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**A NEW SPECIES OF *NIXE* FROM INDIANA  
(EPHEMEROPTERA: HEPTAGENIIDAE)<sup>1</sup>**

W. P. McCafferty<sup>2</sup>

ABSTRACT

*Nixe flowersi* n. sp. is described for Indiana heptageniid mayflies that had previously been misidentified as *Heptagenia persimplex* McDunnough.

McCafferty (1977) described the larval stage of three species of *Heptagenia* s.l. in North America, including larvae reared to adults identified as *Heptagenia persimplex* McDunnough. Reexamination of the latter material in light of the recent studies of Flowers (1980, 1982), wherein four distinct genera were recognized for species previously placed in *Heptagenia*, has revealed that the larvae of *H. persimplex* (sensu McCafferty 1977) and associated adults from Indiana represent a new species of the genus *Nixe* Flowers, subgenus *Nixe* s.s.

*Heptagenia persimplex* was transferred to the genus *Macdunnoa* Lehmkuhl by Flowers (1982) based on restudied adult features; however, the larvae of *M. persimplex* remain unknown. Known *Macdunnoa* larvae were shown to have reduced gills on abdominal segment 6 and vestigial gills on segment 7 as well as a unique combination of mouthpart characters. *Nixe* (*Nixe*) diagnostically possesses contiguous or nearly contiguous eyes (Fig. 1) as well as small dorsolateral penes spines and elongate third and fourth forceps segments in adult males (Fig. 2); lacks fibrilliform portions of gills 6 and 7 and possesses intersegmental setae on the cerci in the larvae; and has reticulate ridges over the chorionic surface of the oval eggs (Fig. 3). These characters all easily distinguish *Nixe* (*Nixe*) from other closely related genera, including *Heptagenia*, *Leucrocota*, and *Macdunnoa*.

The following described new species complies in all respects to the generic and subgeneric characters of *Nixe* (*Nixe*) put forth by Flowers (1980) and is named in honor of him.

*Nixe flowersi* new species  
(Figs. 1-3)

**Adult Male** (in alcohol). Length: body, 5-7 mm; forewings, 6-7 mm. Eyes black, separated on vertex by width of lateral ocellus (Fig. 1). Ocelli black basally, white apically. Head, body, and legs cream colored, lacking any distinct patterning. Mesothorax and terminal four abdominal segments shaded slightly darker than remainder of body. Wings translucent. Terminal filaments cream colored. Genitalia (Fig. 2) with penes lobes rounded, each with small median spine and minute dorsolateral spine (sometimes not apparent); titillators extending about half length of penes lobes.

**Adult Female** (in alcohol). Length: body, 6 mm; forewings, 7.5 mm. Eyes widely separated. Coloration as in male. Wings translucent.

