

*Diapheromera femorata* Say.—Pair in copula (natural size)  
and egg (greatly enlarged).

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## POPULAR AND PRACTICAL ENTOMOLOGY.

### WALKING STICKS.

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Walking Sticks belong to the Order of Orthoptera and are classed under the family Phasmidae, the members of which present a great variety of form. It may be said without exaggeration that the Phasmids exhibit some of the most peculiar, curious objects to be found anywhere in natural history. Among this strange group of insects are those that resemble leaves of trees, lichen-covered bark, stems of grasses and sticks; and so faithfully are these protective characteristics portrayed that an observer may readily be deceived by them even when actually aware of the presence of the insect. It may be worthy of passing notice to mention here that to the Phasmids belong some of the largest insects known. In the Tropics, where both sexes develop wings they attain their greatest size, six inches being a common length.

The particular species to which this paper refers is popularly known by a variety of names such as "stick insect," "stick bug," "specter," "prairie alligator," "devil's horse," "devil's darning needle," etc; the correct name, however, is the thick-thighed walking stick, an appropriate one given by reason of the remarkably dilated femora.

It was during the summer of 1918, while engaged on an oak-borer problem in Queen's Park, Aylmer, Que., ten miles northwest of Ottawa City, that the writer came upon a number of thick-thighed walking sticks, (*Diaperomera femorata* Say), defoliating oak, basswood and hazel. Several specimens were collected for the purpose of making a closer study of the life-history of these extraordinary insects and of obtaining notes on egg records, feeding, general habits and other biologic data. Observations were continued during 1919, and the results of the two seasons work are briefly recorded in this paper.

*Ecology.* The particular locality where most of the collecting was done was in a thickly wooded lot covered with a mixed growth, for the most part red oaks, but also containing a considerable proportion of maple, ash, basswood, hazel, hickory, ironwood, beech, elm, service-berry and large numbers of sumach and hawthorn. Here small, green, young nymphs of the walking stick were often to be found during June wandering about on the ground over dead leaves and mosses, trying to locate some convenient twig or trunk of a suitable host plant to crawl upon; or, what was more frequent, would be seen on the trunks of the oaks, awkwardly and lazily plodding their way upwards over the roughened bark to the tender, green leaves above, where not only abundant food awaited them, but also excellent protection from enemies was afforded by means of their deceptive colouration. Searching carefully under the large basswood leaves, and by moving quietly among the under growth many specimens of half-grown nymphs

could be located clinging to the twigs and branches, their presence not always being detected at first sight on account of the odd similarity of their long thin bodies and legs to the twigs and branches they were on, a protective resemblance of quite a remarkable character. When disturbed they would often drop suddenly to earth or nervously jerk themselves this way and that; if irritated they exhibited a queer habit of swaying or rolling from side to side, cradle-fashion. Both sexes were taken, but females proved more abundant. Several pairs in *copula* were observed on oak later in the season during August and September.

*Egg.* This exceedingly odd and interesting object may readily be mistaken for a seed of some kind. In fact one may favourably compare it with that of hemp, so closely does it resemble this product of the vegetable kingdom both in size and shape. It is for the most part black in colour, and highly polished, with a dull whitish keel, shading to olive tints; oval in shape, flattened slightly on the sides and quite hard. At one end is the operculum or capsule, a circular cover which is dark amber in colour, deeply wrinkled and surrounded with a crown of spines, below which a dark oval ring is arranged somewhat obliquely. An oblong scar appears on the whitened area, which is very much like the hilum of a bean.

*Nymph.* The young nymph is bright green in colour, slow-moving and very awkward. When first hatched the body is about 5/16 of an inch long, and is of a yellow-green cast; legs and antennae are prominently long and eyes noticeably dark brown. It often happens that some difficulty is experienced in emerging from the egg, and it is not an uncommon sight to find the egg shell attached to one of the hind tarsi being dragged about by the young stick. This may be due to a lack of moisture, for if a drop of water is placed on the shell the creature soon extricates itself. The swaying or rocking habit is very marked in the youngest of nymphs, even those of one day old. As the adult stages are approached, the green tints become tinged with yellow, these again take on a darker shading and tone down to grey-greens, dull-reds, mottled-browns, and dark-greys.

*Adults.* Generally speaking these insects are long, slim, very narrow, and stick-like in shape. The female is much longer than the male and measures on an average from 3¼ inches to 3½ inches in length, and not more than 3/16 inch broad at the widest part of the abdomen. The head is short and truncate, fits closely to the thorax and at first sight appears to be part of same. The antennae are situated well in front of the eyes and stand upon strong pedestals which are placed widely apart on the head; they are very fine, thread-like organs, of many segments and very long, often exceeding 2 inches; the eyes are large, bulging and strongly rounded; the palpi long, prominent, and conspicuously used while feeding. Not only does the female differ from her mate in length, but her front legs are more dilated, the ridges and grooves on these being more distinctly and deeply marked; the peculiar curve at the base of the front femora which permits the legs to fit very closely to the head is more pronounced than in the male; the middle femora are not swollen as is certainly the case in the male, and the spurs carried on the femora of the second and third pairs of legs are small, insignificant points when compared with those of the male's which are very prominent, sharp and thorn-like, situated near the knee joint. In the female the head and legs are without markings, whereas the male has three

vertical dark-brown stripes on his head and three broad bands of the same colour on the middle femora. Perhaps the thorax is worthy of more than usual attention on account of its extraordinary length. The prothorax, or first division, is very short and bears the first pair of legs which come off from the centre; the second division, or mesothorax, is easily the longest segment in the body, averaging  $\frac{3}{4}$  inch; while the third, or metathorax, is a little shorter than the second, in the last two cases the legs being situated at the very extremity of the joints, respectively. The final segment of the male terminates in a pair of pincer-like claspers with which he seizes the female securely when mating.

*Copulating habitus.* Copulation occurs frequently and is often of some duration. *In coitu* the abdomen of the male is ranged at the side of the female in a slanting position, the tip being hooked upward somewhat after the manner in which a scorpion carries its tail, and brought forward to meet the genital opening of the female which is situated on the eighth segment of the abdomen: the claspers seize just above the opening and the union is made immediately. The front and middle pairs of legs are usually employed to grasp the female, while the third pair is extended outwards as a support. The female holds to her resting place chiefly by the second and third pairs of legs. Sometimes one of the front legs will act as a support, say on the side of the cage, while the other hangs out into space. The front pair, however, is often extended straight forward and placed close together appearing as only one member, or spread out widely apart and raised somewhat upwards in much the same attitude as that of the praying mantis, a near relative of the walking stick. Oviposition begins at once.

*Oviposition.* This occurs in late summer and autumn, from about the middle of August to October. The female walking stick has no interest whatever in her eggs after she has laid them. She scatters them indiscriminately from wherever she happens to be, dropping them from the topmost branches of some oak or from a low coppice to the earth—it is all the same to her,—she has finished with them entirely and neither knows nor cares afterwards what becomes of them. On the ground the majority get covered up in the long grasses or become hidden among the dead leaves, mosses and general debris of the woods at autumn time in this way they receive protection from birds and other enemies until hatching in June.

Oviposition is an interesting performance. When ready to be deposited the egg is slowly pushed down the oviducts to the exterior and as it emerges the egg guides are forced downward to receive it. It glides on to these and is held there as if in a hand, being supported on either side by two finger-like processes. The black and shiny portion lies at the top of the guides and the whitened area with its crease and scar at the bottom. The operculum end appears last. The egg is held about 5 minutes on the guides and when dry the female stirs by walking a step or two, or vigorously jerks her abdomen sideways, sending the egg from her to the ground. From laboratory records this summer, the two females I had confined in cages laid respectively 152 and 141 eggs, at an average rate of three a day. Oviposition was carried on intermittently with copulation, eggs being laid up to within a few hours of the death of the female. Perhaps one of the strangest habits peculiar to some of the females at this time,

when oviposition is at an end, is the withering and splitting of the abdomen much the same as a bean pod will dry, curl and split open.

Females in the late fall may be found in this unfortunate spent condition with strength only left to drag themselves about awhile longer. Some specimens in our collection exemplify this most extraordinary characteristic.

*Time of Hatching.* Although abundant during 1918 it is worthy of note that throughout the past season, 1919, these insects were exceedingly scarce. Whether this was due to parasites, or weather conditions, or other controlling factors I am unable to say. A close watch was kept throughout the summer for any sign of their activities but I only succeeded in locating one nymph on June 14th, and two pairs of adults and one female on August 13. These last were collected for egg records and I was able to keep them in the laboratory until the beginning of October.

