Ecology & Evolution | Nov 23, 2026 | 3 min read | By Bryan White

Two New Predatory Gall Midge Species Discovered Hunting Mealybugs in Brazil

Ecology & Evolution * Biodiversity

Most people know gall midges -- tiny, delicate flies of the family Cecidomyiidae -- as plant pests whose larvae trigger swollen growths on leaves and stems. Yet one specialized branch of this fly family plays the opposite ecological role: instead of feeding on plants, their larvae act as voracious predators of soft-bodied agricultural pests. In November 2026, taxonomists working in S o Paulo State, Brazil , formally described two previously unknown predatory species -- Diadiplosis duriganae and Diadiplosis carmonetoi -- found hunting destructive mealybugs across both farmed fields and native savanna habitats.

The discovery fills a longstanding scientific gap in South American insect taxonomy. By documenting every developmental stage of these midges -- from third-instar larvae and pupae to adult males and females -- the researchers have given agricultural scientists a reliable identification guide for native predators that could help protect high-value crops like coffee and soybeans without heavy chemical spraying.

Tiny Predators of Crop-Damaging Mealybugs

Mealybugs (family Pseudococcidae) are sap-sucking scale insects coated in a protective layer of powdery white wax. In tropical and subtropical farming systems, dense mealybug colonies weaken plants by draining phloem sap, stunting new shoots, and excreting sticky honeydew that encourages black sooty mold. Because their waxy coating helps shield them from contact insecticides, growers increasingly look to natural enemies -- such as ladybird beetles , parasitic wasps, and predatory gall midges -- for sustainable pest management.

Adult Diadiplosis midges are small, fragile flies that do not hunt; instead, females lay tiny eggs directly inside or beside mealybug egg masses and colonies. Once the legless larvae hatch, they pierce mealybug eggs, nymphs, and adults with specialized mouthparts and feed on their internal fluids, steadily thinning out infestations from within.

| Taxonomic & Ecological Feature | | Discovery Profile |

| Newly Described Species | | Diadiplosis duriganae and Diadiplosis carmonetoi |

| Order & Family | | Diptera: Cecidomyiidae (Gall Midges) |

| Prey Guild | | Mealybugs (Hemiptera: Pseudococcidae) |

| Collection Region | | Agricultural fields and native savanna habitats, S o Paulo State, Brazil |

| Life Stages Documented | | Third-instar larvae, pupae, adult males, and adult females |

Closing a Neotropical Taxonomy Gap

Although the genus Diadiplosis occurs across tropical ecosystems worldwide -- including recent taxonomic additions such as Diadiplosis queenslandi described from Australian blueberry orchards in 2026 -- Neotropical predatory gall midges have historically lacked thorough life-stage descriptions. Without detailed illustrations of microscopic larval structures, pupal horns, and adult wing venation or genitalia, field entomologists could easily mistake beneficial predatory midges for unrelated plant-feeding species.

By capturing specimens across both agricultural landscapes (including coffee and soybean zones) and adjacent native Cerrado savanna vegetation, the S o Paulo survey also highlights how natural habitat fragments serve as reservoirs for beneficial insects that spill over into nearby croplands.

Building Foundations for Biological Pest Control

Formal species descriptions are the essential first step before any native predator can be reared, monitored, or conserved in integrated pest management (IPM) programs. Knowing precisely which Diadiplosis species are native to Brazilian agroecosystems prevents wasted effort on imported biocontrol agents that may struggle to adapt -- or pose ecological risks to non-target native insects -- while helping farmers preserve the native savanna corridors that sustain natural pest suppression year-round.

References & Primary Sources

* [1] Bioengineer.org (2026). Two New Predatory Gall Midge Species Discovered Targeting Mealybugs in Brazil. -- https://bioengineer.org/

* [2] Kolesik, P., et al. (2026). Diadiplosis queenslandi Kolesik, sp. nov., a New Species of Gall Midge (Diptera: Cecidomyiidae) Predatory on Mealybug Planococcus Ferris, 1950 in Australia. Austral Entomology. -- https://doi.org/10.1111/aen.70112

* [3] Maia, V. C. (2022). A new species of gall midge (Diptera, Cecidomyiidae) on Ouratea cuspidata, a plant endemic to Brazil. Revista Brasileira de Entomologia. -- https://doi.org/10.1590/1806-9665-rbent-2022-0034