
A New Gall Midge Pest Infesting Pinxterbloom Azalea Flowers in Maryland and Washington, D.C.

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Pinxterbloom Azalea, *Rhododendron periclymenoides* (Michaux) Shinnery, blooms in late April in the vicinity of Washington, D.C. Among the showy pink flowers can also be seen aborted flower buds (Figure 1). Lying among the scales and flower parts of the damaged buds are yellow insect larvae less than three mm long (Figure 2). By the end of April, these larvae have dropped to the ground and burrowed into the soil. Affected buds then succumb to rot and die. The insect responsible for the damage is a species of gall midge new to science that belongs in the genus *Dasineura*. It will be described and named elsewhere (1) but for now can be dubbed the pinxterbloom gall midge.

Gall midges are small, gnat-like flies that belong to the family Cecidomyiidae. More than 900 species of this family are known to attack plants in North America (2). Adults are innocuous but the larvae of many species feed in or on plants, where many are responsible for distinctive, complex galls. Larvae of the new species on pinxterbloom live among flower parts and prevent normal flower development. Most plant-feeding gall midges attack only one host or a few closely related hosts on which they feed by sucking plant juices. Affected plant parts may appear healthy while the larvae are feeding but they are reallocating their energy to the gall midge larvae.

Most gall midges and all other species of *Dasineura* in northeastern North America over-winter as mature larvae, either in the ground or in plant tissue. They pupate in spring and adults emerge a short time later, mate almost immediately, and the females then lay eggs on or near the susceptible plant tissue. Larvae quickly hatch and, sometimes following a short period of relocation, soon begin feeding. The biology of this new species of *Dasineura* is different and unique in that adults emerge from the soil and lay their eggs in the fall. The effect of this strategy is that the larvae become active in late winter before the ground is unfrozen, giving them a march on spring.

One other gall midge is known to attack Pinxterbloom Azalea in eastern US and should not be confused with the new species. This is *Asphondylia azaleae* Felt which infests leaf buds of *R. periclymenoides* and *R. prinophyllum* (Small) Millais (2).

I observed the progress of the pinxterbloom gall midge found in woods on the South Farm of the Beltsville Agricultural Research Center, Beltsville, MD, from spring of 1993 to autumn of 1994. Figure 3 summarizes its life cycle. In mid-April, 1993, I found as many as 75 mature, third instar larvae among the flower parts and bud scales of each unopened flower cluster. Larvae were quiescent and apparently no longer feeding, their heads directed towards the bud apex and not engaged with the plant (Figure 2). For two weeks in April, 1994, larvae lay in the flower buds, although when disturbed they became active and quickly wriggled out of the buds. On the day following a heavy rain on April 28, 1994, no larvae remained in the buds. Some larvae had previously been collected for observation and rearing in my home. These were placed in pots filled with damp peat moss. Upon leaving the buds, larvae immediately burrowed beneath the surface of the peat moss where the



Top: Figure 1. Flowers and aborted flower buds on Pinxterbloom Azalea.

Bottom: Figure 2. Insect larvae on Pinxterbloom Azalea buds.

larvae spun ovoid, white cocoons and entered diapause. I did not determine when the larvae entered the pupal stage, but larvae had not yet pupated by July 30, 1994. Adults were discovered emerging on October 17, 1993, and, evidently, had been doing so for some time because many dead specimens were found in the rearing box. Adults contained to emerge until October 21. In 1994, emergence began on October 1 and ended on October 22. The surface of the peat moss was covered with white pupal skins, so the fully developed pupae had crawled from the cocoons to the surface of the peat before adults emerged.

On November 8, 1993, shortly after emergence of adults in captivity, I found eggs between outer bud scales of pinxterbloom at Beltsville. Eggs were elongate-ovoid, contiguous, in groups of ten or more set side by side.

