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# The Canadian Entomologist.

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## DESCRIPTIONS OF SOME NEW SPECIES OF EPIPASCHINÆ AND PHYCITIDÆ.

BY REV. GEO. D. HULST, BROOKLYN, N. Y.

### EPIPASCHINÆ.

*Oncida luniferella*, n. sp.—Tongue blackish with some light gray scales; labial palpi and face light gray; antennæ blackish gray; antennal projection light gray at base, becoming blackish gray towards summit; thorax gray, patagia lighter, becoming nearly white posteriorly; abdomen gray with black scales intermixed, somewhat washed with fuscous, and often stained with yellowish. Fore wings light gray at base to raised scale ridge immediately before the first cross-line; this line is white, rounded from costa to median vein, and thence to inner margin, edged on both sides with black and preceded by a scale ridge which is reddish brown in colour; middle field light gray, glistening, slightly powdered with blackish scales, this colour reaching to outer margin posterior to vein 5; near middle of field and between vein 1 and median vein a raised scale tuft, blackish. Outer line distinct at costa, whitish, becoming lost in the ground colour behind vein 5; this line is with a deep inward sinus from costa to about vein 5, forming a sort of lunule, which is edged on both sides with black; the inner edging is broader posteriorly, and there somewhat washed with reddish; the outer, broad, nearly filling the apical space, washed with reddish posteriorly; a marginal line of black dots. Hind wings glistening translucent whitish fuscous, with a faint yellowish stain. Beneath fore wings fuscous to outer line, that being fainter than above; apical space reddish. Hind wings slightly more fuscous and duller than above. Expands 28 mm.

Colorado. Six examples from Mr. David Bruce.

*Benta Slossonii*, n. sp.—Expands 25 mm. Palpi and face dark fuscous; antennæ blackish fuscous; thorax blackish, mixed somewhat with gray scales; abdomen dark fuscous, almost black, each seg-

ment edged with lighter colour posteriorly. Fore wings, basal line not very distinct, dark gray, sinuous, strongly angulated at vein 1; basal field blackish, much mixed with gray scales, especially along costa, and slightly marked with reddish at middle at median vein; middle field blackish gray, with three narrow black lines: the first edging basal line, the third limiting the field outwardly, this forming a sinus rounding inwardly within discal spot to base of veins 3 and 4, then another less pronounced sinus to inner margin, forming a prominent tooth at veins 3 and 4; the second line is slightly within and sub-parallel with the third; on the space between the first and second black lines are two oval black rings, one on cell and the other just below it, joined at each end with first and second cross-lines; outside the basal field the colour is light gray, more or less mixed with black, the outer line whitish, indistinct, showing with the darker edgings almost straight across the wing; outer field blackish, with gray intermixed, giving indications, especially apically, of a scalloped submarginal line, as well as one narrowly at margin. Hind wings, even fuscous blackish. Beneath all wings even dark fuscous, with a gray spot on fore wings along costa at beginning of outer line.

South Florida. One specimen, a ♀, from Mrs. Slosson, taken in early spring. The species is provisionally placed in the genus *Benta*.

#### PHYCITIDÆ.

*Pyla metalicella*, n. sp.—Expands 32 mm. Palpi ascending, long, black; head, thorax, abdomen and wings dull smoky black, without any indications of lines. The palpi on the outside, the face, the thorax and fore wings strongly iridescent with bronze green, this being specially marked on the patagia and base of wings; abdomen somewhat bronzy; hind wings without iridescence. Beneath all parts blackish; the thorax, legs, fore wings and anterior margin of hind wings being strongly iridescent; on the body this has a coppery tint.

Colorado. One ♂, from Mr. Bruce. A most beautiful insect, with wings narrower and longer than *P. scintillans*, Grt., and with a much more decided iridescence.

*Pyla bistriatella*, n. sp.—Expands 25 mm. Head, thorax and fore wings deep black, the fore wings with two broad white stripes, the inner straight, the outer slightly wavy and parallel with outer margin; hind

wings and abdomen dull black. The head, thorax and fore wings are strongly iridescent with dark bluish-green, the abdomen less so. Beneath as above, but less iridescent.

Yosemite Valley, Cal. One ♂. Differs somewhat in structure from the typical *Pyla*. The labial palpi are nearly horizontal, second member long, heavily scaled; end member very small, scarcely visible; maxillary palpi small, not scale or pencil tufted.

*Pyla incorruscella*, n. sp.—Expands 21 mm. Palpi and face deep black; thorax deep black with a few dark gray scales; fore wings dull black, intermixed with some dark fuscous scales; two cross-lines of stained white, the inner oblique, rounded, diffuse, the outer angulated in at vein 6, rounded outwardly from there to vein 5, then slightly wavy to inner margin. Beneath dark fuscous, two lighter fuscous spots along costa, one before discal space and the other at end of second cross-line. No iridescence on any part of the insect.

Colorado One ♂, from Mr. Bruce. Smaller than *P. aeneola*, without iridescence, maxillary palpi small, but scale tufted.

*Pyla aeneola*, n. sp.—Expands 25 mm. Labial palpi grayish fuscous below, blackish, with blue-green iridescence above; face black, bluish iridescent; thorax black, with coppery-bronze iridescence. Wings blackish in ♂, the fore wings with scattered iridescent scales on middle of wings, scarcely any showing along edges. ♀ fore wings blackish, almost completely greenish-yellow iridescent; hind wings black, with reddish-brown tint in some lights. Beneath blackish, slightly iridescent in ♂ along anterior margin of hind wings; all parts completely iridescent in ♀.

Colorado. One ♂, two ♀ ♀, from Mr. Bruce. The labial palpi are ascending, long, end member long, maxillary palpi small, with two or three long scales at end. Abdomen of ♂ with lateral scale tufts on last segment, and a row of orange-yellow hair tufts below. ♀ with antennæ bent above base, and a slight tuft in sinus, almost as distinct as that of the ♀; maxillary palpi also quite as prominent as in ♂. The sex is beyond question, as the ovipositor is strongly protruded.

*Dioryctria Brucei*, n. sp.—Expands 24 to 28 mm. Palpi gray, black at tips; head above whitish; thorax gray, more whitish on dorsal parts; abdomen alternating whitish and gray on each segment, very slightly washed with ochre. Fore wings whitish, more or less overlaid with blackish scales, giving a clear gray appearance; cross-lines whitish, very irregular, not sharply outlined. The basal with a long outward

tooth below cell, a small inward one just below this ; also a blackish spot outwardly at costa, on cell, and towards inner margin, giving the relics of an outer marginal black line. Outer line with large, deep teeth inwardly, at cell, and below it, these coalescing with the inner line in a whitish streak ; between these, three even teeth outwardly ; submarginal line whitish, scalloped, or showing only in whitish dashes at end of veins ; margin with dark lunules between the veins. Hind wings ochre-fuscous, darkest at margins ; beneath nearly colour of hind wings, the lines of fore wings faintly showing.

There is some variation in the specimens ; in some the cross-lines are less diffuse, the angles more even, and a double black discal spot apparent on fore wings.

Colorado. Four ♂ ♂, 5 ♀ ♀, from Mr. Bruce.

*Epischmia incanella*, n. sp.—Expands 30 mm. Palpi rough scaled, drooping, light gray, with dark scales intermixed ; tongue scarcely longer than palpi ; head gray ; thorax gray ; abdomen light fuscous gray, washed with ochre. Fore wings gray, much overlaid with dark gray or blackish, more lightly along the costa, which thus shows in a light gray streak reaching to outer line ; inner line indistinct, broad costally, narrow and dentate towards inner margin, faintly marked with two or three black spots outwardly ; a black spot at centre of outer margin of cell ; outer line very far towards outer margin, quite indistinct, but an outward rounding at middle, and a tooth inward near inner margin ; a tendency at margin to have the veins marked with black dashes. Hind wings light, with a fuscous shading. Underneath light fuscous, the fore wings somewhat the darker, except on marginal space.

Colorado. Two ♀ ♀, from Mr. Bruce.

*Volusia pallidipennella*, n. sp.—Expands 20 mm. Palpi, head, thorax and abdomen light gray, with a slight fuscous washing, the tegulae lighter, almost white, and the abdomen more stained with fuscous. Fore wings whitish, sprinkled with black scales, giving a light gray appearance ; cross-lines indistinct, the basal consisting of a broad, dull reddish band, not reaching costa, edged each side with whitish, and this with broken blackish, not very distinct ; discal spot black, distinct ; outer line whitish, far out, sub-parallel with margin, slightly bent at middle. Hind wings light fuscous, darker at margins. Beneath light fuscous, the fore wings darker, especially towards apex, where the outer cross-line shows.

Colorado. One ♂, from Mr. Bruce.

*Pinipestis umbrifennis*, n. sp.—Expands 24 mm. Palpi black, a little grayish at tips; head and thorax black; abdomen blackish, a little lighter on each segment posteriorly. Fore wings mouse-black, slightly grayish across basal portion within scale ridge; also a triangular, dark grayish space along costa on middle field, enclosing double black discal spots, and a faint grayish marginal shade. Basal line not apparent; scale ridge strong, jet black; outer line narrow, dark gray, bent inward at end of cell, then with three even teeth outward, then angled inward before reaching inner margin. Hind wings deep black, with a blackish-brown reflection. Beneath almost uniform dull somewhat glistening black.

