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EENY-379
doi.org/10.32473/EDIS-in736-2007

Azalea Leafminer, *Caloptilia azaleella* (Brants) (Insecta: Lepidoptera: Gracillariidae)[1]

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The Featured Creatures collection provides in-depth profiles of insects, nematodes, arachnids, and other organisms relevant to Florida. These profiles are intended for the use of interested laypersons with some knowledge of biology as well as academic audiences.

Introduction

The azalea leafminer, *Caloptilia azaleella* (Brants), is a larva of a tiny purple- and yellow-marked moth. It is found almost everywhere azaleas are grown. Leaf injury by the larva is very characteristic. The folding over of the leaf tip or leaf margin occurs after the larva emerges from within the leaf.

In Florida, the larvae are found in every month of the year. However, infestations are most noticeable in nurseries from early spring through August.



Figure 1. Mature larva of the azalea leafminer, *Caloptilia azaleella* (Brants).
Credit: Russell F. Mizell, University of Florida

Distribution

This insect is a destructive pest of azaleas throughout the range of its host. Endemic to Japan, it has been introduced worldwide.

In the United States, this species is found from Florida to Texas and north to Long Island, New York, West Virginia, and the Ohio Valley. It also is found in northern California and the US Pacific Northwest (Johnson and Lyon 1994, Heppner 2003).

Description and Biology

The adult azalea leafminer deposits eggs on the underside of the leaf along the midrib. When mature, the larva often selects an undamaged leaf, rolls up in it and pupates. The adult moth emerges in about a week, mates, and begins the cycle again (Johnson and Lyon 1994).

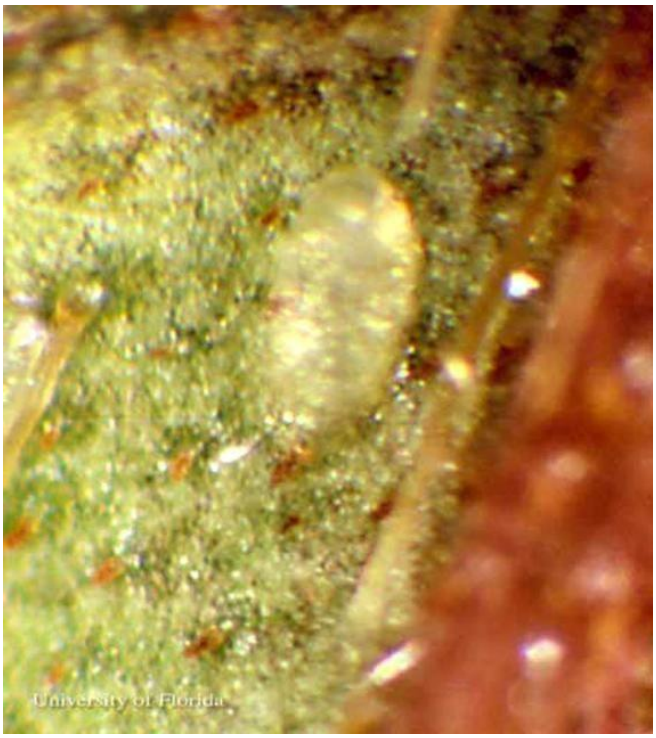


Figure 2. Egg of the azalea leafminer, *Caloptilia azaleella* (Brants).
Credit: Russell F. Mizell, University of Florida



Figure 3. Pupa (pupal case removed) of the azalea leafminer, *Caloptilia azaleella* (Brants).
Credit: Russell F. Mizell, University of Florida



Figure 4. Typical cocoon of the azalea leafminer, *Caloptilia azaleella* (Brants).
Credit: Lyle J. Buss, University of Florida

The azalea leafminer is a leafminer only for the first half of its larval life. Upon hatching, the young larva enters the leaf directly beneath its eggshell and feeds as a leafminer, creating a blister on the underside of the leaf. The mined area turns brown (Johnson and Lyon 1994).



Figure 5. Young larva (upper middle) of the azalea leafminer, *Caloptilia azaleella* (Brants). Note brown color of mined area.
Credit: Lyle J. Buss, University of Florida

Once it has reached mid-size, the larva migrates to the upper leaf surface and by means of silk pulls the leaf over its body and chew holes in the leaf. The larva may also tie newly expanding leaves together at the tip of a shoot and feed in the same manner. At this point, the larva is known as a leaftier. Injured leaves usually turn yellow and drop (Johnson and Lyon 1994).



Figure 6. Mid-sized larva (4.5 mm (~3/16 in) long) of the azalea leafminer, *Caloptilia azaleella* (Brants). Note dark frass (insect waste) at upper left of image. Head of larva is at right.
Credit: Lyle J. Buss, University of Florida

The larval stage that folds the leaf is about 0.5 inches long, yellowish, and with three pairs of abdominal prolegs, which are found on abdominal segments 3, 4, and 5. The proleg hooks (crochets) are singly arranged in a U-shaped pattern (penellipse).

