

The Canadian Entomologist.

Vol. XLIX.

LONDON, AUGUST, 1917

No. 8

POPULAR AND PRACTICAL ENTOMOLOGY.

THE STRAWBERRY ROOT WEEVIL IN BRITISH COLUMBIA.

BY R. C. TREHERNE, ENTOMOLOGICAL BRANCH, DEPARTMENT OF AGRICULTURE, OTTAWA.

Since issuing Bulletin No. 8, of the Dominion Entomological Branch, on the Strawberry Root Weevil (*Otiorhynchus ovatus*) in British Columbia, certain studies have been undertaken which may well be recorded at the present time.

This weevil still maintains its high degree of importance in the strawberry plantations of the Province. It has gained access to the fine strawberry plantations of the Saanich Peninsula, near Victoria, to a degree which is causing considerable apprehension among the growers.

While primarily an insect adapted to the moist, cooler areas adjacent to the Pacific Ocean, it has been reported as causing considerable damage to plantations in the arid transitional areas of the interior. During the past two years reports of this nature have been received from northern points in the Okanagan Valley, and more recently it was observed in considerable quantity at Grand Forks. Many enquiries further have been received from the Lower Kootenay country, particularly Kaslo, Nelson and Boswell. It has not, as yet, been reported from the Creston district, but there is no doubt that its presence will be felt in this latter section at no distant date, even supposing it does not occur there at present.

It has been claimed that this insect is an introduced species from Europe. I find this very hard to believe, and I would be very much interested to find out on what grounds this statement is advanced. I have taken it at various altitudes up to 4,000 feet in the mountains, far removed from any cultivated land, and I have seen it on isolated, rocky islands of the Pacific Coast of British Columbia. In one instance, I remember finding it on a rocky

island, almost devoid of grassy vegetation and supporting only a stunted growth of fir trees. Considering the fact that this island was several hundred yards from the coast line and at all tides entirely surrounded by salt water, combined with the fact that the weevil is unable to fly, it becomes increasingly hard to believe that this insect is other than an indigenous species.

All evidence points to this weevil being primarily a grass-infesting insect, and further that it is more or less uniformly distributed throughout the southern sections of British Columbia. It will attack strawberry plantations when the native vegetation is removed and it has received its name, not because strawberries alone are attacked, but because this fruit offers a suitable form of nourishment to its taste. Strawberries being grown in consolidated areas under a high state of cultivation, naturally suffer to a marked extent. It is useless for growers to consider it advisable to purchase plants from non-infested districts, as is so often suggested. The statements made above naturally preclude this form of suggestion, apart from any remarks on the egg-laying period in relation to transplanting.

It seems a foregone conclusion that all strawberry plantations in this part of the world, are doomed to the possibility of infestation despite the efforts of the growers. Much, however, may be done to alleviate the nuisance. The control measures, while given on previous occasions, may well be mentioned again. They are briefly as follows:

1. Rotation of crops, which includes naturally the growing of strawberries in proportion to the land available on individual farms.
2. The production of strawberries on the "one" or "two-year cropping plan," which includes the choice of varieties suitable to these plans.
3. The removal of old or infested plantations by ploughing at the end of the egg-laying period, which ordinarily would mean in September. Such land should be thoroughly cultivated in the autumn and kept devoid of all vegetation during the winter.

If these suggestions are properly put into force it may reasonably be expected that little damage would result from the attacks of the weevil larvæ on the root system. It is urged that districts liable to infestation, entering upon the industry of strawberry culture, should adopt these plans before they are forced to do so by the presence of the weevil.

Experience has shown that it is common to find at times well over a hundred larvæ at work on the roots of individual plants, growing on the hill system, and yet the plant would not be dead. A totally unprofitable crop is the result, but the plant itself survives the ordeal. On enquiry it may be found, almost invariably, that the plantation is entering upon its third cropping year. Frequently one hears of severe infestation in young plantations, but in such cases it has been found that the land has been made the recipient of continuous crops of strawberries for several years. It is exceptional to find plantations devastated in the first year of growth or virgin soil, although a few instances of this have been reported.

On the Effect of "Burning Over" a Strawberry Field as a Means of Controlling the Strawberry Root Weevil.

During the past summer experiments were conducted on the efficiency of burning over an old strawberry plantation just previous to the termination of the crop. The plants, growing on the hill system, on approximately $1\frac{1}{2}$ acres, were "mattocked up" and roots, tops and straw-bedding raked into windrows. On about half the field the strawberry rows were raked into one windrow, while on the other half four rows were raked into one row. The plants were left in these rows for about 24 hours, the day being bright and sunny. In this way the plants were allowed to dry, making burning easier, and secondly those beetles left in the old strawberry rows would be forced to shelter in the windrows, during the night, as to a bait. Finally the rows were fired at a convenient point to utilize the prevailing breeze.

At the time this work was done the great majority of the

adults had transformed from the pupæ in the soil and were hidden away among the debris around the plants. Egg laying was in full swing and comparatively few larvæ and pupæ were left in the ground.

The results attending this experiment showed that a great many adults were destroyed by the action of the heat, but on the other hand a great many survived. The best results, as to mortality, were shown in the larger windrows where the heat appeared more sustained and concentrated. A number of adults were contained in small wooden boxes and glass vials, which were in turn sunk to the level of the soil in the row, and it was shown that without exception all perished. Careful observations were taken as soon as the fire had passed over to ascertain the general results on a practical scale, and it was interesting to note the remarkable ingenuity displayed by the weevils to avoid destruction. Under nearly every clod of earth or beneath compact piles of straw, which had not become ignited, were found small groups of adults, sometimes to the number of twenty, packed together as far away as possible from the source of heat. These weevils were perfectly normal and unharmed, and some laid eggs in captivity after removal from the field. In some instances adults had burrowed into loose soil to avoid destruction.

The general results of the work showed that burning the plantation at the time when the greatest number of adults were on the surface possessed only a half measure of success. The adults that survived would undoubtedly migrate to the nearby strawberry plantations and this, taking place at the season of the year when egg laying was in progress, was precisely what we should aim to avoid.

It may be said, however, that better results would probably attend this method of control if the roots of the plants were shaken free of soil and the lumps of earth broken and compacted in the windrow. If this were done burning of old plantations might be added to the control measures already mentioned.

NEW SPIDERS FROM CANADA AND THE ADJOINING STATES.

BY J. H. EMERTON, BOSTON, MASS.

In examining a large number of spiders from Canada and the northern United States, the following species appear to be undescribed. Six of them are from Metlakatla and other parts of the coast of British Columbia, collected by J. H. Keen and now in the collection of Nathan Banks, by whom several had been recognized as new and partly prepared for publication. Three are from Departure Bay on Vancouver Island, collected by T. B. Kurata, of Toronto. Two are from the mountains near Banff, collected by N. B. Sanson. Four are from Mt. Whiteface in the Adirondack Mts. of Northern New York, collected by the writer and C. R. Crosby, of Cornell University. The two *Philodromus* are from Ontario; one of them very common all over the eastern part of Canada.

Lophocarenum sculptum, n. sp.

A little over 2 mm. long. Legs and palpi dull yellow. Cephalothorax and abdomen dark brown. Abdomen with a hard spot covering the whole back of the male and nearly the whole of the female as in *L. excavatum*, and in several *Ceratinella*. The abdomen is covered with depressed spots around the hairs. The

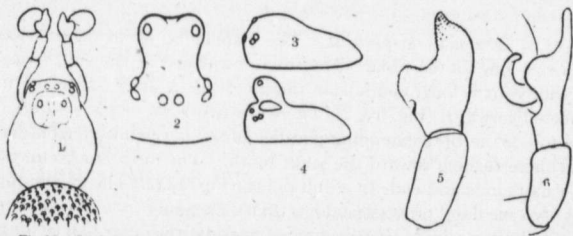


Fig 12.—*Lophocarenum sculptum*.—1, back of cephalothorax, part of abdomen and palpi of male; 2, front of head of male; 3, profile of cephalothorax of female; 4, profile of cephalothorax of male; 5, male palpus seen from above; 6, male palpus, outer side.

head of the male has a small, abrupt hump, carrying the upper middle eyes near the top; (Fig. 12, 2 and 4) it is slightly notched in the middle and constricted at the sides and in front, and under the

constricted part on each side is a deep groove. The female has a slight elevation of the head just behind the eyes. (Fig. 12, 3.) The male palpi are moderately long with the patella twice as long as it is wide, and the tibia widened at the end, with a pointed process on the inner side extending over the tarsus. (Fig. 12, 5 and 6.)

Metlakatla, B.C., from J. H. Keen in Nathan Banks' collection.

