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THE LARVA OF *PERLESTA ADENA* STARK, 1989 (PLECOPTERA: PERLIDAE)

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ABSTRACT

Only ten of the 32 proposed Nearctic *Perlesta* species are known in the larval stage. In this study an additional association and description was made for the larva of *Perlesta adena* Stark, 1989. The pigment pattern of the larva is characterized by a distinct pale M-line on the frons and a series of pale, median spots on abdominal terga 2-10 that comprise a median pale stripe. The larval stage of this species is most similar to that of *Perlesta fusca* Poulton & Stewart, 1991, and *P. xube* Stark & Rhodes, 1997, among described species.

Keywords: Plecoptera, Nearctic, *Perlesta adena,* larval description

INTRODUCTION

Genus *Perlesta* (Banks 1906) presently includes 32 Nearctic species (DeWalt et al. 2019), two proposed from China (Wu 1938, 1948, Murányi & Li 2016), and a report of two larvae collected in Río Pará, San José Province, Costa Rica (Gutiérrez-Fonseca & Springer 2011). In the eastern Nearctic the genus is well represented in spring and early summer Plecoptera collections as adults in light traps and as larvae in kick samples. Despite their abundance in this region, only 10 species are partially described as larvae (DeWalt 2002, Kirchner & Kondratieff 1997, Poulton & Stewart 1991, Stark 1989, Stark & Rhodes 1997, Stewart & Stark 2002).

Perlesta adena Stark, 1989, one of the more distinctive, darkly pigmented *Perlesta* species as an adult, is similar to *P. fusca* Poulton & Stewart, 1991 and *P. xube* Stark & Rhodes, 1997. The species is known from Indiana, Kentucky, Ohio and Tennessee (Grubbs & DeWalt 2018, Stark 1989), and a few larval specimens have recently been field associated at sites in Trousdale Co., Tennessee. This association allows us to provide the first larval description of *P. adena*.

MATERIALS AND METHODS

Adult *Perlesta* were collected by the authors with beating sheets from three streams in Trousdale Co. Tennessee, two larvae were collected with kick nets, and an exuvia was hand-picked from rocks. Specimens were preserved in

80% ethanol and examined with a Wild M-5 or Olympus SZH10 dissecting microscope. A few previously collected specimens were obtained from the Bill P. Stark collection (BPSC), Mississippi College, Clinton, MS and the C.P. Gillette Museum of Arthropod Diversity, Colorado State University, Fort Collins, CO (CSUIC). Specimens collected by the junior author are deposited in the Audrey B. Harrison collection (ABHC), Clinton, MS.

Photomicrographs were taken using a Canon MT6i camera package and Martin 1.38x Widefield DSLR T-mount adapter for Olympus microscopes. Ten to fifteen photographs were taken at different foci, and the images stacked to form a composite image using Zerene Stacker software version 1.04. Images were adjusted for brightness and contrast and cropped using Windows Photo Viewer.

Fig. 1. *Perlesta adena*. Larval habitus, dorsal.

RESULTS AND DISCUSSION

Perlesta adena Stark, 1989

http://lsid.speciesfile.org/urn:lsid:Plecoptera.speciesfile.org:TaxonName:1240

(Figs. 1-3)

Perlesta adena Stark, 1989:277. Holotype ♂ (USNM), Stillwater River, Hwy 185, Miami Co., Ohio
Perlesta adena: Stark, 2004:90.
Perlesta adena: Grubbs & DeWalt, 2018:84.

Material examined: OHIO: Ross Co., Ralston Run, Paint Creek Rd, Ralston, near jct Blain Highway, 23 May 1999, B. Stark, R.F. Kirchner, 9♂, 7♀, 1 larva (BPSC). **TENNESSEE:** Trousdale Co., Browning Branch, Hwy 260, 36.42695, -86.20354, 20 May 2019, B. Stark, A.B. Harrison, 1♂, 2♀ (BPSC), 1♂, 1♀, 4 exuviae (ABHC). Hawkins Branch, Hawkins Branch Rd, 36.44923, -86.20828, 20 May 2019, 3♂, 3♀, 3 exuviae (ABHC), 3♂, 1♀, 1 larva (BPSC). Rocky Crk tributary, Hwy 35, "Philippi Church", 36.39043, -86.25434, 11 May 2000, R.F. Kirchner, B.C. Kondratieff, 55♂, 10♀, 1 larva (CSUIC). Same site, 25 May 1999, B. Stark, 1♀ (BPSC). Same site, 19 May 2019, B. Stark, A.B. Harrison, 1♂ (ABHC), 1 larva, 1 exuvia (BPSC).

Adult habitus: Male and female terminalia, and egg described by Stark (1989, 2004). Additional details were provided by Grubbs & DeWalt (2018).

Larva: Body length approximately 10 mm (n = 4). Head with extensive dark brown pigment at least partially covering occiput and frons (Figs. 1-2). Pale M-line distinct forward of median ocellus; four small, oval pale spots on frons, two forward and two posterior of M-line. Antennal scape dark brown, pedicel and flagellum pale brown. Clypeus and median field of labrum pale, and a slanted pale band extends along suture posterior to lateral ocelli and anterior to occiput and compound eye. Lacinia typical of genus with two moderately strong dark setae near base of secondary tooth, and several (~5-7) smaller pale setae along inner lacinial margin (Fig. 3). Row of occipital spinules obscure due to dark pigment (Fig. 2). Pronotum with extensive pigmentation

Figs. 2-3. *Perlesta adena* larval structures. 2. Head and pronotum, dorsal. 3. Maxilla.

consisting of a broad, dark median stripe with pale center, a broad pale band present laterally, and dark rugosities numerous on pale background (Figs. 1-2). Legs pale without distinctive pigment pattern (Fig. 1). Abdomen brown with a pair of small pale median spots on terga 2-8; a single large pale brown spot surrounds paired spots on terga forming a longitudinal pale stripe on abdomen (Fig. 1). Abdominal terga 2-10 bear several scattered, robust socketed intercalary setae. Cerci pale brown.

Comments: Among species known in the larval stage, larvae of *P. adena* are most similar to those of *P. fusca* Poulton & Stewart, 1991, and to the unidentified specimen in Stewart & Stark (2002) illustrated in fig. 13.27. The head patterns of these species share a pale M-line anterior to the median ocellus, four pale oval spots on the frons, a pale straight band on the clypeus and a pair of moderately sized reticulate oval areas adjacent to the compound eyes. In addition, the median pronotal bands for these species are virtually indistinguishable (Poulton & Stewart 1991). The larvae of *P. adena* are also relatively similar to those of *P. baumanni* Stark, 1989, and *P. xube* Stark & Rhodes, 1997.

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