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The Canadian Entomologist.

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NOTES ON AEGERIA PINI.

BY D. S. KELLICOTT, BUFFALO, N. Y.

The description of this moth on page 7 of this volume was drawn from a single female specimen and that not in good condition. I have this season secured fresh examples of both sexes; from these I note some additions and corrections to the previous account.

The male is smaller than the female but of similar ornamentation. The antennæ are fimbricate; the hoary hairs towards the base are nearly equal in length to the diameter of the joint on which they stand. The fourth abdominal ring bears an orange band on the posterior half in the female; it occupies nearly the entire width of the ring in the male. The black of the upper side of the abdomen is continued in the tail fringe. As regards the color of the head, the vertex in one female was black, in one black with a few orange hairs, in another the orange equals the black; it is orange in all the males seen; the under side of first joint of palpi is orange. There are a few orange scales on the coxæ of the first pair, and an oblique tuft of same color on inner side of fore tibiæ; these marks occur in both sexes. In some examples there are a few orange scales or hairs on top of thorax, especially on the inner edge of shoulder covers.

It seems worthy of note that the specimens hatching in confinement, and so not having used their wings in flight, have the hind wings sparsely covered with scales, as in the case of the newly hatched *sesia*. These scales fall off easily, but appear to be retained more firmly than in the former cases with which I am acquainted. An apparently full grown larva brought in July 15, 1880, gave a pupa May 19 and an imago July 2, from which I conclude that the larva does not transform until two years old. The moths appeared ten days later in 1880 than in 1881.

DESCRIPTION OF PREPARATORY STAGES OF HELICONIA CHARITONIA, LINN.

BY W. H. EDWARDS, COALBURGH, W. VA.

EGG—Cylindrical, one half higher than broad, flat at base, tapering very slightly from base to about three fourths the length, then conoidal, the top flattened and a little depressed; marked by 14 vertical ridges, straight, narrow, not very prominent, and extending from base to the middle of the cone; below the cone are horizontal striæ, which with the ridges enclose long, rectangular spaces; there are nine tiers of these, each space roundly excavated; above the base of the cone are similar spaces in one tier, but they are higher and more nearly square and more deeply excavated; next these is a tier of seven cells, irregularly pentagonal; the flattened top is composed of three concentric rows of small spaces, the outer one largest, and this and the next formed of pentagons; the inner row is made of rhomboids with the micropyle in the centre; color yellow. Duration of this stage 3 days.

YOUNG LARVA—Length .08 inch; cylindrical, segments 2 to 7 of about even thickness, then tapering, the dorsum sloping; marked by six rows of rounded tubercles, each of which sends out a long black hair, those on three anterior segments bent forwards, the others back; there is also a minute tubercle at the junctions of the segments a little below the subdorsal row, with short hairs; color pale red-brown; legs and feet same; head obovoid, a little lighter in hue than the body; sparsely pilose. To 1st moult 2 to 3 days.

After 1st Moult—Length .22 inch; cylindrical, nearly even, the segments a little rounded; color light brown, changing, as the stage proceeds, to greenish-white, mottled with brown; armed with six rows of spines, two sub-dorsal, one on middle of each side, and one infra-stigmatal; these spines are short, slender, tapering, black, with a few short black bristles on the sides standing almost at right angles to the spine; on 2 a chitinous dorsal patch with hairs; feet and legs brown; head obovoid, truncated, a little depressed at the suture, the vertices low, rounded, and on each a short, tapering blunt process, black, with a few fine bristles. To next moult 2 days.

After 2nd Moult—Length .5 inch; color dull white, mottled or

spotted with yellow-brown; under side wholly brown; the spines long, sharp; head as before. To next moult 2 days.

After 3rd Moult.—Length .7 inch; slender, whiter than before, the color not pure but with a green tint; dorsal spines .1 inch long, upper laterals .09 inch, lower laterals .07 inch; head greenish-yellow, the processes more like the body spines, .08 inch long, directed forward and a little recurved. To next moult 3 days.

After 4th Moult—Length 1 inch, and in 3 days reached maturity.