***Aræoncus patellatus*, n. sp.**

2 mm. long, pale without markings. The head is slightly elevated, more in the male than in the female. The upper eyes are more than their diameter apart, and farther apart in the male than in the female, almost touching the lateral eyes. (Fig. 13, 3.) The front middle eyes are small and near together, and as far from the upper eyes as these are from each other. The lateral eyes are in pairs touching each other, and surrounded by a common, dark border. The space between the eyes is covered by short, stiff hairs directed upward. (Fig. 13, 3.) The male palpi resemble slightly



Fig. 13.—*Aræoncus patellatus*.—1, epigynum; 2, male palpus, outer side; 3, head of male from above.

those of *Aræoncus bispinosus*. The patella is, as in *bispinosus*, twice as long as the tibia. The tibia is widened at the end, twice as wide as it is long, and has on the inner side a short, sharp tooth directed forward. (Fig. 13, 2). There are two rows of stiff hairs on the top of the tibia extending parallel as far as the anterior border and there turning toward the inner tooth. The tarsal hook curves in a half circle and ends in a dull point. (Fig. 13, 2.) The epigynum has two median processes, (Fig. 13, 1) the inner one T-shaped, much like the middle lobe in many *Lycosidæ*, the outer half as long and paddle-shaped.

Metlakatla, B.C., J. H. Keen.

***Gongylidium curvitaris*, n. sp.**

4 mm. long. Cephalothorax and legs pale yellow-brown. Abdomen gray with small, light spots of irregular shape and

arrangement, the middle ones sometimes in pairs. Size and general appearance like *Pedanostethus riparius*. The head is only slightly narrowed in front, but more in the male than in the female. The upper eyes are all of the same size and equal distances apart, the lower front pair half as large as the others and close together, but not touching. (Fig. 14, 5.) In the male the metatarsi of the front



Fig. 14.—*Gongylidium curvitaris*.—1, male palpus, from above; 2, male palpus, outer side; 3, metatarsus of first leg of male; 4, epigynum; 5, eyes.

legs are slightly curved, and some of the hairs near the middle of the joint are thicker than the others. (Fig. 14, 3.) The male palpi resemble closely those of *G. (Tmeticus) brunneus* Em. of the White Mountains, but the tibia has a sharper and more recurved point, (Fig. 14, 2) the tarsal hook though nearly of the same shape has the point less widened and the palpal organ has a long, stiff tube curved in a half circle and extending beyond the end of the tarsus. (Fig. 14, 1 and 2.) The epigynum is like that of *brunneus* but longer, projecting farther from the surface of the abdomen (Fig. 14, 4).

Mt. Whiteface, Adirondacks, N.Y., in moss in spruce forest at 4,000 ft.. May 24, 1916.

Gongylidium macrochelis, n. sp.

3 mm. long. Abdomen gray. Cephalothorax, legs and palpi dull orange. Resembles in size and colour *Tmeticus armatus* Bks., with which it was found. The head is low and wide, and the mandibles large and thick with a large tooth on the front and inner side as in *probatum* and *tridentatum*. The front of the mandibles has scattered elevations at the base of the hairs and on the

outer sides are fine, parallel, horizontal lines. There are three or four small teeth on the inner side of the claw groove. (Fig. 15, 1 and 2.) The maxillæ are wide and have several scattered elevations with one larger one near the front. The male palpi are

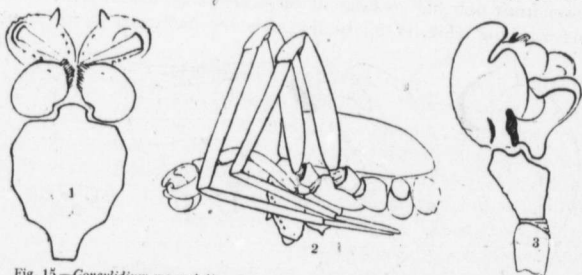


Fig. 15.—*Gongylidium macrochelis*.—1, sternum, maxillæ and mandibles of male; 2, side of male; 3, male palpus, outer side.

long, with both patella and tibia longer than wide. The tibia is widened toward the end but has no large processes. (Fig. 15, 3.) The tarsus is short and round and has a deep notch on the outer side. The tarsal hook is of a complicated shape, shown in (Fig. 15, 3). The base is thickened and near it is a round tooth turned toward the tibia. The end of the hook curves outward and reaches back to the edge of the tarsus.

Sulphur Mountain, Banff, N.B. Sanson. In April on snow in company with *Tmeticus armatus*.

***Gongylidium unidentatum*, n. sp.**

1.5 mm. long. Cephalothorax and abdomen gray and legs pale. Eyes as in *Tmeticus bidentatus*. Mandibles without any



Fig. 16.—*Gongylidium unidentatum*.—1, male palpus, above; 2, male palpus, outer side; 3, male palpus, inner side.

large tooth in front. Tarsus of male palpus extending over the tarsus half its length and pointed, with the point slightly turned down. (Fig. 16, 1, 2 and 3.) Tarsal hook simple.

Mt. Whiteface, Adirondacks, N.Y., C. R. Crosby. One specimen.

***Microneta clavata*, n. sp.**

2 mm. long, pale yellowish. Both sexes of the same size. The male palpi are small and coloured like the legs. The tibia is thickened toward the end, where it is as wide as long. The tarsal hook is simple in form, the basal half straight, following the edge of the tibia and the terminal half curved in a half circle (Fig. 17, 3.) The epigynum is large, with a smooth, rounded end extending backward, turned a little way from the surface of the abdomen. (Fig. 17, 4.)

Wilmington Notch, Adirondacks, N.Y. C. R. Crosby.

***Microneta pallida*, n. sp.**

A little over 2 mm. long and pale, without any markings. The abdomen is slightly thickened in front and pointed behind. The front of the head extends a little forward beyond the mandibles. The mandibles are thickened at the base and have a few

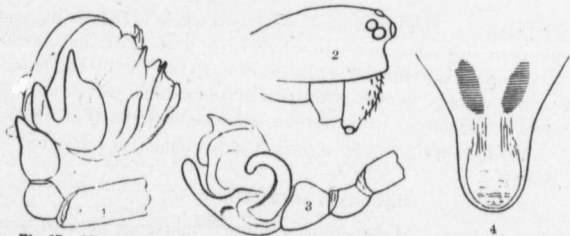


Fig. 17.—*Microneta pallida*.—1, outer side of male palpus; 2, profile of head and mandibles. *Microneta clavata*.—3, male palpus; 4 epigynum.

stiff hairs on the front as in *angulata* and *formica*; (Fig. 17, 2.) The male palpi have the tibia thickened in the middle and the end extended on the upper side over the tarsus. (Fig. 17, 1.) The tarsal hook is wide and flat as in *angulata*. The tarsus has on the upper

side two processes, neither very large; one near the base and the other in the middle.

Departure Bay, Vancouver Is., 1913, T. B. Kurata.

Microneta orcina, n. sp.

2 mm. long. Legs pale. Cephalothorax pale yellow brown. Abdomen pale gray with lighter spots in pairs as in several *Diplostyla* and *Bathyphantes*. (Fig. 18, 1.) The cephalothorax is nearly as wide as long, with the front of the head not much over half as wide. The male palpi have the tibia enlarged at the end without

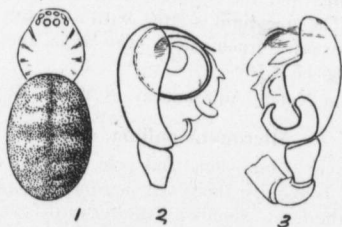


Fig. 18.—*Microneta orcina*.—1, dorsal markings of male; 2, male palpus; 3, male palpus, outer side.

any processes. The tarsal hook is straight where it crosses the end of the tibia and then curves in a half circle to a point, and on the outer side near the end is a slight projection (Fig 18, 3.) The palpal organ has a long, slender, transparent tube which curves around the end of the palpus in more than a complete circle. (Fig. 18, 2.)

Inverness, B.C. J. H. Keen. One specimen in collection of N. Banks.

Diplostyla inornata, n. sp.

2 mm. long. Abdomen gray without markings or with only a trace of markings. Cephalothorax gray but lighter than the abdomen. Legs pale without markings. Palpi of male resembling those of *nigrina*, except that the tarsal hook is only slightly widened at the tip (Fig. 19, 5) and the basal process is slightly curved inward over the coil of the tube. (Fig. 19, 6.)

Mt. Whiteface, Adirondacks, N. Y., August, 1916.

Diplostyla keenii, n. sp.