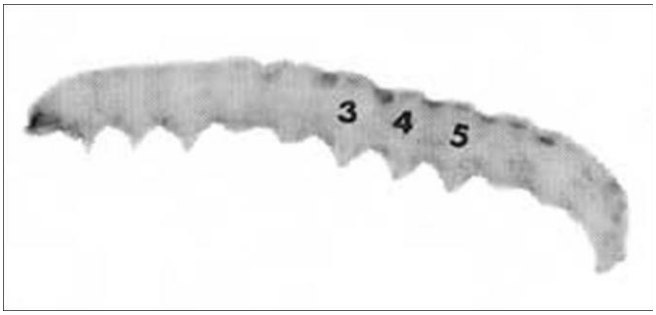


Figure 7. Larva with abdominal segments bearing prolegs indicated by number.
Credit: Division of Plant Industry

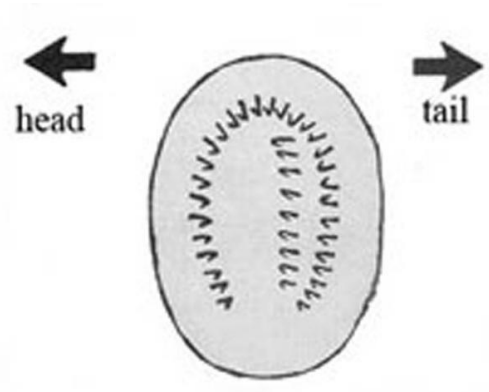


Figure 8. Ventral view of left proleg, fourth abdominal segment, showing arrangement of crochets.
Credit: Division of Plant Industry

The adult is a small yellow or golden-colored moth with purplish markings on the wings. The wingspread is about 10 to 13 mm. Most of its life is spent hidden among the leaves of the host.



Figure 9. Adult azalea leafminer, *Caloptilia azaleella* (Brants).
Credit: Lyle. J Buss, University of Florida



Figure 10. Adult azalea leafminer, *Caloptilia azaleella* (Brants). Wingspan of this specimen is 9.9 mm.
Credit: Lyle J. Buss, University of Florida



Figure 11. Ovipositor of adult female azalea leafminer, *Caloptilia azaleella* (Brants).
Credit: Russell F. Mizell, University of Florida

In Florida, there is continuous breeding. Georgia has reported three to four generations a year, while even as far north as Long Island there are two generations per year. In Oregon, there are three generations per year, and the insect overwinters as a last-instar larva or pupa in a rolled leaf, or occasionally as a tiny miner in a leaf (Johnson and Lyon 1994).

Hosts

Azaleas (*Rhodendron* spp.) are the only hosts recorded for this insect.

Economic Importance

This leaf miner is a pest of container and field-grown azalea nursery stock. However, plants in the landscape are also commonly attacked. Injured leaves usually turn yellow and drop, thus causing an unsightly plant. If the insect is controlled early, the plants will outgrow the injury it causes (Johnson and Lyon 1994).



Figure 12. Under leaf surface of azalea foliage damaged by azalea leafminer, *Caloptilia azaleella* (Brants); leaf folds (tip of leaf) and two mines (brown areas).
Credit: Lyle J. Buss, University of Florida



Figure 13. Upper leaf surface of azalea foliage damaged by azalea leafminer, *Caloptilia azaleella* (Brants); leaf die-back (at tip) and two mines (near tip).
Credit: Lyle J. Buss, University of Florida

Management

Cultural Control

Prune off and destroy infested branches. Keep plants healthy (properly irrigated and fertilized) so they can tolerate and outgrow the damage (Buss 2006).

Biological Control

There are at least three species of parasitoids of the azalea leafminer, in the genus *Sympiesis* Förster (Hymenoptera: Eulophidae). They are the major species attacking the pupa (Mizell and Schiffhaur 1991).



Figure 14. Larva of a *Sympiesis* sp. parasitoid feeeding on a larva of an azalea leafminer, *Caloptilia azaleella* (Brants).
Credit: Russell F. Mizell, University of Florida



Figure 15. Adult female *Sympiesis* sp. parasitoid of the azalea leafminer, *Caloptilia azaleella* (Brants).
Credit: Lyle J. Buss, University of Florida



Figure 16. Adult male *Sympiesis* sp. parasitoid of the azalea leafminer, *Caloptilia azaleella* (Brants).
Credit: Lyle J. Buss, University of Florida



Figure 17. The cocoon of a *Sympiesis* sp. parasitoid of the azalea leafminer, *Caloptilia azaleella* (Brants).
Credit: Lyle J. Buss, University of Florida

Chemical Control

Leafminers are difficult to control as they are protected by leaf tissue. The best time to manage them is when larvae first hatch inside the leaves and begin to feed, as plant damage is minimal. When many large or long mines are seen, the leafminer may have completed its development, and control is not useful (Buss 2006).

Acknowledgment

The Project Coordinator thanks Dr. Russell F. Mizell, University of Florida, for his review of this updated publication.

Selected References

Burks RA. (2003). *Sympiesis* Förster, 1856. Key to the Nearctic genera of Eulophidae, subfamilies: Entedoninae, Euderinae, and Eulophinae (Hymenoptera: Chalcidoidea). (27 May 2016)

Buss EA. (2006). Leafminers on Ornamental Plants. Ask IFAS. https://ufdc.ufl.edu/IR00002884/00001.

Dickey RD. 1965. Azalea culture. Agricultural Experiment Station Circular S-172. University of Florida, Gainesville, Florida.

Heppner JB. 2003. Lepidoptera of Florida. Arthropods of Florida and Neighboring Land Areas Vol. 17. Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville, FL.

Johnson WT, Lyon HH. 1994. Insects That Feed on Trees and Shrubs. 2nd ed. rev. Cornell University Press, Ithaca, NY. 560 p.

Kerr TW. 1959. Insects of ornamental trees and shrubs in Rhode Island. Agricultural Experiment Station Bulletin 348: 12–13.

Mizell RF, Schiffhaur DE. 1991. Biology, effects on hosts, and control of azalea leafminer (Lepidoptera: Gracillariidae) on nursery stock. Environmental Entomology 20: 597–602.

[1] This document is EENY-379 (originally published as DPI Entomology Circular 55), one of a series of the UF/IFAS Department of Entomology and Nematology. Original publication date June 2007. Revised April 2010, March 2013, May 2016, July 2022, and December 2025. Visit the Ask IFAS website at https://ask.ifas.ufl.edu/ for the currently supported version of this publication.

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