

**A DISTINCTIVE NEW SPECIES OF *STENONEMA*
(EPHEMEROPTERA: HEPTAGENIIDAE) FROM
KENTUCKY AND MISSOURI¹**

W. P. McCAFFERTY

Department of Entomology, Purdue University, West Lafayette, Indiana
47907.

Abstract.—The new species, *Stenonema bednariki*, is described from larval specimens taken from streams in Kentucky and Missouri. The species, which is easily identifiable by its unique head pattern, is closely related to *S. pulchellum* (Walsh) and is a member of Cluster III-A of the subgenus *Maccaffertium*.

A new, "comprehensive" revision of a genus often leads to the user's ability to recognize enigmatic populations, which may in fact be new species. Thus, the revision precipitates new taxonomic discoveries. Such was the case when aquatic biologists, working independently in Kentucky and Missouri and using the recent revision of *Stenonema* (Bednarik and McCafferty, 1979), noticed that certain larval specimens of *Stenonema* taken in stream surveys could not be keyed. My study of these materials indicates that they represent a distinctive new species. Although adults remain unknown, a comparative species taxonomy of *Stenonema* is thoroughly established for the larval stage. The new species is named after Dr. Andrew Bednarik.

Stenonema bednariki McCafferty, NEW SPECIES

Fig. 1

Larva (in alcohol).—Mature length excluding caudal filaments: 6.0–7.5 mm.

Head: Dorsally dark brown with conspicuous large pale markings but lacking pale speckling; 3 pale yellow markings anterior to compound eyes consisting of single large diamond or crown-shaped marking medially between antennal bases and pair of obliquely transverse bars anterior to antennal bases; lateral margins of head capsule nearly straight and seemingly

¹ Purdue Agriculture Experiment Station Journal No. 8358.

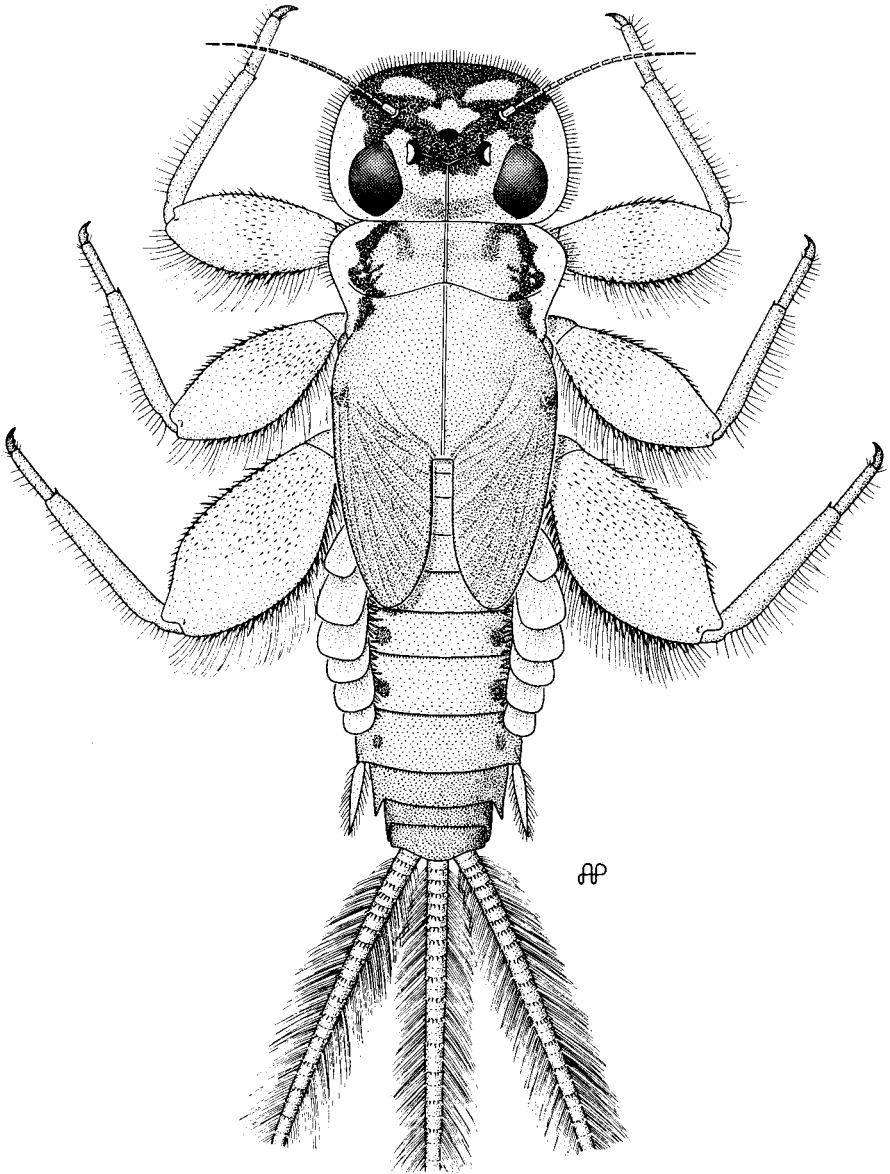


Fig. 1. *Stenonema bednariki*, larva.

lacking any pigment up to anterolateral corners; rounded, unpigmented areas at anteromedial margins of compound eyes and overlying lateral ocelli. Mandibles each with 5–7 teeth on inner margin of outer incisor; maxillae each with 4 or 5 spinelike setae and no hair setae on crown, and 16–20 hair setae in submedial row.

