FIELD RECOGNITION OF ADULT ACENTRELLA AND HETEROCLOEON (EPHEMEROPTERA: BAETIDAE)

R.D. Waltzi

ABSTRACT

The highly developed anterior process of the mesothorax, is described as a useful field character for identifying adults of Acentrella and Heterocloeon in the Nearctic. This presumed adult synapomorphy suggests a sister relationship of the two genera.

Larvae of the genera Acentrella Bengtsson and Heterocloeon McDunnough have been recognized previously as very closely allied on the basis of shared larval synapomorphies (Morihara and McCafferty 1979a), including the more broadly shared synapomorphy of the femoral villopore (Waltz and McCafferty 1987a,b; McCafferty and Waltz 1990). Larvae of both genera are recognized as living in low sediment, relatively high quality lotic waters.

Identification of adults of these two genera from among other baetids has been largely reliant on species characters of color and hindwing form (see Traver 1935). Both Acentrella and Heterocloeon tend to possess darkly pigmented abdominal terga (as do Labiobaetis Novikova and Kluge (McCafferty and Waltz, in ms.) and some members of the Baetis rhodani group). However, normally darkly pigmented abdominal terga of Acentrella may appear to be lightly pigmented when preserved in alcohol. Hindwing characters currently provide the most satisfactory means of differentiating Acentrella from Heterocloeon, and separating both genera from other Nearctic baetids, with the possible exception of some members of Labiobaetis. Species of Acentrella may or may not possess hindwings. Acentrella hindwings always lack a costal process and bear two longitudinal veins. Most Heterocloeon possess extremely small hindwings that lack a costal process and veins. The one known exception is H. frivolum (McDunnough) which has retained the typical Acentrella hindwings and can not be separated from A. ampla Traver in the adult stage (Morihara and McCafferty 1979a). For field sorting purposes, the use of hindwing characters is time consuming and difficult, specimens, if not discarded, may be relegated to a collective identification “Baetidae” or “Baetis spp.” by non-specialists.

While reviewing adult characters of these and other baetid genera in the course of ongoing systematic revisions of the Baetidae, a striking character state was identified which is unique to Acentrella and Heterocloeon, i.e., a conical, dorsally directed, anterior process of the mesothorax (Fig. 1). Outgroup analyses indicate that the ancestral condition is greatly reduced, low, and non-projecting (e.g., in the baetid genera Cloeon Leach and Callibaetis Eaton as well as in Siphlonuridae and Ameletidae) and that the highly devel-

1Indiana Department of Natural Resources, Division of Entomology and Plant Pathology, 402 West Washington, Room W-290, Indianapolis, IN 46204.
Figure 1. Acentrella carolina, female. Mesothorax (Lateral view, right side). (Arrow indicates anterior process).

Figured condition of the anterior process of the mesothorax is a synapomorphy uniting Acentrella and Heterocloeon, not shared by other Nearctic genera or species groups of Baetis as defined by Morihara and McCafferty (1979b) and Waltz and McCafferty (1987b). Comparative figures of the anterior process of the mesothorax are available for some baetid genera in Edmunds et al. (1976): Apobaetis Day (Fig. 262), Paracloeodes Day (Fig. 263), Baetodes (Fig. 264), and an unnamed member of the Baetis fuscatus group (as Pseudocloeon sp.) (Fig. 261).

In all other Nearctic genera of Baetidae the anterior process of the mesothorax is much smaller in size, never projects dorsally, and has never been found to be apically pointed.

The anterior process of the mesothorax (Fig. 1) provides a rapid means of identifying adult members of Acentrella and Heterocloeon from among other Baetidae. Hindwing characters discussed above will still need to be used to make genus and species determinations. A new key to the Nearctic species of Acentrella, for example, has been provided by McCafferty et al. (1993). It is hoped that recognizing this new "field" character will help make determinations of the presence of these taxa more expedient and accurate when sorting mixed samples of adult Nearctic baetids.

ACKNOWLEDGMENTS

I thank A. V. Provonsha, Purdue University, for the preliminary sketch of Acentrella carolina (Banks) used in Figure 1 and the Harvard Museum of Comparative Zoology for loan of several types used in studies preparatory to this study.