MATURE LARVA.—Length 1.25 to 1.5 inch; cylindrical, slender, nearly of even size from 2 to 12, the segments a little rounded; color dead white, with no gloss, smooth, with no hairs; spotted with black or black-brown, the spots disposed in cross rows, two of which are back of the spines and one on the extreme anterior end of the segment; mostly rounded or oval, but those on medio-dorsal line are half-oval except the spots on the posterior edges of the segments, which are triangular; these spots form one dorsal row and two on either side; over the basal ridge, on 4 to 11, is a brown patch covering the adjacent edges of the segments; another patch covers each spiracle; under side reddish-brown with a green tint; segment 2 has a dorsal chitinous bar divided in middle, and on either part are two black tubercles with hairs; the body furnished with six rows of spines, two sub-dorsal, one on middle of each side, and one infra-stigmatal; the dorsals run from 3 to 13; the upper laterals from 5 to 13, the lower from 5 to 12; and between 2 and 3, 3 and 4, in line with upper laterals, is a spine; the spines of the four upper rows are straight and erect, but those of the lower row are turned down and a little recurved; all are alike, shining black, and about each are from 5 to 7 short black bristles irregularly placed; the dorsals measure .16 inch, the 1st laterals .14, the lower 1 inch, and there is little variation in the length of the spines of each row; legs brown, tipped black, pro-legs brown, with a black spot on the side of each; head obovoid, rounded in front, truncated, a little depressed at the suture, the vertices but little elevated, rounded; color greenish-white, vitreous; on either side the suture on mid-front a round black spot; the ocelli black on a small black patch; mandibles black; on each vertex a black spine nearly like those of the body, but less tapering and more blunt, .1 inch long, directed forward at about 45°, and a little recurved.

As the larvæ approach suspension the spots change to brown, and the

white becomes dull and sordid. Twelve hours after suspension, pupation takes place.

CHRYSALIS—Length to top of head .95 inch, to end of processes on head 1.1 inch; slender, compressed laterally, the thoracic segments on ventral side highly arched and rounded abruptly down to abdomen; the sides of this elevation covered entirely by the wing cases, sloping, almost flat or a little convex, the two wing cases not quite meeting, but separated by a narrow depressed ridge, on either side of which is a row of small bead-like tubercles, each giving out at top a short sharp bristle or thorn; this ridge widens anteriorly so as to include the antennæ cases, and the rows of beads pass along and around head case to its top on the dorsal side, but for a little distance at the base of the antennæ lose their bristles; head case prominent, compressed transversely, nearly square at top; upon each vertex a narrow leaf-like process, lanceolate, flattened and thin, serrated on both edges, divergent, like horns; mesonotum prominent, compressed at top into a thin carina which rises on the anterior part in a double curve to a sharp point, but on the posterior side slopes at about 45°; followed by a rounded excavation considerably longer than the mesonotum itself; abdomen cylindrical; on the two upper segments a large sub-dorsal, flaring, flattened process rounded irregularly on the edge and completely spanning both segments; on the next segment is a small sharp rounded process, and on the next another small and flattened; on the next a sharp tubercle, in some cases flattened; on the tops of all these processes are thorns, one on each of the smaller, and two on the largest; in row with these, on the depression and on the sides of mesonotum are four low conical tubercles, each with a short thorn; segments 9, 10, 11, in the ventral line, have the anterior edges turned up and produced into low divergent points; at the base of the head case on dorsal side a large burnished gold spot, and the tubercles behind the mesonotum are similar to this in color; general hue brown, in shades; the anterior parts, which includes head case, mesonotum and half the wing cases, being light or yellowish; the rest of wing cases dark, or streaked dark in the interspaces of the wings; the light part of these cases somewhat gray or whitish; the processes on head and the antennæ cases are dark; abdomen varied in longitudinal streaks, confined to each segment, dark and light brown, with some oblique whitish marks on the ventral side. Duration of this stage 6 to 7 days.

This species is common in Southern Florida, and has been taken at

least as far north as Port Royal, S. C., from which place I have seen an example. It is a tropical species, however, and abounds in Central America and the Antilles. By the kindness of Dr. Wm. Wittfeld, of Indian River, eggs were obtained by tying the females in bags over stems of Passiflora, and after several failures, owing to delays on the journey, I received 30th Aug., 1880, larvæ of different sizes. The eggs had been mailed very soon after laying, and the larvæ had hatched on the road. I gave them Passiflora coerulea. All the changes take place with great rapidity, scarcely two days being necessary for each larval stage. When mature, being porcelain-white, with their long black body and head spines, they are conspicuous objects, and very pretty ones. They move about actively, and in habit and general appearance—except color—remind one of Agraulis *Vanillae*. Dr. Wittfeld informs me that on touching the chrysalis of *Charitonia*, it wriggles about and gives out a perceptible creaking noise, but I had not observed this with my chrysalids.* The chrysalis is a most remarkable object, from its general shape and the thorny flattened projections on the abdomen, and the foliaceous processes on the head.

Several imagos came forth in my room and one of them I turned loose in the garden, placing it carefully upon a Passion flower. It rested some moments, with wings fully expanded over the flower and depressed a little below horizontal, and then flew slowly away toward the woods and I saw it no more.

Dr. Wittfeld informs me that these butterflies frequent paths in the woods, or are found feeding at a little distance from the woods, to which they at once betake themselves, if alarmed, and that with rapid wing, though usually their flight is rather heavy and measured. Also that they have the habit of gathering in flocks towards night and roost on Spanish moss, and on dry twigs of trees, especially such as have dead leaves still hanging to them. He has seen them so roosting, always with heads up, to number of 50 or 60. In the morning, after the sun is well up, they come trooping from the woods in search of flowers.