Colorado. One ♂, from Mr. Bruce.

*Salebria delectella*, n. sp.—Expands 33 mm. Palpi thin, lightly scaled, gray; thorax blackish-gray, with a subdorsal tuft of orange-yellow scales on each side; abdomen blackish-gray, and gray-ringed on each segment. Fore wings, general colour blackish-gray; basal space, except along costa, dull reddish; middle field, first half of ground colour, the outer half much lighter gray; outer field, except towards costa, dull reddish; discal spot a large white lunule, concave side outward; basal line light gray, well out, waved, dentate; outer line gray, somewhat indeterminate on borders, with a more prominent outward dentation at middle; marginal line black. Hind wings light translucent fuscous, with black marginal line, except along inner margin. Beneath, fore wings dark fuscous, the outer line faintly showing; hind wings much as above.

Colorado. Two ♀♀, from Mr. Bruce.

In general appearance somewhat resembling *Salebria tarmitalis*, which is now put by Mr. Ragonot under the genus *Myrcala*. This may also belong there, as the cell of the hind wings is very short. But as I have no male, the position of the insect is in doubt. The thoracic tufts are somewhat peculiar.

*Salebria georgiella*, n. sp.—Expands 17 mm. Palpi fuscous gray, blackish in front, strong, heavily scaled, reaching above head; maxillary palpi strongly pencil tufted, bright yellow; antennæ brownish fuscous, the scale tuft in bend very heavy; head fuscous gray; thorax gray or bluish-gray; abdomen ringed with ochre-fuscous and yellow ochre, somewhat tufted at end. Fore wings gray, washed with fuscous along costa, becoming clear gray posteriorly; a dull brick-red central dash at base, and a large dull brick-red spot within basal line posterior to centre and reaching

thence to inner margin, somewhat quadrate in form; lines light gray, not well defined, the basal with an outer angle at middle and towards inner margin; outer line rounded from costa to centre, then angled outwardly, then nearly straight to inner margin, all faintly serrate; discal spot distinct; outer line edged both sides with darker fuscous. Hind wings ochre-fuscous, dark iridescent at apex. Beneath even dark fuscous, hind wings somewhat lighter than fore wings.

Charlotte Harbor, Florida. One ♂, from Mrs. Slosson.

### CANADIAN COCCIDÆ.

#### III. A LECANIUM, PERHAPS IDENTICAL WITH *L. RUGOSUM*, SIGNORET.

BY T. D. A. COCKERELL, N. MEX. AGR. EXP. STA.

I have just received from Mr. James Fletcher a small bottle of scales found on plum at Queenston, Ontario. He writes concerning them: "Dead scales picked from a plum tree in the Niagara district, where it was very abundant on plums and much rarer on peach trees growing amongst the plums."

Directly I saw these scales, they struck me as something unusual, and yet I rather expected they would prove to be some form of *L. persicæ*. Unfortunately they were full of the mycelium of a fungus (doubtless *Cordyceps*), as well as in some cases containing a Chalcidid parasite, so that their specific characters were very hard to make out. The fungus, which must be a very important check to their increase, was not noticed on examination with a lens; but on boiling the scales in liquor potassæ, they stained the liquor brown, and a microscopic examination showed the fungus quite plainly. Of course, from mere mycelium no determination could be made. I saw in one case what looked like germinating spores, but perhaps in this I was mistaken.

Assuming that the scales were not *persicæ*, I went through the descriptions to see what they would fit better. *Lecanium rugosum*, Sign., seemed the very thing, though comparison in detail revealed some differences.

The following information on *Lec. rugosum* was translated from Signoret by my wife. I transcribe it for the use of those who have not the original:

## L. RUGOSUM, Signoret, 1873.

"Among the species which are found on the peach-tree, there is one which is neither *L. persicæ* nor *L. rotundum*, and which approaches more nearly to the latter than to the former.

"*L. rugosum* is round, rather elevated and very rugose on the sides, where there is a strong punctuation more or less confluent, and between the points smooth spaces forming a kind of hills. It is of a dark brown; the antennæ are of eight joints, of which the third, 'mutique,' is longer by itself than the five following ones, the fourth, fifth, sixth and seventh of equal length. By the antennæ alone, as well as by the shape, it is easy to distinguish *L. rugosum* from the two other species; in *persicæ* the fourth joint is longer by itself than the three following, and in *rugosum* it is equal to the others; in *rotundum* the fourth joint is equal to the third, and perhaps even longer; further, there are only seven joints to the antennæ instead of eight.

"We found this species on peach-trees in our garden, at Clamart. It is not very abundant. Its length is from 4 to 5 mm. by about the same width; height from 2 to 3 mm.

"One other peculiarity we ought to point out in this species is the form of the posterior tarsi, which are as if flattened, wider than the tibiæ and a third shorter.

"The anterior tarsi are ordinary, but have a furrow on the internal face. The claws are very wide at the base; the digitules of the claws are long and unequal in size, the one forming a more extended 'cornet' than the other. The digitules of the tarsi are long and straight, inserted at a distance from one another. The tibiæ, in general, present four to five hairs at the summit, one longer than the rest; the femora have two at the summit, the trochanters one very long one, the coxæ two or three.

"We have never met with the males, but have seen several white shells whence they had emerged. This shell is smooth in this species and rugose in *rotundum*."

So far Signoret. Now to return to the Queenston scales. We have here a scale differing from ordinary *persicæ* in being almost round in outline, very dark, and especially very rugose. Surely, then, it is Signoret's *rugosum*? But, if at first this seems an inevitable conclusion, it is rather contradicted by the microscopic char-



acters. I found, even after examining many specimens, but one antenna; but this was clearly seen to be 7-jointed, not 8-jointed, as in *rugosum* and *persicæ*. I found no legs in position, but several fairly well-preserved ones broken from the bodies. These showed the long digitules, but I did not get a sight of the peculiar posterior tarsus. The following description gives the details I found:

LECANIUM FROM QUEENSTON.

♀. Antenna 7-jointed, 3 longest, 4 a little shorter, 7 a little shorter than 4, 2 shorter than 4, 5 and 6 shortest and about equal. Formula approximately 34721 (56).

Legs well-developed; trochanter and coxa each with a hair; femur rather slender, not very much longer than tibia; tibia about one-third longer than tarsus. Tarsal digitules slender, very long. Digitules of claw also long, extending considerably beyond tip of claw, with quite large knobs. Claw nearly straight. Derm with large gland-pits, often double. Anal plates with their caudolateral sides longer than the cephalolateral.

Of species with 7-jointed antennæ, there is *L. rotundum*; but this is out of the question, from its globose, nearly smooth scale. But how about *L. juglandis* (*juglandifex*), with which I have identified a species sent by Dr. Lintner from Rochester, N. Y., on plum? The antenna of this Rochester insect is just like the antenna of the Queenston species; in fact, the microscopical characters of these forms are so much alike as to strongly suggest their identity. Yet the scales seem decidedly different.

Some one may here say, How about the *Lecanium cerasifex*, Fitch., 1856? This was said to be hemispherical, nearly the size and shape of a half-pea, black, more or less mottled with pale dull yellow dots. I confess I do not know what this is, and look with some doubt on identifications of it from such a description as Fitch gave. Until some one has given us a better description from the type, I think *cerasifex* must be put in the doubtful list. There is no good reason for supposing it identical with the Queenston scale.

The solution of the question here raised must probably be left in the hands of one who can study the insect, in all its stages, on the spot. The following questions might be addressed to a suitable enquirer:—

- (1.) *L. rugosum*, hitherto known from France, closely resembles our insect in outward form. Can the diversities in microscopic details be reconciled?

- (2.) *L. juglandis*, from Rochester, N. Y., closely resembles our insect in microscopic characters. Can the diversities in outward form be reconciled?
- (3.) Is it possible that the parasitic fungus would so alter the scale in its growth as to make it seem like a different species?
- (4.) Can the male scale be found, and if so, is it smooth or rough?
- (5.) Can the Queenston people tell anything of the origin and spread of the scale?

[Mr. Cockerell has more recently examined other material from Queenston, Ont., and also some from Geneva, N. Y., and is strongly of opinion that the species in both cases is the same as the Rochester (N. Y.) *L. juglandis*. The scales are shiny, red-brown; in both cases accompanied by hibernating young.—J. F.]

#### SOME NEW SPECIES OF ROBINSONIA.

BY W. SCHAUS, TWICKENHAM, ENGLAND.

*Robinsonia Grotei*, sp. nov.—Head white, posteriorly shaded with yellow. Collar white, with a central brown spot. Thorax brown, with a central white line; patagia white, laterally edged with brown. Abdomen dorsally brownish-yellow, with a subdorsal row of small white spots, and a lateral row of small black spots; underneath whitish. Primaries above white, with the margins broadly brown, except at the apex, where the white extends to the fringe; an oblique brown band, from the costal margin at a third from the base to the inner angle, separates the white into two large spaces. Secondaries white. Primaries underneath white, showing indistinctly the markings of the upper surface.

Ex., 45-47 mm.

Hab.—Rio Janeiro, Trinidad; Jalapa, Mexico.

This species is very closely allied to *Robinsonia formula*, Grote, but differs in the straight brown margins which are sinuate in *R. formula*.