In his Report of Forest Insects for 1878, I find that the late Doctor Riley, of the United States Bureau of Entomology, refers to a communication received from a Mr. Snow, of Yates Co., N. Y., in which the latter states that walking sticks were unusually abundant every other year and that many of the eggs were found to remain on the ground for two consecutive winters before hatching. A further reference in this same report is made to the investigations of Messrs. Bringham and Trouvelot. These gentlemen, writing in the Proceedings of the Boston Society of Natural History, Volume XI, pages 88 to 89, observed that the eggs of the walking stick only hatch after an interval of two years.

Eggs laid in the summer of 1918 and held in storage for winter and spring in a box of sand left exposed to the atmosphere failed to hatch last summer. Those of 1919 were put into glass vials corked with loose cotton batting and left on the laboratory table in a temperature averaging about 70 degrees. On January 28th, 1920, I examined several of these and found them well advanced in their embryonic development. About 18th February, much to my astonishment, a nymph made its appearance in one of the bottles, to be followed by several others at irregular intervals. I had nothing at the time to feed the youngsters on except rock fern (*Pteris* sp.) to which they did not take happily. Later I tried several kinds of green foods, lettuce, tradescantia, geranium, etc., and dried oak leaves soaked in water, but to no avail. The nymphs all died.

*Notes on Habits.* The Phasmids have been popularly considered harmful and poisonous. Such is not the case. In fact the very reverse is the truth. They are quite harmless, inoffensive creatures, strict vegetarians and easily managed in confinement. One large female, I had in the house for three months and made quite a pet of her. I would often remove her from the cage and allow her to walk over a pot of ferns on the table. She would meander up and down on the green leaves, not attempting to drop to the table or trying to get away. If I put water on the leaves she would immediately take some up and blow it out from her mouth in the form of a bubble, then draw it in and blow it out again, keeping this up for some time, as it were for my amusement. Again I would place her on the table near an electric light. She would walk towards it, hesitate, look around as if uncertain what next to do, then rear herself, spreading out her long front legs to the light, as much as to say "Humph!

I wonder what that is?" and all the time waving her antennae, much the same as a cockroach will do when on the scent for food. After the frost came, killing most of the vegetation, I would gather a few dried oak leaves and soak them in water for her. These she would eat sparingly of, often preferring only to drink up what moisture there might be on the leaf surface. Finally I could get nothing more green for her in the garden and tried a sprig of white pine needles. These she refused. Her egg record dropped to one a day and this only at spasmodic intervals. She was getting weak and helpless. One night I found she had fallen to the bottom of the cage and seemed unable to move. Next morning she was dead.

Walking Sticks are remarkably strong and adhere tenaciously to clothing, netting or roughened surfaces from which it is difficult to remove them without injury, since the legs break easily. Very smooth surfaces are no hindrance to their movements due to the circular white pulvillus, or suction pad on each tarsus, and they will walk up or down the sides of a glass cage quite as easily as on the flat table. Feeding usually takes place at night, and during the day they rest quietly, for the most part at the top of the cage on the cloth covering, head and back downwards. The males spend most of their time *in coitu*, eating little or nothing in confinement. They are the first to die, the females living on for weeks afterwards to deposit their eggs.

*Injury.* At Aylmer any damage done by this insect so far as I have observed has been negligible. There are, however, localities in the States where the walking stick has proved a serious pest. Mr. Fernald, Economic Zoologist at Harrisburgh, Pa., 1898, reports the appearance of walking sticks near Duncanville Pa., "in countless numbers." The trees attacked were mostly chestnut, oak, and maple, the area of infestation being over one mile long and half a mile wide. Mr. Snow of Yates Co., N. Y., in a letter to Doctor Riley in 1878 relates how walking sticks "had stripped 25 acres of young timber, mostly white oak and hickory, on his reservation."

That such severe infestations as these are likely to occur in Canada I am inclined to doubt, but in the warmer sections, such as Niagara Glen, minor, local outbreaks may take place, as for example that referred to in Ont. Ent. Report, 1904. However, these creatures are very susceptible to cool weather and it is quite possible that the early frosts of the more northern latitudes play a considerable part in their control.

*Control.* The following control methods have been recommended by Doctor Riley: Poison the vegetation by spraying with Paris green to kill off the very young nymphs and destroy eggs by digging, or burning the grass and vegetation. These appear to be very effective measures but I have had no opportunity so far to test any of them. One female stick in a sickly condition, I secured this summer had eight or ten tachinid eggs on different parts of the body. She refused all food and died two days after being brought into the laboratory, the body becoming quite limp and withered. I kept the specimen in a vial for closer examination, but no evidence of parasites was observed so concluded that their life cycle had been interrupted by the death of the host which perhaps was brought about by some other agency than the fly itself.

SOME NEW SPECIES OF THE GENUS *Lonchæa*  
(DIPTERA, LONCHÆIDÆ).BY J. R. MALLOCH,  
Uabana, Ill.***Lonchæa major*, sp. n.**

*Male*.—Shining black, with a slight bluish tinge. Antennæ and palpi black; arista yellowish at base. Legs pitchy black, the hind tarsi hardly paler than their tibiæ. Wings hyaline, veins brownish yellow, whitish at bases. Calyptræ white, fringes concolorous except at junction of upper and lower, where there are some long, black, setulose hairs. Halteres black.

Eyes bare; frons about twice as long as wide, parallel-sided, surface with short, moderately dense hairs; upper orbits slightly rugose above, bare; frontal lunule hairy; longest hairs on arista over twice as long as its basal diameter; third antennal segment about four times as long as its width, extending to mouth margin. Scutellum with setulose hairs on margins and between apical bristles, the disc bare; pteropleura bare; no hairs adjacent to the stigmal bristle. Abdomen broad, with rather dense, short, setulose hairs on dorsum; fourth tergite about 1.5 as long as third. Hind femur without distinct anteroventral bristles. Auxiliary vein almost fused with first at its apex.

Length 6.5 mm.

*Type*.—Amazon, South America. Type in British Museum.

***Lonchæa nigrocærulea*, sp. n.**

*Male*.—Blue-black, almost metallic in colour. Antennæ and palpi black; arista pale at base; upper orbits and ocellar triangle glossy. Legs black. Wings, calyptræ, and halteres as in *major*.

Frons about 1.5 as long as wide, sparsely hairy; upper orbits highly glossy smooth; third antennal segment about four times as long as wide, extending below mouth margin; arista as in *major*; palpi dilated, slightly protruded. Praescutellar acrostichals very long; scutellum as in *major*; pteropleura bare; no bristly hairs adjacent to stigmal bristle. Abdomen with longer hairs than in *major*, especially at apex of fourth tergite; fourth tergite about twice as long as third. Venation as in *major*, but the antepenultimate section of fourth vein is only two-thirds as long as penultimate, whereas in *major* it is three-fourths as long. Hind femur with a few distinct anteroventral bristles.

Length 4 mm.

*Type*.—Barbados (E. F. Becher). Type in British Museum.

***Lonchæa striatifrons*, sp. n.**

*Male*.—Glossy steel-blue, the abdomen paler than the thorax. Frons shining black, ocellar spot and upper orbits glossy blue; third antennal segment reddish at base below. Legs black, tarsi with the exception of the apical two or three segments reddish testaceous. Wings clear, yellow at bases. Calyptræ white, fringes concolorous. Halteres black.

Frons less than twice as long as wide at anterior margin, not distinctly  
November, 1920

narrowed anteriorly, the surface of interfrontalia finely striate on upper half laterally; orbits narrow, distinctly separated from ocellar triangle posteriorly their surfaces microscopically diagonally striate anteriorly; hairs on frons short and sparse; third antennal segment three times as long as wide; cheek narrow, without dense hairs or strong bristles. Thorax as in *polita* Say. Basal abdominal sternite with some hairs on each side. Legs and wings as in *polita*. Fringes of calyptæ longer than usual, about six of the hairs at apex of the fold setulose and longer than the calyptæ.

*Female*.—Frons at least one-third of the head-width and less than 1.5 as long as wide, not so distinctly striated as in male. Ovipositor as in *polita* Say. Length 4-4.5 mm.

*Type*.—Male, allotype, and one male paratype, Santa Clara, Cal. (Baker); one male, San Diego, Cal. (Harkins collection); one male, Palo Alto, Cal., August 3. Type in collection of University of California.

