



## Contributions to the larvae of North American *Nixe* (Ephemeroptera: Heptageniidae), with the description of *N. dorotheae* sp. nov. from southern Indiana

J.M. WEBB<sup>1</sup> & W.P. MCCAFFERTY<sup>2</sup>

<sup>1</sup>Biodiversity Institute of Ontario, University of Guelph, 50 Stone Rd E, Guelph, Ontario, Canada N1G 2W1.

E-mail: jmw975@yahoo.com

<sup>2</sup>Department of Entomology, Purdue University, West Lafayette, IN 47907-2089, USA. E-mail: mccafferty@purdue.edu

### Abstract

*Nixe dorotheae* n. sp. (Ephemeroptera: Heptageniidae) is described from southern Indiana, USA based on larvae, males, and females. Larvae are easily differentiated from those of the other known North American species by the presence of two rows of denticles on the tarsal claws. Males are differentiated from congeners by the presence of median spines on the apical sclerites of the penes and reddish-brown abdominal terga. The larva of *N. rusticalis* is described for the first time; it is differentiated from known North American *Nixe* by having more than 15 comb setae on the maxilla. A preliminary key for the larvae of the known North American *Nixe* is provided.

**Key words:** *Nixe*, North America, taxonomy, new species, key

### Introduction

The Heptageniidae (Ephemeroptera) form a major component of lotic ecosystems throughout most of the world except in the Australasian and Neotropical faunas. In North America, the identification of the immature stages of most genera remains difficult, partly because the larvae of many species remain to be associated with adults, but also because currently available keys and descriptions are largely based on color pattern differences or do not take into account all of the nominal taxa. The Ecdyonurinae, comprised of the genera *Nixe* Flowers, 1980, *Leucrocuta* Flowers, 1980, and *Ecdyonurus* Eaton, 1868 in North America (Wang and McCafferty 2004), are the most poorly known and the most commonly used keys (Traver 1935, Burks 1953) do not allow confident identifications.

There are currently eight nominal species of *Nixe* known from North America (McCafferty 2004): *N. flowersi* McCafferty, 1981; *N. horrida* (McDunnough, 1926); *N. inconspicua* (McDunnough, 1924a); *N. kennedyi* (McDunnough, 1924b); *N. lucidipennis* (Clemens, 1913); *N. perfida* (McDunnough, 1926); *N. rusticalis* (McDunnough, 1931); and *N. spinosa* (Traver, 1933). The larvae of *N. horrida*, *N. kennedyi*, *N. rusticalis*, and *N. spinosa* have not yet been described, but the larvae of *N. rusticalis* are known (Webb 2002). In this paper, we describe a new species of *Nixe* from southern Indiana based on both larval and adult lifestages, describe the larvae of *N. rusticalis* for the first time, and provide a preliminary key for the species.

### *Nixe dorotheae* Webb & McCafferty NEW SPECIES

**Larvae:** Body length 7.5–10.5 mm; caudal filaments 5–8.5 mm. General color brown with pale markings (Figs. 1–3). **Head:** Head capsule brown with two pale markings on anterior margin separated by distance less than distance between antennae bases, with pair of pale markings directly posterior to marginal pale markings, with small black spots often present near anterior margin, and with narrow pale streak extending from compound eye to lateral margin of head capsule; ocelli black with pale spot anterior to median ocellus and pale spot laterad of lateral