*Robinsonia perfecta*, Hy. Edw., is a synonym of *Sallæa ochrosteria*, Feld., and *Turuptiana obliqua*, Walk., the last being the oldest name, and generically quite distinct from *Robinsonia*, which is most closely allied to *Ormetica*, Clem. The genus *Ormetica* is congeneric with *Euplesia*, Feld., and will have priority over the latter. *Ormetica sphingiformis*, Clem., has been redescribed by Mr.

Druce as *Automolis inutata*, which is placed by Kirby as a synonym of *Chelonia taniata*, Guér. I have not read Guérin's description, but presuming Mr. Kirby is right, the species will stand as *Ormetica taniata*, Guér.

*Robinsonia fogra*, sp. nov. —Head yellowish. Collar white. Thorax white, with some gray marks; patagia finely edged with gray. Abdomen above brownish yellow: some clusters of brown hairs towards the base; a subdorsal row of white spots and a lateral row of black spots; underneath white. Primaries above white, the veins gray, the margins clouded with gray, and a terminal row of gray streaks between the veins; an indistinct and irregular outer gray line. Secondaries above whitish, clouded with gray along the margin; the fringe dark gray. Underneath, the wings are similar, but with less gray, and the white ground colour is slightly iridescent.

Ex., 44 mm.

Hab.—Aroa, Venezuela.

*Robinsonia Lefavrei*, sp. nov.—Head brown, minutely spotted with white. Collar brown, with four white spots. Thorax brownish; patagia white, edged with brown. Abdomen above brown, with a subdorsal orange line; underneath white. Primaries above white; the costal margin broadly brownish yellow; the cell filled in with brown scales: the outer and inner margins broadly brown, the latter with a white streak about its centre; veins 2, 3, 4, 6 and 7 brown, dividing the white portion into a series of spots, the largest being between the median and submedian veins, and beyond the cell between veins 4 and 6; the two apical spots the smallest and oval in shape. Secondaries above white, with a long brown streak from the base to the anal angle, and a shorter streak below vein 2, from the cell to the outer margin; the costal margin narrowly shaded with brown; underneath the same, with the markings less distinct.

Ex., 44 mm.

Hab.—Rio Janeiro.

I am indebted for this species to Monsieur Paul Lefavre, Chargé d'Affaires for France at Rio Janeiro. I have also seen a specimen in the collection of Mr. Neumoegen, of New York.

## PRELIMINARY STUDIES IN SIPHONAPTERA.--II.

BY CARL F. BAKER, FORT COLLINS, COLO.

Family *Pulicidae*, Tschb.

1880. Taschenberg, Die Flohe, p. 62.

## Table of Genera.\*

- A. Eyes well developed; antennæ with circular incisions or cleft only on one side; head and thorax usually stout and compact; head rarely angulated in front; lower edge of head and pronotum behind sometimes with combs, abdominal segments and discs of cheeks without. . . . . *Pulex*.
- AA. Eyes wanting, or very rudimentary; antennæ with circular incisions.
- B. Eyes entirely wanting: head and thorax stout and compact; head angulated in front, truncate; discs of cheeks, pronotum, and several abdominal segments with combs of numerous spines, the whole body heavily bristled. . . . . *Hystrichosylla*.

\* The genus *Stephanocirrus*, Skuse (Records of Austral. Mus., II., 5, Sydney, Sept., 1890), with its single species, *Pasguri*, Skuse, parasitic on *Pasyurus maculatus*, Kerr., I do not include in this table. As characterized, it possesses a most extraordinary structure. Should further study verify all points of the description, this genus will form a very interesting addition to the family. It, however, seems probable that two species have been confused, and that both are referable to known genera. The description (for a copy of which I am indebted to Mr. Wm. J. Fox) is as follows:—“*Stephanocirrus*, gen. nov. Body elongate, especially in the female, bristly, noticeably stronger at the anal extremity. Antennæ capitate, four-jointed, the second joint in the female with long bristles extending to the tip of the fourth; in the male very short; fourth joint lamellar, apparently composed of nine segments. Head moderately large; in the female with an exerted, cap-like patella in the front, strongly pectinated round its posterior margin, the face also strongly pectinated; in the male the posterior margin of the head only pectinated; eyes wanting in the female; trophi less than the length of the head; mandibles extremely slender, minutely serrated, encased in four-jointed labial palpi, which they somewhat exceed in length; lingua extremely slender; maxilla elongate, triangular, somewhat exceeding the second joint of the labial palpi, with no apparent apical joint; maxillary palpi four-jointed, the first and fourth of about equal length, the third shorter and the second the longest, acuminate; joints of the labial palpi progressively diminishing in length and thickness. Prothorax in female with a strong pectinate fringe. Legs long, spinous; coxæ of posterior two pairs with a distinct notch posteriorly at the apex; femora very minutely and sparingly spined; tarsi five-jointed, the first, second and fifth joints long, the third shorter, the fourth shortest, half the length of the fifth; claws microscopically denticulate.

\*\* *Stephanocirrus pasguri*, sp. nov. Length of male, 1.60 mm.; of female, 2.80 mm. Castaneous brown, nitidous. Head of the male convex above, of female flat. Eyes of male small, black. Pectinal fringes and setæ black or dark brown. Thorax long, in the female nearly the length of the body. Abdomen about twice as long as broad in the male, shorter in the female, darker castaneous brown in the female, bristly. Legs of a uniform pale castaneous brown. Habitat—New South Wales, on *Pasyurus maculatus*, Kerr.”

- BB. Eyes wanting, or very rudimentary; head and thorax slender; head usually long, rounded in front, vertex often more or less produced; combs on head and pronotum, and sometimes on abdominal segments, that on the head of not more than four spines on each side ..... *Typhlopsylla*.

Genus *Pulex*, Linn.

1746. Linnaeus, Fauna Suecica.

1832. Curtis, British Entom., IX., No. 417. (Ceratopsyllus.)

1857. Kolenati, Wiener Entom., Monatsschrift, I., p. 65. (Monopsyllus.)

1863. Kolenati, Hor. Soc. Entom., Ross, II., p. 32, etc. (Trichopsylla, Ctenonotus, Ctenophthalmus. Ctenopsyllus, Ceratopsyllus, and Ctenocephalus.)

Table of Divisions.

- A. Head beneath and pronotum behind without combs of spines. . . . . Division I.  
 AA. Head beneath without, pronotum behind, with a comb of spines. . . . . Division II.  
 AAA. Head beneath and pronotum, both with combs of spines. . . . . Division III.

Division I.—Table of Species.\*

- A. Head above sloping obliquely forward, angled in front; segments of abdomen each with 5 to 6 transverse rows of bristles; second joint of antennæ without long bristles. . . . . *kerguelensis*.  
 AA. Head above and in front evenly rounded; segments of abdomen each with 1 or 2 transverse rows of bristles.  
 B. Segments of abdomen each with 2 transverse rows of bristles; size large; length: male, 3 mm.; female, 4 mm.; head behind antennal groove with two rows of numerous long black bristles; bristles on second antennal joint extending beyond end of third joint; labial

\* *Pulex tuberculaticeps*, Bezzi (Bull. della Soc. Entomo., Ital., XXII., 1890, "Notes on Some Epizotic Insects"), belongs in Division I, and is nearly related to *P. globiceps*. It was taken from *Ursus arctos*, and is characterized by the truncated and medially tuberculated front, the subequal first and fifth joints of posterior tarsi, the slightly greater size and other minor details. Its position would be between *kerguelensis* and *globiceps*. I have been unable as yet to obtain specimens of fleas from bears in this country. It is, however, a well-known fact among hunters in the West that the grizzly and silver-tip are sometimes found "alive" with them.

- palpi 5-jointed; meso-and-metathoracic pleura with numerous long black hairs; male claspers very large, sharp angled above posteriorly. . . . . *globiceps*.
- BB. Segments of abdomen each with a single well-defined transverse row of bristles; size smaller: male, 2-2.5 mm.; female, 2.5-4 mm.; head behind antennal groove with very few scattering bristles; bristles on second antennal joint shorter than third joint: meso-and-metathoracic pleura with few scattering short hairs.
- C. Male claspers very small, slender and cylindrical; tarsi slender; of anterior tarsi, fifth joint as long as or shorter than 1 and 2 together, and as 2 and 3 together; of middle tarsi, fifth joint three times 4 or less, and less than 2; of posterior tarsi, fifth joint less than 3 and 4 together, second three times 4 or more, much longer than 5, and more than 3 and 4 together, while 1 is longer than 4 and 5 together; internal penis support short, not spirally coiled towards the front; labial palpi 4-jointed; pale brown in colour; length: male, 2 mm.; female, 2.5 mm. . . . . *pallidus*.
- CC. Male claspers very large, half-oval: of anterior tarsi, fifth joint is longer than 1 and 2 together, and longer than 2 and 3 together; of middle tarsi, fifth joint is three times 4 or more, and as long as 2 or longer; of posterior tarsi, fifth joint as long as 3 and 4 together or longer, second less than three times 4, less than 5, and as long as 3 and 4 together or less, while 1 is longer than 5; internal penis support several times spirally coiled towards the front; labial palpi 3-jointed; colour varying between reddish and piceous; length: male, 2-2.5 mm.; female, 2.75-4 mm.
- D. Mandibles and hypopharynx very short, not reaching one-half length of anterior coxæ; joints of labial palpi robust, first joints longer than second, third longer than 1; maxillary palpi, with second joint in female shorter than 4; anterior lobe of exsertible portion of penis\* with upper half as broad throughout as lower half just above base. . . . . *simulans*, n. sp.
- DD. Mandibles and hypopharynx longer, reaching more than one-half length of anterior coxæ; joints of labial palpi slender, first equals 3, second shorter; maxillary palpi with second joint in female much longer than 4; anterior lobe of exsertible portion of penis with upper half very narrow and cylindrical. . . . . *irritans*.

