BIOLOGICAL AND MORPHOLOGICAL NOTES ON *DASYHELEA PSEUDOINCISURATA* (DIPTERA: CERATOPOGONIDAE)[1]

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ABSTRACT: *Dasyhelea pseudoincisurata* larvae were collected from a waste tire and a bucket. Larvae presumably fed in algae in these containers, but after collection they fed only on dead insects. Larval thoracic pigmentation is described. Pupae move rapidly across the substrate with the aid of abdominal spicules. The mean pupal period was 2.1 days. Attempts to recover eggs from reared adults were unsuccessful.

Little is known about the immature stages of many biting midges (Ceratopogonidae), and even basic details of life history, including larval habitat and feeding behavior, are poorly understood for most species. During a survey of containers for *Aedes albopictus* (Skuse), a number of biting midge larvae were collected from an old tire and from a plastic bucket. These larvae were placed into a plastic petri dish along with water from the larval habitat. Pupae were collected and placed into separate dishes to await adult emergence. The adults reared from these larvae were identified as *Dasyhelea pseudoincisurata* Waugh & Wirth (1976).

Dasyhelea spp. larvae may be found in a number of different habitats, including natural cavities. *Dasyhelea pseudoincisurata* has been collected from treeholes and cavities in rocks (Waugh & Wirth 1976). Wirth & Waugh (1976) found other *Dasyhelea* spp. larvae in cavities in tree stumps. Collections of *Dasyhelea* larvae from artificial containers are not often reported, but they are by no means unknown. For example, Remmert (1953) described *Dasyhelea tecticola* from specimens collected in rain gutters.

When *D. pseudoincisurata* larvae were collected, their alimentary tracts were filled with a green material. This material was believed to be algae, however, microscopic examination of one larva's alimentary tract revealed mostly unidentifiable debris, although fungal spores were present. During rearing, larvae were fed dead mosquito, chironomid, and psychodid larvae, mosquito pupae, and a gravid adult female bibionid. These were first killed by crushing them with forceps, after which all were consumed by the *Dasyhelea* larvae. The *Dasyhelea* larvae began feeding at the wound site, and one *Dasyhelea* larva pulled a mosquito's alimentary tract outside of its body and began feeding on its contents. Other *Dasyhelea* larvae ignored the prey's alimentary canal and instead fed on fat body and muscle tissue of the mosquito. The feeding behavior of the *Dasyhelea* larvae resembled that of some *Bezzia*

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larvae (Hribar & Mullen 1991). Some *Dasyhelea* larvae used their anal crochets to hold themselves in place while feeding. It appeared that only the third and fourth instar *Dasyhelea* larvae fed on mosquitoes. Twice, younger larvae were seen attempting to feed, but these were pushed aside by the vigorous feeding of the older larvae. Younger larvae are probably not strong enough to compete against older larvae. *Dasyhelea* larvae most often are said to feed on algae and fungi (Mullen & Hribar 1988). However, Lee & Chan (1985) reported that *Dasyhelea ampullariae* Macfie larvae fed on mosquito larvae in the same habitat. Mosquitoes and *Dasyhelea grisea* (Coquillett) can coexist in the same habitat with no apparent harm to either species (Baumgartner 1986).

Thoracic pigmentation of the larvae was a brown coloration present on the dorsal aspect which extended toward the ventral surface on the prothoracic and mesothoracic segments. On these segments the pigment was distributed in an easily recognizable pattern (Fig. 1), but the prothorax was more strongly

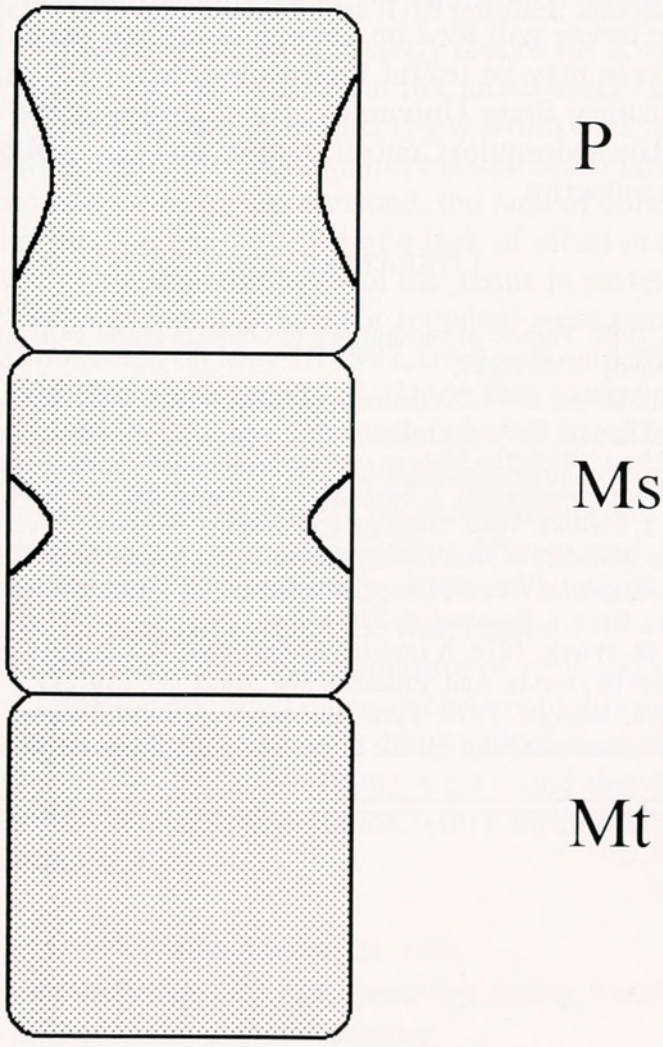

Fig. 1. Thoracic pigmentation of *Dasyhelea* larvae collected in waste tire; P - prothorax, Ms - mesothorax, Mt - metathorax.

pigmented than were other thoracic segments, with less pigmentation present on the abdominal segments. The crochets on the anal segment were large and arranged in a starburst pattern. The larva of *D. pseudoincisurata* is undescribed, and these characters may permit larvae to be distinguished from those of other species.

Pupae were placed into separate plastic petri dishes lined with moist filter paper at ambient room temperature, which varied from 23° C to 26° C (74° F to 78° F). Pupae were active and used their large distinctive spicules to move rapidly across filter paper. Average length of the pupal stage was 2.1 days; 23 adults were reared. Adult males used their foretarsi to groom their antennae. There are long spines at the base of the tarsus, and perhaps these also are used for grooming. Adults were provided with 10% sucrose solution as an energy source for possible mating and oviposition, but these attempts to collect eggs were not successful.

While laboratory conditions do not duplicate natural conditions, *D. pseudoincisurata* larvae will feed on a range of offered prey. The distinctive pattern of the larvae may be useful for species identification. I thank W.L. Grogan, Jr., Salisbury State University, for identifying the midges. D.A. Shroyer, Indian River Mosquito Control District, and G.L. Miller, USDA, commented on the manuscript

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