#### *Lonchæa bakeri*, sp. n.

*Female*.—Glossy black, without distinct bluish tinge, the frons greenish blue anteriorly. Face and cheeks with whitish pruinosity; frons shining upper, orbits and ocellar triangle glossy; antennæ brownish black. Legs black, tarsi yellow, apical two segments darkened. Wings clear, veins yellow. Calyptæ and their fringes white.

Frons at vertex one-third of the head-width, not narrowed anteriorly, its length about 1.5 of its width, surface microscopically striate on upper half granulose anteriorly, with sparse hairs; upper orbits almost imperceptibly striate; third antennal segment not twice as long as wide; face not carinate, cheek with 3 or 4 strong, but not very long bristles on lower margin anteriorly. A strong bristle on upper margin of mesopleura a little behind spiracle and considerably cephalad of the vertical series at anterior margin of haired area; scutellum without hairs between apical bristles. Ovipositor not broad, the apical hairs very short. Hind femora without antero-ventral bristles; antero-dorsal setulæ on hind tibiæ stronger than usual. Veins 3 and 4 very slightly convergent apically. Fringes of calyptæ normal.

Length 3 mm., exclusive of ovipositor.

*Type*.—Chinangega, Nicaragua (F. C. Baker).

Named in honour of the collector.

This species is closely allied to *albiceps* Malloch, having the same armature of the mesopleura, and the same type of frons but without the transverse depression, and the calyptæ white, and venation different.

Type in collection of University of California.

#### AN ADDITION TO BIBLIOGRAPHY ON AGRILUS (Coleop.).

Through an oversight on our part, a recent paper of Burke's was omitted from the *Agrilus* bibliography, (Can. Ent., Sept., 1920, p. 204), and is given below.

Burke, Jour. Econ. Ent., Vol. 10, No. 3, pp. 325-332, 1917. Contains notes on food plants and habits of *Agrilus angelicus* Horn, *A. niveiventris* Horn, *A. granulatus* Say, *A. anxius* Gory, *A. acutipennis* Mann., *A. politus* Say.

C. A. FROST and H. B. WEISS.



OVIPOSITION BY AN EVANIID, *EVANIA APPENDIGASTER* LINN.

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Recently the author and his wife witnessed oviposition by an ensign fly, *Evania appendigaster* Linn, in an egg mass of an Oriental cockroach, *Blatta orientalis* Linn.

On Sunday evening, August 8, 1920, as the female Evaniid drank from a drop of water which accidentally had been spilled upon the floor of our room she was captured by inverting an ordinary glass tumbler over her, slipping a piece of paper between the mouth of the tumbler and the floor upon which it rested. As this was done the Evaniid leaped upon the inside wall of the tumbler, soon becoming rather restless, for she ran over the inside surface of the glass and over the piece of paper upon which it rested.

Fortunately we had at our disposal an egg mass of a cockroach, *Blatta orientalis* Linn. which had been deposited in the morning of the same day that we captured the Evaniid. By slightly tipping the inverted tumbler we

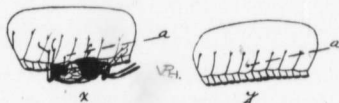


Fig. 23.—Oviposition of *Evania appendigaster* L.

shoved the Blattid egg mass beneath it. Much to our surprise almost immediately there in bright electric lamp light the Evaniid left the inside wall of the confining tumbler, ran over the Blattid ootheca, crawled over the surface momentarily as she actively vibrated her antenna and finally settled upon it with the long axis of her body parallel with the long axis of the egg mass as it lay upon its right side. Having satisfactorily settled herself, lying upon her right side she extended her ovipositor and crawling slightly forward she punctured the ootheca in the fifth egg cell of the left side, remaining in position for about fifteen minutes. She then left the egg mass and resting upon the inside wall of the tumbler actively cleaned the ovipositor, wings and antennae. Later, at 10.00 p.m. I turned the ootheca that it rested upon its left side. She revisited it but soon ran a short distance away and continued to clean her legs, wings and antennae. On the following day we introduced another freshly deposited egg mass of the same species of cockroach. The Evaniid visited it and running inquisitively around it several times she finally tried to turn it upon its opposite side by running across the middle of its length dragging the hind legs that they hooked the flanged edge of the ootheca. She failed to turn it completely over and left it, apparently little concerned by its presence.

X of the figure represents the ootheca of *Blatta orientalis* Linn. lying upon its right side and the Evaniid in position as she oviposits in the puncture which she has made at (a).

Y of the figure shows the ootheca still in the same position as in X, but the Evaniid has left it, showing the oviposition puncture at (a).

NOTES ON THE COLEOPTERA WITH DESCRIPTION OF  
NEW SPECIES.

BY C. A. FROST.

Framingham, Mass.

(Continued from page 232.)

**Chrysobothris verdigripennis** Frost. My type material was taken at Wales, Maine, on July 23, 1908, and fortunately included both sexes and the extremes of colour variation. Considerable study was given the series the following winter, and the characters were carefully worked out so that it was apparent that an undescribed species was at hand. After this, specimens were submitted to Mr. Blanchard who made further investigations, and to whom the entire series was sent for a description of the species. He delayed this for some months, and when he suggested turning it over to another specialist, I requested the return of the specimens and finished my investigations.

Since the description (Jour. N. Y. Ent. Soc., Vol. XVIII) I have seen but one living specimen, which was resting on the trunk of a lone hemlock in a small clearing at Monmouth, Me., July 18, 1915. I approached too cautiously, and as it took wing the net missed it by an inch. He who would capture this agile and watchful insect must be quick and sure, for it tarries not. I recall that the original series were resting on beech trunks in the hot July sunshine, and after losing several I tried making a quick leap, thrusting the net below them and smashing down on them with my hat or a bunch of ferns as they rose; This method resulted in sweeping some of the specimens into the net.

I have also seen one specimen from Connecticut, two from Le Pas, Manitoba, (J. B. Wallis), one from Vermont, and a typical male from Port Maitland, Nova Scotia, August 2, 1910. A male I retained from the two Manitoba specimens (July 3, 1917) is only 11 mm. in length and a of dark bronze colour, but otherwise typical. Mr. A. S. Nicolay writes me that he has one from Lake Superior, and another from the Catskill Mts., New York, August 14, 1889.

**Agrilus lateralis** Say. The capture of a pair of this species by Mr. C. W. Johnson at St. Augustine, Fla., April 21, 1919, seems to add a new section of the country to the already wide distribution of this rather uncommon insect. The female of this pair is unusually large, 9.4 mm. It has been recorded from Maine (Wales, June 23, 192) to New Mexico.

**Agrilus champlaini** Frost. Since the description (Can. Ent., 1912) the male holotype has been deposited in the collection of the State Agricultural Experiment Station at New Haven, Conn. The female allotype and a typical male are still in my collection. The remains of an *Agrilus* that strongly resembles this species were dug, together with a dead *Saperda obliqua*, from a gall on *Alnus incana* at Framingham, Mass. The gall appeared to have been mainly the work of the *Saperda*. *Champlaini* was described from specimens reared from galls on the twigs of *Ostrya virginica*.

**Agrilus criddlei**, n. sp. Form of *anxius*, less elongate, olivaceous bronze, with bluish reflections, slightly shining; antennæ reaching beyond the middle of the thorax, serrate from the fourth joint, greenish bronze; front slightly concave, greenish, occiput very slightly impressed, median line reaching middle of front, surface with coarse, rough punctures irregularly confluent.

Prothorax about one-fourth wider than long, base equal to apex in width, sides feebly arcuate, margins slightly sinuous, hind angles with an evident but not sharply-defined arcuate carina, disk convex with a shallow basal depression in front of scutellum, and two vague foveæ in front of middle on each side, surface confusedly strigate, intervals punctate. Scutellum smooth, shining aeneous, not carinate.

Elytra very little wider than the thorax, slightly sinuate behind the humeri, a little wider at middle than at base, apices rounded serrulate, not acute; disk sub-convex with vague costæ, suture elevated behind the middle, basal depressions moderate, surface imbricate-granulate.

