
THE EARLY STAGES OF *ABLABESMYIA ANNULATA*
(SAY) (DIPTERA, CHIRONOMIDAE)¹

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ABSTRACT

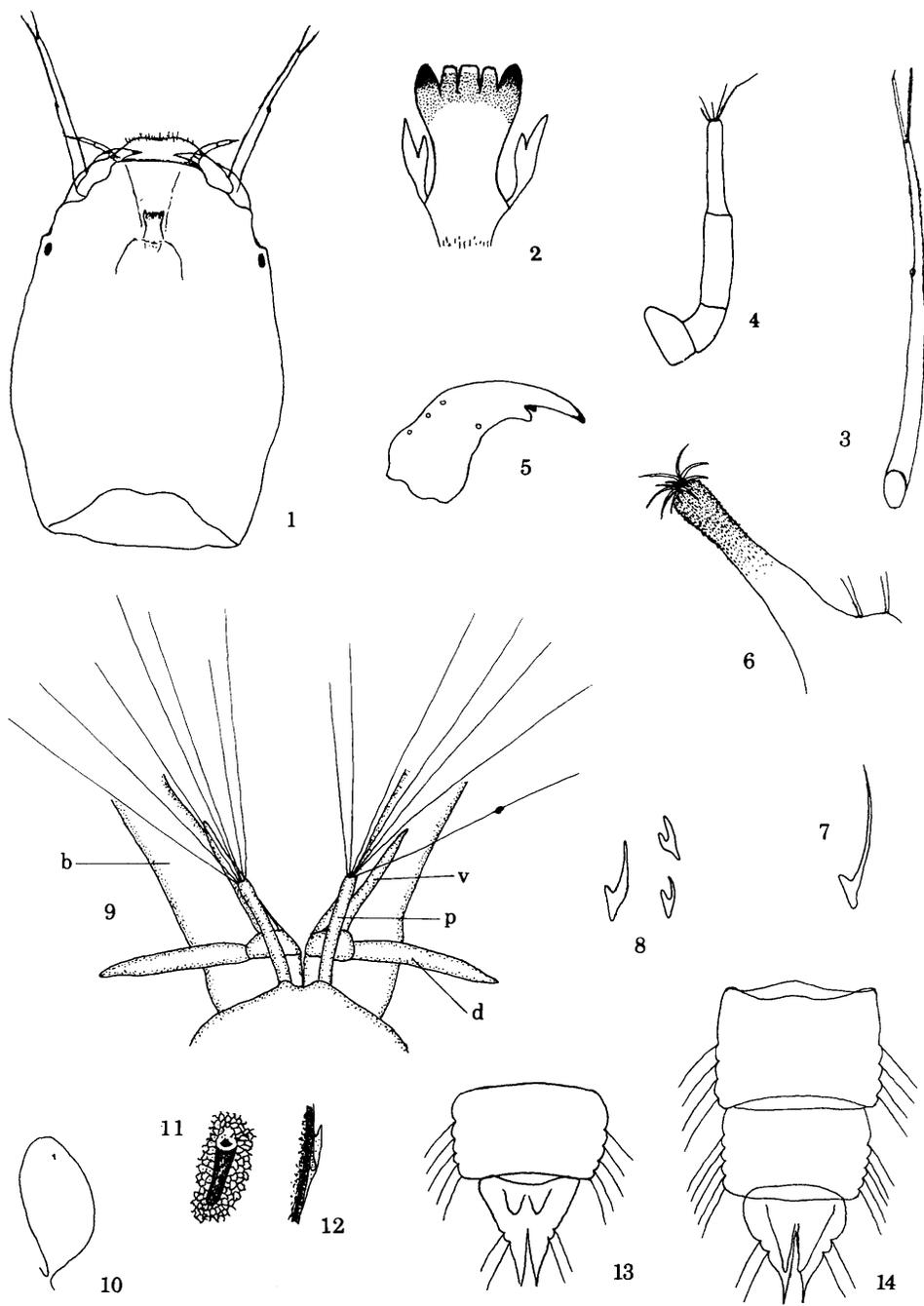
The larva of *Ablabesmyia annulata* is remarkably similar to Malloch's *Tanypus* sp. A, briefly described in 1915. It differs from other American species in the following characteristics: 3 inner teeth of lingua truncate, all claws of posterior prolegs yellow, and both anterior and posterior prolegs apically and densely armed with spinules. In the pupa, the respiratory organ is smooth and ovate, lacking a terminal papilla. The respiratory opening is distinctly preapical. The species is widely distributed in Ohio.