* In Part II of Dr. Weismann's Studies in the Theory of Descent, Lond. con. 1881, is an abstract of a paper by Dr. Fritz Müller, on Brazilian butterflies, in which it is stated that "the pupæ of Heliconius when moving their posterior segments rapidly, as they do whenever they are disturbed, produce a very perceptible hissing noise by the friction of these segments, this sound perhaps serving to terrify small foes."

Mr. Thaxter has described Danais *Archippus* as flocking in this manner, in Florida, but this seems to be a habit at certain seasons, during the day as well as night. *Charitonia* would seem to roost in crowds at night only, and to disperse during the day for feeding, like so many pigeons. I find nothing of this in books, nor have I been able to find that any of the preparatory stages of this species have been figured or even described by authors. I have a complete set of drawings of the egg, larva at each stage, and chrysalis, and shall in due time give a Plate to them in Butterflies of N. A.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Vol. xi., p. 154.)

FAMILY NOCTUIDÆ.

429. PLUSIA RECTANGULA *Kirby*.—Expansion of wings 1½ inch. Taken in Canada by Dr. Bigsby.

Body cinereous, underneath whiter. Antennæ testaceous; thorax crested? as the scales are mostly rubbed off this cannot however be positively asserted; wings incumbent; primaries with a subcrenate edge; inclining to ash-colored, clouded with black, with a subramose rectangular somewhat silvery spot, extending from near the base to the middle of the wing; between which and the apex is a narrow white wavy band, edged with black; and still nearer the margin a zigzag transverse black line; the secondary wings are plicatile, cinereous, and dusted at the apex with brown.

N. B. The silvery rectangular spot in the primary wings of this insect, when they are brought near to each other, forms a quadrangular area very much resembling a picture in a silver frame.

[307.] 430. PLUSIA GAMMA *Linn.*—Expansion of the wings 1½ inch. Taken in Canada by Dr. Bigsby.

Head, crests of the thorax and abdomen gray; these crests are edged with white and in the anterior ones the margin is formed by a black and white line; abdomen cinereous; antennæ above testaceous, underneath white banded with brown; the primary wings are shaded and clouded with black, brown and white, and towards the apex have three indistinct bands, the first white internally abbreviated, the second dark-brown, and the marginal one gray including a transverse series of black crescents; in the disk of the wing is a pallid silvery signature, representing the Greek letter gamma, or the Roman Y, the forked part pointing to the costal margin; from the upper point of the fork a white curving line runs obliquely to the anal margin of the wing near its base; secondary wings light brown, or drab, with the nervures, and posterior margin broadly, dark-brown; fringe alternately dark and light; underneath the wings are cinereous, darker at the apex.

[308.] 431. PLUSIA FALCIFERA *Kirby*.—Expansion of the wings 1½ inch. Taken in Nova Scotia by Dr. Mac Culloch.

Body gray. Antennæ and thorax, when laid bare, testaceous; primary wings gray with a faint reddish tint, a broad brown spot, or cloud, almost triangular, traverses the middle of the wing, which partly includes, and is partly edged, by a sickle-shaped silvery streak; the part representing the handle of the sickle being broader than the rest, and sending forth externally near its apex a short branch, which, with the internal apex of the handle, forms a fork; the inner tine, or branch, of which terminates in a slender line running in a curve to the costal margin, where it touches the scutellum; a brown indistinct cloud, or band, also runs obliquely from the anal to the apical angle of the wing; a very minute, pale streak marks it just transversely above the former angle; the posterior margin is slightly indented; the secondary wings are reddish-brown, with an obsolete, pale, submarginal band.

432. PLUSIA IOTA *Linn.*—Expansion of wings 1¾ inch. Taken in Nova Scotia by Dr. Mac Culloch and in Canada by Dr. Bigsby.

[309.] Body, legs and antennæ fawn-colored, as are likewise the paler parts of the wings; primaries clouded and streaked with dark, and reddish-brown; the disk of these wings is occupied by a large cloud of this color inscribed with two, sometimes silvery, and sometimes golden, brilliant metallic spots, tending to form an obtuse angle with each other; the upper one, or that nearest the base of the wing being acuminated towards that

part, rounded towards the apex, and sending forth two branches towards the costal area; the lower spot is subtriangular or V-shaped, with the point towards the base of the wings; the two together form, in some sort, a semicolon reversed; between the lower or ovate spot and the costa is a rather indistinct circlet of gold or silver, and two streaks of the same lustre may be traced lower down between it and the inner margin of the wing; the disk near the apex is bronzed; from the brown cloud mentioned above runs a wavy brown streak to the external apical angle, the apex itself is terminated by a band formed by indistinct black crescents; and above the streak is a transverse band formed by two faint lines of dark indistinct crescents including a pale band; secondary wings darker at the apex.

