Green glow helps repel nocturnal predators

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anead@tulane.edu

A greenish glow from a millipede appears to warn predators that they won't be very tasty, according to a research team that includes Justin Yeager, a doctoral student in the Tulane Department of Ecology and Evolutionary Biology. These nocturnal, inch-long invertebrates, the only bioluminescent millipedes known, protect themselves by secreting highly toxic cyanide.

Doctoral student Justin Yaeger believes his research of green-glowing millipedes reveals that they have developed a technique to ward off predators. (Photo by Sabree Hill)

Yeager is a co-author of a study, "Bioluminescent Aposematism in Millipedes," published in *Current Biology*, which details experiments with these unique millipedes in the mountains of California.

The researchers wanted to know why did these millipedes develop bioluminescence.

"I'm interested in how species can evolve different colorations," says Yeager, who also studies the evolution of coloration in poison frogs.

The evolution of this trait has been hypothesized in several ways. “It either serves no function, it attracts predators, it deters predators, or it could be used in sexual selection, where females have specific color preferences in males,” Yeager says.

“But since these millipedes are blind, this signal isn't for other millipedes. It's a signal to potential predators that they are unpalatable because they release cyanide.”

The hypothesis that bioluminescence protects the millipedes was tested by capturing approximately 170 millipedes, painting half of them to hide their natural glow, then tethering them in place on the forest floor. The researchers also created clay scale models of the millipedes, painted half of them with a green glowing pigment matching the millipedes' bioluminescence, and placed them on the ground.

The main predators, based on attack marks, were mice of the region.

“We found that the ones that glowed were attacked significantly less,” says Yeager. “We demonstrated that this bioluminescence essentially is an advertisement to the predators of the unpalatably or unprofitability of the millipede.”