

THE IMMATURE STAGES OF PLAGIOGNATHUS
POLITUS UHLER AND CAMPYLOMMA VER-
BASCI HERRICK-SCHAEFFER (CAPSIDÆ,
HEMIPTERA).

BY M. D. LEONARD,

ITHACA, N. Y.

Plagiognathus politus Uhler.

This little black capsid spends the winter in the egg-stage in one-year-old apple twigs. The eggs are inserted nearly their full length into the tissue of the stem at the base of the leaf-buds and lie nearly parallel to the axis of the twig. Sometimes they are inserted directly into the bud scales. Ordinarily the eggs are laid singly but often two or three may be found projecting from the base of a single bud.

Plagiognathus politus has been reared in large numbers during the past few seasons from apple twigs collected at Ithaca, N. Y. These were brought into the insectary in February or March and the pale yellow nymphs first appeared about the time the blossoms were beginning to show pink.

The following descriptions of the stages are from rearings made during the past two seasons at Ithaca, N. Y.* They are taken from the living specimens.

The Egg (Pl. XIV, fig. 7).—Length, .9-.95 mm.; width, .2 mm.; cylindrical, slightly compressed and curved; somewhat constricted near anterior end which is squarely truncate; cap narrowly elliptical in outline; color shining pale yellowish or whitish.

Stage I (Pl. XIV, fig. 8).—Length, .8 mm. General color, pale yellowish; eyes reddish; antennæ in some specimens slightly tinged with dusky; tip of beak dusky; tip of tarsi slightly tinged with dusky; position of abdominal gland faintly indicated by greenish.

Stage II (Pl. XIV, fig. 9).—Length, about 1.12 mm., greatest width of abdomen about .5 mm. General color pale yellowish, abdomen often tinged with greenish. Antennæ, except tip of segments, tinged with dusky; second segment sometimes has indication of brownish ring at middle; indication of a dusky stripe on dorsal edge of hind femora; tibiæ more slender than in preceding stage, faint dusky band near base of tibiæ, especially of posterior pair; tip of tarsi distinctly

darkened. Edge of dorsal abdominal gland narrowly bordered with dusky. Hairs on body darker than in preceding stage. Prothorax slightly emarginate behind.

Stage III (Pl. XIV, fig. 10).—Length, 1.5 mm. General color pale yellowish green. Whole body with sprinkling of fine hairs which in some lights are golden, in others darker. Eyes dark reddish; head yellowish; thorax often with indistinct greenish markings. Abdominal gland edged narrowly with dusky. Mesothoracic wing-pads just beginning to become apparent. Antennæ, except first segment, pale grayish, each segment lighter at tip and darker at base. Legs yellowish; femora with a blackish stripe on dorsal edge and a short stripe on ventral edge; tibiæ with a blackish band at base. Extreme tip dusky; tarsi dusky at base and tip paler in middle.

Stage IV (Pl. XIV, fig. 11).—Length, 1.85 mm. General color more greenish than in preceding stage. Body more thickly clothed with hair than in preceding stage. Eyes dark reddish; head yellowish; prothorax often with two large more or less distinct yellowish spots, mesothorax often yellowish on lateral margins; wing-pads extend back onto second abdominal segment. Abdomen green; tip often yellowish; abdominal gland narrowly edged with dusky. Antennæ light brownish, base of each segment dusky, and tip, except in terminal segment, whitish; first segment dusky or blackish at the middle; second segment relatively longer than in preceding stage; legs yellowish; stripe on ventral edge longer than in preceding stage; tibiæ blackish at base, sometimes dusky at tip, with two rows of blackish spots from each of which arises a blackish hair; tarsi as in preceding stage.

Stage V (Pl. XIV, fig. 13).—Length, 2.2 mm. General color greenish, often a yellowish green. Markings variable but in general as follows: Head tinged with yellow; eyes dark reddish; the yellowish spots on prothorax more or less distinct, sometimes lacking, often darker green irregular markings on mesothorax and wing-pads, lateral margins often yellowish. Wing-pads reach back onto fourth abdominal segment. At the end of the instar the wing-pads become blackish at the tip and tinged more or less with dusky throughout. Antennæ brownish yellow; first segment with two narrow blackish stripes reaching nearly to the tip, remaining segments dusky at base and, excepting the fourth, whitish at extreme tip. The relative length

of the segments about as in the preceding stage; antennæ and legs more slender. Legs as in stage IV but markings, as a rule, darker.

Adult (Pl. XIV, fig. 14).—Length, about 4 mm. Color dark brown to black, somewhat shining. Eyes dark reddish. Antennæ blackish. Coxæ, trochanters and femora black, except tip of latter which is yellow; remainder of legs as in fifth stage nymph. The two cells at the base of the membrane are outlined with whitish. Whole body, legs and antennæ covered with fine golden hairs.