N. B. In the Nova Scotia specimens the discoidal spots are silvery, while in that from Canada their lustre is golden. The synonymy of this species seems very doubtful; the metallic signature can scarcely be said to represent either a mark of interrogation, or a Greek Iota reversed; they most resemble a semicolon.

IX.—DIPTERA.

FAMILY CULICIDÆ.

433. CULEX PUNCTOR *Kirby*.—Length of body 3⅓ lines. Two specimens taken in Lat. 65°.

Body black. Proboscis longer than the trunk; sheath black; valvules and lancets testaceous; palpi somewhat incrassated towards the apex; antennæ broken off in both specimens; wings white, iridescent, with testaceous nervures, without scales, hairs and fringe; legs testaceous.

[310.] FAMILY TIPULIDÆ.

434. TIPULA PRATORUM *Kirby*.—Length of body 7 lines. Taken with the preceding.

♂. Head and trunk slate-colored. Antennæ black, with the scape yellow; thorax with four brown stripes, the lateral ones abbreviated; wings embrowned, clouded with white; nervures black, but those at the base of the wing are testaceous; there is a black dot or two near the anterior margin; and the stigma, or what represents it, is black; the poisers are pale but black at the tip; legs obscurely testaceous; thighs

and shanks black at the tip; tarsi black; abdomen clubbed, yellow, with a longitudinal dorsal brown stripe; anal club black.

♀. Wings not spotted with white; legs distinctly testaceous, black at the joints; last joints of the tarsi black; abdomen lanceolate, yellow, with a dorsal, ventral, and on each side a lateral, brown stripe.

FAMILY BIBIONIDÆ.

[311.] 435. ASPITES (ARTHRIA) ANALIS *Kirby*.—Plate vi., fig. 8.—Length of body, excluding wings, 2 lines; including wings, 3 lines. Several taken in Lat. 65°.

Body black, naked. Head very small; trunk with a dorsal area marked out by a ridge; on each side is a reddish-yellow line drawn from the collar to the base of the wing; but in some specimens this is very indistinct; poisers white; wings hyaline, iridescent, much longer than the body; costal area divided into three areolets, with testaceous nervures, terminating in a black stigma; there are four spurious nervures, the first abbreviated, and the anal one bent towards the margin; the legs are reddish-yellow except the apex of the tarsi, which is black; the intermediate pair are smaller and shorter than the others; anterior thighs are much incrassated, and the tibiæ terminate in a spine; the posterior thighs are elongated; abdomen flat above; anus yellow, as is sometimes the margin of the ventral segments.

FAMILY EMPIDÆ.

436. EMPIS LUCTUOSA *Kirby*.—Length of body, including wings, 3 lines. Taken with the preceding.

Body entirely black. Proboscis very little longer than the head; wings a little embrowned, with a large black stigma, iridescent, nervures black.

[312.] 437. EMPIS GENICULATA *Kirby*.—Length of body 3 lines. Taken with the preceding.

Very similar to the preceding, but not so black; wings slightly embrowned, beautifully iridescent; legs, where the shank is united to the thigh, white; proboscis nearly as long as the thorax.

FAMILY BOMBYLIADÆ.

438. BOMBYLIUS MAJOR *Linn.*—Length of body, including proboscis, 7 lines; excluding do., 5 lines. Expansion of wings 1 in. to ¾ inch. Taken in Lat. 65°.

[313.] Body black, thickly covered above with yellowish, soft, but erect hairs; underneath the hairs are whiter, but those on the breast, at the origin of the legs, are black; wings with the anterior half longitudinally black-brown, the dark color on the inner side being sinuated or uneven; the posterior half of the wings is transparent with black nervures; the legs are long, and pale-yellow; but the tarsi are reddish-black at the extremity; the eyes are triangular.

[This species is taken in Europe, and in N. America in Nova Scotia, New York, &c.]

439. BOMBYLIUS PYGMÆUS *Fabr.*—Length of body, including proboscis, 5 *lines; excluding do., 3 lines.; expansion of wings 9 lines.* Taken with the preceding.

Body black, hairy. Hair below the eyes black; eyes meeting at the vertex; behind the eyes the hairs are gray; those on the thorax are tawny or reddish with a white tuft on each side at the anterior and posterior margin; the wings are longitudinally dusky at the anterior margin; more than the posterior half is hyaline, with several scattered black dots, the interior ones being the largest; the legs are testaceous, but black at the tip; the abdomen is covered by reddish hairs with dark ones intermingled; those at the anus are whitish.

[Taken in various localities throughout N. America.]

FAMILY TABANIDÆ.

440. TABANUS AFFINIS *Kirby.*—Length of body 7¾ lines. Taken with the preceding.

[314.] Body black with hoary down. Proboscis, palpi, and base of the antennæ obscurely, all red; down on the trunk very thin, mixed with a few black hairs; tubercles before the wings, winglets and knob of the poisers, pale testaceous; legs black with the four posterior tibiæ rufous; wings embrowned, with darker nervures; three first segments of the abdo-

men rufous, each with a black dorsal spot; margin of the segments pale with a whitish fringe; the fourth segment has a pair of round, red, dorsal spots.