INTRODUCTION

This study was initiated when larvae bearing a similarity to *Tanypus* sp. A of Malloch (1915) were collected by Randy Kingsley near Oxford. One of these larvae was carried to adulthood and found to be *Ablabesmyia annulata* (Say). The species was also reared 12 times previously at Put-in-Bay, Ohio. At the time when the Put-in-Bay material was collected, there was still some confusion about the identity of *A. annulata* and *A. monilis*.

Ablabesmyia monilis was described by Linnaeus in 1758 (as *Tipula monilis*) from the Old World, but has been widely reported from the Nearctic region. The first American species of the genus as now constituted was *A. annulata*, described by Say (1823) (as *Tanypus annulatus*) from Pennsylvania. Johannsen, in his monographic work in 1905, regarded *T. annulatus* as a synonym of *A. monilis*. Malloch (1915) likewise did not distinguish between the two species. Under the name of *Tanypus monilis*, Malloch described not only the adult, but also the larva and pupa. At the same time Malloch described a larva which he called *Tanypus* sp. A. After taking advantage of considerable further study, Johannsen (1946) published his revision of *Pentaneura*, a genus which then included *Ablabesmyia* as now defined. He separated *P. monilis* from *P. annulata*, particularly on the basis of the banding of the fore tibia and the fascia of the abdomen. Johannsen pointed out that Malloch's description of the adult applied to *P. annulata*, not to *P. monilis*. His judgment has been supported by later workers. The present study clearly indicates that Malloch's corresponding larva could not have been that of *Ablabesmyia annulata*. As noted above, the larvae at hand are remarkably similar to Malloch's *Tanypus* sp. A, particularly with respect to the lingua, which is unlike that of other species of *Ablabesmyia*. There is some question about the similarity as regards the mandible and maxillary palp. More details would be desirable here to make a final judgment. Malloch's description of the pupa is very brief, but the respiratory organ could be that of *A. annulata*.

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FIGURES 1-14. Details of immatures of *Ablabesmyia annulata*. Larva: 1, head; 2, lingua and superlinguae; 3, antenna; 4, maxillary palp; 5, mandible; 6, posterior proleg; 7, terminal claw of posterior proleg; 8, secondary claws of posterior proleg; 9, posterior end (p, preanal papilla; d, dorsal or outer gill; v, ventral or inner gill; b, base of posterior gill). Pupa: 10, respiratory organ; 11, area of respiratory opening viewed perpendicularly; 12, area of respiratory opening viewed tangentially; 13, posterior end, female; 14, posterior end, male.

It is obvious, in view of the circumstances related above, that the American literature involving records of *Ablabesmyia monilis*, *A. annulata*, and possibly allied species must be treated with some reservation. For example, on checking, the writer finds that the records of *Pentaneura monilis* in a paper by Shelford and Boesel (1942) should be referred to *Ablabesmyia annulata*. The determination was based on adults reared from larvae. Sublette (1957) found two species of *Pentaneura* associated with Lake Texoma which he identified as *P. annulata* and *P. basalis?* He also found two larval types in the lake. One of these he indicated was like Malloch's *Tanypus* sp. A. Quite naturally he associated the larva of *Tanypus* sp. A with *P. basalis?* since, if Malloch's correlations were correct, it could not be *P. annulata*. Other examples will doubtless come to light. There follows a description of the immature stages of *Ablabesmyia annulata*, emphasizing diagnostic features.