3 mm. long. Cephalothorax pale with light gray radiating markings. Legs long and pale with faint gray rings at the end and middle of each joint. Abdomen pale with distinct gray markings, two pairs of large spots more or less connected on the front

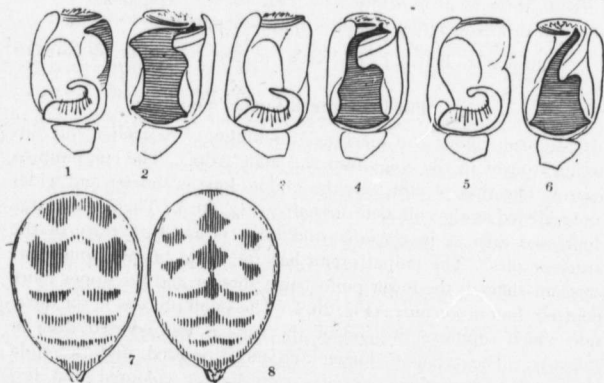


Fig. 19.—*Diplostyla*.—1 and 2, male palpus of *D. keenii*; 3 and 4, male palpus of *D. brevipes*; 5 and 6, male palpus of *D. incornata*; 7, dorsal markings of *D. keenii*; 8, dorsal markings of *D. brevipes*.

half and three transverse on the hinder half, the front one divided in two. (Fig. 19, 7.) The male palpus has the tarsal hook blunt pointed. (Fig. 19, 1.) The basal process is wide in the middle, with the inner corner much elongated. The slender portion turns off at a right angle. (Fig. 19, 2.) The epigynum is of the usual shape but very short, as in *alboventris*.

Metlakatla, J. H. Keen, in collection of Nathan Banks.

Diplostyla brevipes, n. sp.

3 mm. long. Cephalothorax and legs pale, dull yellow without any markings. Abdomen whitish with gray markings; on the front half, two spots in the middle line, each partly connected with two lateral spots; behind these three transverse marks, the front one partly divided in three (Fig. 19, 8.) The legs are unusually

short, the first femur but little longer than the cephalothorax. The male palpus has the tarsal hook pointed at the tip, and it is more pointed at the base than in the other species. (Fig. 19, 3.) The basal process of the palpal organ has the slender portion bent in the middle at nearly a right angle, and its point has a tooth turned outward as in *alboventris*, (Fig. 19, 4.) The epigynum has the two processes straight and of middle length.

Metlakatla, B.C. J. H. Keen, in the collection of Nathan Banks.

***Pardosa metlakatla*, n. sp.**

In size, colour and markings resembling *P. glacialis*, but differing from it in the epigynum and male palpi. The epigynum is narrow like that of *atra*, but the middle lobe is shorter and wider and widened at the end as in *sternalis*. (Fig. 20, 3.) There is no large depressed area as in *glacialis*, and there is hardly a trace of the anterior pits. The palpal organ has the basal process somewhat crescent-shaped, the lower point being shorter and the upper more pointed than in *glacialis*. (Fig. 20, 4.) The small process on the outer side which supports the end of the tube is less pointed than in *glacialis*. The tarsus is longer and more pointed, and the tibia less thickened than in *glacialis*, and lighter coloured and less thickly covered with hair.

Metlakatla, B.C. J. H. Keen. Mountains north of Vancouver. W. Taylor.

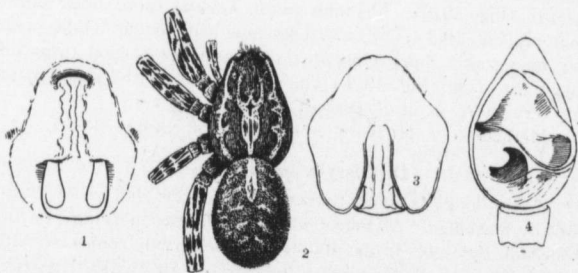


Fig. 20.—*Pardosa vancouveri*.—1, epigynum; 2, dorsal markings. *Pardosa metlakatla*.—3, epigynum; 4, male palpus.

***Pardosa vancouveri*, n. sp.**

7 mm. long. Gray with the colour much broken into spots of irregular shape. The cephalothorax has three light stripes, the middle one two-thirds as long as the cephalothorax, widened at the front end and divided in three. (Fig. 20, 2.) The side stripes extend the whole length of the cephalothorax and are of irregular width. The legs are darkest at the base, and have broken and irregular spots on all the joints. The abdomen has the usual long middle spot at the front end, behind which are small, irregular, light spots in pairs. On the under side the colours are somewhat lighter on the coxae and femora, and the abdomen has three indefinite dark stripes on a light ground. The epigynum is long and partly divided into two parts. The anterior end has a wide, distinct pit, from which a soft and narrow ridge extends backward as far as the transverse division. (Fig. 20, 1.) The posterior half has a wide middle lobe in which is a ridge approaching the form of a T. (Fig. 20, 1.) The male is yet unknown.

Departure Bay and Vancouver, in gardens and fields. T. B. Kurata.

***Pæcilochroa columbiana*, n. sp.**

Cephalothorax 2.5 mm. long. Abdomen variable in size according to contents. Cephalothorax orange brown with black hairs. Legs orange yellow except the femora, which are dark like the cephalothorax, the first and second femora sometimes darker than the others. The abdomen is black with a white, transverse stripe at the front, two transverse spots in the middle, and sometimes a few white hairs in front of the spinnerets. On the under

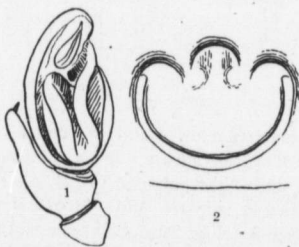


Fig. 21.—*Pæcilochroa columbiana*. 1, male palpus, under side; 2, epigynum.

side there are no definite markings, but the abdomen is usually lighter in the middle and toward the front, and the posterior coxae are lighter than those in front. The male is darker than the females. The epigynum has a middle and two lateral pits in front, and a rounded lobe directed backward and fitting into a larger depression. (Fig. 21, 2.) The male palpus somewhat resembles that of *P. montana*, but the process of the tibia is smaller and the point less turned backward. (Fig. 21, 1.) This species is distinct from *P. pacifica* Bks., with which it has been compared.

Departure Bay, Vancouver Island, 1913, T. B. Kurata.

***Philodromus canadensis*, n. sp.**

5 mm. long. Second femur of male 3 mm. Marked in gray (Fig. 22, 3) much like *P. vulgaris* and like *P. bidentatus* with which it is sometimes associated, but it does not have the sharp division between the dorsal and ventral colour areas that is usual in *vulgaris*. It has somewhat shorter legs than *bidentatus*, especially in the males. The male palpi resemble those of *vulgaris*, but the outer

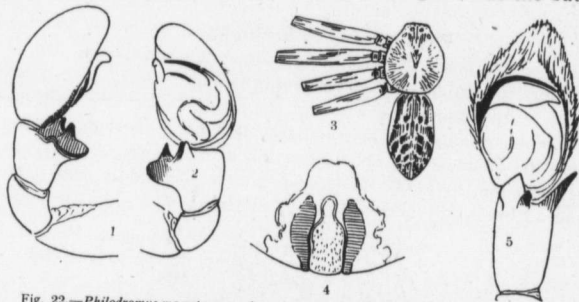


Fig. 22.—*Philodromus macrotarsus*.—1, male palpus, upper side; 2, male palpus, under side. *Philodromus canadensis*.—3, dorsal markings; 4, epigynum; 5, male palpus, under side.

process of the tibia is narrower and the under process more triangular and with a short truncate tooth at its base, a little curved toward the outer side of the palpus. (Fig. 22, 5.) The tibia is wider in the middle than in *vulgaris*, and widened more on the inner than on the outer side. (Fig. 22, 5.) The epigynum resembles that of *vulgaris*, but is shorter. (Fig. 22, 4)

Common about Montreal and Ottawa and westward to Lake Nipigon and Prince Albert; Grand Isle, Lake Champlain; Sandusky, Ohio.

***Philodromus macrotarsus*, n. sp.**

4 mm. long. Femur of second leg 3 mm. The specimen, a male, is freshly molted and light in colour. The abdomen has a series of transverse marks in light and dark gray, and the legs are indistinctly ringed in the middle and near the ends of the joints. The male palpus has the tibia twice as wide as long, most of the width being on the outer side. (Fig. 22, 1.) On the projecting portion is a black pointed process directed forward and visible from above or below. On the under side is a double process also directed forward, the outer half dark and the inner half translucent brown. The palpal organ has on the end near the outer side a short, stout process curving downward and opposite to it is the dark pointed tube. (Fig. 22, 2.)