VARIETY B. Antennæ all black.

441. TABANUS ZONALIS *Kirby*.—Length of body 7½ lines. Taken with the preceding.

Body black, with a few hairs of the same color, especially at the sides of the trunk. Antennæ reddish at the base; sheath of the proboscis, and palpi, black; haustellum testaceous; breast whitish from inconspicuous down; tubercles before the wings subferruginous; wings subtestaceous with some of the nervures black; knob of the poisers reddish; thighs black, reddish at the tip; tibiæ, and tarsi, except the anterior pair, which are black, as well as the apex of the anterior tibiæ, red; abdominal segments above and below margined with white decumbent down and fringe.

442. CHRYSOPS SEPULCHRALIS *Fabr*.—Length of body 6 lines. Taken with the preceding.

[315.] Body black, slightly downy. Head hoary from pubescence; proboscis with a black sheath and testaceous haustellum; feelers black; antennæ red at the base; below the antennæ is an obtriangular levigated, and naked space, with rounded angles, and somewhat elevated; behind the antennæ in the frontal space, between the eyes, the ordinary levigated and naked areas, which in *Tabanus* are longitudinal, in *Chrysops* are transverse; sides of the trunk hairy with black erect hairs, it is also marked above with four longitudinal hoary stripes formed by invisible pubescence; underneath the trunk is covered with down of the same description and color, and set with tufts of longer hairs; wings white, with the costal margin and a middle abbreviated band, and nervures brown; legs and abdomen black, and extremity whitish from down.

[An European species.]

FAMILY SYRPHIDÆ.

443. SCÆVA RIBESII *Fabr*.—Length of body 4 lines. Taken with the preceding.

Head concavo-convex; underneath black, with the edge fringed with whitish hairs; vertex black; face below the antennæ yellowish; hoary

from decumbent hairs next the eyes; antennæ yellowish with a darker cloud; trunk bronzed with a greenish tint, downy especially on the sides, down whitish; wings hyaline, longer than the body, with black nervures, but those of the costal area are ferruginous; scutellum large, yellow; legs luteous, coxæ and trochanters dark-brown, posterior tarsi black, first joint below with a brush of golden colored bristles; abdomen depressed, above black with five yellow bands, viz, one consisting of two crescents, forming an interrupted band, [316] traversing the middle of the first segment; then a broadish subinterrupted one traversing the base of the second and third; and lastly the margin of the two last segments is also yellow, as is the under side of the abdomen.

[An European species; taken also in Nova Scotia.]

FAMILY MUSCIDÆ.

444. MUSCA CADAVERUM *Kirby*.—Length of body 4¾ lines. A single specimen taken in Lat. 65°.

Body black, with black hairs and bristles. Antennæ plumate; eyes brown; the cheeks and front in certain lights appear hoary or silvery from inconspicuous down, in others black; feelers subferruginous; trunk and abdomen black-blue with a greenish tint; wings hyaline; intermediate areolet obtusangular; winglets white, bordered with a testaceous nervure.

This species approaches very near to *M. cadaverina*, but the front, winglets and palpi are of a different color.

445. MUSCA MORTISEQUA *Kirby*.—Length of body 5½ lines. Several taken with the preceding.

[317.] Body black, with black hairs and bristles. Eyes brown; cheek and front ferruginous, in certain lights exhibiting something of a golden lustre; feelers long, slender, reddish-yellow; trunk slightly hoary, with three very indistinct black dorsal stripes; wings hyaline, with the intermediate areolet projecting internally into an acute angle; winglets white terminated by a white nervure; abdomen heart-shaped, glossy, blue with a slight tint of green.

This seems to be the American representative of *M. vomitoria*, from which it differs chiefly in having three obsolete black stripes between the wings; in the anterior spiracles not being of a different color from the rest of the trunk; in having white winglets and not black edged with

white; and in the abdomen exhibiting no changeable appearance of chequer-work.

VARIETY B. with a green abdomen.

C. with chalybeous abdomen.

X.—HOMALOPTERA, Leach.

FAMILY HIPPOBOSCIDÆ.

446. HIPPOBOSCA EQUINA *Linn.*—Length of body, excluding wings, 4 lines; including do., 5 lines. Locality not mentioned.

Body flat; subpubescent, dirty-yellow, spotted with brown, with whitish signatures. On the forehead, between the eyes, is a brown quadrangular spot shaped like what are called skates eggs, with four projecting points at the angles; abdomen underneath pale, anus hairy; tarsi with four black claws, the inner ones shorter and truncated; wings much longer than the body.

[An European species. Loew (*Monographs of Diptera*, part i.) divides the order of Diptera into three sections:—*Nemocera*, *Brachycera* and *Coriacea*, and includes this family, with the *Nycteribidæ*, in the last mentioned.]