\* See Wagner, Hort. Soc. Ent., Ross. T., XXIII., pl. X., fig. 25, k.

*Pulex kerguelensis*, Tschb.

1880. Taschenberg, Die Flohe, p. 67.

This is a very unique and well-marked species. Taschenberg gives the proportional lengths of tarsal joints as follows:—On anterior legs first equals 5; on middle legs second equals 5 and equals 3 and 4 together, first is somewhat longer; on posterior legs first is a third longer than 2, 3 and 4 together somewhat shorter than 2, and 5 a little longer than 3. Length of male is given as 2 mm., of female, 3 to 4.5 mm. The four known examples were collected on the Kerguelen Islands by Mr. Eaton, from *Pelecanoides urinatrix*, Gmel, and sent to Ritsema for determination.

*Pulex globiceps*, Tschb.

1840. Motschulsky, Bull. Soc. Imp. de Moscou, p. 170. (*P. vulpes*.)

1880. Taschenberg, Die Flohe, p. 66. (*P. globiceps*.)

A large flea, well separated by its elongated body and proportionally very small head, standing between *kerguelensis* and *irritans* with its allies. Taschenberg says of the maxillary palpi: "their thick joints of almost equal length." However, in specimens received from him, the second joint in the female is less than three-fourths of the fourth in length. He further says the antennal grooves are open, and the colour is darkish-brown, yellowish-gray posteriorly in mature females. The labial palpi in the specimens received from Dr. Taschenberg are certainly 5-jointed, the sutures between the several joints being equally distinct. In these specimens I find the comparative lengths of tarsal joints as follows:—In anterior legs the fifth joint is about as long as 1 and 2 together, and as long as 2 and 3 together; in middle legs the fifth joint is three times 4 and longer than 2; in posterior legs the fifth joint is shorter than 3 and 4 together, and about two-thirds of 1, while the second is about twice 4 and less than 5. The following records have been made of its occurrence: From *Canis vulpes* (Halle, Taschenberg, and Holland, Ritsema), from *Meles taxus* (Zool. Gardens at Rotterdam), from *Canis*, sp. (Russia, Motschulsky).

*Pulex pallidus*, Tschb.

1880. Taschenberg, Die Flohe, p. 65.

I have before me a large series of specimens sent to me as a new species by Dr. Taschenberg. They were taken on *Mus albipes*, in the Island of Socotra. They coincide in every respect with the original description and illustrations of *pallidus*, and must be referred to that

species as it now stands. The specimens from the Berl. Zool. Mus., described by Taschenberg, were found on *Herpestes ichneumon*, in Egypt. The same or a nearly related *Herpestes* is found in Socotra, and as its habits resemble in many ways those of the *Mus*, it is very easy to see how the same species of flea might occur on both.

*Pulex simulans*, n. sp.

Two specimens of this flea, taken from opossum (*Didelphis virginiana*), were sent to me by Mr. L. O. Howard, from the U. S. Dep. of Agriculture collection. Though distinct, yet it is very closely related to *P. irritans*, and might easily be confused with that species.

*Pulex irritans*, Linn.

1746. Linnaeus, Faun. Suec. 2nd Ed., No. 1695.

This nearly cosmopolitan flea I have received from Mr. S. C. Dundore, of Lakeside, Cala., and through Mr. L. O. Howard, from Azura, Cala., at both of which localities it is common.

(TO BE CONTINUED.)

## NOTES ON SOME REARED HYMENOPTERA, LARGELY PARASITIC, AND CHIEFLY FROM OHIO.

BY F. M. WEBSTER, WOOSTER, OHIO.

*Elachistus ohioensis* (MS.), Ashmead.—Reared from pupæ, in which stage it probably passes the winter; found November 7th, within the shells of beech-nuts, the kernels of which had been attacked and eaten by some kind of larva which had burrowed out these kernels, leaving only a mass of excrement. A hole in the shells indicated an attack similar to that of some species of *Balaninus*, though, as I found no larvæ of them, it was impossible to learn their exact nature. Locality, Wooster, Ohio.

*Cirrospilus flavicinctus*, Riley.—This was described in Lintner's First Report as being reared from *Bucculatrix pomifoliella*, Clemens, in Missouri, and also New York. My rearings were from *Aspidisca splendoriferella*, Clem., the cocoons of which were collected near Cleveland, Ohio.

*Aphidius chenopodiaphidis* (MS.), Ashmead.—This was reared from an Aphid found on the leaves of *Chenopodium album*, Linn., collected in the vicinity of Cleveland, Ohio, June 29th.

*Isocratus vulgaris*, Walker.—This and an undetermined *Apanteles* were reared with the species next following.



*Lysiphlebus salicaphis*, Fitch.—Reared August 24th from Aphid on Wahoo, *Euonymus atropurpureus*, Jacq., near Wooster, Ohio.

*Pachyneuron aphidiivora*, Ashmead.—Reared from Aphid on leaves of *Liriodendron tulipifera*, Linn., collected in Bennett Woods, Cincinnati, Ohio, June 29th.

*Rhaphitelus maculatus*, Walker.—This was reared from *Scolytus rugulosus*, Ratz., burrowing in the trunks and larger limbs of fruit trees in Northern Ohio.

*Praon coloradensis*, Ashmead.—Reared from an Aphid on Gladiolus, August 8. Locality, Cleveland, Ohio.

*Elasmus nigrescens*, Ashmead.—Reared from cocoons on leaves received from Warren county, Southern Ohio. The leaves appeared to have been attacked by Fall Web-worm, though none of these caterpillars were present. Date of emerging, September 17.

*Eulophus tricolaus*, Prov.—Reared from mines of *Tischeria malifoliella*, Clem., in leaves of apple, received from near Schenectady, N. Y.

*Segnipicis nigrifemora*, Ashmead.—Reared from the same host as the preceding species, and from the same locality, but from another lot of leaves.

*Microgaster xylinoides* (MS.), Ashmead.—Found, dead, in fold of leaf of Linden; Wooster, Ohio, October 15, 1894. The fold had been made by some leaf-folding larva, and extended along one of the lateral veins of the leaf.

*Habrocytus aulacis* (MS.), Ashmead.—Reared from stems of *Lactuca canadensis*, Linn., collected near Lodi, Ohio, October 26, 1894.

*Spilochalcis torvina*, Cresson.—This was reared from the rather conspicuous cocoon, which is dingy-white banded with black. Have collected similar cocoons in Tensas Parish, Louisiana, and also in Indiana. These were from near Cleveland, Ohio.

*Rhodites spinosa*, Ashmead.—(Described only from the galls.) Both sexes were reared from spiny galls on rose, growing along the edges of woods in Huron county, Ohio. Females emerged in the fields on May 11, and the males followed within a few days. Collected and reared May, 1894.

*Amblynotus iowensis*, Ashmead.—This was reared from a mass of grape leaves, affected by Phylloxera and collected along the shore of Lake Erie, near Cleveland, Ohio. From the same leaves a considerable number of *Hemerobius occidentalis*, Fitch, were also reared.

The determinations were made by Mr. W. H. Ashmead.

## THE COLEOPTERA OF CANADA.

BY H. F. WICKHAM, IOWA CITY, IOWA.

## VIII. THE HALIPLIDÆ AND DYTISCIDÆ OF ONTARIO AND QUEBEC.

The above-mentioned families of carnivorous water beetles are taken up here by request of the Editor and Committee, because of the great difficulty most students of Coleoptera, especially if they are beginners, find in identifying any of their captures in these groups, or even in separating the species with approximate accuracy. It is to be feared that with many it will prove difficult to follow the tables herewith presented; but they have been made as plain as circumstances will allow, and care has been taken to follow the best authorities in the selection of characters supposed to mark the respective species, so that by diligent attention to details the user of the paper may hope to co-relate his collection with our lists.

The HALIPLIDÆ which may be considered first, includes a small number of beetles easily recognized by the very convex body, narrowed and often pointed before and behind; in colour yellowish, with numerous black spots on the thorax and elytra. The antennæ are ten-jointed, situated on the front before the eyes, glabrous and filiform; the legs are slender, not fitted for vigorous swimming, the hind coxæ furnished with broad plates, contiguous internally, which conceal the posterior legs at their basal half, and from three to six ventral segments. These little creatures, which, from their peculiar spotted appearance, suggest aquatic lady-birds, may be found very commonly during the summer in ponds where plant life abounds, especially Algae. On account of their feeble swimming power they are easily captured by raking the mass of vegetable matter on to the bank, when the beetles, on crawling out to regain the water, may be secured.