Vineland, Ontario. W. A. Ross, Sept., 1916.

***Chalcoscirtus carbonarius*, n. sp.**

Female 4 mm. Male 3 mm. long. Dark gray, the male almost black, the female with the abdomen lighter than the cephalothorax and lighter below than above, without any markings. There are very small, scattered hairs all over the body and the skin is roughened with fine, irregular lines, and in some lights is

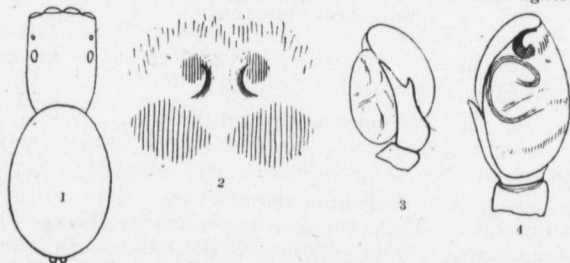


Fig. 23.—*Chalcoscirtus carbonarius*.—1, outline of female; 2, epigynum; 3, male palpus, outer side; 4 male palpus, under side.

slightly iridescent. The abdomen is longer than the cephalothorax. The cephalothorax is one-half longer than wide, with the

sides straight and parallel. (Fig. 1.) The eye area is wider than long, the front row of eyes covers the whole width of the head, and the small, middle eyes are nearer the upper pair than the front row. The leg of the first pair is not much thicker than the others in either sex, and the tibia has on the under side three pairs of long spines. The mandibles have no teeth under the claw. The male palpi have the tibia as long as wide, with a long process extending half the length of the tarsus and having a sharp tooth in the middle of the upper edge. (Fig. 23, 3.) The palpal organ is oval and thick, extending back at the base over part of the tibia. (Fig. 23, 3 and 4.) The tube is at the tip and is short and curved in a half circle. (Fig. 23, 4.) The epigynum has two small, semi-circular openings behind which the round spermathecae show through the skin. (Fig. 23, 2.)

Simpson summit, 7,000 ft., near Banff; a smaller species, *C. montanus* Banks, is found on Mt. Washington, N. H., above the trees.

ON SOME NEW OR NOTEWORTHY COLEOPTERA FROM THE WEST COAST OF FLORIDA.—III.

BY W. S. BLATCHLEY, INDIANAPOLIS, IND.

(Continued from page 240.)

***Elytroleptus floridanus* Lec.**

One example of this rare form was beaten from oak on March 23. It was described from Florida in 1862, and Schwarz records the taking of a single specimen at Haulover.

***Plectomerus dentipes* Olivier.**

Three examples of this small and well-marked Longicorn have been taken by beating oak in November and December.

***Zagymnus clerinus* Lec.**

Schwarz records this species as very rare in the stems of dry palmetto leaves. Five specimens have been taken at Dunedin, three on pine lumber in October and December, the others at electric porch light in June. Two of the five are wholly black, one of them being 19 mm. in length. The others are typical in hue, the head and thorax red and the elytra maculate, the length 13-15 mm.

August, 1917

Cryptocephalus nanus Fab.

One specimen by beating in a wet hammock, March 27. LeConte records* it from Arkansas and Florida. No other Floridian record is known to me.

Cryptocephalus calidus Suff.

One specimen beneath chunk near pond. Not before recorded definitely from Florida.

Pachybrachys stygicus Fall.

Occurs frequently on huckleberry foliage and flowers in autumn and spring. Fall's types were from a number of localities in Florida and Alabama.

Pachybrachys characteristicus Suff.

Fall also records this from several localities in Florida.** One specimen was secured at Dunedin in a wet hammock.

Monoxia batisia, sp. nov.

Elongate-oblong, feebly convex. Fuscous-black, above thickly clothed with short, prostrate, silken yellow pubescence, the blackish ground colour showing in a narrow median line on head and thorax and in some irregular spots and short curved lines along the inner portions of, and some rows of minute dots along the sides of each elytron; antennæ and legs reddish-brown, more or less annulate or tinged with fuscous; under surface fuscous, very sparsely and finely pubescent. Head with a broad, shallow but distinct median impression. Thorax nearly twice as wide as long, not narrower at apex than base, sides broadly curved and rounded into the base, which is distinctly, obtusely emarginate at middle, front angles obtusely rounded; disc finely and closely punctate and with a vague median impression and another each side. Elytra one-third wider and five times as long as thorax, sides parallel for three-fourths their length, then curved into the rounded apex; disc more or less uneven, finely, densely and deeply reticulate-punctate. Male with tarsal claws bifid one-third their length, the last ventral broadly and deeply emarginate. Female with claws simple, last ventral truncate or nearly so. Length, male, 3.5 mm.; female, 4-4.3 mm.

*Trans. Amer. Ent. Soc., VIII, 1880, 201.

**Trans. Amer. Ent. Soc., XLI, 1915, 376.

Swept in numbers, January 29—April 2, from the foliage of the fleshy-leaved seaside plant, *Batis maritima* L., which covers large tracts along the inner borders of the mangrove swamps on Hog Island, opposite Dunedin. With the exception of *puncticollis* Say, 7–8.5 mm. in length, this is the only *Monoxia* definitely known from east of the Mississippi River, though LeConte, in 1865,* mentioned one of his types of *obtusa* (now placed as a synonym of his *debilis***) as having been found at Andover, Mass. Horn in his "Galerucini" states,*** however, that this locality "is much more than doubtful." From *debilis* *M. batisia* may be known by the much more distinct median impression of head, different form of thorax with the basal margin distinctly emarginate and by the much deeper emargination of the last ventral of male.

In this connection it may be mentioned that Fabricius in 1801†, described from Carolina a *Galeruca atomaria*, the status of which is in doubt. His description, based mainly on colour, is as follows:

"*atomaria*, G.—Pallida, elytrorum sutura, atomisque ferrugineis. Statura parva *G. tenella*. [3.2–4 mm.] Antennæ ferrugineae. Caput ferrugineum, vertice nigro. Thorax marginatus, pallidus, immaculatus. Elytra laevia, pallida, sutura, quæ tamen apicem haud attingit, puncto maiori distincto in medio atomisque ferrugineis. Corpus pallidum."

Habitat in Carolina Mus. D. Bosc.

LeConte (loc. cit. 205) states that "this was probably a species of *Monoxia*," and it was so listed by Gemminger & Harold. It is possible that this is the species I have described as *M. batisia*, but it cannot be so determined from the brief description of Fabricius.

***Haltica nana* Crotch.**

One specimen swept from low herbage, October 26. Horn‡ gives its range as South Carolina to Florida.

*Proc. Phil. Acad. Nat. Sci., 222.

**Since *obtusa* was described first on the same page, it should be made the name of the species, with *debilis* as the synonym.

***Trans. Amer. Ent. Soc., XX, 1893, 86.

†Syst. Eleut. I, 490.

‡Trans. Amer. Ent. Soc., XVI, 1889, 221.

***Haltica marevagans* Horn.**

Taken in some numbers by sweeping the sea purslane, *Sesuvium maritimum* Walt., along a dredged ditch on Hog Island. Feb. 5—March 25. Horn, (loc. cit., p. 226) states that it occurs along the sea coast region from Florida to New Jersey.

***Chaetocnema brunnescens* Horn.**

This handsome little bronzed-brown species was swept from the sea-blite, *Batis maritima* L. on Hog Island, February 27, a dozen or more being taken. As pointed out by Horn* its peculiar colour and distinctly punctured head make it easily known. His types were taken by Schwarz at Key West (who also took a series at Punta Gorda) and we can find no other published record.

***Blapstinus aciculus*, sp. nov.**

Elongate-oval, feebly convex. Above piceous-black, very finely alutaceous, subopaque, sparsely clothed with minute prostrate brownish-yellow hairs; beneath piceous, legs and antennae dark reddish-brown. Head almost flat, finely, sparsely and evenly punctate, the clypeus broadly emarginate, Antennae gradually enlarged toward apex, second joint one-half the length of third, the latter slightly longer than fourth. Thorax subquadrate, one-fourth wider than long, sides subparallel from base to apical third, then gradually converging to the apical angles which are obtuse; hind angles rectangular, base feebly bisinuate; disc finely, evenly and rather sparsely aciculate punctate. Elytra at base but slightly wider than thorax, sides very feebly diverging to behind the middle, then broadly curved to apex; striae rather deep, their punctures fine and well separated; intervals convex, each with numerous minute punctures, each one of which bears a very fine hair. Under surface of abdomen finely and sparsely punctate, that of prosternum reticulate-punctate. Male with three basal joints of front tarsi rather widely dilated and spongy pubescent beneath, first three segments of abdomen widely and shallowly concave, the fifth with a broad, rounded concavity at middle. Length 4.5 mm.