[318.] XI.—APHANIPTERA.

FAMILY PULICIDÆ.

447. PULEX GIGAS *Kirby.*—Plate vi., fig. 9.—Length of body 2 lines. Two specimens taken in Lat. 65°.

Body ovate, reddish-yellow; segments, particularly the first of the trunk, pectinated with black bristles; antennæ, though short, very distinct, standing out from the head, they seem to consist of two joints, the last conical and obtuse; the base of the second segment of the trunk is

black; the thighs are very flat and wide, inclining to ovate; tibiae armed with long black bristles.

This I believe is the largest flea known, but I have not been able to ascertain upon what animal it was captured.

(Concluded.)

ON TWO NEW CHALCID FLIES FROM FLORIDA, PARASITIC UPON THE LARVÆ OF SYRPHUS FLIES.

BY WM. H. ASHMEAD, JACKSONVILLE, FLA.

Having continued my investigations on Orange Insects, I have made many other discoveries. Among these probably the most interesting is the breeding of two species of *Chalcids* from the larvæ of *Syrphus* flies.

Now, as a general rule, the *Chalcididæ* must be considered beneficial, the majority of them preying upon other insects injurious to the agriculturist, the species belonging to the *Eurytomide* genus *Isosoma*, being, I believe, the only vegetable feeders known among them.

In my recent pamphlet on "Orange Insects," I described and figured several bred from Aphides, Coccides, etc.; besides, I have since bred hundreds from other sources, and all may be considered beneficial.

Nevertheless, there are exceptions to all rules, and those now under consideration must come under that head and be classed as injurious, because they prey upon the larvæ of flies which destroy our orange aphides—pests particularly troublesome to the orange grower in spring and fall. Another strange fact about these *Chalcids*, and which needs a thorough investigation, is this: How do so many manage to live in and subsist upon the Syrphus without destroying it at once? For it is not until the larva has transformed into a puparium, that these little parasites themselves transform—first into pupæ, and afterwards into perfect flies, which escape by eating a hole through the head of the puparium. From a single puparium I had 18 Chalcids (5 males and 13 females). On carefully opening another, I found it closely packed with Chalcid pupæ, like "sardines in a box." Undoubtedly all of these lived as minute worms in the larva of the Syrphus fly, feeding day after day on the fatty substance, but

instinctively avoiding all vital organs. Alas, poor larva! For days the victim of these minute worms, and like the misery of some poor mortal, finds release from suffering only in death.

In Europe, Westwood, Introduction to the Modern Classification of Insects, vol. 2, p. 160, states that *Eupelmus syrphi* Bouche, infests the larvæ of *Syrphus ribesii* and *S. balteatus*. In vol. 1, p. 423, that *Spalangia nigra* is parasitic on the pupæ of the common house fly, *Musca domestica*.

In America I do not know of any having been described from Syrphus flies, excepting *Eriophilus mali* Hald. I consequently presume these are unknown to science, and submit the following descriptions:

SPALANGIA? SYRPHI, n. sp.?

♀. Length .07 inch. Head and thorax black, coarsely, uniformly, but not deeply punctate, and with slight purplish and brassy reflections. Head transverse, much broader than thorax, mandibles 4-dentate, dentations not so deep as in ♂; antennæ 11-jointed, reddish-brown, slightly but gradually widening towards tip, covered with short pubescence; thorax—parapsidal grooves converging towards scutellum, but abruptly ending at middle of mesothorax; collare very short, hardly visible, scutellum convex; abdomen ovate, brownish black, smooth and highly polished, with a slight cupreous tinge at base, and attached to thorax by a short peduncle; legs honey yellow, anterior and middle femora dark, posterior pair being brownish black; wings hyaline, iridescent, veins greenish yellow, stigma slightly thickened at base, stigmal vein with a little pointed knob near the tip.

♂. Length .05 inch. Head and thorax bright greenish golden, punctation as in ♀; antennæ 11-jointed, filiform, reddish brown and covered with rather long hairs, collare very short, hardly visible, purplish; abdomen ovate, purplish black, smooth and shining, with a short peduncle; legs honey yellow, coxæ brassy; wings hyaline iridescent.

Described from 2 ♂ and 5 ♀ specimens bred from the pupæ of *Syrphus philadelphicus*.

PTEROMALUS 4-MACULATÆ, n. sp.

♀. Length .05 inch. Head wider than thorax, bluish purple, microscopically punctate, with mouth parts brownish black; eyes brownish, antennæ 9-jointed, reddish brown, scape very long, as long as all the others combined excepting club; 2nd joint as long as 3 and 4 combined and

thicker; 3rd shortest, others slightly widening towards tip; 9th broadly fusiform and longer than joints 6, 7 and 8 combined; thorax about twice as long as broad, microscopically punctate and with a slight brassy tinge and sparsely pubescent; collare hardly visible; praescutum much broader than long, convex, occupying nearly the whole mesothorax, scuti small, triangular and purplish; scutellum rather large, convex, triangular, tinged with brassy and with the basal margin purplish; pleuræ large, convex, smooth and shining; abdomen very short, sessile, flattened and triangular when seen from above; legs—coxæ brownish, femora and more than half of the tibiæ brownish yellow, tip of femora and balance of tibiae and feet honey yellow, hind legs with rather long tibial spur; wings hyaline, iridescent, with only a short costa and stigmal vein, reaching to one-third the length of wing.

