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LIFE-HISTORY OF *XYLINA BETHUNEI*, G. & R.

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On the evening of 17th of April, 1898, a ♀ of this species entered my room, and was bottled and not looked at again until the morning of the 19th, when it was found that the cyanide in the bottle was exhausted and that the moth was still alive and had laid a considerable number of eggs. The eggs were distributed through the cotton wool at the bottom of the bottle, and this had to be carefully pulled to pieces thread by thread to secure the eggs.

The following description was taken :

Egg.—Somewhat of gumdrop shape, .60 mm. in diameter, wider than high. Many low ribs rising from the base, the whole surface pitted with rather large depressions having the appearance near the apex of short transverse striæ. Colour when laid, creamy with a tinge of green, soon turning whitish and then soon showing a mottling of brownish red. Later they turned darker, but the mottling remained; hatching 1st and 2nd May. Egg period about 14 days.

Young larva.—Stage I: Length, at rest, 1.42 mm.; in motion, 1.70 mm. Head large, considerably exceeding the 2nd segment, lower part projecting forward. Colour creamy white, but with a darker interior shade beginning at the 3rd segment and extending about two-thirds to anal end, but darker and more marked on the anterior segments. Setæ long, concolorous, as are also the feet and claspers.

The larvæ were offered wild cherry, red-oak bud, hawthorn, silver maple, white birch, willow, plantain, ash, apple. They ate several of the foods offered, but preferred cherry, maple or apple; hawthorn, birch and plantain were not touched.

By the 5th May the general colour was a pale green, the interior shade being dark green, though some did not show the darker interior shade, being uniformly pale green.

Passing 1st moult 7th May; described 9th May.

After 1st moult.—Stage II: Length 6 mm. Head pale greenish with a few white hairs, ocelli black. Body pale green, dark green interiorly, with a whitish subdorsal line, and a similar subspiracular line. Warts whitish.

By the 12th some had passed 2nd moult.

After 2nd moult.—Stage III: Length 8.60–9.40 mm. Head pale horn colour. Body green, darker, especially interiorly, above, yellowish green below. There is now a very broken dorsal line of short white dashes. The warts are conspicuous, being of a shiny white, like glazed china. Setæ short and whitish; spiracles very inconspicuous. These larvæ are sometimes restless, but do not tend to stray from the food-plant. They constantly spin threads, so that when picked up with a camel's-hair pencil they are sometimes pulled back by the thread.

While under observation one began to clear away the frass from the maple leaf it was on, picking the pieces up with its jaws and throwing them aside. One mass so thrown consisted of six or more pellets stuck together.

By the 15th nearly all had passed the 3rd moult.

After 3rd moult.—Stage IV: Length, at rest, 12 mm.; in motion, 14.5 mm. Very evenly cylindrical, but with a slight fullness about the 12th segment. Head very pale green with a few whitish hairs, mouth-parts whitish, ocelli rather inconspicuous. Body green with yellowish shades, especially at the segmental folds. Warts as before.

The white lines are the same as before, but the subspiracular fold is strongly marked and is yellowish white. There is an indication by white dots of another line between the subspiracular fold and subdorsal stripe. The spiracles are small and very inconspicuous. Feet and claspers pale greenish.

Passing 4th moult 17th May.

After 4th moult.—Stage V: Length, at rest, 15.6 mm. Head, 2nd and 13th segments, light green, rest of body yellowish green. Warts and stripes as before, white. Setæ pale yellowish, subspiracular fold yellowish white, feet and claspers light green.

On 22nd nine out of fourteen in one jar were found to have passed the 5th moult, and the appearance of the larva is now entirely changed.

After 5th moult.—Stage VI: Length, at rest, 24 mm.; in motion, 28 mm.

Head pale greenish horn colour mottled with blackish green. Body

greenish gray, mottled on part above the subspiracular fold with velvety black. Top of the second segment almost solidly black, with a thin pale horn colour dorsal line, the warts very small and similar in colour to dorsal line. This black patch is bordered on the sides by a whitish line, and below is a clear greenish wedge-shape space, wider anteriorly; below this it is mottled in black to the subspiracular band. Dorsal stripe from 3rd segment to 13th yellow, shaded with orange. Warts distinct, white like glazed porcelain. Setæ rather weak, pale in colour. On 8th to 11th segments there are two small white dots like warts in advance of wart i., at about same distance from i. as ii. is. These spots are a little further from the dorsal line than i., but not quite as far as ii. Subdorsal stripe broken up into a line of spots, subspiracular fold broad, cream colour; just above this a black band of varying width, widest at the spiracles, which show upon it as white ovals; between this and the subdorsal stripe there is a series of white dots.

The black mottling tends to be grouped about the warts and other white dots.

The top of the 12th segment is slightly swollen. Below the subspiracular fold the body is pale green with only a powdering of black atoms about the warts v. and vi.

Feet and claspers pale green.

On 23rd May I noticed that there were only 13 larvæ in the jar where there had been 14, and it is possible that one had been eaten, though they had never been short of food. In the other jar cannibalism, which is a characteristic of this group, had evidently been practised, as evidenced by the remaining anal extremity of a larva which had apparently been devoured when in process of moulting.

I therefore separated them into four jars so that they should have more room. One larva was of a much grayer tone than the average, being wanting in the greenish shade. The larvæ were mature about the end of May, the colour as usual changing just before the pupation, the greenish shade of the upper area giving place to a pinkish tinge.

The length of the mature larva is 31-32 mm. The larva enters the ground and makes a close cocoon of grayish silk and pellets of earth. The pupa is of the usual noctuid type. The moths began to appear about the 29th July, and continued to emerge for a week or ten days. This is very much earlier than they would have emerged had they been subjected to the vicissitudes of their natural life out of doors.