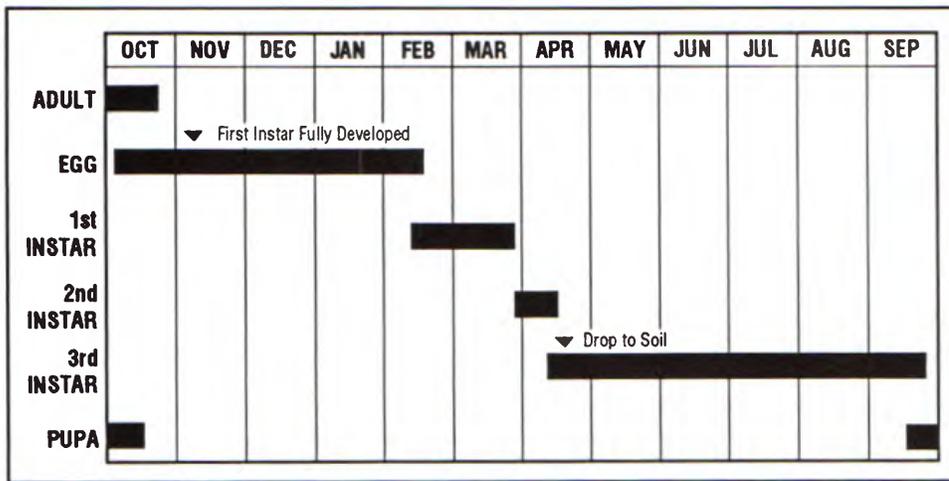


Figure 3. Pinxterbloom gall midge life cycle.

Females (Figure 4) had evidently used their long, protrusible ovipositors to insert the eggs between the scales. No eggs were found among the primordial flowers, possibly because the tightly overlapping inner bud scales prevented entry of the ovipositor. These eggs already contained quiescent, fully developed first instar larvae. All larval heads were pointed toward the bud apex, showing that the eggs were laid caudal end first. Upon leaving the eggs in spring the larvae were in position to crawl directly upward, around the top of the outer bud scales, and make their way downward into the flowers.

Stationary, whitish first instars about 0.4 mm long, were first noticed on February 23, 1994, lying on the surface of stamens and pistils. At this time the soil beneath the plants was still frozen. Until March 15 when the flower parts of normal and infested flowers were only beginning to swell, larvae grew only to 0.5 mm long. By March 17, 1994, the first instars were noticeably larger, up to 0.6 mm long, and appeared to be more motile. Minute brown areas were noticeable on the pistils or stamens near apparent feeding points. By March 25, 1994, larvae still had not molted but the brown spots were more pronounced and the flower parts showed some distortion. By April 4, all larvae had molted to the second instar. They were greenish white and about 1.6 mm long. Stamens and pistils in infested buds showed



Figure 4. Adult female Pinxterbloom gall midge.

some deformation and more extensive brown scarring (Figure 5). Both normal and infested buds were enlarging but still not open.

On April 8, second instars were noticeably larger, about 2.3 mm long. Flower parts showed conspicuous distortion and scattered brown spots. By April 12 the second instars were about 2.5 mm long. At this time stamens and pistils of uninfested buds were elongating and the petals becoming reddish, and new leaves were emerging in straight, narrow fascicles about 1/2 inch long.

By April 14 most larvae had molted to the third instar, which were yellow and about 2.5 mm long. Third instars apparently did not feed, but crawled away from the stamens and pistils, repositioned themselves head outwards among bud scales, and became inactive. On April 20, 1994, uninfested



Figure 5. Insect damaged stamens and pistils.

flowers lengthened and unfurled quickly while infested buds remained closed. On April 25, 1994, uninfested pinxterbloom flowers were in full bloom. Larvae still remained in infested flowers until three days later when, evidently in response to a heavy rain, the larvae left the buds.

I have seen similar damaged buds on pinxterbloom in the U.S. National Arboretum, Washington, D.C. but have not further investigated geographic and host ranges of this species. It may infest other native deciduous azaleas. No parasitoid wasps (Hymenoptera) were reared with the gall midge and the only predator noticed was an unidentified mite (Acarina) found on one occasion feeding on a gall midge larva in the flower buds. Local control might be achieved by cutting off damaged buds and burning them before the larvae drop to the ground.

References

- (1) Gagné, R. J., in preparation. "A new species of *Dasineura* (Diptera: cecidomyiidae) infesting Pinxterbloom Azalea flowers in Maryland and Washington, D.C.". To be submitted to the Proceedings of the Entomological Society of Washington.
- (2) Gagné, R. J. *The Plant-Feeding Gall Midges of North America*. Cornell University Press, Ithaca, New York. xiii and 355 pp and 4 pls. 1989.

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