♂. Length .04 inch. Head purplish, vertex and face brassy, microscopically punctate, with a few larger punctures scattered in front of ocelli; antennae 8-jointed, filiform, scape shorter than in ♀ and with the joints irregular and covered with long hairs; callare, unlike the female, is transverse quadrate; scutellum triangular with a brassy tinge and the edges rounded; abdomen longer than in female, blackish.

Varieties of the male occur with the head, thorax and scutellum as in the female, with an attenuated, transverse collare and with 9-jointed antennae; also with coarse punctures on the face and along the margin of the eyes, and with the middle pair of femora yellowish.

These varieties are important as showing how certain species of Chalcid flies are liable to vary in coloration and structure, even those bred from the same brood.

Described from 18 females and 8 males; 13 females and 5 males raised from one larva, and 3 males and 5 females raised from another larva of *Syrphus 4-maculatus* Ashmead, in November, 1880.

This species I place in the genus *Pteromalus* provisionally, for the reason that the description was made from dry specimens and the antennae in the ♂ and the structure of the abdomen of both sexes was too much shrunken to make a critical examination.

ON A LARVA OF MORDELLA.

BY V. T. CHAMBERS, COVINGTON, KY.

In previous numbers of the CAN. ENT. (vols. ix, p. 232, and viii, p. 137) I have given an account of a singular larva found in thorns of *Gleditschia triacanthos* or Honey Locust. I have never succeeded in rearing the imago from the larvæ found in the thorns, but the same larva —or one that I have not been able to distinguish from it—lives also in the pith of the "iron weed" *(Veronia)* and also in that of the "hog weed" or "horse weed," *Ambrosia trifida;* and in the pith of these stems is also found a Lepidopterous larva which I have not been able to rear to the imago state, but which does not seem to differ from that of *Laverna gleditschœella* found in the thorns. Both larvæ, therefore, or larvæ not yet distinguished from them, inhabit the thorns of the Honey Locust, the Iron Weed and the Horse Weed. I have bred the Lepidopterous larva from the thorns; it is that of *Laverna gleditschœella* Cham., but I have not bred the "curious larva" from them. I have bred the "curious larva" from the Iron Weed, but not from the thorns on the *Ambrosia*. It proves to be the larva of a beetle allied to *Mordella*, if it does not, as I think it does, belong to that genus. I send a bred specimen herewith; it is, I think, a common species. Please give me its name.

From the fact that it feeds in the same stems with the *Lavernæ* larvæ, I thought it probable that the *Mordella* larva fed upon that of the *Laverna*, or upon some of the other larvæ found in the thorns of *Gleditschia;* but it is more probable that the fact simply is that the pith of these plants affords food to all of the species.

I have seen the *Mordella* larva eating its way through the pith, or rather cutting its way with its mandibles, for I never saw it swallow any of the pith, nor have I found any of it in the larval intestine. It may therefore be parasitic on the *Laverna* larva, in the sense that it eats the *Laverna* where it meets it in the stem. But it must be capable of feeding and growing for a long time without meeting the Lepidopterous larva, for it is frequently found in stems and thorns in which no other larvæ have been seen.

Besides the *Laverna* and *Mordella* larvæ, many others also—of other genera and orders—feed in the *Gleditschia* thorns, as I have already stated in the papers before referred to. Thus in these thorns I have found a

beetle larva resembling that of a *Brachys*, one of the Carabidæ one-half an inch long, one of a small bee, and one of a wasp, the names of which have been given me by Mr. W. H. Patton, but to which I cannot just now refer. Mr. Patton also informs me that the ants found in the thorns and mentioned in the former papers (loc. cit.) do not belong to the species and genera there suggested. I mention these species as being on the food of the *Mordella* larva.

But in the pith of the *Veronia* and *Ambrosia* I have found only the *Laverna* larva, that of the *Mordella*, that of one of the larger moths and which I have not succeeded in rearing, and some small Dipterous larvæ. It may be that the Hymenopterous larvæ found in the thor s will yet be found in *Veronia* and *Ambrosia;* but if not, then of course the *Mordella*, if it feeds upon them at all, is not confined to them. This latter larva excited my attention by its singular structure and mode of locomotion. Its maxillæ are much like its legs, and are used as legs ; the body is arched so that the feet are brought to bear on the lower surface, and the dorsal tubercles (or as I have elsewhere called them, the dorsal prolegs) are brought to bear upon the upper surface, and all are used as organs of locomotion, and the larva is unable to crawl when in any other position.