Body beneath more shining and more bronzed than above, pubescent; prosternal lobe emarginate, intercoxal process moderately broad, slightly concave, tip acute, surface coarsely punctate becoming asperate toward the tip, a smooth space at middle of lobe, propleuræ less coarsely punctured; metasternum with a central smooth, narrow groove, surface coarsely asperate at middle, becoming densely irregularly strigate at sides, on the coxal plates and metepisterna; first abdominal segment more finely strigate becoming more sparse at middle, rest of ventral segments sparsely punctulate, denser at sides; first ventral segment with a broad, shallow groove sparsely strigate above, smooth with a few asperities near second segment, on which it becomes smooth and vanishes near the posterior edge, last segment eroded truncate, vertical portion truncate and smooth; pygidium sparsely coarsely punctate with a projecting carina. Front and middle tibiæ feebly mucronate, hind tibiæ simple; claws deeply cleft on all the feet alike. Length 7.5 mm., width 2 mm.

The type is a male from Aweme, Manitoba, collected by Mr. Norman Criddle, to whom the species is dedicated. A male paratype from the same locality and date (June 25, 1903) is very similar except that the front is decidedly concave. There are at hand a male and a female from Toronto, Ontario, and a male from Rigaud, Quebec, all of which seem to belong to this species, but as there is but one tarsal claw, and that a middle one, among them, they will be merely noted. Dr. Horn mentions a single specimen of this species, without locality, under his remarks about *anxius* (Species of *Agrilus* of Boreal America. Trans. Am. Ent. Soc., Vol. XVIII).

The most evident character that separates this from *anxius* is the cleft claws of the hind tarsi, but there are many, more obscure, differences that appear to be constant when the insects are carefully studied. The head is broader between the eyes, front more concave, and more coarsely punctured, inner margin of eyes straighter, emargination of clypeus more shallow and abrupt, prothoracic margin less sinuate, sides less arcuate, base wider nearly equaling the elytra, emargination of the prosternal lobe less deep, beneath more coarsely and densely sculptured in general, cleft of claws more wide and deep.

***Agrilus auricomus* Frost.** This species has so far turned out to be extremely local and occurs only for a very limited period, possibly less than a week. Specimens of both sexes were taken on a single red oak tree, June 14, 1913, in the same locality where the types were taken in 1909. On June 9, 1915, they were found on a red oak tree 200 feet north of 1913 locality. It has been found only on one tree in the same year, although careful search for it has been made on

all the surrounding oaks; no captures have been made after three days in succession, and in 1914, 1916, 1917, 1918 and 1919 none were found in the type locality. One specimen has been seen from Hubbardston, and a specimen was taken from tanglefoot on a white oak in Sherborn, Mass., in July.

**Agrilus crataegi** Frost. Since the description from Pennsylvania material the species has turned up in Edgebrook and Riverside, Ill. Specimens were taken by Mr. Emil Lilieblad, June 12 to 26, 1913, and June 20 and 27, 1914, and others by Mr. Carl Selinger on June 11, 1915. A large number of both sexes have been examined from this locality, and but one slight colour variant noted; in this the cupreous reflections of the posterior fourth of elytra are wanting. Two specimens have been seen from Virginia, taken in June by Mr. Nathan Banks.

**Telephorus neglectus** Fall. This species was first discovered in the pupal state while digging up an abandoned ant hill, April 30, 1910. They were of a pinkish colour and soon changed to nearly black. Other pupæ were found April 27, 1913, and changed to adults on May 4.

In comparing these adults with supposed *carolinus* the difference in the form of the claws was noticed and specimens of both forms were sent to Dr. W. Horn, of Berlin, Germany. He submitted them to M. Pic, who pronounced them both *carolinus*, but Dr. Horn agreed with me that the specimens with the claws basally toothed (*neglectus*) must be placed near *dentiger*. The type of *dentiger* was then examined and found to be entirely different. There might seem to be some question which of the two species was before Fabricius, but from the known habitat of *neglectus* it is probable that the more widely-distributed and generally accepted form is the true *carolinus*.

Besides the unguinal characters, the elytra are more coarsely granulate-punctate and slightly more shining, the second and third antennal joints are more nearly equal in the female of *neglectus*. There is also a small angle of the yellow (sometimes pinkish) border entrant into the base of the dark thoracic disk at the middle; while this is an apparently trivial thing, it is constant in my large series, and the species were separated by this character before using a lens to examine the claws.

**Laricobius erichsoni** Rosen. Several specimens of this rarely-taken beetle were found on willow catkins at Sherborn, Mass., April 19, 1913, and May 8, 1909. In 1919, on May 18, one was swept from the flowering shrubs of *Rhodora canadensis* at Framingham.

**Geotrupes horni** Blanchard. The recorded range of this species is considerably extended toward the northeast by the capture of two specimens at Monmouth, Me., while digging under fungi on September 4 and 9, 1917.

**Disonycha funerea** Rand. A specimen has been taken at Wellesley, Mass., by Mr. A. P. Morse, May 9, 1892, and I have seen another one in the collection of Mr. E. J. Smith, of Sherborn. It was originally described from Florida; there are two specimens in the Harris collection from Georgia.

**Barynotus schoeneri** Zetterst. In the "Rhynchophora or Weevils of North Eastern America", by Blatchley and Leng, this species is recorded as having been taken at Wales, Me., and Framingham, Mass. This is an error due to my carelessness in not verifying the characters of a species of *Panscopus*

(probably *erinaceus*) after getting the name from another collection. My single *Panscopus erinaceus* was so discoloured that I did not until recently recognize their resemblance.

**Allandrus brevicornis**, n. sp. Form shorter and more robust than *bifasciatus*, black to piceous black with a brassy tint in some specimens. Head and beak densely, closely punctured with sparse white pubescence, beak dilated at tip, with a very fine but distinct carina extending from in front of the eyes nearly to the front margin, eyes prominent; antennæ dark piceous, reaching the hind angles of the prothorax in the female and passing them by the length of the club in the male, first joint short; second nearly equal to third but stouter; third longer than the fourth which is equal to fifth; sixth, seventh and eighth nearly equal, shorter and broader; club flattened, first joint as long as next two. Prothorax closely punctured, gradually narrowed in front and abruptly behind the remote transverse ridge which is nearly straight in the transverse portion and flexed forward at the sides where it is distinct nearly to the middle of the prothorax. The grayish-white pubescence is irregularly distributed and more evident in front of the scutellum, at basal angles and front margin. Elytra with lightly impressed, deeply punctate striæ; the punctures are larger and more widely separated on the disk near the base, becoming finer and less distinct toward the apices, intervals densely, finely granulate-punctate, the whitish pubescence which is very sparse is condensed on the scutellum, in a median fascia, which extends along the suture to base but does not reach the margins at the sides, in a less-defined fascia at the declivity, and at the apex. Beneath more densely pubescent with grayish-white hairs, which are more evident on the prosternum, densely punctate, more shallowly on the abdomen. Length 2 to 3.8 mm. Width 0.8 to 2.6 mm.

This species differs from *bifasciatus* in its shorter form, black colour, darker antennæ and legs, shorter and more widely dilated beak, more prominent eyes, narrower and more densely-punctured intervals of the elytra, larger, deeper and more crowded punctures of the striæ, and more especially by the very fine carina of the beak (which is so elevated in the male of *bifasciatus* as to nearly equal in height one-half of the width of the beak), and the length of the male antennæ (which in *bifasciatus* is equal to the entire body exclusive of the beak). The sparse pubescence gives it the appearance of a black insect, while the dense pubescence of *bifasciatus* causes it to appear as a grayish one. The first three abdominal segments of the male are slightly flattened.

This species has been taken frequently by beating dead willows at Framingham, Mass., June 19 to July 27. One male from Monmouth, Me., differs in the less distinct carina of beak which seems to be situated at the bottom of a shallow concavity. I have taken in all at least a dozen specimens of this, but none of the real *bifasciatus*, while in the Blanchard collection there are 10 specimens of the latter and none of *brevicornis*. I have at hand two female specimens belonging to Mr. F. S. Carr, of Edmonton, Alta., which were taken there on July 30, 1916, and June 11, 1918. One of these is much larger (3.8 mm.) than any of mine, and the whitish pubescence is more dense, contrasting strongly with the black denuded places. The carina of the beak in this specimen is nearly obsolete.

The disposition of the types is as follows: Two in the collection of Mr. F. S. Carr, Edmonton, Alta., one each in the Museum of Comparative Zoology at Cambridge, the collection of the Boston Society of Natural History, the National Museum collection at Washington, the collection of H. C. Fall, and seven in my own collection.

