

Stoneflies mapped across Ohio, with implications for water quality and nature conservation

April 12 2012



The Spinyleg Willowfly, *Taeniopteryx maura* (Pictet) is a common inhabitant of clear brooks in southern and eastern Ohio. Note the spur on the male's hind leg that gives the species its common name. Credit: Dr. R. Edward DeWalt

Stoneflies, or [Plecoptera](#), are insects that live in water during immature stages, but are terrestrial as adults. They are among the best bioindicators of river [water quality](#) and general landscape disturbance. Anglers often model their dry and wet flies (lures) after these insects.

Scientists at the University of Illinois and Western Kentucky University, funded by the USA National Science Foundation, have completed the first ever statewide assessment of stonefly diversity in Ohio. The study

has been published in the open-access journal *ZooKeys*.

The team used over 30,000 [insect specimens](#) gathered from 18 regional museums (Illinois Natural History Survey, Brigham Young University, Ohio State University) and from new sampling for the analysis. They determined that at least 102, but possibly as high as 120 [species](#) occur in Ohio. The majority of species were found to have evolved to survive warm summer [water temperatures](#) and even drought, most similar to the stoneflies found in the neighboring states of Indiana and Kentucky. Analyses demonstrated that the greatest number of species lived in the eastern half of the state where forest cover is greatest.

This study provides important conservation information. The researchers found that over 17% of the species were rare, being known from only one or two locations. One of these species, the Atlantic Needlefly, *Leuctra duplicata* Claassen), is known only from two adjacent springbrooks in northeast Ohio. This information will help Ohio organizations to prioritize species and high quality streams for greater protection. Several other species were known from historical records, but have not been collected in the last 50-60 years. These species have long life cycles (1-2 years), a [life span](#) that increases their risk for local extinction. One example is a species that occurred in the larger rivers of Ohio, the Enigmatic Stone, *Attaneuria ruralis* (Hagen).

The scientists plan to use the data from Ohio and other states in the region to predict where species will be found and how climate change will affect the distribution of these environmentally sensitive insects in the future.

More information: DeWalt RE, Cao Y, Tweddale T, Grubbs SA, Hinz L, Pessino M, Robinson JL (2012) Ohio USA stoneflies (Insecta, Plecoptera): species richness estimation, distribution of functional niche traits, drainage affiliations, and relationships to other states. *ZooKeys*

178: 1-26. [doi: 10.3897/zookeys.178.2616](https://doi.org/10.3897/zookeys.178.2616)

Provided by Pensoft Publishers

Citation: Stoneflies mapped across Ohio, with implications for water quality and nature conservation (2012, April 12) retrieved 3 May 2024 from
<https://phys.org/news/2012-04-stoneflies-ohio-implications-quality-nature.html>

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