Dr. Packard, in the Guide, says of *Mordella* that "the larvæ are said to live in the pith of plants, and are long, sub-cylindrical, and the sides of the rings are furnished with fleshy tubercles." In this species the tubercles are on the back. Westwood (Introduction, vol. 1, p. 293) figures and describes (after Schilling) a form of *Mordella* larva certainly quite different from that of this species. It is called the larva of *M. pusilla* and is said to feed in the pith of *Artemesia*. He also mentions a larva found in the pith of Hoarhound as that of *M. pusilla*, whilst the larvae of the genus *Ripiphorus* are parasitic upon other insects. This larva most probably feeds upon the pith, but possibly it may feed upon some of the other larvae, Lepidopterous or Hymenopterous, which it meets sometimes in the pith. Not being a Coleopterist, I do not know what is known by them as to the habits of the Mordellidae now, and perhaps the facts above given may be new to some of them.

I do not know the duration of the larval state in this species. The larva may be found in the stems in fall and winter and spring, and passes into the pupa state in April and May, remaining in that state for two weeks or more.

Since the foregoing was written I have found the same *Mordella* larva common in the galls of *Gelechia gallæ-solidaginis* Riley, in stems of *Solidago* (Golden-rod) eating into and through the walls of the galls; but not disturbing the larvae or pupae of the moth. But here it eats into the body of the wall of the cavity and does not confine itself to the pith.

NOTE ON HEMARIS BUFFALOENSIS.

BY A. R. GROTE.

The Rev. Mr. Hulst, who has arbitrarily drawn together distinct species of *Catocala*, as *C. crataegi* and *C. polygama*, forgetting that the larva of the former is described, has also referred *Buffaloensis* as a small form of *Thysbe*, or *uniformis*. But Prof. Lintner has described the larva of *Buffaloensis* (Ent. Cont. II., 8), and in answer to my enquiries Prof. Lintner states that *Buffaloensis* is well known to him and may be distinguished by the different shape of the discal cell of primaries, the cross-bar of scales nearly fusing with the lower edge of the cell and not running in the centre of it. I have myself no doubt of the validity of *Buffaloensis*, which is probably unknown to Mr. Hulst, but what I wish to call attention to is the reckless way in which distinct forms have been recently united without all the facts or literature being studied or known.

ENTOMOLOGICAL NOTES.

On the 11th of June I took a pair of *Saperda Fayi* upon thorn, a rather rare insect with Canadian collectors hitherto, I believe. Ten years ago or more I captured one, and had not met with it since, but this year amidst a general scarcity it seemed to be quite abundant here, the different collectors finding it well represented in every direction around the city. One day, coming on a favorable locality, I took 19; returning to the same place the following afternoon, I got 30, and had to leave before 4 o'clock on account of rain—going back a few days later and securing 34. I found old bushes in an exposed situation the most productive.

Hamilton, Ont. J. ALSTON MOFFAT.

CUPES CAPITATA.

For some years past I have been, during the month of July, in the habit of collecting specimens of this pretty little beetle on the fence of a churchyard adjoining my residence. This year they were exceedingly numerous, and I captured in four days over 80, of which some 50 were females. It is curious to note that I have invariably found that certain pickets of the fence were selected by the beetles, and that out of a long distance of fencing round the sides of the church, these few pickets on one side would be the only place to find the beetle. I can give no reason for such selection--the trees and food plants round the fence are similar; they congregate for breeding purposes and then suddenly disappear, and can only be rarely found afterwards. Do any of our readers know the life history of this beetle? E. BAYNES REED, London, Ont.

THE CODLING MOTH.

Prof. E. W. Claypole, of Antioch College, Yellow Springs, Ohio, in a recent communication states that he has lately captured two specimens of this moth, *Carpocapsa pomonella*, at sugar under an apple tree. Whether they were chance captures or whether they were attracted by the sugar he is unable to form an opinion.

I received more than a year ago two specimens of *Eristalis tenax* Lin. collected in Washington Territory by Mr. H. K. Morrison. The specimens on careful comparison show no differences whatever from typical eastern ones. The peculiar hairy markings of the eyes, to which my attention was directed by Baron Osten-Sacken, are quite the same. I have specimens also from Kansas, showing that this common European fly has spread over the whole United States since it was first observed by Osten-Sacken in November, 1875, or somewhat earlier by Mr. Patton. The fly at present is very abundant in the vicinity of New Haven, making its appearance about the middle of July and remaining till cold weather, in early October being frequently found in houses and gardens. That this species should have become so very widely spread in three or four years seems remarkable, but, on the other hand, it would seem more remarkable that so conspicuous and common a fly should have entirely eluded so experienced and zealous an Entomologist as Baron Osten-Sacken, had the species really been in North America earlier.

S. W. WILLISTON, M. D.