ACERPENNA THERMOPHILOS, comb. n. (EPHEMEROPTERA: BAETIDAE)[1,2]

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ABSTRACT: The western North American baetid species *Acerpenna thermophilos*, comb. n., is removed from *Baetis*, where it was originally described. Recent work on the genus *Acerpenna* indicates that hindwing and male genitalia characteristics of the species are typical of the genus *Acerpenna*, not *Baetis*. Only the future discovery of the larval stage of this species will indicate the degree of relationship with *A. pygmaea*.

Waltz and McCafferty (1987) established the North American genus *Acerpenna* based primarily on the distinctiveness of its larvae. Certain species that were previously placed in *Baetis* were included in *Acerpenna*. Those species are not related to *Baetis* and are not members of the *Baetis* complex of genera, as defined by larval characters (see generic key in Lugo-Ortiz and McCafferty [1998]). Species initially placed in *Acerpenna* were known in the larval stage, and included *A. macdunnoughi* (Ide) and *A. pygmaea* (Hagen). Waltz and McCafferty (1987) also indicated a combination of hindwing and forceps shape characteristics that could be diagnostic of the adults of the genus. McCafferty and Waltz (1990) added *A. harti* (McDunnough) and *A. akataleptos* (McDunnough) to *Acerpenna*. At that time, these latter species were unknown as larvae but possessed adult characteristics consistent with *Acerpenna*. Waltz et al. (1998) reared *A. harti* and showed that its larvae and adults had characteristics that fell within a range that they could associate with *A. pygmaea*.

Numerous western, and especially Californian species of *Baetis*, remain unknown in the larval stage and poorly known in general. For example, of the nine valid California species currently considered in *Baetis* and listed by Day (1956), only *B. adonis* Traver, *B. bicaudatus* Dodds, and *B. tricaudatus* Dodds are known in the larval stage (see McCafferty and Silldorff 1998). In reviewing the adults of the other six California species, it was obvious that one of them was not correctly placed in *Baetis*, but apparently belonged to *Acerpenna*. This species is *Acerpenna thermophilos* (McDunnough), comb. n.

Hindwings and genitalia characteristics of *A. thermophilos* agree with those of other species of *Acerpenna*. Most revealing is the costal border distal to the costal process of the hindwing, which is undulate as indicated for *Acerpenna* by Waltz and McCafferty (1987). Also, as is often the case in *Acerpenna*, the apex of the hindwing is somewhat blunt and the anal margin is slightly con-

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cave in the basal half. Compare Fig. 163 (Traver 1935) of *A. thermophilos* with Fig. 1 (McCafferty and Morihara 1979) of *A. macdunnoughi* and Fig. 2 (Waltz et al. 1998) of *A. pygmaea*. Only the genus *Camelobaetidius* Demoulin has similar hindwings (see Traver and Edmunds 1968). The genital forceps of *A. thermophilos* are also typical of *Acerpenna*, particularly in terms of the elongate terminal segment (see Fig. 2 in Morihara and McCafferty [1979]). However, some *Camelobaetidius* species also have this type of forceps.

Traver and Edmunds (1968) indicated that all species of *Camelobaetidius* had only two longitudinal veins in the hindwings. I have seen no exceptions to this in material studied since then, not even the presence of a short third vein or a long intercalary vein. Waltz et al. (1998) showed in two of the variations of hindwings in *A. pygmaea* that short third veins were present, and McCafferty and Morihara (1979) showed that *A. macdunnoughi* had a third vein in the hindwing extending from about mid-wing to the apical margin. *Acerpenna thermophilos* has a third vein in the hindwing that extends for about three quarters of the length of the wing. This is an essential criterion at this time for placing the species in *Acerpenna* rather than *Camelobaetidius*. Although the adults of *Acerpenna* and *Camelobaetidius* are similar, the larvae of these two genera are very distinct.

Acerpenna thermophilos was described from Yellowstone, Wyoming, and has subsequently been taken in California near the Eel River and probably also Cloverdale (Traver 1935). Waltz et al. (1998) indicated that in addition to *A. harti*, the west Canadian species *A. akataleptos* may also prove to be a synonym of the widespread *A. pygmaea*. Both McDunnough (1926) and Traver (1935) indicated that adults of *A. thermophilos* were highly distinguishable from the *pygmaea/harti/akataleptos* type. Although the presence of the long third vein in the hindwing and larger size might suggest that *A. thermophilos* is a valid species, experience with baetids has shown that hindwing venation can sometimes be deceptive because it can be highly variable. This was demonstrated by Durfee and Kondratieff (1993), for example, with multiple rearings of *B. magnus* McCafferty and Waltz and *B. tricaudatus* in Colorado. Discovery of the larvae of *A. thermophilos* will probably be the final arbiter as to the validity of the species.

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SOCIETY MEETING OF FEBRUARY 24, 1999

(continued from page 192)

native beetle to the rates for the introduced biological control agent, *G. nymphaeae* eggs were also placed in the field and the number of eggs eaten was counted daily. Egg predation rates were much higher for this native beetle, around 50% were eaten in this experiment. These results indicate that the introduced beetles may be less vulnerable to predators found in North America than native herbivores. This suggests that egg predators should not prevent *G. calmariensis* from maintaining viable populations in North America.

Since their release in 1992, all three biological control agents have established populations in some loosestrife stands in North America. A thriving population of *G. pusilla* at Tinicum Marsh near Philadelphia, Pennsylvania has been monitored for the past three summers to determine whether the beetles are having an impact on the loosestrife there. There was no detectable decline in density of loosestrife at the marsh, but the number of loosestrife seeds in the seedbank appeared to have declined. This indicates that the beetles may be causing a decrease in flowering and subsequent seedset. More time is needed to determine whether the beetles are able to cause a significant decline in loosestrife densities in the area.

In notes of entomological interest, Andrew Short reported that he collected *Zorytypus hubbardi* (Zoraptera) from a dead log at a locality in northeastern Delaware. This marks the most northeasterly record of the order in the eastern U.S. Joe Sheldon shared a few of his slides from a recent biological inventory trip to Belize. Debbie Carr requested help with the bio blitz to be held in Fairmont Park, May 21-22.

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