

Yellow-eyed grasses may have more insect visitors than previously thought

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Yellow-eyed grasses are visited by a diverse group of arthropods — including spiders, beetles, and other insects such as grasshoppers, locusts and crickets, according to the researchers. Credit: Terry Torres-Cruz

Scientists previously believed that a family of flowering plants called yellow-eyed grasses didn't attract many insect visitors, but the recent

discovery of a fungus that hijacks the plant and forms fungal "pseudoflowers" has researchers rethinking this assumption.

In 2020, [scientists working in Guyana discovered](#) small fungal structures on the grasses that resembled the plant's natural flowers, sparking an interest in the plant. Scientists hypothesized that the fungus was mimicking the flowers to attract insects that would then pick up and spread the fungal spores.

The theory prompted researchers to rethink the assumption that insects rarely visited the plants: Why would a fungus potentially try to mimic the plant's flowers if they didn't attract insects?

In a new study published in the [*Proceedings of the Entomological Society of Washington*](#), a team led by Penn State researchers published the first documentation of arthropods that visit these grasses in Guyana, a South American country where species of the plant are most diverse.

They found that these plants are visited by a diverse group of arthropods—including spiders, beetles, and other insects such as grasshoppers, locusts and crickets. A casebearing moth caterpillar, called *Coleophora*, also was observed visiting the plants.

Terry Torres-Cruz, a postdoctoral research assistant at Purdue University, led the study while earning her doctorate in [plant pathology](#) from the Penn State College of Agricultural Sciences. She said the findings suggest that insects and other arthropods may visit these plants more often than previously believed.

"We were a little surprised that we observed such a variety of insects on these grasses and their flowers, which don't produce nectar and were thought not to attract many insect visitors," Torres-Cruz said. "But most of what we knew about insect visitation to these plants were from studies

in the U.S., so conducting this study in Guyana resulted in new observations."

Michael Skvarla, assistant research professor of arthropod identification at Penn State, said the results also may offer insight into how the plants are pollinated.

"Yellow-eyed grasses have historically been thought to be wind-pollinated, so finding that they're visited by so many types of insects opens the possibility that they could actually be insect-pollinated," Skvarla said. "These plants also exist in Africa, Asia and Australia, so it would be great if we could confirm that insects visit the flowers on those continents, as well."

While a few yellow-eyed grass species have been used as ornamentals in floral arrangements, as companion plants for [carnivorous plants](#), and as food for [wild turkeys](#), they generally have little economic or agricultural importance. But, the researchers said, studying the grasses is important.

One species of the plant—*Xyris tennesseensis*—is a federally endangered species in the U.S., and many other wetland plants are threatened by habitat destruction worldwide. Learning more about how these plants are pollinated and produce seeds could help with maintaining these species.

"Part of my work studying these plants was trying to determine whether insects visited flowers at all, because there were no official reports for the species of interest," Torres-Cruz said.

Additionally, there aren't many known fungal pseudoflower systems, according to the researchers, so learning more about this system will allow scientists to compare against other pseudoflower systems.

For this study, the researchers observed the plants at three sites in Guyana: the Demerara-Mahaica region, the Upper Demerara-Berbice region and the Potaro-Siparuni region. They took photographs during observation periods and later used them to identify arthropods.

They found that approximately 15 to 20 arthropods visited the plants in each area per hour.

In the Demerara-Mahaica region, researchers observed long-jawed orb weavers, looper caterpillars and meadow katydids. In the Upper Demerara-Berbice region, they saw bees and meadow katydids on the plants. Finally, in the Potaro-Siparuni region, the team spotted orb weaving spiders, lynx spiders, crab spiders, leaf beetles, stingless bees, meadow katydids and casebearer moth larval cases on the grasses.

"The meadow katydid, belonging to the Orthoptera order, was the only insect seen at all three sites," Torres-Cruz said. "They were often observed feeding on the pollen and floral tissues of the plants."

The researchers said in the future, additional studies could investigate whether insects visit the yellow-eyed grasses on other continents, as well. A planned follow-up study led by Torres-Cruz also will compare insect visitation between the flowers on the grasses and the fungal pseudoflowers on the plants.

More information: Terry J. Torres-Cruz et al, Diversity of Arthropods that Visit *Xyris* spp. (Xyridaceae): New Observations from Guyana, *Proceedings of the Entomological Society of Washington* (2024). [DOI: 10.4289/0013-8797.125.2.246](https://doi.org/10.4289/0013-8797.125.2.246)

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