Only two genera are represented in Canada: *Haliplus*, which has the elytral interstices punctate and the last joint of the palpi small, subulate, and *Cnemidotus*, without interstitial elytral punctures, the terminal palpal joint conical, longer than the third. The species are difficult to define; the following characters, however, are those accepted as specific by Mr. Crotch, in his "Revision."

## HALIPLUS, Latr.

A. Thorax without basal impression; larger species.

b. Head with bilobed black spot on the vertex; elytral striæ not deeper at base (.15 in.) . . . . . *cribrarius*, Lec.

bb. Head unspotted; punctures of elytral striæ finer towards apex.

Thorax with black spot anteriorly (.13-.14 in.) . . . *triopsis*, Say.

Thorax immaculate (.16 in.) . . . . . *fasciatus*, Aubé.

AA. Thorax with an impressed plica on each side near the base; smaller species.

Pale ochreous yellow; punctuation stronger, thoracic plica shorter (.11-.12 in.) . . . . . *ruficollis*, DeG.

Fulvous; punctuation less strong, thoracic plica longer (.12 in.) . . . . . *longulus*, Lec.

#### CNEMIDOTUS, Er.

Our two species are easily distinguished from those of *Halipilus* by the thorax being ornamented with two black basal spots. Mr. Crotch unites under the name *12-punctatus* (fig. 5) the two forms which have been separated on these characters:



FIG. 5. Hind coxæ without this angle (.16 in.) . . . . . *muticus*, Lec.

Hind coxæ with a prominent angle on the hind margin (.15 in.) . . . . . *12-punctatus*, Say.

The next family, the DYTISCIDÆ, is separated with ease from the *Haliplidæ* by the following characters: the body is usually much less stout and convex and more obtuse at the ends; the antennæ are eleven-jointed, usually filiform, though occasionally somewhat clavate or thickened at middle, inserted under the front behind the base of the mandibles. The posterior coxæ are large, reaching the sides of the body, but not covering the ventral segments. Legs natatorial, ciliate with long hairs. From the *Carabidæ* they may be known by the structure of the hind coxæ mentioned above.

All the species are more or less strictly aquatic in habit, and are as a rule strong swimmers. They may be found in numbers in ponds and water courses, sometimes being seen under the ice after the approach of winter. At night they fly around and are often attracted by lights. Some of the more northern forms, especially of *Agabus* and *Hydroporus*, may be taken under wet moss, or beneath stones or boards which have been lying on the grass in marshy places. The sexual modifications in the family are very interesting, the males often possessing a peculiar modification of the anterior (and less frequently the middle) tarsi, whereby the basal joints are dilated into a more or less cup-shaped surface, which is studded beneath with little stalked disks. The number of these disks in

connection with their arrangement and relative size, together with the extent and form of the dilatation of the tarsi, furnishes excellent characters for the separation of groups, and will be referred to again later.

The larvæ are aquatic and carnivorous, in form elongate, cylindrical or fusiform, the head large and flat, the antennæ frontal, the mandibles falcate, suctorial. The legs are terminated by two claws, and the abdomen lacks the tracheal branchiæ seen in the *Gyrinidæ*. They remain in the water until full growth is attained, when they repair to some convenient place under a board, stone or tuft of vegetation, where probably by the squirming motions of the body a cell is made in which the change to pupa takes place; the length of time spent in this latter stage must vary greatly in different broods and with the various species, but it was found to be ten or eleven days in the case of *Dytiscus verticalis*, of which a larva, taken at Bayfield, Wis., pupated on July 18th, the beetles appearing on the 28th.

The *Dytiscidæ* do not offer that diversity of form, colour and sculpture presented by many of the families of terrestrial beetles, hence the selection of easily seen, though superficial, points on which groups might be set apart has not been found practicable, and it has been considered wise to use in the main the structural differences proved useful by such workers as Drs. Sharp and Lacoste in the primary divisions. Though the discrimination of the genera and species will sometimes be difficult for the beginner, it is hoped that at least in most cases a correct identification will be the reward of careful work with sufficient material. The two great divisions of the family, as defined by Dr. Sharp, are these:—

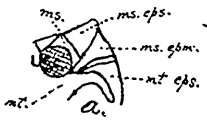


FIG. 6.

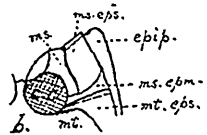


FIG. 7.

1. Metathoracic episternum not reaching the middle coxal cavity (fig. 6a) . . . . . *Dytisci fragmentati*.
2. Metathoracic episternum reaching the middle coxal cavity (fig. 7b). . . . . *Dytisci complicati*.

Of the accompanying cuts, fig. 6 a represents a diagram of a portion of the under surface of *Laccophilus*, which belongs to the *fragmentati*, *cc* being the middle coxal cavity. It will be seen that the mesosternal epimeron (*ms. epm.*) articulates at its inner end with the metasternum (*mt.*), and thus cuts off the metasternal episternum (*mt. eps.*) from the coxal cavity. In fig. 7 b, however, which is a diagram of similar parts of *Colymbites* of the *complicati*, the mesosternal

epimeron does not articulate with the metasternum, and thus allows the episternum of the latter to reach the cavity. These features are not, as a rule, difficult to make out from specimens, and form the basis of the modern classification of the family. Both figures, which are taken from Dr. Sharp's memoir, are lettered alike, *ms.* being the mesosternum proper, *ms. eps.* its episternum and *epip.* the epipleura. Of the Dytisci fragmentati only one genus is recorded in the Canadian list, *i. e.*:

LACCOPHILUS, Leach.

This includes two species from the fauna under consideration, both of which are rather small, very active beetles of ovate form and pale colour, in which yellowish or testaceous predominates. They separate thus:

Larger (.24 in.), head, thorax, legs and under surface testaceous; elytra dark, with the margin and four submarginal spots (subhumeral, median, post median and subapical) yellowish, also with three irregular yellowish basal marks and a narrow sutural line.....*maculosus*, Germ.

Smaller (.20 in.), pale; elytra with the subhumeral mark of *maculosus*, the others confused.....*proximus*, Say.

The Dytisci complicati form the bulk of the Canadian fauna in this family, and may be conveniently divided into four tribes as follows, in order to avoid a long and complicated synoptic table:

A. Prosternum deflexed between the front coxæ, front and middle tarsi four-jointed or apparently so, small species.....Hydroporini.  
AA. Prosternum not deflexed; tarsi distinctly five-jointed.

b. Front tarsi of males with three\* basal joints dilated, forming an oblong or elongate surface.....Colymbetini.

bb. Front tarsi of males dilated so as to form a rounded or triangular disk.

Posterior pairs of spiracles large, transverse; ♂ anterior tarsal disk rounded, the cupules of unequal size. Posterior tarsi with two nearly equal claws except in *Hydaticus*.....Dytiscini.

Posterior pairs of spiracles small, anterior tarsi of ♂ forming a subtriangular disk having four rows of small, equal cupules. Hind tarsi with one claw or very unequal claws.....Cybistrini.

\*There are only two in *Agabinus*.

Of the above-mentioned tribes the *Hydroporini* contains nearly all of the small species, and can be treated only with considerable difficulty, as the genera are distinguished by structural characters not always evident without the destruction of a specimen. After some practice, however, the facies will be found a tolerably reliable guide. The genera may be known by these characters:

- A. Small (.06 to .07 in.) First ventral connate with hind coxæ.  
 Form rounded, robust . . . . . *Desmopachria*.  
 Form oblong, depressed . . . . . *Bidessus*.
- AA. Larger (usually over .10 in.) First ventral free.  
 b. Scutel distinct . . . . . *Celina*.  
 bb. Scutel invisible.  
 Elytral ligula\* distinct, abrupt . . . . . *Cælambres*.  
 Elytral ligula wanting.  
 Mesosternum not attaining metasternum . . . . . *Deronectes*.  
 Mesosternal fork connected with the intercoxal process of  
 the metasternum . . . . . *Hydroporus*.

#### DESMOPACHRIA, Bab.

*D. convexa*, Aubé, is a small species (.07 in.), rounded and convex in form, and of a shining brownish-red colour without markings. The elytra are finely punctured, the clypeus with distinct margin. I find it here in small creeks or ditches through meadows.

#### BIDESSUS, Sharp.

Contains two small Canadian beetles of depressed, oblong form and brownish colour, sometimes with paler markings. The thorax and elytra have a common basal striola on each side.

Nearly unicolorous, punctuation fine (.06 in.) . . . . . *affinis*, Say.  
 Brownish, elytra with paler shades and coarse punctures (.06 in.) *fuscatus*, Cr.

#### CELINA, Aubé.

The Canadian records give *C. angustata*, Aubé, as an inhabitant of the region, possibly in error, as the genus is characteristically southern. It is a parallel, elongate insect of a brownish-red colour, the elytra darker, mucronate. The thorax is transverse, gently rounded on the sides, the disk with fine punctures, which become deep in front and on the sides near the base (.14 in.).

\*This is a tongue or raised process on the under surface of the elytra near the outer margin. They must be lifted to show it.

## CÆLAMBUS, Thom.

Several species belonging to this genus may be known by the presence of a ligula on the inferior surface of the elytra near the extero-posterior angle; it seems to render possible a more perfect fitting together of the elytra and the ventral segments and may easily be seen by raising the wing-case. In colour most of the *Cælambi* are pale above with more or less distinct black markings. Beneath the body is convex, sometimes much so.