Thorax: Pronotum yellow to light brown, with pair of sublateral longitudinal brown stripes bending medially at anterior margin and then posteriorly for about $\frac{1}{2}$ length of pronotum so as to resemble pair of inverted U-shaped markings, sometimes connected medially by transverse bar. Some individuals with brown spot at apices of hindwing pads. Forefemur with sparse dorsal armature restricted to medial $\frac{1}{3}$ and consisting of elongate paddle-shaped setae and some pointed spinelike setae; spinelike setae present along anterior margin; hair setae and few spinelike setae present along posterior margin. Foretarsal claw adenticulate in mature individuals. Hindfemur much broader than fore- and midfemora.

Abdomen: Dorsally yellow to light brown, with segments 6–10 sometimes slightly darker than anterior segments; sublateral pair of brown spots (varying in size among individuals but usually very small) present on each of segments 1–7 and sometimes faintly evident posterior to segment 7. Lateral projections absent on abdominal segments anterior to segment 6. Ventrally pale yellow and lacking conspicuous markings although faint pair of submedian spots at base of segment 8 in some, and segment 9 slightly darker in some. Gill lamellae of segments 1–6 truncate apically. Caudal filaments uniformly yellow to brown and each with very thick, silver setae along lateral margins.

Holotype.—Kentucky: Pulaski County, Fishing Creek, 10.3 km south of confluence of Lick Creek, 31-VII-1979, S. M. Call. Deposited in the Entomological Research Collection, Purdue University, West Lafayette, Indiana.

Paratypes.—5 larvae, same data and deposition as for holotype; 5 larvae, same data as for holotype, deposited in the U.S. National Museum, Washington, D.C.; 3 larvae, Missouri, Iron County, Strother Creek, 22-VII-1979, L. Trial, deposited in the Entomology Museum, University of Missouri, Columbia, Missouri.

Additional material examined.—47 larvae from Crawford, Iron, and McDonald counties, Missouri, deposited in the Entomological Research Collection, Purdue University or the Entomology Museum, University of Missouri.

Discussion.—*Stenonema bednariki* is most easily diagnosed by the unique and highly conspicuous markings of the larval head capsule. In addition, the broad hind femur, thick setae of the caudal filaments, and the restricted dorsal armature of the forefemur are all readily evident and unusual for the genus. Mouthpart structure is most similar to that of *S. pulchellum* (Walsh),

exiguum Traver, and *terminatum* (Walsh), but color patterns and setal distribution on *S. bednariki* are different. *Stenonema bednariki* is also a relatively small-sized species (mature larvae are 6–7.5 mm). Among other mature *Stenonema* larvae, only *S. integrum* (McDunnough), *mediopunctatum* (McDunnough), *pulchellum*, and *smithae* Traver are ever this small.

Stenonema bednariki is a member of the subgenus *Maccaffertium* as evidenced by its gill structure. Within *Maccaffertium*, *S. bednariki* is phylogenetically most closely related to *S. pulchellum*, *terminatum*, *exiguum*, and *merivulatum* Carle and Lewis; all share the apomorphic losses of maxillary crown hair setae and anterior abdominal projections. These species belong to the Cluster III-A group as defined by Bednarik and McCafferty (1979). Owing to the similar reduction in spinelike maxillary crown setae and possibly body size, it appears that *S. bednariki* is most closely related to *S. pulchellum*.

The holotype and paratypes from Kentucky were taken in the Upper Cumberland River Basin on predominantly slab rubble and gravelly substrates of a fourth-order stream. The gradient of the stream was moderate and the water quality good at the open-canopy-area collection site. Three other species of *Stenonema* (*mediopunctatum*, *vicarium* (Walker), and *femoratum* (Say)), as well as *Stenacron interpunctatum* (Say) were taken at the same site. Missouri collection sites were all located in the southern part of that state in habitats similar to the site in Kentucky.

ACKNOWLEDGMENTS

My thanks are due to Samuel M. Call and the Kentucky Nature Preserves Commission and to Linden Trial and the Missouri Department of Conservation for providing the specimens; to Arwin Provonsha for the illustration; and to Andrew Bednarik for verifying the description.

LITERATURE CITED

- Bednarik, A. F. and W. P. McCafferty. 1979. Biosystematic revision of the genus *Stenonema* (Ephemeroptera: Heptageniidae). Can. Bull. Fish. Aquat. Sci. 201: vi + 73 pp.