Described from four males taken December 22-24 beneath dried cow dung in a sandy lane. Allied to *humilis* Casey, but body broader and form and sculpture of thorax, and secondary sexual characters very different. Specimens have been sub-

*Trans. Amer. Ent. Soc., XVI, 1889, 260.

mitted to Mr. Fall and Col. Casey, and both say it is unlike any species known to them.

Arrhenoplita ferruginea Lec.

A colony of 20 or more adults of this interesting Tenebrionid were taken on Jan. 25 from a woody fungus on the side of an oak log. Larvæ and pupæ were also present. Described from Louisiana, Schwarz lists it as rare at Enterprise, Fla., in company with *Boletotherus bifurcus* Fab.

Helops cisteloides Germ.

I can find no mention of this species in any of the published lists of Florida beetles. Horn in his "Tenebrionidæ"* gives the "Gulf States" as its habitat. About Dunedin it is quite frequent during the winter months, a score or more being taken from between the bundles of a stack of shingles, and others at porch light.

Mycetochares puncticollis, sp. nov.

Elongate, slender, subparallel. Black, very sparsely clothed with a fine, prostrate, brownish-yellow pubescence; elytra each with a large oval reddish-yellow humeral spot; antennæ, labrum, tibiæ and tarsi pale brownish-yellow, femora and under surface piceous. Eyes rather large, separated by twice their width. Thorax nearly twice as wide as long, basal foveæ two, small; sides broadly curved; hind angles obtuse; surface, as well as that of head, finely, very densely and evenly punctate. Elytra as wide at base as thorax, disc without trace of striæ, very finely and closely rugosely punctate. Under surface minutely and sparsely punctate. Front coxæ separated by a prosternal process. Length 3.8 mm.

Described from a single specimen sifted from dead leaves, March 8. Allied to *fraterna* Say but differs from it and all other described species by the fine, dense punctuation of thorax. The pale spot of elytra is oblong-oval and confined to the humerus, whereas in *fraterna* it is much larger and placed obliquely between humerus and suture.

Anthicus convexulus Casey.

Single specimens were swept from huckleberry on March 20 and April 8. Described from South Carolina.

*Trans. Amer. Phil. Soc., XIV, 1870, 936.

Eleminus ashmeadi Casey.

Four examples have been taken at Dunedin, February 23—April 11, by sweeping ferns in a wet hammock, and another at Sanford on March 28. The unique type of Casey was from St. Nicholas, Florida.

Zonantes schwarzi Casey.

A specimen of this well-marked, little Anthicid was beaten from the flowers of the Virginia willow, *Itea virginica* L., in a wet hammock on March 27. Only the type, described from Biscayne Bay, Fla., has heretofore been recorded. From Casey's description* the Dunedin specimen differs somewhat in colour, the median black bar of elytra being broken at the suture, while the legs are pale except the femora which are black at base.

Sandytes ptinoides Schz.

This species occurs on ferns and other foliage in wet hammocks. Two specimens have been taken near Dunedin, one December 17, the other March 12. It is recorded from New Smyrna and Enterprise by Schwarz as very rare.

Gnathium francilloni Kirby.

Four specimens taken by sweeping low vegetation along the margin of a pond, October 26. No previous published Florida record can be found.

Nemognathus nemorensis Hentz.

One specimen taken with the preceding. "Tampa, very rare," is Schwarz's record.

Nemognathus vittigera Lec.

Ft. Myers, Sarasota and Dunedin, one specimen from each locality; March 4—June 10; the one on the latter date at porch light, the others on flowers of thistle. Le Conte gives its range** as Illinois, Missouri and Texas.

Alloxaxis pleuralis Lec.

Six specimens at porch light; June 10—July 5.

Alloxaxis floridana Horn.

Also at porch light, nine specimens having been taken in June and July. It is very probable that this will prove to be only a

*Ann. N.Y. Acad. Sci., VIII, 1895, 783.

**Trans. Amer. Ent. Soc., VIII, 1880, 215.

pale variety of the preceding. Horn's unique type was from Biscayne Bay.

Paragraphus setosus Blatch.

This genus and species were founded* on a single specimen taken in the axils of a thistle on Hog Island. Especial attention was given to the search for additional examples during the past winter. On December 27, the first visit to that portion of the island where the type was found, more than 40 thistles were chopped up, and 71 examples of *Agraphus bellicus* Say taken from their axils, as well as a number of *Tanymecus lacena* Hbst., but no *Paragraphus*. On January 29 another trip was made. The two species mentioned were still found but in diminished numbers, and after a long search a single example of the *Paragraphus* rewarded my efforts, so that now two are in my collection. Both the type and its mate were taken within 50 yards of one another, and within that distance of the Gulf beach on the western side of the island and about the middle of its length.

Conotrachelus maritimus, sp. nov.

Oval, robust. Dark reddish-brown, vertex and elytra thinly clothed with short, scale-like prostrate reddish hairs; elytra each with a small spot of similar white hairs at the bases of the third and fifth intervals, and a minute tuft of mixed white and reddish scales near apex of third interval. Beak as long as thorax, male, as head and thorax, female, finely carinate above, striate on sides, coarsely and densely punctate. Thorax almost naked, bell-shaped, about as wide as long, sides broadly rounded, much narrowed in front, base bisinuate; disc with a trace of a very fine median carina, coarsely, very densely and deeply reticulate-punctate, each puncture enclosing a prostrate, oblong reddish scale. Elytra oval, nearly twice as wide at base as thorax, sides straight from base to middle, then strongly converging to the obtuse apex; striae feebly impressed, each marked with a row of small, rounded punctures, each puncture partly closed by a prostrate, oblong scale; third, fifth and seventh intervals slightly elevated, all the intervals with a row of very short, erect black bristles, those on the declivity more evident and in part paler. Under surface and femora coarsely and densely punctate, each

*Rhynchophora of N. E. Amer., 1916, 110.

puncture scale-bearing like those of thorax. Femora armed with a small obtuse tooth; claws with a long acute one. Length 3.5-3.8 mm.

A compact and prettily marked little species, described from nine specimens taken singly or in pairs, February 17-22, beneath chunks of dead stems of saw palmetto along the borders of a thinly wooded tract one mile north of Dunedin, on the margin of Clearwater Bay. None of them were more than 50 feet from the edge of the water at high tide. The species belongs to Group III of the genus *Conotrachelus* as treated in the Rhynchophora of N. E. America. In some of the specimens the elytra are in part faintly mottled with minute patches of isolated white scales.

Anchonus duryi Blatch.

This peculiarly sculptured Cossonid was described* from specimens taken at Sarasota and West Palm Beach. It is also in the National Museum from St. Petersburg, 21 miles south of Dunedin. Single specimens were taken during the winter, January 24 and February 17, both under the same conditions and in the same locality as the *Conotrachelus* above described.

Since the second paper of this series appeared in the July Canadian Entomologist, Mr. E. A. Schwarz has called my attention to the fact that the name *Ischyryus tripunctatus* has been preoccupied by Crotch (1873) for a Santo Domingo species. The species I described under that name may, therefore, be known as *Ischyryus dunedinensis*.

Mr. Schwarz also cited me to a paper by H. G. Hubbard (Psyche, Vol. IV p. 215) on *Hypotrachia spissipes* Lec., in which the female is first described and the habits of both sexes given from specimens observed at Crescent City, Fla.

In addition to the localities given for *Chlorophorus annularis* Fab., Schwarz adds China, Japan and the Philippines, where it breeds in bamboo, a plant which has been introduced extensively in and about Dunedin. He states that; 'Unless the beetle becomes established in the bamboo debris wherever the plant is grown in this country, it should not be included in our lists.'

*Rhynchophora, p. 521.

LOUISIANA RECORDS OF THE BINDWEED PROMINENT.
(*SCHIZURA IPOMEÆ* DDY.)BY E. S. TUCKER, STATE AGRICULTURAL EXPERIMENT STATION,
BATON ROUGE, LA.

Three specimens of a prominent caterpillar were collected on rose leaves, at the home of the writer in Baton Rouge, La., October 4, 1913. On being confined with the sprigs of the plant on which they fed for a while, one soon pupated in an oval cocoon covered with fragments of dried leaves. Another only succeeded in spinning a similar cocoon, as it died inside of the latter without pupating. The third failed entirely. Not until after a moth was found to have emerged from the first cocoon, on January 28, 1914, the adult then being somewhat rubbed but alive, could the species be positively identified. A critical study of the specimen led to the conclusion that it represented the bindweed prominent, *Schizura ipomeæ* Ddy. The larvæ had agreed as closely with figures of same stage of *Schizura unicornis* S. & A. as with that of the determined name, according to Packard's monograph.