- A. Body beneath rufous, very convex. Head and thorax rufous, elytra brownish, or with distinct irregular pale markings (.12 to .13 in.).....*inequalis*, Fabr.
- AA. Body black beneath, less convex.
- b. Larger (.20 to .22 in.), deeply or coarsely punctate. Colour variable.....*impressopunctatus*, Schall.
- bb. Smaller (.11 to .17 in.).
- c. Thorax hardly narrower than elytra. Piceous; head, feet and thorax testaceous, the latter infusate at base and apex (.11 in.).....*turbidus*, Lec.
- cc. Thorax distinctly narrower than the elytra.
- Oval, convex, testaceous above, elytra with fine and coarser punctures intermixed (.13 in.).....*ovoideus*, Lec.
- Longer, less convex, piceo-testaceous above.
- Thorax and elytra hardly infusate (.15 in.) *patruclis*, Lec.
- Thorax infusate at middle, elytra at apex (.17 in.)  
.....*nubilus*, Lec.

## DERONECTES, Sharp.

The two *Deronectes* recorded from the Canadian fauna are densely punctured, opaque pubescent insects. They separate thus:

- Oblong-ovate, legs, antennæ and body beneath rufous, thorax with front margin, base and two large basal spots black, elytra with six or seven more or less interrupted and confluent vittæ (.17 in.).....*depressus*, Fabr.
- Elongate-ovate, black above and beneath, legs and antennæ red, elytra greenish-black, with or without many narrow, more or less confluent vittæ (.18 in.).....*griseostriatus*, DeGeer.

HYDROPORUS, Clairv.

A large genus, difficult to deal with on account of the similarity of several of the species and of the difference in the sculpture, which shows itself occasionally in the two sexes. The annexed table of the Canadian species is in the main a translation of the necessary portions of Dr. Leconte's arrangement of the genus in the Proc. Phil. Acad., 1855, with such changes in the names as will bring it into accord with our present lists:

- A<sup>1</sup>. Oblong-elongate, glabrous, thorax with basal impressed striolæ, the whole base transversely depressed, sides forming an angle with the elytra. Clypeus not margined. Colour above ochreous, head with one, thorax with two fuscous marks, elytra each with six linear vittæ and two submarginal spots fuscous (.17 in.)  
 ..... *alpinus*, Payk., var. *12-lineatus*, Lec.
- A<sup>2</sup>. Oblong-ovate, moderately convex, confusedly punctate, pubescent; sides of thorax forming an angle with the elytra, hind angles rectangular, clypeus truncate, colour rufo-testaceous, elytra with black fasciæ (.17 in.) ..... *hybridus*, Aubé.
- A<sup>3</sup>. Oblong, less convex, pubescent; elytra strongly punctured, with two smooth narrow lines on each side, clypeus rounded; above black, head and elytral fasciæ testaceous (.13 in.) .. *striatopunctatus*, Mels.
- A<sup>4</sup>. Oblong, usually obtuse in front; thorax not or hardly forming an angle with the elytra, which are without smooth lines.

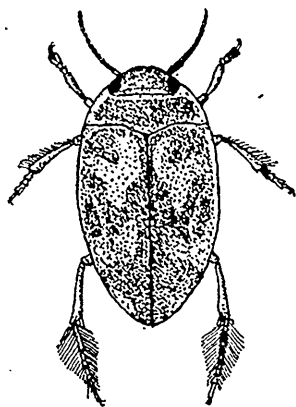


FIG. 8.

- b. Pubescent; thorax regularly evenly punctured.
- c. Clypeus rounded, broadly margined. Colour ferruginous, thorax blackish at base and apex, elytra with black fasciæ.  
 Thorax finely margined (.18 in.) ..... *consimilis*, Lec.  
 Thorax broadly margined (.17 to .18 in.) (fig. 8) .. *undulatus*, Say.
- cc. Clypeus rounded, not margined.
- d. Colour ferruginous, elytra black, with yellowish spots or vittæ.
- e. Elytral spots forming transverse fasciæ, thorax blackish at base (.18 in.) .. *spurius*, Lec.



- cc. Elytral spots linear, subconfluent.  
 Thorax infusate at base and apex (.18 in.)  
 ..... *sericeus*, Lec.  
 Thorax not infusate (.08 in.) . . . *vittatipennis*, G.&H.
- ccc. Elytra black, margin and two vittæ on each testaceous.  
 Thorax dark at base and apex (.16 in.) . *vittatus*, Lec.
- dd. Black or blackish above, sides of elytra often rufescent.
- f. Punctuation indistinct.  
 Sides of prothorax oblique (.20 in.) . . . *modestus*, Aubé.  
 Sides of prothorax rounded (.21 in.) . . . *notabilis*, Lec.
- ff. Punctuation distinct (.16 in.) . . . . . *niger*, Say.
- bb. Pubescent or glabrous; thorax unequally punctured, disk often nearly smooth.
- g. Thorax hardly margined at the sides.
- h. Sides of thorax not forming an angle with the elytra.  
 More elongate, sub-parallel (.16 in.) . *americanus*, Aubé.  
 Broader, pointed behind, more obtuse in front (.16 in.) . . . . . *dichrous*, Melsh.  
 More ovate, humeral angles pale (.15 in.) . *signatus*, Mann.
- hh. Sides of thorax forming an obtuse angle with the elytra.  
 Black, sparsely pubescent (.14 in.) . . . *caliginosus*, Lec.  
 Pubescence wanting (.12 in.) . . . . . *tristis*, Payk.
- gg. Thorax conspicuously margined at sides.  
 Pubescent, black, feet rufo-piceous (.17 in.) . *tenebrosus*, Lec.  
 Glabrous, rather broad, thorax very faintly punctulate; elytra faintly punctate (.14 in.) . . . . . *stagnalis*, G. & H.  
 Glabrous, still broader and shorter, thorax nearly smooth, elytra more sparingly and strongly punctate (.14 in.) . . . . . *oblitus*, Aubé.
- bbb. Glabrous, thorax equally punctate; ferruginous, elytra black with testaceous fasciæ, thorax broadly infusate at apex, body beneath piceous black (.14 in.) . . . . . *concinus*, Lec.
- A<sup>5</sup>. Elongate, obconic, glabrous, elytra piceo-testaceous, coarsely punctate, clypeus rounded not emarginate, male antennæ dilated at middle.  
 Punctuation mixed, fine and coarser (.20 in.) . . *oblongus*, Steph.  
 Punctuation uniform (.25 in.) . . . . . *difformis*, Lec.
- A<sup>6</sup>. Sub-ovate, convex, finely pubescent. clypeus broadly emarginate at middle; yellowish testaceous, finely punctured. elytra piceous with lateral spots (.09 in.) . . . . . *mellitus*, Lec.

## NEW HAMPSHIRE TENTHREDINIDÆ.

BY ALEX. D. MACGILLIVRAY, ITHACA, N.Y.

The new species described below were contained in a collection of saw-flies recently received from Mrs. Annie Trumbull Slosson, and were collected on Mount Washington and at Franconia, New Hampshire. The collection was of interest on account of the number of species it contained which are evidently related to a boreal fauna.

*Macrophya mixta*, n. sp.—♀ Black, with the following parts white: two spots on the clypeus, the labrum, a spot on each mandible, two spots on the occiput pseudocaudad of the ocelli, a narrow line on collar and tegulæ, the anterior coxæ at apex and a narrow line at side, the middle and posterior coxæ at apex, the trochanters, the distal halves of the anterior femora, the anterior tibiæ beneath, the knees of the middle legs, the middle tibiæ beneath, the posterior tibiæ with a band at middle, all the tarsi except the base of the first segment and the apices of the others, a large spot on the posterior coxæ, two spots on the caudal margin of the basal plates, and a narrow margin on basal plates at side; costa and stigma black; lanceolate cell closed; clypeus emarginate; third segment of the antennæ twice the length of the fourth; head coarsely punctured. Length, 8 mm.

Habitat.—Mount Washington and Franconia, New Hampshire.

This species is related to *flavicoxæ*, Nort., but readily separated by having the posterior femora wholly black.

*Macrophya nidonca*, n. sp.—♂ Black, with the following parts white: the clypeus, labrum, a spot on each mandible, the eighth and ninth segments of the antennæ, the collar, the scutellum, a narrow transverse band on the metathorax, the apices of all the coxæ, the trochanters, a spot on each of the posterior coxæ, the basal third of the posterior femora, the posterior tarsi beyond the middle of the basal segment (their apices are fuscous), abdominal segments two to five above and below (the following segments are blackish-piceous), and a small dot near the apices of posterior tibiæ above; first segment of the antennæ but little longer than second, third and fourth subequal; costa pale, stigma black; lanceolate cell closed. Length, 8 mm.

Habitat.—Franconia, New Hampshire.

Near *trisyllabus*, Nort., but readily recognized by the almost wholly black posterior femora and tibiæ.