A SYNOPTIC REVISION OF THE ANTHOMYIID GENUS  
HYDROPHORIA ROBINEAU-DESVOIDY (DIPTERA).

BY J. R. MALLOCH,  
Urbana, Ill.

The species of this genus with the exception of *subpellucens* Malloch are entirely black, with the tibiae yellowish in a few cases. The thorax is usually distinctly trivittate, and the abdomen has a black dorsocentral vitta. With the single exception of *nigerrima* Malloch the American species known to me have the halteres with yellow knobs, and all have the arista distinctly hairy.

There are, I consider, two genera included under this generic name, separable as indicated in the first two captions of my key, but it is impossible for me to decide with the data available to me what the correct generic names are. *Acroptena* Pokorny is undoubtedly applicable to the group with hairy hypopleura, this character being used in this key for the first time, but whether *Hydrophoria* is synonymous or not I am unable to say as I do not have the type species before me. My object at this time is to place before students of the family data for the identification of their material in the composite group, such being of more importance than the separation of the larger segregates.

It is not at all improbable that some of the species recently described by me from America will eventually prove to be the same as European species previously described, but the species are so very similar that only a comparison of European and American examples will suffice to decide their specific identities. Comparison of European examples of *ruralis* Meigen and *subpellucens* Malloch proves that they are very closely allied if not identical, but there are some characters which do not agree entirely, and for the present I have decided to consider them as distinct.

The larvæ, so far as I know, are aquatic, and the species are mostly northern in their distribution, commonest in the northwest.

KEY TO SPECIES.

MALES.

1. Hypopleura with some long hairs on upper margin in front of spiracle... 2.  
Hypopleura bare..... 8.
2. Halteres black; deep black species, with thorax and abdomen almost devoid of gray pruinescence; eyes separated by more than width across posterior ocelli, the orbits each with a series of long hairs along the inner margin..... *nigerrima* Malloch
- Halteres with yellow or pale knobs; thorax and abdomen with gray pruinescence; eyes usually separated by less than width across posterior ocelli..... 3.
3. Basal segment of hypopygium with very many stout bristles which are

- downwardly directed and slightly curved; the segment before it glossy, with 3 long bristly hairs on each side of disc..... *arctica* Malloch.
- Basal segment of hypopygium either with short hairs or bristles on sides or with slender bristly hairs, or the segment in front of it is highly glossy and bare, or pruinose and sparsely hairy..... 4.
4. Segment in front of basal hypopygial glossy, bare; hind tibia with 4 posterodorsal bristles..... *polita* Malloch.
- Segment in front of basal hypopygial more or less pruinose and with numerous bristly hairs..... 5.
5. Upper calyptra dark-haired at lateral angle; bristles on abdominal tergites most dense and stronger on the portions incurved ventrad..... *katmaiensis* Malloch.
- Calyptrae entirely pale-haired; bristles on tergites strongest at apices on dorsum..... 6.
6. Mid femur with 3 or 4 short, strong bristles on basal half of anteroventral surface; hind tibia with 3 posterodorsal bristles..... *occidentalis* Malloch.
- Mid femur without bristles on basal half of anteroventral surface; hind tibia with 2 posterodorsal bristles..... 7.
7. Eyes separated by more than width across posterior ocelli; mid tibia with a small, anteroventral bristle; processes of fifth abdominal sternite moderately stout, with very minute hairs on their apical halves, and a sparse fringe of hairs on their inner margins on basal half..... *proxima* Malloch.
- Eyes separated by less than width across posterior ocelli; mid tibia without an anteroventral bristle; processes of fifth abdominal sternite slender, with long hairs to apices, their inner margins with a fringe of closely-placed, rather long hairs on basal half..... *divisa* Meigen.
8. Fourth tergite (third visible) without a dense tuft of fuscous bristly hairs, which are backwardly directed, at each posterior lateral angle..... 9.
- Fourth tergite with a tuft of fuscous bristles or hairs at each posterior lateral angle..... 13.
9. Abdomen with sides of second and third tergites largely yellowish testaceous; legs brownish, not deep black; arista with its longest hairs about as long as width of third antennal segment..... *subpellucens* Malloch.
- Abdomen and legs entirely black; longest hairs on arista not as long as width of third antennal segment..... 10.
10. Hind tibia with a few bristly hairs on posterior surface basad of middle..... 10 a.
- Hind tibia without bristly hairs on posterior surface; hypopygium with strongest bristles at or near its base..... 11.
- 10a. Narrowest part of frons not wider than distance between posterior ocelli; process of fifth sternite elongate, subcylindrical, their inner margins with a few fine hairs, their outer margins with some long bristles..... *galeasa* Malloch.
- Narrowest part of frons as wide as distance across posterior ocelli; process of fifth sternite short, broad, glossy, their inner margins fringed with long, fine hairs, their outer margins bare..... *seticauda* Malloch.

11. Parafacial in profile at base of antennæ distinctly broader than third antennal segment; eyes separated by at least as great a distance as width across posterior ocelli; processes of fifth sternite broad, fringed along their inner margins with fine hairs, the disc with a few bristly hairs..... 12.
- Parafacial in profile at no point as broad as third antennal segment; eyes separated by about width of anterior ocellus; processes of fifth sternite narrow, fringed along their inner margins with hairs which apically become longer and are incurved, the disc with long, bristly hairs which are similar to those on inner margins..... *uniformis* Malloch.
12. Thorax with at least one pair of well-developed presutural acrostichals; mesopleura with 3 or 4 bristles near upper anterior angle..... *coloradensis* Malloch.
- Thorax without distinguishable presutural acrostichals, with fine hairs only; mesopleura with a few bristly hairs near anterior upper angle... 12a.
- 12a. Longest hairs on arista much longer than its basal diameter; hind tibia with three posterodorsal bristles..... *flavohalterata* Malloch.
- Longest hairs on arista not as long as its basal diameter; hind tibia with three long and one or two short posterodorsal bristles... *congrua* Malloch.
13. Fourth (visible) tergite at middle much shorter than third; hind femur without bristles on posteroventral surface except one at apex and a small one near base; arista plumose basally..... *elongata* Malloch.
- Fourth tergite at least as long as third; hind femur with some bristles on basal half of posteroventral surface..... 14.
14. Third tergite with very short bristles in lateral tuft, the tuft not conspicuous, the tergite not much narrowed laterally; longest hairs on arista longer than its basal diameter..... *borealis* Malloch.
- Third tergite with a conspicuous tuft of long bristles at lateral margin, the tergite much narrowed laterally..... 15.
15. Longest hairs on arista about as long as width of third antennal segment; tergal tuft very dense, the bristles rather uniform in length, not extending beyond apex of fourth tergite..... *ambigua* Meigen.
- Longest hairs on arista not longer than its basal diameter; tergal tuft not very dense, the bristles of unequal lengths, some of them extending to apex of abdomen..... *alaskensis*, sp. n.

## FEMALES.

1. Hypopleura with a few long hairs on upper margin in front of spiracle, rarely these hairs absent or almost so, but all species have the orbits with a number of setulose hairs, which are sometimes very long, laterad of the supraorbital bristles; apical genital segment without short-curved spines..... 2
- Hypopleura bare; no setulose hairs laterad of the supraorbitals; apical genital segment with a few short-curved spines or bristles besides the usual hairs..... 5.
2. Halteres black; mid femur with a few strong bristles and numerous long setulose hairs on anteroventral surface; parafacial in profile distinctly broader than third antennal segment..... *nigerrima* Malloch.
- Halteres with yellow knobs..... 3



