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The ecology and evolution of a cycad-weevil pollination mutualism

LE JEUDI 22 AVRIL 2021 À 12 H 30

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Zamia cycads and their *Rhopalotria* weevil pollinators are a classic example of a brood site pollination mutualism where both partners completely depend on the other for life cycle completion. Using insect behavior and physiology, plant transcriptomics and morphology, chemical ecology, and phylogenetics, I describe the ecology and evolution of this symbiosis. This mutualism pair exhibits a push-pull pollination mechanism whereby cyclical changes in plant volatile production initiate pollinator movement between male and female reproductive cones. This mechanism is likely found across the Cycadales with origins before the rise of flowering plants and therefore represents one of the oldest known pollination mechanisms. This chemically-mediated mutualistic species interaction affects trait evolution in both lineages with evolution of both plant volatile production and insect volatile perception. Cycad tissues are extremely toxic to all animals including insects and a third party to this mutualism may also exist in the form of specialized gut bacteria that are shared across cycad herbivores and may play a role in ameliorating the toxic cycad tissue.

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