*Macrophya Slossonia*, n. sp.—♀ Black, with the following parts yellowish-white: the labrum, clypeus, the mandibles, a triangular spot beneath the antennæ, a lunate spot beneath the eyes, a dot at the upper angle of the eye, a spot on the sides of the collar, the scutellum, a spot above the posterior coxæ, all the tarsi, and the sides of the basal plates; the following parts are rufous: the three basal segments of the antennæ within, antennal segments eight and nine, the tegulæ, the anterior coxæ before, the anterior femora except a black line above, the anterior tibiæ, the middle femora slightly at apex in front, the middle tibiæ, the basal half of the posterior tibiæ, the costal margin of the wings, the stigma in front, and abdominal segments three to five; third segment of the antennæ about one-third longer than the fourth; inner spur of anterior tibiæ bifid; claws emarginate; eyes strongly converging at base, not reaching the base of the mandibles; clypeus deeply emarginate; a fuscous dot in the second submarginal cell; lanceolate cell with a short, straight cross-nervure. Length, 9 mm.

Habitat.—Franconia, New Hampshire.

Dedicated to Mrs. Annie Trumbull Slosson. This is nearest *bifasciata*, Say, but has the posterior femora wholly black.

*Taxonus borealis*, n. sp.—♀ Black, with the following parts white: the clypeus, labrum, the mandibles except at apex, coxæ, trochanters, tegulæ, the collar with a narrow margin, and venter except apical segment and the sheaths of the ovipositor; the following parts are rufous: abdominal segments two to five above except at sides where they are marked with a large round fuscous spot, occupying most of the side of each segment, the legs except the parts above named and the apices of the middle tibiæ, the apex of the posterior femora, the apex of the posterior tibiæ and the posterior tarsi entirely; the head shining black, polished; the lateral sinuses deep, reaching the back of the head; the clypeus deeply emarginate; the labrum acutely rounded; the antennæ short and slender, the third segment twice the length of the fourth; the thorax and pleuræ shining, polished; wings hyaline, costa and stigma at base, white; stigma black at apex; veins black: posterior wings with two middle cells. Length, 7 mm.

Habitat.—Mt. Washington and Franconia, N. H.

*Tenthredo redimacula*, n. sp. — ♀ Rufous, with the following parts black: a transverse spot at the ocelli, another just above the base of the antennæ, connected each side by lines which extend from the vertical spot

to the base of the clypeus in the lateral sinuses, thence along the base of the clypeus and the pseudorsal margin of the mandibles to their pseudo-caudal side, the occiput, the prothorax except a small spot on the apex of the collar, a spot at the apex of the median lobe of the mesothorax, the side lobes entirely except a small portion at middle, the pectus, the pleuræ except an oblique spot at middle, the sutures of the metathorax, the basal membrane, the caudal margin of the basal plates, abdominal segments one to three, the venter except at apex, the anterior coxæ, the anterior trochanters except beneath, the middle coxæ except beneath, the middle trochanters, the middle femora narrowly at apex and at base above connected by a fuscous line, the middle tibiæ with a line above on apical half, the posterior coxæ at base and apex, the posterior trochanters, the posterior femora and tibiæ with a line at base and apex above, and the stigma except at base; the following parts yellow: the clypeus, labrum, the mandibles, a spot above the posterior coxæ, the sides of the basal plates, the anterior femora and tibiæ, and the middle and posterior tibiæ before; the legs except parts named, reddish-yellow; clypeus emarginate; costa rufous, subcosta black; veins rufous; third segment of the antennæ twice the length of the fourth. Length, 12 mm.

Habitat.—Mount Washington, New Hampshire.

This species is closely related to *diluta*, Cress.

*Tenthredo nigricollis*, Kirby. — ♀ Black, with the following parts white: the labrum, the clypeus, mandibles, segments six to nine of the antennæ, a spot above the posterior coxæ and a spot on the sides of the basal plates; the four anterior tibiæ and tarsi testaceous; wings yellowish hyaline; nervures brown; costa yellowish, stigma black; collar black. Length, 12 mm.

Habitat.—Hudson's Bay Territory (Kirby), Mount Washington, New Hampshire.

This species is related to *grandis*, Nort., and *antennata*, Kirby, but it has the collar black.

*Tenthredo basilaris*, Prov. — ♀ Black, with the following parts yellowish-white: the clypeus, labrum, the mandibles except apex, which are ferruginous, the cheeks, a dot at the summit of the eyes, the tegulæ, collar above, a spot above the posterior coxæ, the sides of the basal plates, the apical half of the anterior coxæ, the trochanters except a black spot above, and the anterior femora and tibiæ in front; the following parts are

rufous, the basal segments of the antennæ, the legs except the parts named, the base of the anterior coxæ, the middle and posterior coxæ, a spot at the base of the middle femora above, the apex of the posterior femora and tibiæ, and the abdomen except the basal plates; clypeus emarginate; the eyes strongly converging below: third segment of antennæ about one-fourth longer than the fourth; stigma at base pale. Length, 12 mm.

Habitat.—Franconia, New Hampshire.

This species is nearest to *ruficolor*, Nort., but differs in having the apex of the posterior femora black above.

*Tenthredo frigida*, n. sp.—♂ Black, with the following parts yellowish-white: clypeus, labrum, the mandibles except tips which are rufous, cheeks, tegulæ, collar, a spot above anterior coxæ, a line on pleuræ, a spot above posterior coxæ, a narrow margin to the sides of the basal plates, the prosternum, the pectus, the anterior coxæ, the anterior trochanters, and femora except a black line above; remainder of legs rufous except a black line above on the middle femora and the posterior trochanters and a black spot at the base of the posterior femora above, and the apices of the segments of the posterior tarsi black; the abdomen except the basal half of the first segment, rufous; costa rufous, stigma black; veins black; clypeus emarginate; third segment of the antennæ one-third longer than fourth; front deeply hollowed out between the eyes; eyes strongly converging below. Length, 10 mm.

Habitat.—Mount Washington, New Hampshire (Mrs. Slosson); Olympia, Washington (Trevor Kincaid).

This species is related to *rubella*, Cress, but differs in having the four anterior femora with a black line above.

*Tenthredo pallicola*, n. sp.—♀ Black, with the following parts yellowish-white: the labrum, clypeus, the mandibles, the cheeks as far as the middle of the eye, the front below the antennæ, a narrow margin on the inner side of the eye as far as their posterior margin, the collar, tegulæ, a broad oblique band on the pleuræ, the ventral margin of the pronotum, the posternum, the pectus at middle, a spot above the posterior coxæ, all the coxæ and trochanters, the basal half of the anterior femora, and the middle and posterior femora at base; the following parts are rufous: the remainder of the anterior and middle femora, tibiæ, and tarsi, the posterior femora and tibiæ at middle, the apical segment of the posterior tarsi, and the abdomen beyond the basal plates, except the sheaths

of the ovipositor which are black; the apical third of the posterior femora, the extreme base and the apical third of the posterior tibiæ, and the posterior tarsi entirely except the apical segment, black; antennæ black; the third segment twice the length of the fourth; the basal plates finely margined with fuscous white at sides; the wings hyaline, the costa and base of the stigma rufous; veins brownish. Length, 11 mm.

Habitat.—Mount Washington, New Hampshire.

Readily separated from *pallivoxa*, Prov., by wanting the black lines on anterior legs and in having the three basal abdominal segments rufous.

*Tenthredo barnstonii*, Kirby.—♂ Black, with the following parts white: clypeus, labrum, the mandibles except apex, palpi, the four anterior femora and tibiæ in front, and a spot above the posterior coxæ; the inner spur of the anterior tibiæ bifid; the following parts rufous: the apical segments of all the tarsi, and the abdomen, except the basal plates and the first segment; the basal plates entirely and the first abdominal segment except a diamond-shaped rufous mark at middle, its long axis being transverse, black; the four anterior tarsi are paler before but not nearly so light as the tibiæ and femora; costa and stigma at base testaceous; clypeus emarginate; third segment of antennæ twice the length of the fourth; wings hyaline. Length, 9 mm.

Habitat.—Hudson's Bay Territories (Kirby), Mount Washington, New Hampshire.

This species is related to *tricolor*, Nort., and *occidentalis*, Cress. From the former it is separated by having the middle femora pale beneath, and from the latter by having the abdomen black at base and rufous at apex.

*Tenthredo remota*, n. sp.—♀ Black, with the following parts yellow: the clypeus, labrum, the mandibles except at apex, the cheeks, the tegulæ, collar, a curved mark above the anterior coxæ, a spot above the posterior coxæ, the basal membrane, the sides of the basal plates and their posterior margin very narrowly, the coxæ at apex, the trochanters, except a black spot above, the anterior and middle femora and tibiæ except a black line above, the anterior tarsi, the middle tarsi except fuscous spots on the apices of the segments, the posterior femora at base beneath slightly, and the apical segment of the posterior tarsi; abdominal segments one to three black, the remainder rufous; eyes strongly converging at base; third segment of the antennæ about one-third longer than fourth; costa and

stigma black, paler at their juncture; marginal cross-nervure strongly bowed, received by the third submarginal cell at its apical two-thirds; inner spur of the anterior tibiæ with an oblique prolongation on the side. Length, 13 mm.

Habitat.—Franconia, New Hampshire.

Closely related to *barnstonii*, Kirby, from which it is separated by having the collar and tegulæ yellow.

#### IN REPLY TO MR. HULST.

BY A. R. GROTE, A. M., BREMEN, GERMANY.