Campylomma verbasci Herrick-Schaeffer.

This species is found throughout the summer at Rochester Junction, N. Y., breeding abundantly on the common mullein, *Verbascum thapsus* L., and on apple nursery stock. The following technical descriptions of the immature stages are based on rearings made by the writer during the summer of 1914.

The Egg (Pl. XIV, fig. 1).—Length .75 mm., width .15 mm.; cylindrical, rather strongly curved; posterior end bluntly rounded; constricted just before anterior end which is obliquely truncate; cap very narrowly elliptical in outline; color whitish or pale yellowish, semi-shining.

Stage I (Pl. XIV, fig. 2).—Length .6 mm., greatest width of abdomen .12 mm. Color, very pale translucent yellowish. Eyes reddish. Body sparsely covered with rather long hairs which are dark in some lights, golden in others. Legs and antennæ translucent whitish. Beneath as above; tip of beak dusky.

Stage II (Pl. XIV, fig. 3).—Length, .85 mm., greatest width across abdomen, .36 mm. General color pale yellowish, legs and antennæ usually pale translucent. Otherwise as in preceding stage except that body is proportionately a little stouter and relative size of thoracic segments is different as can be seen by comparing the figures.

Stage III (Pl. XIV, fig. 4).—Length, 1.24 mm., greatest width (across thorax) .5 mm. General color pale yellowish, thorax often tinged in irregular spots with pale greenish; abdomen pale greenish. Wing-pads just beginning to show on mesothorax. Antennæ and legs pale yellowish, extreme tip of tarsi slightly dusky. A round, blackish, setigerous spot above, and a fainter one below, near tip of hind femora. A faint setigerous spot on fore and middle tibiæ near tip, above. Middle and hind tibiæ each with two blackish setigerous

spots near base. Tip of beak dusky. Body somewhat more thickly clothed with hairs than in preceding stage.

Stage IV (Pl. XIV, fig. 12).—Length, 1.5 mm.; greatest width (across wing-pads), .62 mm. Head and thorax pale yellowish; prothorax often with two large greenish circles; remainder of thorax and wing-pads usually tinged with irregular greenish markings, abdomen pale green, tip yellowish. Wing-pads extend back to third abdominal segment. Eyes reddish. Antennæ and legs pale yellowish. Spots on femora as in preceding stage. Middle tibiæ with two or three, and hind tibiæ with five or six round blackish spots from each of which arise two blackish hairs. Tip of tarsi dusky. Whole dorsum rather thickly clothed with hairs which in some lights are golden, in others dark. Beneath pale yellowish except venter which is pale green. Tip of beak dusky.

Stage V (Pl. XIV, fig. 5).—Length, 1.9 mm.; greatest width (across wing-pads), .95 mm. General color pale greenish, abdomen a somewhat darker shade than rest of body. Darker greenish marking on thorax and wing-pads as indicated in the figure; extreme tip of wing-pads often dusky. Eyes dark red. Legs and antennæ pale yellowish. There are seven, four, and two setigerous spots on the hind, middle and fore tibiæ respectively. Tip of beak and extreme tip of tarsi dusky. Body, as in preceding stage, thickly clothed with fine hairs.

Adult (Pl. XIV, fig. 7).—Length, 2.65 mm. General color greenish gray or dirty grayish white; head and prothorax more inclined to brownish-yellow, the former often reddish-brown. Cuneus usually with a large brownish spot. Legs and antennæ yellowish, slightly tinged with brownish; a black ring on middle of first segment and at base of segment of antennæ. Legs marked as in fifth stage nymph except that posterior femora are marked with many small black spots. Beneath black or dark brown. Beak yellowish, tip dark brown.

EXPLANATION OF PLATE XIV.

C. verbasci.

- Fig. 1. Egg.
- Fig. 2. Stage one.
- Fig. 3. Stage two.
- Fig. 4. Stage three.
- Fig. 12. Stage four.
- Fig. 5. Stage five.
- Fig. 6. Adult.

P. politus.

- Fig. 7. Egg.
- Fig. 8. Stage one.
- Fig. 9. Stage two.
- Fig. 10. Stage three.
- Fig. 11. Stage four.
- Fig. 13. Stage five.
- Fig. 14. Adult.



Leonard, Mortimer Demarest. 1915. "The Immature Stages of Plagiognathus Politus Uhler and Campylomma Verbasci Herrick-Schaeffer (Capsidæ, Hemiptera)." *Journal of the New York Entomological Society* 23, 193–196.

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