
Butterflies “treat” sick young

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Courtesy of Emory University
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Monarch butterflies seem to “treat” their unborn offspring for a parasitic infection by laying the eggs on a plant that helps fight the illness, a new study suggests.

Infected butterflies “prefer to lay their eggs on plants that will make their offspring less sick, suggesting that monarchs have evolved the ability to medicate their offspring,” said Jaap de Roode, an evolutionary biologist with Emory University in Atlanta, Ga., who led the research.



Monarch butterflies seem to use plants to treat their offspring for a type of infection, biologists are claiming. (Photo by Randy Loftus, USFWS)

Various studies have pointed to evidence of apes or other mammals “self-medicating,” but the discovery of such behavior in insects would be new. De Roode and colleagues published a report on the findings Oct. 6 in the the research journal *Ecology Letters*.

Monarch butterflies are known for their spectacular migration from the United States to Mexico each year, and for the striking pattern of orange, black and white on their wings. The bright colors are a warning to birds and other predators that the butterfly may be poisonous.

In their young, caterpillar stage, monarchs feed on any of dozens of species of milkweed plants, including some species that contain high levels of cardenolides. These chemicals don’t harm the caterpillars, but make them toxic to predators even after they emerge as adults.



A monarch butterfly caterpillar crawls over a milkweed plant. Monarchs feed on any of dozens of species of milkweed plants, including some species that contain high levels of chemicals that make them toxic to predators. (Image courtesy USDA)

Previous research has focused on whether the butterflies choose more toxic species of milkweed to ward off predators. De Roode wondered if the choice could be related to the *Ophryocystis elektroscirrha*, parasites that invade the gut of monarchs when they are in the young caterpillar stage and stay into the insects' adulthood. The parasites sap the butterflies' energy, shorten their lives, and sometimes kill them, their fluids oozing out of their bodies.

An infected female that lays eggs passes on the parasites to her offspring. But experiments in de Roode's lab, he said, revealed that infected females, unlike others, show a specific preference for laying eggs on toxic milkweed.

Few studies have been done on self-medication by animals, he added, but some scientists have theorized that the practice may be more widespread than we realize.

"The results are also exciting because the behavior is trans-generational," said Thierry Lefevre, a post-doctoral fellow in de Roode's lab. "While the mother is expressing the behavior, only her offspring benefit."

The findings also may have implications for human health, said University of Michigan chemical ecologist Mark Hunter, who collaborated with de Roode's group. "Studying organisms engaged in self-medication gives us a clue as to what compounds might be worth investigating for their potential as human medicines."