

Ancient species of mayfly had short, tragic life

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This ancient mayfly, trapped 100 million years ago in amber, is a new species named Vetuformosa buckleyi. (Photo by George Poinar, Jr., courtesy of Oregon State University)

About 100 million years ago, a tiny mayfly had a problem.

Like most adult mayflies, she only had that one day to live anyway, so there was no time to waste. She took her mating flight, got fertilized, and was about to lay her eggs when something went horribly wrong. She got stuck in some oozing tree sap and died, preserved for all time in the magic of amber. There would be ho hatchlings.

It was a pretty rude ending to what was already going to be a short <u>adulthood</u>. But her personal tragedy proved fortunate for scientists. The



tiny specimen – just described by an Oregon State University researcher as a new subfamily, genus and species of mayfly – has helped to shed further light on the ecology of the distant past. And at least she didn't get eaten by a fish.

"Understanding the ecology and history of mayflies is important, in part because they are one of the most important fish foods in the world," said George Poinar, Jr., a professor of entomology at OSU and one of the world's leading experts in the use of amber to study ancient life forms.

"This is the first time we ever documented such long antennae and an ovipositor in this order of insects," Poinar said. "This species is now extinct. It probably had to lay its eggs on a certain type of substrate or habitat that disappeared, and the species disappeared with it. It's not good to be too specialized."

An ovipositor, Poinar said, is an egg-laying mechanism many insects use to place their eggs in a specific location, like inside plant tissue. No mayflies have ovipositors today.

Around the world, this group of insects is hugely important in stream biology. They furnish food for most stream predators, including fish.

They are also followed closely by fishermen, who create lures to resemble the latest mayfly hatch in streams and lakes. Many regions have charts to outline the expected hatch dates of particular mayfly species, which often fill the streams with flying insects and send fish into a feeding frenzy used to the advantage of astute anglers.

The life of a mayfly is odd. It lives in nymph form for about a year in freshwater, then emerges for only a single day as an adult to mate, lay eggs and then die.



"After their mating flight mayflies are usually dead by the end of the day," Poinar said. "There's only one thing they really care about on that one eventful day, and it's not eating. They don't even have functional mouth parts."

Clues learned from insect specimens such as this, researchers say, can provide invaluable insights into ancient ecosystems, what life forms existed, and how they may have interacted. Specimens can be preserved in near-perfect form when captured in tree sap that later becomes fossilized into <u>amber</u>, a semi-precious stone.

This particular fossil came from the Hukawng Valley of Burma, now known as Myanmar. It was formed between 97 and 110 million years ago. The findings of this study were published in *Historical Biology*, a professional journal.

"She was a very young female," Poinar said. "I named the genus Vetuformosa, which in Latin means old and beautifully formed."

Provided by Oregon State University

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