LARVA

Color yellowish in life. Head 1.4–1.6 times as long as wide; length, 1.3–1.4 mm., width, 0.9–1.0 mm. Head sharply narrowed immediately anterior to eyes, the outline in dorsal view angling sharply mesad at about the level of the posterior end of the lingua (fig. 1). Eyes simple, slightly elongate in dorsal view, placed just behind angulation. Eye in lateral view U-shaped, slightly open anteriorly. Lateral outline of head undulate posteriorly, the posterior half or third tending to be slightly constricted rather than evenly rounded (fig. 1). Mounted head capsules depressed by cover slip may not show this feature. Lingua with 5 teeth (fig. 2), the outer teeth usually black or dark brown, apically moderately acute; 3 inner teeth slightly shorter than outer ones, truncate, and usually brown basally and yellow apically. Inner teeth in some specimens quite dark and only slightly lighter than outer ones, or all the teeth less heavily pigmented, the outer being brownish and the inner quite pale. Superlinguae unequally bifurcate (fig. 2), the outer bifurcation longer. Antennal ratio (segment 1/end segments) 6.1–6.4. Antennal blade single, almost as long as terminal segments combined. Sense pit at 61–62% of length of segment 1 from base of segment 1 (fig. 3). Antennae 54–56% as long as head, or head about 1.8 times as long as antenna. Maxillary palp (fig. 4) with 6 segments bearing a ratio of 3:4:11:12:6:3 from base to apex; segments 1 and 2 obscure in some specimens; segment 3 slightly broader than segment 4; segments 5 and 6 setiform; segment 4 bearing about 4 shorter accessory styles of unequal length in addition to the terminal segments. Mandible (fig. 5) with apex blackened; inner margin with an accessory tooth plus an auxiliary tooth in the angle formed by the accessory tooth; outer margin with 2 or 3 scars. Anterior prolegs on first thoracic segment only about half as long as posterior prolegs, the terminal third bifurcate; each bifurcation provided with a circle of simple apical claws and smaller subapical claws, the latter merging gradually into smaller claws and then spinules, which fade out at the base of each bifurcation. Posterior prolegs 2 in number, completely separate, slender, slightly narrower in diameter near middle (fig. 6); each slightly longer than length of head capsule and bearing at least 13 claws at or near apex; all claws yellow, not darkened. Terminal claws long and simple (fig. 7); subterminal claws shorter and simple or shorter and broadly bifid (fig. 8). About half of each proleg distally armed rather densely with small recurved spinules decreasing in size and fading out near middle of proleg. Preanal papillae (fig. 9) about 7 to 9 times as long as average width, separated at base by about their own diameter. Each papilla bearing 7 long bristles. Several pairs of delicate bristles present between base of preanal papillae and prolegs. Anal gills 4 in number (fig. 9), as long as or longer than preanal papillae, attached above base of prolegs and tapering apically. Total length 9–11 mm.

PUPA

Respiratory organ (fig. 10) brown, ovate, and smooth at 100x, with surface microscopically divided into irregular hexagonal or pentagonal areas; length 0.7–0.8 mm., width 0.3–0.4 mm. Respiratory opening minute and preapical, being located about 13 to 17% of total length of organ from apex. Immediate area of opening (fig. 11 and 12) only slightly raised, without dis-

inct papilla; sieve plate extremely faint or absent. A row of 10 or more spinules medially placed in relation to respiratory organ, the innermost being largest with the others becoming progressively smaller as the base of respiratory organ is approached. Additional smaller spinules in irregular rows visible under favorable circumstances adjacent to this row. Some specimens showing 12 or more spinules in the primary row, suggesting that this characteristic may be of limited diagnostic value. Anal lobes terminally acute (fig. 13 and 14), the distance between the tips being less than half as great as length of anal lobe behind second lateral filament. Lobes of anal fin as long as (male) or longer than (female) combined width at base. Lateral filaments as follows on each side: 4 on segment 7, 5 on segment 8, and 2 on anal fin. Most anterior filament of segment 7 near middle of segment, that of segment 8 anterior to middle (about $\frac{1}{3}$ distance from anterior end of segment). That these are somewhat variable is suggested by the fact that on two specimens the filaments are noticeably asymmetrical. Genital sheath short in female (fig. 13), about 34-45% of length of anal fin; genital sheath long in male (fig. 14), about 62-76% of length of anal fin. Total length 7-9 mm.

DISCUSSION

In the key to *Ablabesmyia* larvae of Beck and Beck (1966), *A. annulata* will separate out at once on the basis of its having only yellow claws on the posterior prolegs. The lingua is unique in having the three inner teeth truncate. Furthermore, both posterior and anterior prolegs are apically armed with spinules. The pupa is at least two millimeters longer than are those of other species keyed by Beck and Beck (1966). The respiratory organ is unusual in having a minute preapical opening without a distinct prominence or papilla.

Ablabesmyia annulata occurs widely in the Nearctic region from California to the east coast and from Manitoba and Quebec to Florida. The writer's collection provides records from the following Ohio counties: Ottawa, Erie, Ashtabula, Auglaize, Franklin, Butler, and Jackson. Dates for adults range from May to August. The species has been collected as early as April in Illinois (Roback, 1971) and as late as September in Iowa (Morrissey, 1950) and Minnesota (Roback, 1971).

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