Mr. Hulst has been at the pains of taking a sentence of mine as the text of a discourse as to the value of genitalic characters in classification, in the January number of the CANADIAN ENTOMOLOGIST. Whether this sentence will really bear the edifice Mr. Hulst has erected upon it, is a matter which hardly concerns me. Before either Mr. Smith or Mr. Hulst wrote, I had pointed out the value of the genitalia in generic groupings, in this following Lederer, as an accessory character. My opinion had been (but this is only an opinion) that morphologically the characters drawn from the male anal appendages were of similar value to those drawn from the antennæ. I either did not hear, or had forgotten, Prof. Fernald's unprinted paper on the classification of the Tortricidæ. As I took the greatest interest in Prof. Fernald's studies, it is more than probable I did not hear it. If the sub-family *Phycitinae* can be divided into two groups or tribes from a decided modification of the genitalia, I think there would be no objection to its use, except that the character is difficult of verification. I would ask Mr. Hulst how he comes to classify species, of which he only knows the female, with such certainty in his paper? But this and other questions as to Mr. Hulst's classification are a matter for M. Ragonot to consider, and those who especially interest themselves in the study of the *Phycitinae*. My sentence has another origin and meaning which I will illustrate. During a visit Mr. Smith paid me on Staten Island, he pointed out to me that the legs of our *Catocala* were differently spined in the different species. I had not observed this. Shortly afterwards we had a new paper by Mr. Hulst on *Catocala*, illustrated by Mr. Smith, in which the species were strangely jumbled on the strength of this character. In fact, Mr. Hulst went so far as to count the number of spines on the joints to found his divisions. [Compare Bull. Brook. Ent. Soc., III. and VII., 31.] In the American Naturalist will be found a

notice, by Dr. Packard, of this paper, which I almost lack the patience to discuss. Now, after the extended work of Mr. Smith upon the genitalia of the Noctuidæ, comes Mr. Hulst with his genitalic sub-families of the *Phycitinae*. This is what I meant by Mr. Hulst's "mission."

And now as to the *Pyralidæ*. The student will find that, in proposing the group or sub-family *Epipaschiinae* (*Epipaschiæ*), in 1878, I gave a long comparison of the structure (always excepting the genitalia) on page 685 of the U. S. Geol. Survey, Vol. IV. Therefore, although I emphasize the character of the peculiar development of the male antennæ, I did not then base my new group on this character alone, which Mr. Hulst now erroneously charges me with doing (p. 11). May I ask Mr. Hulst why, in his subsequent paper on this group in Ent. Am., he credited its creation to Lord Walsingham? I am glad to be able to refer to my paper of 1878, in which I, for the first time in America, gave full details with figures of the structure of genera of the *Phycitinae* (*Phycidæ*), always excepting the genitalia. On page 692, l. c. I define this group quite fully, and draw attention to the peculiar structure of the female frenulum, a character which I did not find mentioned by my predecessors. I gave abundant generic details, with figures of the neurulation, which I recapitulated a little later in the American Entomologist. May I ask what Mr. Hulst means when he says of these papers that I made "no progress"? In the pages of the Brooklyn Entomological publications will be found Prof. Fernald's revision of Mr. Hulst's synonyms in the *Pyralidæ*. To have redescribed Walker's irrecognizable species is no reproach, but Mr. Hulst has even gone into other families for his "new species," and Mr. Ragonot calls his method of description—I think, correctly—"haphazard." As to this sort of work, I think I may repeat Mr. Hulst's question: "Is it scientific?" Had Mr. Hulst not repressed my work, and I think entirely misrepresented it on the *Phycitinae*, giving my titles away to others, it is probable that I never would have penned my text to his sermon. And had his work in descriptive entomology been of a different nature, I should have had no legitimate doubt as to the value of his structural observations.



## CORRESPONDENCE.

## MUNCHAUSEN SUBSTANTIATED.

On one occasion when that illustrious and veracious traveller, Baron Munchausen, was pursuing the enemy into the gate of a fortified town, the portcullis dropped and cut off the hinder part of his horse. Heated by the conflict and the routing of the enemy, he rode to a tank to give the faithful animal some water. The horse drank like the parched earth after a six-months' drought, until the Baron finally looked around and saw the mutilation, and found that as fast as the horse drank, the water ran out of his sliced-off body, and that his thirst would probably never be slaked.

The universal verdict of the reading public for many years has placed Munchausen high upon the long list of writers whose tales are more interesting than true, and yet physiologists tell us that in the simple narrative which I have just briefed the Baron was one of the first to voice a great physiological fact. That is, that while thirst is felt in the mouth and throat, it is in reality a general craving of the whole system, and that no amount of water in the mouth alone will prevent an animal from dying of thirst.

Now, as Munchausen was ahead of his generation as a physiologist, why should we not more patiently search in his works for other truths? Just as we have our investigators and expert interpreters of hidden meanings in Shakespeare and Browning, and the Wagner music dramas, why should not societies be formed for the investigation and interpretation of Munchausen?

All this, however, is theoretical and suggestive, and introductory to the statement that I know of a chain of facts which resemble Munchausen's horse-decorpitation story, and briefly and without further plea, the facts are these:

There is a genial little caterpillar which disports itself among the leaves of the Washington shade trees in the month of August, and which is known to its select circle of acquaintances as the fall web-worm. There is also an enterprising green bug of predatory instincts which is called the soldier-bug, and which, afflicted with as strong and persistent a thirst as that of a Kentucky colonel, seeks continually to assuage it by drinking the blood of the fall web-worm. In this gory pursuit, however, the soldier-bug has a strong rival in the wheel-bug, who, if the former is compared to the Kentucky colonel, must be likened for thirst to the Georgia Judge—the

Washington variety. The interests of these two cheerful creatures conflict. Their sanguinary occupations lead them to the same hunting-ground, and sometimes there are not worms enough to go round.

On such an occasion as this a soldier-bug, awaking early with a bad headache and a tremendous desire for a cocktail, found a solitary web-worm, inserted his beak into the wriggling body, as one would put a straw into a brandy smash, and began to suck. At this moment a wheel-bug discovered the pair, and stuck his beak into the back of the soldier-bug, and also began to suck.

There was the soldier-bug in precisely the situation of Munchausen's horse. As fast as he sucked the blood of the caterpillar, it was sucked out of him by the wheel-bug. The observer's sympathy for the web-worm was lost in admiration for the pluck of the soldier-bug and in sorrow for his predicament, until both admiration and sorrow were overcome by the brilliant thought that in this observation was Munchausen substantiated.

CIMEX.

#### BOOK NOTICE.

"AMERICAN SPIDERS AND THEIR SPINNING-WORK.—A Natural History of the Orb-weaving Spiders of the United States, with Special Regard to their Industry and Habits: By HENRY C. McCook, D. D., author and publisher, Philadelphia, Vols. I. to III., 1889-1894."

It is with pleasure that the nature-loving public congratulates Dr. McCook on the completion of his self-imposed and heroic task,—not alone of five years' duration, but more nearly of twenty-five. The author started out five years ago to give to the world a work on spiders, and he has not only done this, but has also given us a model of patient, conscientious and unprejudiced labour that will stand as a monument to its author long after he has himself laid down his pen and passed to the unknown beyond; he has given to the observer in whatever department of natural science, a standard which he may well follow. Purity, both as to observation and conclusion, is stamped on every page. It is as if he had plunged his cup into the clear, cool mountain stream and handed us, direct, a refreshing draught of the crystal waters. He has evidently not studied spiders in his pulpit, but if there is any other place that he has visited, and whence he has not brought back some

original observation on these wonderful creatures, as portrayed in his work, I do not now recall it. He has interested himself in their love affairs, and, though not officiating, has been present at their weddings; has gone into the home of Madam Spider and told everything he saw there,—how she cares for her young with a tenderness that is almost human, and treats her poor husband in a manner decidedly the reverse; how they secure their food and protect themselves and their young from their enemies;—in short, he has gone into every phase of spider life and given us a simple record of all that he saw, at the same time not forgetting to call attention to the works of others, and give strict credit for all that they have done, a sure indication of honesty and sincerity of purpose. That the work is, to an extent, imperfect, and, perhaps, defective, the author does not hesitate to admit, but there is everywhere shown a commendable desire to reduce these defects to a minimum, and few could have done as well. Had the author chosen to consult his personal comfort and financial interests, he would never have undertaken the task, which, from first to last, was of necessity a labour of love, the financial loss being only compensated for by the thanks of his fellow-workers, and the knowledge that, with his pen and pencil, he has done more than have any others of his countrymen, to further our knowledge of this most interesting group of organisms.

The first volume treats particularly of snares and nests; the second volume considers the cocooning industry, maternal instincts and general habits; the third volume contains six chapters of natural history descriptions, while the remaining and major portion is devoted to descriptions of the Orb-weaving fauna of the United States. The work contains over 1,200 pages, illustrated by 853 uncoloured figures, drawn from life, and many of them being full-page illustrations; 40 lithographic plates, on which are engraved 913 figures, coloured by hand from nature, and a full page engraving of Prof. Hentz, the father of American Araneology.

The work should find its way into every public and educational library, and especially the latter, while the individual who possesses himself of a copy will treasure it carefully and part with it only of necessity.

F. M. W.