3. At least the hind tibia partly or entirely yellowish testaceous; mid tibia without an anteroventral bristle; hind tibia with 2 posterodorsal bristles..... *divisa* Meigen.  
 All tibiae black; mid tibia with an anteroventral bristle; hind tibia with 3 or more posterodorsal bristles..... 4.  
 All tibiae black or fuscous; mid tibia with an anteroventral bristle; hind tibia with 2 posterodorsal bristles..... *proxima* Malloch.
4. Dorsum of thorax and abdomen slightly blue-gray pruinulent; longest hairs on arista much shorter than width of third antennal segment; mid tibia with one anterodorsal bristle..... *arctica* Malloch.  
 Dorsum of thorax and abdomen densely pale gray pruinulent; longest hairs on arista at least as long as width of third antennal segment mid tibia with 2 anterodorsal bristles..... *polita* Malloch.
5. Legs brown or dull yellowish, not deep black; basal dorsal abdominal segment largely yellowish testaceous on each side; hind tibia with 2 posterodorsal bristles; longest hairs on arista distinctly longer than width of third antennal segment; small species, not over 5 mm. in length..... *subpellucens* Malloch.  
 Legs deep black; abdomen not yellowish at base; hind tibia with 3 or more bristles on posterodorsal surface, the basal one sometimes very weak... 6.
6. Hind femur with several long hair-like bristles at base on posteroventral surface..... 7.  
 Hind femur with one bristle at base on posteroventral surface..... 11.
7. Costal thorns both small, sometimes barely distinguishable from the adjacent setulae, never as long as the inner cross-vein; parafacial in profile conspicuously narrowed below, not nearly as wide as third antennal segment at lower margin of eye..... *uniformis* Malloch.  
 At least one of the costal thorns long and conspicuous, sometimes as long as the inner cross-vein; parafacial in profile but little narrowed below, as wide as third antennal segment for nearly its entire length..... 8.
8. Hairs on arista not longer than its basal diameter; mid tibia with 2 anteroventral bristles; spines on apical genital segment short and strong, 12-14 in number; hind tibia with one or more posterior setulae..... *alaskensis*, sp. n.  
 Hairs on arista much longer than its basal diameter; mid tibia with 1 anteroventral bristle..... 9.
9. Thorax with two or three pairs of weak acrostichals and some hairs in front of suture; genital segment similar to that of *alaskensis*..... *seticauda* Malloch.  
 Thorax with central area in front of suture with 4 or 6 series of weak hairs..... 10.
10. Apical genital segment with about a dozen short, strong spines; hind tibia with 4 posterodorsal bristles..... *borealis* Malloch.  
 Apical genital segment with 2 fine, short bristles and some hairs; hind tibia with two or three posterodorsal bristles..... *flavohalterata* Malloch.
11. Mid tibia with one or more short bristles immediately basad of the anterodorsal one; thorax with two or three pairs of presutural acrostichals..... *elongata* Malloch.

Mid tibia without short bristle above the anterodorsal one; thorax usually without presutural acrostichals.....*ambigua* Meigen.

### ***Hydrophoria alaskensis*, sp. n.**

*Male and Female*.—Thorax indistinctly trivittate. Abdomen with distinct dorsocentral vitta. Legs black. Wings slightly brownish in basal cells. Calyptre white. Halteres yellow.

*Male*.—Narrowest part of frons about one-tenth of the head-width; parafacial at base of antennæ at least as wide as third antennal segment; longest hairs on arista about twice the basal diameter of arista; cheek about one-fourth as high as eye. Presutural acrostichals weak. Abdomen with very long bristles on sides of third tergite, some of which extend to or beyond apex of abdomen. Fore tibia with one anterodorsal and one posterior bristle at middle; mid tibia with two anteroventral, one or two anterodorsal, and four posterior bristles; hind tibia with four or five anteroventral, an uneven series on anterodorsal, and three posterodorsal bristles, and a few weak posterior setulæ.

*Female*.—Eyes separated by about one-third of the head-width; interfrontalia with a pair of cruciate bristles.

Length 5 mm.

*Type*.—St. George Island, Behring Straits, June 8, 1914. Allotype and 72 paratypes, same locality, June 10-25, 1914, (G. D. Hanna). Paratypes, 6 specimens, St. Paul Island, Alaska, August, 1910, and three specimens, Pribilof Islands, Alaska, August, 1910, (H. Heath).

The specimens from St. George Island are in the collection of the United States Bureau of Biological Survey, those from the other localities are in the collection of the University of California.

The description of this species was written about six years ago from a report of the insects of the Pribilof Islands which has not yet appeared in print, and it is now included to make as complete as possible the synopsis in this paper.

## THE PEA MOTH A NEW SPECIES.

BY CARL HEINRICH.

Washington, D. C.

### ***Laspeyresia novimundi*, n. sp.**

Palpi, face, head and base of patagiae dirty, whitish ochreous. Thorax dark lead gray. Fore wings dark greyish fuscous with a leaden gloss and in apical third a faint red brown suffusion; on costa from middle to apex six short white geminate dashes inwardly margined by black; from the first of these extends a lead bar joining and forming with the inner vertical bar of ocellus a narrow glossy and fairly distinct, angulate fascia; from the third geminate dash a similar and parallel leaden streak runs toward but does not quite meet the outer vertical bar of the ocellus; between the two a thin irregular line of black scales; ocellus with four short, narrow, longitudinal lines, bordered on inner and outer sides by a vertical bar of semi-lustrous lead coloured scales; cilia concolorous with wing. Hind wing dark brown, somewhat paler toward base; cilia pale brown at their base shading to white beyond. Underside of fore and hind wings a

uniform light semi-lustrous brown; costal dashes of fore wing rather faint,

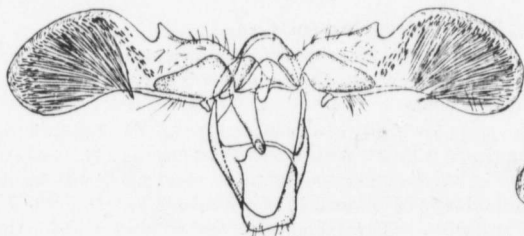


Fig. 24.—*Laspeyresia novimundi*, male genitalia.

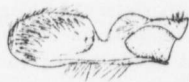


Fig. 25.—*Laspeyresia nigricana*, harpes.

legs greyish ochreous; hind tibiae and tarsi not banded. Male genitalia of type figured. Alar expanse 12-13 mm.

*Habitat.* Sturgeon Bay, Wisconsin.

*Foodplant.* Garden and Field Peas. Eight moths reared by C. L. Fluke Jr. of the Wisconsin Agricultural Experimentation Station from larvae feeding in the pods. Moths issued in July.

*Type.* Cat. No. 23514, U. S. N. M.

This is the species that was identified by Prof. Fernald as the European Pea Moth *Laspeyresia nigricana* Stephens and has so figured in our literature. It was first reported from Canada, destruction to peas in Ontario, Quebec and Maritime Provinces (Fletcher: Experimental Farms Report for 1897, pp. 194-195). Under the name *nigricana* Stephens it appears in several bulletins (Chittenden: U. S. D. A. Bull. 33. 1902. pp. 96-98; U. S. D. A. Bull. 66. Pt. VII. 1909. p. 95). Kearfott records it in the List of Insects of New Jersey and had several specimens so named in his collection. In a recent bulletin by Mr. C. L. Fluke ("The Pea Moth, How to Control It," Bull. 310. Agri. Exp. State U. of Wis. April, 1920) the life history of the insect here described is given. In that publication also appears a note by the author questioning the correctness of the earlier identifications. I am now convinced that our pea moth is not *nigricana* or any of the other European *Laspeyresia*. The genitalic differences are quite distinct as the figures of the harpes show. If *novimundi* is not a native species that has gone over to the pea from some wild legume it has probably been introduced from the orient. At any rate the name *nigricana* does not apply and should be dropped from our lists.

#### APPOINTMENT OF THE DOMINION ENTOMOLOGIST.

The news of Mr. Arthur Gibson's appointment as Dominion Entomologist, which took place early in October, will undoubtedly be received with feelings of pleasure and satisfaction in entomological circles throughout Canada. Mr. Gibson's appointment is the natural outcome of his long and faithful service as senior officer of the Entomological Branch since its inception in 1914. He received his early training under the late Dr. James Fletcher, joining the latter officer's staff in 1899, and has long been recognized, both in the United States

and Canada, as an economic entomologist of wide knowledge and experience. His kindly and genial personality and his unflinching courtesy and fair-mindedness have made him justly popular among his colleagues.

Mr. Gibson is a Fellow of the Entomological Society of London, (Eng.); Fellow of the Entomological Society of America; Fellow of the American Association for the Advancement of Science; President of the Entomological Society of Ontario; Associate Member of the American Association of Economic Entomologists; Editor of the Canadian Field-Naturalist; Member of the Canadian Society of Technical Agriculturists, etc.

We extend to Mr. Gibson our hearty congratulations on his well deserved promotion, and wish him every success in the new responsibilities that he has undertaken.

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NOTES ON SOME COLEOPTERA TAKEN IN THE VICINITY OF  
DUNEDIN, FLORIDA, IN THE SPRING OF 1920, WITH  
DESCRIPTIONS OF NEW SPECIES.

BY W. S. BLATCHLEY,  
Indianapolis, Indiana.