Again at the same place on September 25, 1914, similar larvæ of medium size were taken while feeding on the rose leaves. These examples agreed more closely with Packard's figures of the bindweed prominent than with the unicorn prominent. They pupated about 10 days later, each in the same kind of cocoon as mentioned in the preceding case.

Slight attacks by what appeared to be the same species of caterpillar on pecan foliage came to the writer's attention while inspecting nursery stock at Ferriday, Concordia Parish, La., on September 16 of the latter year. Then under date of the 29th of the same month, a correspondent at Newroads, Pionte Coupee Parish, La., sent like specimens, complaining that the caterpillars were eating the foliage of his young pecan trees. He added, however, that only a few of his trees which had been set out during the preceding winter were attacked so far, and the insect seemed to prefer the less vigorous growth. In asking information about it, he desired to know if means of control would be necessary, and if so, what treatment would be advisable. For reply, the opinion was given that unless the insect became very numerous it could

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hardly do much harm owing to the lateness of the season. In case its depredations should ever present a serious aspect, however, it could easily be poisoned with an arsenical spray.

On August 3, 1915, the writer once more recognized a partially grown caterpillar by its markings and form as the same species, this occurring on a rose bush of a florist's place at Hammond, Tangipahoa Parish, La. As the grower had made a practice of picking off and destroying all such enemies on his plants, he had kept his stock free from ravages.

An inquiry dated October 30 of the same year, which was received from Plaquemines, Iberville Parish, La., brought the species to further notice by referring to a specimen of worm which was destroying rose bushes. Inspection of the accompanying material revealed a partly grown caterpillar answering in all particulars to the bindweed prominent.

A NEW SPECIES OF PHENACOCCLUS
(HEMIPTERA, HOMOPTERA).

BY A. H. HOLLINGER, COLUMBIA, MO.

Phenacoccus pettiti, sp. nov.

Eggs.—Apparently just deposited under the body of the adult female with only a few fine, white, waxy hairs to hold them together, but not enough to be called an ovisac; egg-shells white.

Young.—Lemon or straw-coloured, about 5 mm. long; ovoid with rather broadly rounded extremities; antennæ and legs pale yellow; antennæ about one-half the length of the body or the length of the transverse diameter of the body; very active; eyes blackish; apparently ventrally placed and far apart; a stout, white waxy spur arising from between the anal lobes.

Adult female.—About 2.5 mm. long and 1.3 mm. wide; oval-elliptical; somewhat truncate across the cephalic end; white, waxy exudation at the anal end; body slate-gray to brownish-gray; covered both dorsally and ventrally with a white secretion of waxy powder; on the dorsum laterad of the median line are two rows of abdominal and thoracic depressions which are lacking in secretion; lateral margins covered with abundant white, woolly, waxy secre-

tion, occurring also more or less abundantly over the dorsum, but especially noticeable in irregular longitudinal masses between the latero-medial rows of depressions on the dorsum, and also laterad of each row; a fringe of seventeen short, white, waxy spurs along

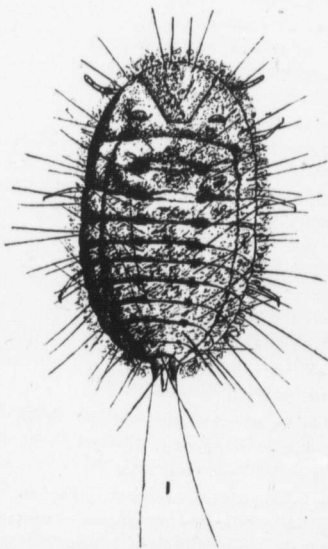


Fig. 24.—*Phenacoccus pettiti* n. sp., greatly enlarged. Note the two longitudinal rows of dorsal depressions and the long, waxy filaments.

either lateral margin of the body, the two caudal ones being the longest; entire dorsum bearing long, thin, silken, glass-like hairs, some of which are as long or longer than the insect; they break off very easily, but are soon replaced by new ones; iridescent; apparently arising from definite locations, for some of them are marginal, arising from about the middle of each segment while others are just anterior and posterior to each dorsal depression; apparently more in the caudal than in the cephalic region, as many as ten arising from the fourth segment from the anal end of one female; legs and antennae pale brownish, when boiled in 10% KOH turns red-brown to brick-

red, but does not colour the solution.

Adult female mounted,—2.7 mm. long and 1.8 mm. wide; *derm* in cephalic region bearing numerous long and short body hairs, most numerous cephalad of the mouth-parts and between the basal segments of the abdomen; also with numerous short and long body hairs in proximity to the anal orifice; cerarius type of gland-pores scattered over the *derm*; several large gland-pores of the "circumgenital" type also near the anal opening; many large

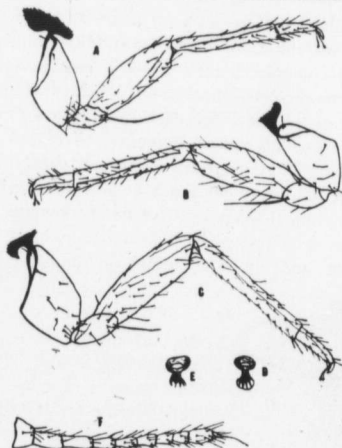


Fig 25.—*Phenacoccus pettiti* n. sp., A, fore leg; B, middle leg; C, hind leg; D, anterior spiracle; E, posterior spiracle; F, antenna.

body-glands near the margins of the body as well as a few scattered over the surface; these glands project above the derm, as in figure; legs and antennae very well developed, strongly chitinized, and with numerous long hairs; *antennal formulae* variable, as follows: 325946178, 32(59)46178, 3(92)5416(78), (23)9154678, (23)95146(78), 329514678, 329(154)678, 32954(16)78, 329546178, 329546187, 32945(61)78, 329451678, 3(29)51(46)78, 3(29)541678, 3925(16)478, 3(92)514678, and 3(29)5(146)78; *antennal curves* as in diagram, *leg measurements*

showing the extremes as follows:

	<i>Trochanter and Femur</i>	<i>Tibia</i>	<i>Tarsus</i>
Prothoracic leg.....	350 x 91	279 x 41	103 x 27
Mesothoracic leg.....	368 x 94	309 x 35	121 x 32
.....	376 x 94	320 x 38	115 x 32
Metathoracic leg.....	385 x 97	323 x 44	118 x 32
.....	412 x 94	368 x 47	118 x 32
.....	420 x 97	397 x 50	132 x 32

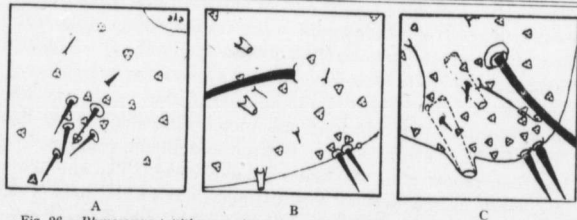


Fig. 26.—*Phenacoccus pettiti* n. sp., A, cerarius of anal lobe on ultimate segment; B, cerarius of penultimate segment; C, second head cerarius.

Tarsal claws 32 mmm. long; tibial spines vary from 20 mmm. to 30 mmm. in length; trochanteral spine varies from 118 mmm. to 147 mmm. long, being of constant length in each specimen; *spiracles* large and Sclerotinia-shaped; *anal lobes* slightly developed, well rounded on the distal ends, and each bearing a seta or hair varying from 265 mmm. to 295 mmm. in length; also bearing several other hairs of varying lengths, from very minute (about 5 mmm.) to longer ones (45 mmm. to 90 mmm.); also bearing *cerarii* composed of two stout, conical spines, surrounded by several small, obscurely-triangular wax pores; also bearing four large gland-pores, two on each lobe, and about 20 mmm. in diameter,

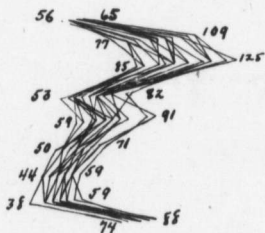


Fig. 27.—Antennal curves of *Phenacoccus pettiti* n. sp.

from which lead cylindrical tubes; *cerarii* distinct and somewhat elevated upon rounded protuberances; *cerarii* of the ultimate and penultimate segments and the second head group as in figures.

Type locality.—Vicinity of Columbia, Boone County, Mo.

