name denotes the number taken from each specimen listed. Amongst the Noctuids I noted

*Tæniocampa communis* Dyar, 7.

*Tæniocampa curtica*, 2

*Hadena dubitans*, 1.

*Peridroma nigra*, 3.

And on the Geometers

*Mesoleuca intermediata*, 1.

*Cænocalpe magnoliata*, 1.

The extreme variation in the size of these mites ranged from 1.4 mm., for the largest, to 0.4 mm. for the smallest specimen.

The colour in all cases was bright red, which is maintained in the specimens when mounted, provided that they are not submerged in ether too long, in which case the colour is either entirely lost in the smaller specimens or remains a dull orange.

The usual point of attachment is in the fold between the thorax and abdomen under the wings, but in one case I found one attached to the median nervule on the underside of the primary.

They are very resistant towards cyanide. Moths which had been placed in the killing bottle for over one hour were found to have mites attached, and these proved to be alive when examined the following morning.

J. WM. COCKLE, Kaslo, B. C.

Mailed September 8th, 1914.