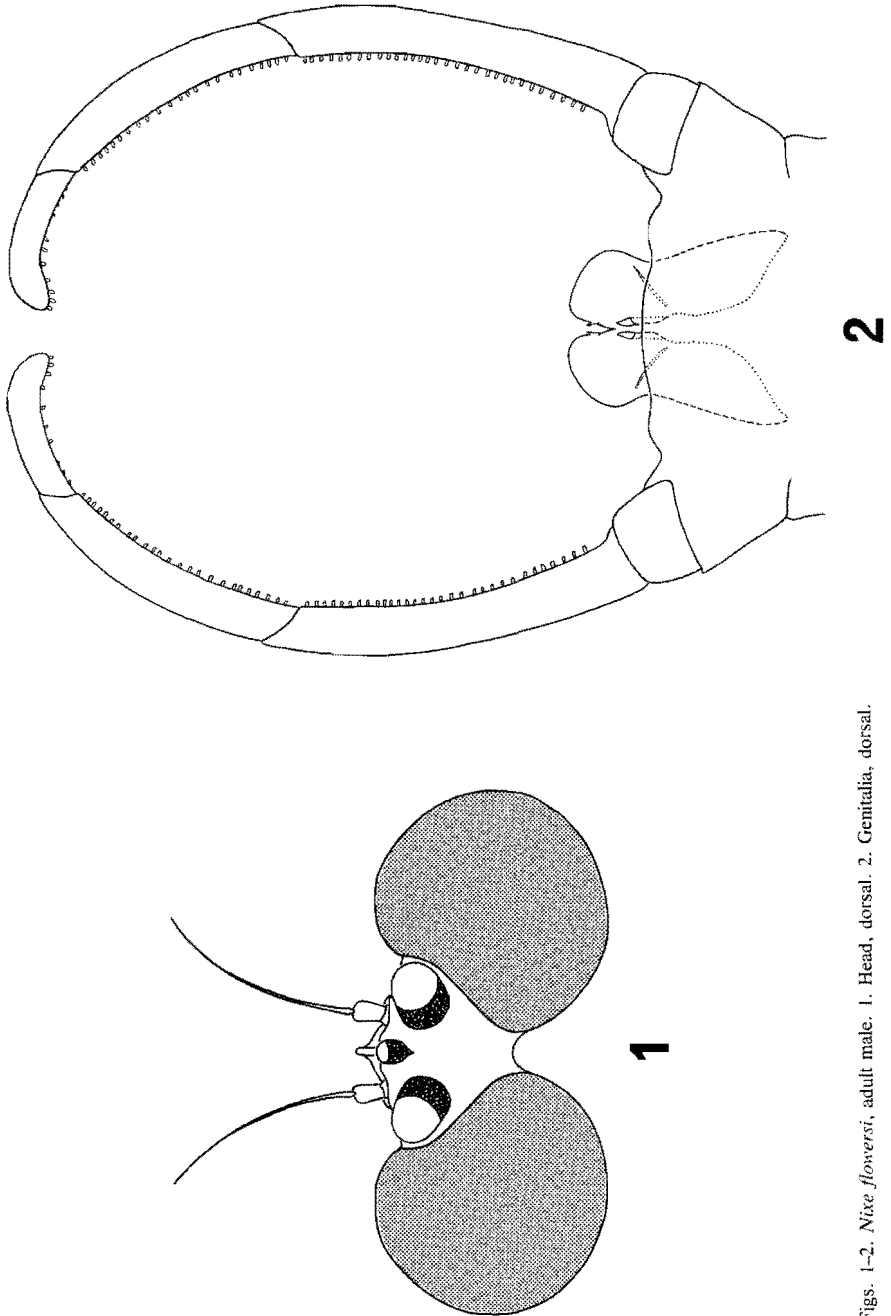
**Larvae.** Described and illustrated by McCafferty (1977) as *Heptagenia persimplex*.

**Egg.** Chorion with reticulate ridges and knob-terminated coiled threads (Fig. 3).

**Material Examined.** Male holotype: Indiana: Crawford Co., Stinking Fork Blue River at State Rd. 66, 1.5 miles S Sulphur Springs; V-19-1977; M. Minno and S. Yocom; deposited in the Entomological Research Collection, Purdue University. Paratypes: 3 males, 1 female, 2

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Figs. 1-2. *Nixes floweri*, adult male. 1. Head, dorsal. 2. Genitalia, dorsal.

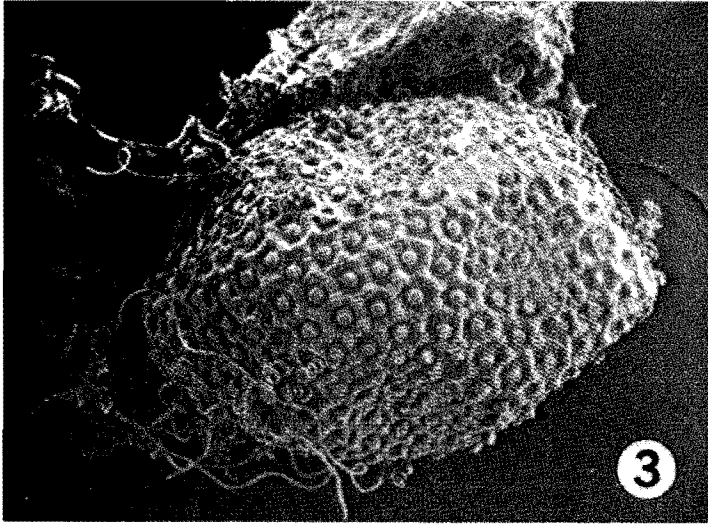


Fig. 3. *Nixe flowersi* egg (415 $\times$ ).

whole larva, 2 cast larval skins, same data and deposition as holotype; 2 male, same data, deposited in the United States National Museum. Male and female subimagos from the type locality deposited at Purdue.

**Remarks.** The translucent wings of the adults appear to be a useful diagnostic character for *N. flowersi*. Diagnoses and variation of the larvae were discussed by McCafferty (1977). The habitat consists of a moderately flowing third order, unimpacted stream in the southern unglaciated region of Indiana.

#### ACKNOWLEDGMENTS

I thank Dr. Wills Flowers for examining specimens and providing the SEM photo, and Mr. Arwin Provonsha for the line drawings.

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