Remarks.—The writer names this species in honour of Professor Pettit, Entomologist of the Michigan Agricultural Experiment Station. It has been found in the act of feeding on *Ambrosia trifida*, *Psedera quinquefolia*, *Rhus toxicodendron*, *Cercis canadensis*, *Symphoricarpos orbiculatus*, and *Fraxinus americana*. It was collected from *Celtis occidentalis*, *Carya ovata*, *Ostrya virginiana*, and *Acer saccharum* upon which it was merely crawling. It is distributed in Missouri in Gentry, Jackson and Boone counties, and it has been reported to the writer from Kansas. The characteristic dorsum of this species will distinguish it in the field while mounted specimens show many distinguishing characters, most important of which are the projecting glands in the anal lobes.

NOTES ON NEBRASKA BEMBICINÆ.

BY CLARENCE E. MICKEL, LINCOLN, NEBRASKA.

Recently the writer worked over the material of the sub-family Bembicinae in the entomological collection of the University of Nebraska. In view of the fact that there seems to be very little Nebraska material of this sub-family in other entomological collections and since a monograph of the Bembicinae has lately appeared, the time seems opportune to publish a list of the Nebraska species. Some notes on synonymy are also included.

Genus STICTIELLA Parker.

Stictiella pictifrons (F. Smith).

Specimens examined: 2 ♀'s. Omaha, 1; Weeping Water, 1. July.

Stictiella plana (Fox).

Specimens examined: 3 ♀'s, 4 ♂'s. McCook, 1; Halsey, 3; Mitchell, 2; Glen, 1. July 10 to August 15.

Stictiella emarginata (Cresson).

Specimens examined: 4 ♀'s, 4 ♂'s. South Sioux City, 1; Maskell, 2; Mitchell, 1; Warbonnet Canyon, 4. June 28 to July 24.

Stictiella speciosa (Cresson).

Specimens examined: 6 ♀'s. Haigler, 1; Sidney, 4; Mitchell, 1. August.

Stictiella spinifera (Mickel).

1916, *Stictia spinifera* Mickel, Trans. Amer. Ent. Soc., XLII, p. 418, ♂.

1917, *Stictiella melampous* Parker, Proc. U. S. Nat. Mus., LII, p. 43, ♂.

The writer has carefully compared the type of *spinifera* with the description and figures of *melampous* published by Mr. Parker, and finds *melampous* to be identical with *spinifera*.

Specimens examined: 3 ♂'s. McCook, 2; Glen, 1. July, August.

Stictiella exigua (Fox.)

Specimens examined: 6 ♀'s, 2 ♂'s. Glen, 7; Warbonnet Canyon, 1. July 12 to August 17.

Stictiella divergens Parker.

1917, *Stictiella divergens* Parker, Proc. U. S. Nat. Mus., LII, p. 55, ♂.

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Attention should be called to the fact that *Stictiella exigua* Mickel, ♂ (Trans. Amer. Ent. Soc., XLII, p. 419) is the same as *divergens*. However, Mr. Parker has assigned another male to *exigua* in his monograph. Biological evidence is needed to show which of these is really the male of *exigua* and to determine the status of the name *divergens*.

Genus BICYRTES Lepeletier.

Bicyrtes fodiens (Handlirsch).

Specimens examined: 1 ♀, 1 ♂. Louisville, 1; Meadow, 1. July.

Bicyrtes ventralis (Say).

Specimens examined: 12 ♀'s, 31 ♂'s, Nebraska City, 1; Omaha, 8; South Bend, 3; Lincoln, 2; Cedar Bluffs, 2; Neligh, 1; Carns, 3; Halsey, 1; Mitchell, 12; Gordon, 1; Glen, 8; Monroe Canyon, 1; Warbonnet Canyon, 1. June 25 to September 27.

Bicyrtes quadrifasciata (Say).

Specimens examined: 9 ♀'s, 16 ♂'s. Omaha, 14; Louisville, 8; South Bend, 1; Meadow, 1; Haigler, 1. July 4 to September 12.

Bicyrtes capnoptera (Handlirsch).

Specimens examined: 5 ♀'s, 2 ♂'s. Mitchell, 7. July 20 to September 4.

Genus BEMBIX Fabricius.

Bembix arcuata Parker.

Specimens examined: 3 ♂'s. Meadow, 3. July.

Bembix nubilipennis Cresson.

Specimens examined: 31 ♀'s, 5 ♂'s. Omaha, 5; Louisville, 3; Lincoln, 23; Fairmont, 2; Holdrege, 1; Culbertson, 1. July 9 to September 8.

Bembix sayi Cresson.

Specimens examined: 8 ♀'s, 19 ♂'s. Lincoln, 3; Fairmont, 1; Haigler, 2; Imperial, 4; North Platte, 1; Halsey, 1; Mitchell, 15. June 22 to August 17.

Bembix belfragei Cresson.

Specimens examined: 3 ♀'s, 3 ♂'s. Omaha, 1; West Point, 1; McCook, 2; Haigler, 1; Halsey, 1. June to August.

Bembix spinolæ Lepeletier.

Specimens examined: 219 ♀'s. Child's Point, 2; Omaha, 47; Louisville, 19; Lincoln, 16; Fairmont, 7; Cedar Bluffs, 1; South

Sioux City, 4; Niobrara, 1; Norfolk, 1; Neligh, 1; Red Cloud, 3; McCook, 1; Haigler, 3; Halsey, 5; Valentine, 2; Mitchell, 86; Glen, 12; Harrison, 3; Monroe Canyon, 5. June 18 to October 11.

Bembix primaestate Johnson and Rohwer.

Specimens examined: 12 ♀'s. Mitchell, 5; Glen, 5; Monroe Canyon, 1; Warbonnet Canyon, 1. July 11 to August 14.

Bembix pruinosa Fox.

Specimens examined: 11 ♀'s, 6 ♂'s. Child's Point, 1; Omaha, 6; Louisville, 2; South Bend, 1; Ashland, 5; Neligh, 2. July 2 to September 3.

Genus MICROBEMBIX Patton.

Microbembix monodonta (Say).

Specimens examined: 51 ♀'s, 23 ♂'s. Omaha, 15; Louisville, 5; South Bend, 13; Ashland, 27; Lincoln, 2; West Point, 2; Neligh, 3; Haigler, 1; Halsey, 1; Mitchell, 3; Gordon Creek, 1. June 18 to September 30.

A NEW SPECIES OF AGRILUS FROM CALIFORNIA.*

BY W. S. FISHER, BUREAU OF ENTOMOLOGY, WASHINGTON, D.C.

Among a collection of Buprestidæ, submitted by Mr. H. E. Burke for determinations, a large series of the following species was found, which has been confused in collections with *Agrilus politus* Say, and the description is presented at the present time, so that the name can be made available for discussing this species in economic papers.

Agrilus burkei, n. sp.

Form of *politus*, of a deep blue to bluish-green colour and moderately shining. Antennæ of a uniform blue or bluish-green throughout, rather short, not reaching to the middle of the prothorax, serrate from the fourth joint. Head nearly flat in front, with a shallow, transverse groove at base of clypeus, terminating in a deep pit just above the base of the antennæ, a feeble median depression reaching from the occiput to near the middle of the front; front coarsely granulate, sparsely clothed with short, white pubescence; occiput strigose. Prothorax wider than long, narrower at base than apex; sides arcuate, feebly sinuate near the posterior

*Contribution from the Branch of Forest Insects, Bureau of Entomology.
August, 1917

angles, which are carinate in both sexes, sinuous when viewed laterally; disc convex with two shallow, median depressions, one near the base and the other near apex, and with deep, prominent lateral depressions; surface coarsely, transversely rugose, with fine, indistinct punctures between the strigæ. Scutellum transversely carinate, surface very finely granulate. Elytra slightly sinuate behind the humeri, dilated behind the middle, and slightly sinuate near the apex, which are separately rounded and serrulate; disc slightly flattened, basal impressions large and deep, reaching from the scutellum to humerus, surface closely imbricate-granulate, without any trace of costæ. Body beneath of same colour as above but more shining, finely, transversely strigose, and sparsely clothed with fine, short, white pubescence; prosternal lobe slightly emarginate; intercoxal process broad, slightly narrowing to apex. Pygidium without a projecting carina. First joint of hind tarsi as long as the next three joints united. Length 6-9 mm.; width 1.75-2.50 mm.

Male.—Front densely punctured and pubescent. Prosternum densely punctured and hairy. Claws of anterior and middle feet cleft near the apex, nearly bifid; posterior claws cleft at middle; forming a broad tooth.

Female.—Front more shining and less densely pubescent. Prosternum sparsely pubescent. Claws of all feet cleft at middle, forming a tooth.

