

Tiny 'headless' insect turns out to be rarest ladybug in the United States

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This photo shows the *Allenius iviei* ladybug from above. Its head is not visible from this angle. Credit: Michael Ivie

A former Montana State University student has discovered the rarest ladybug in the United States, according to MSU entomologist Michael Ivie.

Described in the journal *Systemic Entomology*, the new [ladybug](#) was crawling across a [sand dune](#) in southwest Montana when it dropped into a trap set by entomology grad student Ross Winton.

The ladybug was so small that Winton said he originally thought he had found the body part of an ant. Then he thought the insect was missing its head. He wasn't even sure at first that he had found a ladybug because the insect was tan instead of red and didn't have the spots normally associated with ladybugs.

Closer inspection proved the insect was a male Ladybird Beetle, and its head was attached after all, Winton said. It was just tucked inside a tube in its thorax, much like a turtle pulls its head back into its shell.

Since Winton didn't recognize the ladybug, he took it to Ivie who realized he had once seen a female of that type from Idaho, about 90 miles away from Winton's discovery. Ivie also knew that one of his Australian colleagues was revising the group, so he mailed Winton's ladybug to Canberra.

Winton soon learned that his ladybug—now in pieces and still in Australia—belongs to a unique group of Ladybird Beetles. Ladybird beetles are both familiar and well-known in this country. The group that includes Winton's ladybug contains some of the most bizarre, smallest and least recognizable ladybugs in existence, according to Hermes Escalona and Adam Slipinski who published the *Systemic Entomology* article.

Ivie said Winton's discovery turned out to be the only male of a new species, otherwise known from a single female from just south of the Centennial Valley in Idaho. Since, in an interesting twist, males are required for the description of a new species of Ladybird Beetles, Ross' specimen became the unique single specimen upon which a species is based.

"Without that male specimen, the species could not have been described," Ivie said.

He added that, "The tiny species is known from only two individuals, one male and one female, making it qualify for the rarest species in the USA.

"The species is very unusual not only because of its small size, unique habitat and rarity, but the fact that its head is pulled back into a tube in its thorax makes its biology quite a mystery," Ivie said. "It was so unique that it was placed, along with another new species known from Baja California, in a new genus. While discovery of a new species of beetle in the USA is not an everyday event, a completely new genus is quite rare."

Winton said, "This species and some of its sister species are some of the rarest mostly due to their size, collection frequency, techniques required to collect them and the fact that we know almost nothing about their biology (life cycle, where it lives, what it eats, etc)."

Ivie said he requested that his colleagues name the new ladybug "wintoni" after Winton, but Escalona and Slipinski eventually named it *Allenius iviei*. Ivie, who was Winton's adviser when Winton was studying for his master's degree, proposes that the common name be "Winton's Ladybird Beetle." He said Winton deserved the honor and noted that the find was a "stunning example of the contributions and discoveries made by student researchers at MSU.

"This was totally Ross' discovery," Ivie said. "He is the one who designed the study, placed the traps, sorted the materials and recognized that it was not sand - no small accomplishment when you consider the animal is the size and color of a grain of sand.

"Further, he is the one who recognized it as something unusual," Ivie said.

Ivie's colleague - University of Idaho [entomologist](#) James B. "Ding"

Johnson—said Winton's discovery is significant because, "Each new [species](#) discovered gives us more knowledge on the real biodiversity of the region, nation and world. They also fill in voids in our knowledge of the evolutionary tree of life. Gaps in the data inevitably lead to errors in our understanding. At the minimum, understanding the results of evolution gives us a better idea of the processes, and any discovery may open doors to novel insights.

"Beyond the intrinsic scientific merit of such an increase in knowledge, ladybugs have been used extensively in biological control of insect pests, and any improved understanding of their taxonomic and biological diversity may allow us to use them more effectively and safely," Johnson added.

As so often happens in science, Winton said his discovery was "totally random." He came across the ladybug in 2009 while researching the role of grazing and fire on the community dynamics of insects that live in the sand dunes on the north shore of Red Rocks Lake in Montana's Centennial Valley. Winton believes the one millimeter-long ladybug normally lived in plants, but happened to fall on the sand where it was caught.

Winton earned his bachelor's degree in wildlife management from MSU in 2005 and his master's degree in [entomology](#) in 2010. Now a senior wildlife technician with Idaho Fish and Game, Winton said he mostly works with big game and wildlife habitat these days, but he still remembers what it took to trap the rare ladybug.

He started by diving into recycling bins around Bozeman and visiting Lehrkind's Coca-Cola Bottling Company to collect enough two-liter plastic bottles for his study. He then cut the bottles off at the shoulder and placed the resulting funnel into the bottom piece, creating traps that would funnel insects into preservative at the bottom. Ross then hauled

the traps to Beaverhead County where he buried them up to their edge in the sand dunes, creating a pitfall that trapped insects as they crawled across the sand.

Winton returned every week or so, camping gear in tow, to empty and rebury the traps. If he was in a hurry or happened to be there during a full moon, he could work all night and finish his work in 1 ½ to two days, Winton said.

The traps worked well, but animals and fire sometimes interfered, Winton said. Coyote pups would dig up the bottles and play with them like chew toys. An unexpected controlled burn to remove unwanted vegetation from the sand dunes once caused half the bottles to curl in on themselves. Fortunately, the bottles became like plastic balloons around the insects.

"It was pretty handy," Winton said.

Provided by Montana State University

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