The work on my "Orthoptera of Northeastern America" delayed my trip to Florida in the autumn of 1919, and I did not reach Dunedin until Christmas day. After my arrival a severe illness prevented any collecting for six weeks or more, and led also to the abandonment of a contemplated trip to Marco and other points along the extreme southwestern coast of the State. The first collecting was done on February 14, and from then on until April 28, I was in the field almost every day. I had hoped that by staying two or three weeks later than usual I would find the full spring fauna emerging, and thus make amends in part for the time lost during the winter, but the season, as gauged by the blossoming of plants, was a fortnight or more late, so that in the main the species taken or observed were those of previous years prior to April 10. However, from time to time I ran across a species new or rare to the State, and these, with three or four believed to be hitherto unknown, are treated on the following pages.

**Bembidium picipes** Kirby. A single specimen was captured Feb. 23 on a strip of bare muck along the margin of a pond near Dunedin. The first record for Florida. It was described from British America, is frequent in Indiana and ranges, according to Hayward,<sup>2</sup> from New England and Lake Superior, to Missouri, Kansas and Texas.

**Lebia rhodopus** Schwarz. A half dozen specimens have been taken about Dunedin, where it occurs from January to April on low ground vegetation; one is also at hand from Ft. Myers, Fla. The only other Florida record is that of the type from Tampa. Horn<sup>3</sup> made it an absolute synonym of *L. viridis* Say and not a variety as stated by Leng.<sup>4</sup> A careful study of the Florida specimens, as well as of a score or more taken in Indiana, substantiates my

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1. See Can. Ent., April, 1917, 137.

2. Trans. Amer. Ent. Soc., XXIV, 1897, 83.

3. Trans. Amer. Ent. Soc., X, 1882, 130.

4. Bull. Amer. Mus. Nat. Hist., XXXIV, 1915, 585.

opinion<sup>5</sup> that *rhodopus* is a distinct species, the differences pointed out by Schwarz<sup>6</sup> holding good without variation throughout the series.

***Lebia collaris***. Dej. A single specimen was beaten from a bunch of Spanish moss in high, dry upland oak woods on April 20. It is 5.2 mm. in length, and agrees in every particular with Dejean's original description in which the length is given as  $2\frac{1}{2}$  lines, and breadth as  $1\frac{1}{4}$  lines. The eyes are very prominent, as stated by him, the side margins of the thorax very broad, recurved and of nearly equal width throughout, while the outer joints of the antennæ are very dark brown. Attention is called to these points simply for comparison with examples of the following species which I had had in my collection for several years under the name of *collaris*, their determination having been made from Horn's "Revision of the Species of *Lebia*"<sup>7</sup> without access to Dejean's descriptions.

***Lebia nigripennis*** Dej. Horn in his "Revision" makes this a synonym of *L. collaris*. From the text I judge that he did this without seeing Dejean's type of either species, as he says: Both Dejean's and Chaudoir's descriptions "do not seem to indicate any difference between *nigripennis* and *collaris* except in size and the colour of the head and thorax. These characters are ordinarily good, but in the present instance the colour of the head and thorax is seen to vary in our series." He then gives the length of *collaris* (including *nigripennis*) as 5 mm., whereas Dejean gives the dimensions of *nigripennis* as length  $1\frac{3}{4}$  lines, breadth  $\frac{3}{4}$  line, or 3.5 and 1.2 mm.

In the four specimens at hand, three from Dunedin and one from Sanford, Fla., the size is exactly as given by Dejean for *nigripennis*; the eyes are distinctly less prominent than in the *collaris* specimen above mentioned; the side margins of thorax are less wide and very evidently narrower toward the front angles; and the outer joints of antennæ are pale reddish-brown in all. Leaving aside the colour of the head, which is variable, these characters are, in my opinion, sufficient, when taken in connection with the much smaller size, to restore the name of *nigripennis*, as I believe that these small specimens represent the species which Dejean had before him in naming that form. In no one species of *Lebia* does the size vary as much as between these two forms, and Dr. Horn apparently ignored this difference in size when he combined the two and placed the length at 5 mm. The *L. collaris*, of Horn, is said by Leng to occur in the Middle and Southern States, and has been recorded from several stations in Florida.

***Lebia fuscata*** Dej. This species is sometimes attracted by light, two specimens having been taken at porch light on March 15.

***Aphelogenia vittata*** Fab. One example, April 19. This seems to be a rare beetle not only in Indiana but also in Florida. It is not mentioned by Schwarz, and is recorded only from Jacksonville and Lakeland by Leng.<sup>8</sup> All of my specimens from both States were taken by sweeping vegetation in low, damp localities.

5. Col. Ind., 1910, 145.

6. Proc. Amer. Phil. Soc., XVII, 1878, 354.

7. Trans. Amer. Ent. Soc., IV, 1872, 136.

8. Bull. Amer. Mus. Nat. Hist. XXXIV, 1915, 586.

**Selenophorus ovalis** Dej. My first specimen of this Carabid was found running across the sidewalk near the Club House Annex on March 16. Two others were taken at the same place on March 28. It is usually regarded as rare, is known only from Georgia and Florida, and resembles the more common *S. fossulatus* Dej., but is smaller and with the rows of dorsal punctures much less prominent..

**Canthydrus addendus**, sp. nov.

Elongate-oval, glabrous, shining. Head and thorax reddish-brown; the latter with front margin clouded with fuscous; elytra dark chocolate brown; antennæ, legs and under surface pale reddish-yellow. Head finely alutaceous, impunctate, much broader and more convex than in *C. gibbulus* (Aubé), the interocular space nearly twice as wide as there; clypeus much more broadly rounded; eyes larger, less convex, more coarsely faceted. Thorax with a few very fine punctures on the sides and along the front margin. Elytra oval, very convex at middle, the apical third strongly tapering; surface distinctly alutaceous, more coarsely and much more sparsely punctate than in *gibbulus*. Prosternal process behind the front coxæ narrow, spatulate, both it and median plates of meso- and metasterna very finely and sparsely punctate; hind margin of median metasternal plate subtruncate, its outer apical angles produced. Last ventral segment of both sexes compressed and subcarinate at middle. Length 3-3.2 mm.

Described from 20 specimens taken April 1 from a mass of water weeds in a shallow pond one mile northeast of Dunedin. Allied to *gibbulus* but distinctly larger and more convex. Besides the differences pointed out the median sternal plates of *gibbulus* are very coarsely and densely punctate, and the hind margin of the metasternal one is widely and deeply marginate. Cotypes of *addendus* are in the American Museum of Natural History and the collection of H. C. Fall.

**Hydrochus minimus** Blatch.<sup>9</sup> A second specimen of this minute and very distinct species was taken March 24 from a submerged board in the same pond as the preceding.

**Coccinella 9-notata** Hbst. Although this well-known species or its varieties are said to range over the entire United States, I can find no previous record of its occurrence in Florida. In a collection of beetles, mostly taken at porch light in July and sent to me from Dunedin, I found a single specimen.

**Aulonium parallelopipedum** Say. One specimen March 15 from beneath bark of dead water oak. Not before recorded from Florida but mentioned in the Schwarz MS. list<sup>10</sup> from Tallahassee and Crescent City.

**Botrodrus estriatus** Casey. One specimen, Feb. 11. Beaten from dead limb of red bay at Skinner's hammock. Described from Texas.<sup>11</sup> No published record from Florida, but Schwarz (Ms.) has taken it at Crescent City.

**Conotelus punctatus** Schæffer. This Nitidulid was described<sup>12</sup> from Lake Worth, Fla. I have taken it at Little River, Utopia and Dunedin by sweeping vegetation in low grounds. The elytra are brown with fine but distinct elongate punctures in evident rows.

9. Described in Bull. Amer. Mus. Nat. Hist., XLI, 1919, p. 317, from a unique.

10. See footnote, p. 419, Can. Ent., Dec., 1918.

11. Ann. N. Y. Acad. Sci., V, 1890, 320.

12. Journ. N. Y. Ent. Soc., XIX, 1911, 116.

**Tenebroides floridanus** Schaeffer. A single specimen of this recently described<sup>13</sup> Ostomid is in my collection from Moore Haven, where it was taken March 2 from beneath the bark of a dead custard apple shrub. Schaeffer's type in the U. S. Nat. Museum was from Key West.

**Limnichus nitidulus** Lec. Four specimens have been taken about Dunedin where it occurs beneath bark of dead bay trees and on foliage of low plants. Described from Georgia. Recorded by Schwarz as very rare at Enterprise, Florida.