Habitat.—Placerville, California.

Type, allotype and paratypes.—Cat. No. 21386, U. S. N. M.

Described from a large series of specimens recorded under various Bureau of Entomology, Hopk. U. S. Numbers. These specimens have been reared by Mr. H. E. Burke from material collected at various times by himself, J. J. Sullivan and F. B. Herbert. The larvæ of this species mine in the inner bark and wood of normal, injured, and dying white alder (*Alnus rhombifolia*), and paperleaf alder (*Alnus tenuifolia*).

This species is closely allied to *politus* but differs from it chiefly in colour and habits. Horn in his Revision of the genus *Agrilus* (Trans. Amer. Ent. Soc., XVIII, p. 316, 1891) places all the brassy green or blue forms under LeConte's name *desertus*, which is preoccupied and which has been renamed *solitarius* by

Harold (Col. Hefte, vol. V, p. 124, 1869). LeConte in the original description, does not mention a blue form, but gives the colour as "æneus subnitidus." Horn in the above Revision places all of these forms as synonyms of *politus* Say, in which he says, "The difference of colour has given rise to several names which do not seem worthy of retention, even as varietal names, inasmuch as the intergrading of colour is so gradual as to render it impossible to separate them." At the time Horn wrote his paper on this genus very little was known of their food habits, but as the habits of these insects become better known, and where large series have been reared, the colour seems to be quite constant, so it will be necessary to restore some of the old names.

TOM WILSON.

In the full vigour of his energetic life and while carrying out his duties as Inspector of Indian orchards, Mr. Tom Wilson was burnt to death on March 6th, 1917, when the Quahalla Hotel at Hope, B.C., was totally destroyed by fire.

Few men were more widely known or more universally liked in British Columbia than Tom Wilson, whose extensive knowledge of the natural history of the province, and particularly of the flora, was at the service of all students and nature lovers.

He was born at Mussleburgh, Scotland, on July 25th, 1856. As a young man he learned horticulture and forestry, and at the age of 22 was Foreman in the Royal Botanic Gardens, Edinburgh. Two years later he went to India where he spent six years. Repeated attacks of fever compelled him to return to Scotland, but in 1885, a few months after his return, he came to Canada. After a varied experience in railroad construction, farming and orchard planting he reached Vancouver, B.C., in 1896, and later was appointed as Fruit Inspector in the Provincial Department of Agriculture. In 1900 he was appointed Superintendent of Fumigation at Vancouver, B.C., by the Dominion Government, and in 1906 additional duties as Inspector of Indian Orchards were assigned to him. In 1911 he was relieved of his duties as Superintendent of Fumigation in order that he might devote his entire time to the work in the Indian orchards, an important section of the work of the Entomological Branch. To this work he devoted himself

wholeheartedly. At first his duties consisted in cleansing the Indian orchards, or one might say with greater exactness, the fruit trees on the Indian reserves in British Columbia. From this the work developed under his guidance until the Indians were not only growing excellent fruit but were learning to pack their fruit in the approved fashion, and in many reserves young orchards were being planted. Mr. Wilson wrote an account of the work in the Indian orchards in *The Agricultural Gazette of Canada*, October, 1916. (Vol. 3, No. 6, pp. 856-860.) The Indians and those gentle Sisters who teach the Indian children will miss him.

During his thirty odd years in British Columbia he acquired an extraordinary knowledge of the trees, plants and insects of the province, and long before the establishment of ecology as a special study he had especially interested himself in questions relating to plant distribution and association. He was always connected with the promotion of entomological work in British Columbia, and in 1912 was President of the Entomological Society of British Columbia, to the *Proceedings* of which he contributed papers from time to time. In conjunction with his friend A. H. Bush he made an excellent collection of the insects of British Columbia, and last year, after the death of his old friend on military service in France, he presented the collection to the Entomological Branch, where it now forms part of the Canadian national collection of insects.

He occupied a unique place in the small band of workers in British Columbia. His memory and his hands were at the service of all students of the subjects that he himself so diligently studied. Mountain, forest and the open country were his laboratory, and a journey in his company was a delightful experience. Nothing escaped his attention, and one felt the refreshing effect of a mind that had been stored in the open. His sister, in a recent letter to me, writes: "He enjoyed life so thoroughly lately, was so wholehearted in his pursuits that one did not think of him as in his 62nd year. His splendid constitution, the open air life and the intense love of his work, together with the close touch with nature, all combined to make the years pass lightly. . . ." His tragic death has removed a keen student of nature, a staunch friend and a faithful servant of the State.

C. GORDON HEWITT.

CLEANING BUMBLE-BEES.

Recently, when looking over some back numbers of the CAN. ENT. I came across Mr. Sladen's article on page 116 of vol. XLV, 1913, entitled "Bumble-Bees and Wasps Wanted," and noticed that in the second paragraph he says that "crushed tissue paper should be placed in the cyanide jar to absorb moisture which would otherwise mat and spoil the bees." As I have had some experience in the matter I thought perhaps a cure for this trouble might be of sufficient interest to warrant publication. Several years ago I visited a peach orchard in full bloom, and swarming with bumble-bees. I caught a nice lot of them and took them home, and when I came to pin them out I found that they were all as wet as the traditional "drowned rat," and apparently ruined. I decided to experiment with them; they couldn't be made to look any worse any way and perhaps might be bettered. I took a good-sized bottle with a wide mouth, filled it about half full of water, dumped the bees into it, corked it tightly, and shook it violently for several minutes. I then poured off the water and poured in more and shook again, repeating the process until the water seemed perfectly clean. I then spread the bees out on blotting paper and left them for a few minutes to get rid of the excess of the water, then put them back into the bottle and covered them with denatured alcohol, letting them stand until I thought the alcohol had had time to unite with the water, (perhaps 15 minutes) and then removed them again to fresh blotters to get rid of most of the alcohol, after which I again returned them to the bottle and flooded them with gasoline. After a few minutes in this bath they were again placed on blotting paper, and in a few minutes the gasoline all evaporated, and the bees were as fresh and clean as though never wet; cleaner in fact, for often fresh specimens are badly daubed with honey on the face and head. Possibly the last bath might not have been necessary, but it made them dry quicker. The same process would, I think, be equally successful in cleaning moths which have been drowned in sap buckets, only, of course, they should not be shaken in a bottle, but floated on a pan of water and moved around carefully to get rid of the sugar, just as the bees are freed of the regurgitated honey which is the cause of their being wet and sticky. E. J. SMITH, Sherborn, Mass.

BOOK NOTICE.

PROCEEDINGS OF THE ENTOMOLOGICAL SOCIETY OF NOVA SCOTIA
FOR 1916. No. 2, January, 1917.

The Entomological Society of Nova Scotia deserves great credit for the admirable work it has already accomplished in the short period since it came into being. We have recently received a copy of vol. II of the Proceedings of the Society, containing the papers and addresses presented at the Annual Meeting, which was held at Truro on August 4, 1916. This is a publication of 64 pages, and contains in addition to excellent addresses by the President, Mr. E. C. Allen, and the Superintendent of Education, Dr. A. H. MacKay, thirteen papers on entomological subjects by various members of the Society. Of these papers no less than five are contributions from the Society's indefatigable Secretary-Treasurer, Prof. W. H. Brittain, the Provincial Entomologist, while two more are by the same author in collaboration with others. Mr. G. E. Sanders, of the Dominion Entomological Laboratory, Annapolis Royal, contributes four papers, including one in collaboration with Prof. Brittain.

The list of papers in addition to official reports and addresses is as follows:

"Some Results From a Few Combination Sprays," (W. H. Brittain); "How to Collect and Preserve Insects," (L. A. De Wolfe); "The Nova Scotia Division of Entomology," (W. H. Brittain); "The Effect of Certain Combinations of Spraying Materials on the Set of Apples," (G. E. Sanders); "The Acrididæ of Nova Scotia," (C. B. Gooderham); "The Apple Seed Chalcis," (W. H. Brittain); "Biting Insects Injuring the Fruit of the Apple in Nova Scotia," (G. E. Sanders); "Notes on two Species of Tree-hoppers," (W. H. Brittain); "Arsenate of Lead vs. Arsenate of Lime," (G. E. Sanders); "The Dock Sawfly," (A. G. Dunstan and F. C. Gilliatt); "Notes on the Rose Leaf-hopper," (W. H. Brittain and L. G. Saunders); "Notes on the Rosy Aphis," (W. H. Brittain); "The Toxic Value of Some Common Poisons," (G. E. Sanders and W. H. Brittain).

Mailed August 1st, 1917.