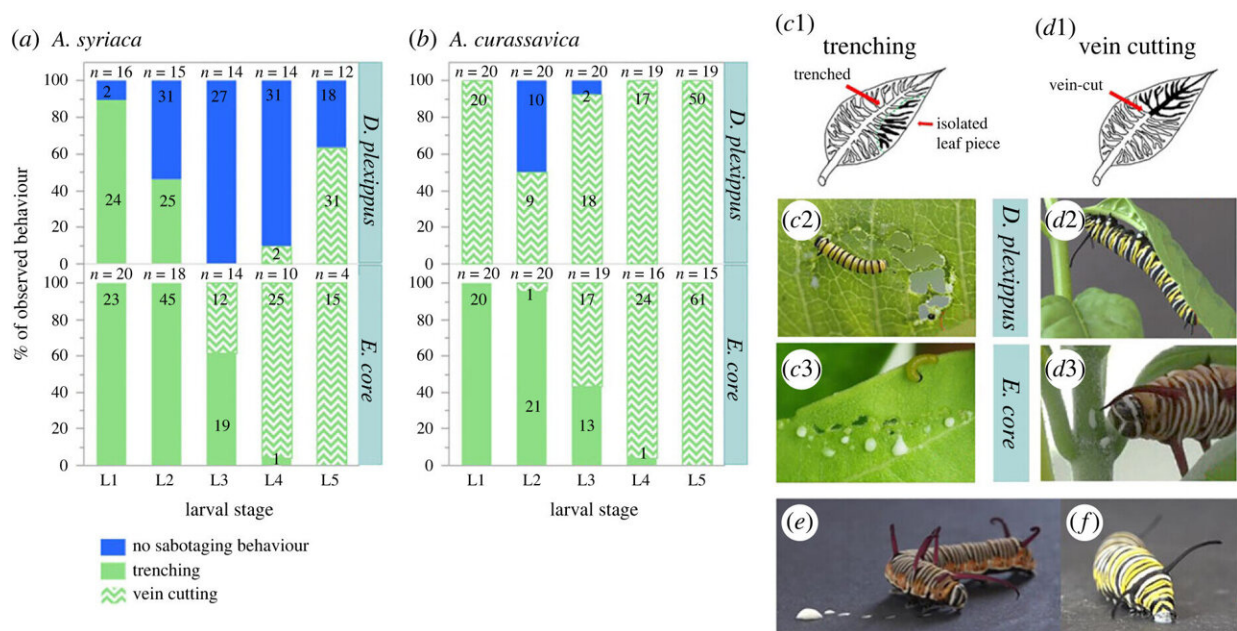


# Monarch caterpillar found to switch from avoiding milkweed-toxin-rich latex to eating it as they age

March 11 2024, by Bob Yirka



Sabotaging behavior and latex drinking by caterpillars of the monarch butterfly (*D. plexippus*) and the common crow (*E. core*). Caterpillars were raised either singly (monarchs) or in pairs of two (Euploea) on individual plants until pupation on *A. syriaca* or on (b) *A. curassavica*. Observed feeding behavior was categorized into trenching (c1–3; i.e., cutting a series of minor leaf veins on the leaf blade, resulting in a trench), vein cutting (d1–3; i.e., cutting a single major leaf vein or the petiole) or no sabotaging behavior (i.e., direct feeding on the leaf

without signs of trenching or vein cutting (e,f) Caterpillar behavior after artificial latex feeding: (e) E. core spitting out latex immediately; (f) D. plexippus drinking latex. Credit: *Proceedings of the Royal Society B: Biological Sciences* (2024). DOI: 10.1098/rspb.2023.2721

A trio of German entomologists has found that young monarch caterpillars switch from avoiding milkweed-toxin-rich latex to eating it as they get older. Their paper is [published](#) in the journal *Proceedings of the Royal Society B*.

Prior research has shown that [monarch caterpillars](#) have developed a way to eat milkweed leaves despite their rich load of toxin-rich latex. They bite a vein and then wait for the milky substance to drain out of the leaf, and then dig in. But there is much more to the story as the researchers in this new study learned.

Monarch butterflies lay their eggs on milkweed leaves. Three to five days later, the [eggs](#) hatch into caterpillars, which grow and molt several times before generating a chrysalis in which they metamorphose into a butterfly. For this new study, the researchers watched the caterpillars grow from the time they hatched until they formed their chrysalis and found that after the caterpillars grew to a certain size, they stopped avoiding the milky goo and began to consume it.

Surprised by the discovery, the researchers wanted to find out if it was completely intentional. They fed some of the caterpillars small doses of toxin-rich [latex](#) directly from a pipette and found that they were just as eager to consume the material. They describe it as like watching a cat lap up milk.

Prior research has shown that some of the materials in milkweed are toxins called cardenolidesâ&#128;"when consumed by some animals, they destroy an [enzyme](#) in their gut that is responsible for balancing sodium and potassium levelsâ&#128;"without the enzyme, the animal typically dies. But the older caterpillars, the research team found, were able to convert the cardenolides into less toxic forms. And that allowed the caterpillars to hold the toxins in their bodies, helping to fend off predators.

**More information:** Anja Betz et al, Late-instar monarch caterpillars sabotage milkweed to acquire toxins, not to disarm plant defence, *Proceedings of the Royal Society B: Biological Sciences* (2024). [DOI: 10.1098/rspb.2023.2721](https://doi.org/10.1098/rspb.2023.2721)

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