**Agriotes insanus** Cand. One specimen, March 20, beaten from oak. No. species of *Agriotes* has hitherto been reported from Florida. The range of *A. insanus* is given by Leconte<sup>14</sup> as, "Massachusetts to Illinois, Kansas and Texas." It is frequent in Indiana where it occurs on the greater ragweed, *Ambrosia trifida* L.

**Agriotes oblongicollis** Melsh. One specimen was taken March 21 by beating the foliage of the wax myrtle, *Myrica cerifera* L. Leconte<sup>15</sup> gives its range as "Georgia to Canada and Illinois." Although Leconte and Horn in characterizing the genus *Agriotes*<sup>16</sup> state that the front is "not margined behind the labrum," it is distinctly so margined in *A. oblongicollis*, as mentioned by Melsheimer in his original description<sup>17</sup>.

**Drapetes geminatus** Say. Hitherto known from Florida only from Enterprise, where Schwarz found it "very rare." A single specimen was taken April 14 by sweeping ferns in Skinner's hammock.

**Agrilus concinnus** Horn. This large and handsome Agrilid was described<sup>18</sup> from "Georgia and Florida," without definite locality. A single example was swept from low huckleberry bushes on April 11.

#### **Tytthonyx flavicollis**, sp. nov.

Elongate-oblong, depressed. Elytra and legs black, strongly shining, finely pubescent; head, except front of occiput, thorax, scutellum, prosternum and side pieces of meso- and metasterna bright reddish-yellow, antennæ and under surface (except as noted) piceous black. Antennæ broad, very strongly serrate, second joint half the length of third, which is slightly shorter than the fourth. Thorax transversely elliptical, larger than in *erythrocephalus*, its margins thickened and angles all rounded; disc almost smooth and with a deep, entire median furrow. Elytra at base not wider than thorax, reaching second abdominal segment, their tips separately rounded; the disk of each with three distinct but feeble costæ, the intervals strongly transversely rugose. Last ventral with a small subacute median notch. Length 4.5 mm.

One male swept April 18 from the foliage of a low huckleberry. Differs from both *T. erythrocephalus* Fabr. and *ruficollis* Schæff. in colour, in sculpture of elytra and in the form of emargination of the last ventral.

**Telephorus bilineatus** Say. One specimen from beneath a chunk, March 31. I was surprised to find that this common northern Lampyrid was

13. Journ. N. Y. Ent. Soc., XXVI, 1918, 199.

14. Trans. Amer. Ent. Soc., XII, 1884, 15.

15. Loc. cited, p. 16.

16. Class. Col. N. Amer., 1883, 186.

17. Proc. Acad. Nat. Sci. Phil., II, 1845, 218.

18. Trans. Amer. Ent. Soc., XVIII, 1891, 310.

not heretofore recorded from Florida. Leconte gives its range<sup>19</sup> as "Atlantic region to Kansas."

**Odontæus filicornis** Say. A male of this uncommon Scarabid was taken at porch light on March 15. Horn gives its range<sup>20</sup> as "Middle and Central States," but Schwarz records one specimen from Enterprise and, in his Mss. notes, another from Tampa.

**Ecyrus exiguus** Lec. One specimen beaten from oak, March 22. The first record for Florida, its range being given by Leng and Hamilton<sup>21</sup> as Ohio, Georgia and Kansas.

**Mecas femoralis** Hald. One specimen taken by sweeping, April 20. Schwarz lists it as rare at Fort Capron and Crescent City.

**Tetraopes tetraophthalmus** Forst. Two specimens taken on milkweed July 15 and sent to me. This is another common northern species of wide range which has not before been recorded from Florida, though known from South Carolina, Louisiana and Mexico.

**Cryptocephalus aulicus** Hald. One specimen taken by sweeping vegetation along a sandy roadway. A rare species, resembling *Griburius larvatus* Newm. in colour and markings. Described from Georgia and known only from that State and Florida. Recorded by Castle and Laurent from Enterprise and noted in the Schwarz Mss. from St. Augustine.

**Graphops varians** Lec. Two specimens beaten from oak, March 19 and April 10. The first record from Florida. Leconte gives its range<sup>22</sup> as Illinois, Texas and Kansas.

**Phyllotreta liebecki** Schaeffer. This is the species recorded by me<sup>23</sup> under the name *Phyllotreta robusta* Lec. as common at Sanford along the borders of cypress swamps. Schaeffer's types were from Enterprise, and he states<sup>24</sup> that it is closely allied to *robusta* but in that species the "fifth antennal joint is prolonged at apex, and the last ventral has a very deeply impressed median line."

**Synchroa punctata** Newm. A rare species in Florida. Schwarz lists<sup>25</sup> one specimen from Haulover and I took one, Feb. 27, and another, April 19, from beneath the bark of a dead red bay tree, *Persea borbonia* L.

**Canifa pusilla** Hald. One specimen July 15, at porch light. Described from South Carolina, frequent in Indiana, but not before known from Florida.

#### **Tachygonus minutus**, sp. nov.

Short, broadly oval. Black, strongly shining; legs and antennæ wholly testaceous. Beak reddish-brown, strongly shining, devoid of punctures; eyes large, almost contiguous; occiput very minutely and sparsely punctured. Thorax bell-shaped, coarsely and densely punctate on sides and with a large rhomboidal smooth space at middle, a tuft of white hairs near each hind angle and a thinner aggregation of similar hairs on sides. Elytra with double rows of coarse, deep punctures, each of which gives rise to a yellowish inclined seta; umbones promi-

19. Trans. Amer. Ent. Soc., IX, 1881, 54.  
 20. Trans. Amer. Ent. Soc., III, 1871, 50.  
 21. Trans. Amer. Ent. Soc., XXIII, 1896, 137.  
 22. Trans. Amer. Ent. Soc., XII, 1884, 26.  
 23. Can. Ent., XLVI, 1914, 142.  
 24. Journ. N. Y. Ent. Soc., XXVII, 339.



ment; intervals very narrow, the alternate ones feebly costate; a small divided and divergent sutural tuft of white hairs on basal third. Hind legs not much longer than the middle ones, armed on inner side with three or four minute teeth. Sides of meso- and metasterna coarsely punctate and clothed with white hairs. Length 1.3 mm.

Described from a single specimen taken April 19 by sweeping ferns in Skinner's hammock. Allied to *T. centralis* Lec., described from Colorado, but smaller, with head more finely punctate and sculpture of elytra very different.

**Derolomus bicolor** Lec. One specimen, April 23, from the leaves of a thistle on Hog Island. Known heretofore only from Enterprise, New Smyrna and Capron on or near the east coast of Florida.

**Lixus leptosomus**<sup>25</sup> Blatch. Two examples swept, April 11, from low herbage along the railway embankment north of Dunedin. The unique type from Sanford, Fla., was the only specimen hitherto known.

**Barinus elusus**, sp. nov.

Elongate, subparallel, convex. Black, shining; legs and antennæ reddish-brown; thorax with a broad stripe of transversely placed white scales on each side; elytra with the second intervals covered their full length with similar scales, bases of third, fourth and sixth intervals, side pieces of meso- and metasterna and sides of last three ventral segments similarly clothed. Beak stout, strongly curved, about three-fourths the length of thorax, very finely and sparsely punctate above, more coarsely on sides of basal half. Head finely alutaceous, finely and sparsely punctate. First joint of funicle two-thirds the length of the rest united. Thorax subcylindrical, one-fourth longer than wide, rather finely punctate, the intervals feebly alutaceous and equal in size to the punctures. Elytra scarcely wider at base and nearly twice as long as thorax, sides parallel to apical fourth, then strongly converging to the separately rounded tips; striæ narrow, deep; intervals flat, feebly alutaceous, each with a single row of rather fine, shallow, irregularly placed punctures. Under surface coarsely and densely punctate, the last three ventral segments more sparsely so. Length 3 mm.

Two specimens taken March 30, April 19 by sweeping along a roadway through Skinner's hammock. Allied to *cribricollis* Lec., but distinct in the more slender form, arrangement of white scales, longer thorax, alutaceous surface, etc.

**Cylindrocapturus nanulus** Lec. Five specimens beaten April 26 from the foliage of *Ampelopsis* in low, moist grounds. Known from Florida heretofore only from Enterprise.

25. Can. Ent., XLVI, 1914, 249.