



Arborvitae Leafminer in Virginia

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Introduction

Arborvitae leafminer (*Argyresthia thuiella*; Lepidoptera: Argyresthiidae) is a small moth that attacks arborvitae (*Thuja occidentalis*), its cultivars, and sometimes false cypress (*Chamaecyparis* sp.). Native to North America, it was originally found in the the native host range of arborvitae in the upper Midwest, northeastern US, and adjacent Canada. It has since spread, presumably through the horticultural trade, to other parts of the US, Canada, and Europe.

Description

Arborvitae leafminer larvae are very small, measuring about 7 mm (0.2") long. They are generally a reddish or brownish green color with a shiny dark head capsule and a small shield-like plate immediately behind the head (Fig. 1). The caterpillars feed inside the leaves where they are hidden from sight. Infestation by arborvitae leafminer may not be apparent until plant damage becomes visible.



Figure 1. Young arborvitae leafminer larva (Robert Childs, University of Massachusetts, Bugwood.org).

Adult arborvitae leafminers are small moths with a wingspan measuring about 8-9 mm (0.3-0.4") long. The narrow wings are held roof-like over the body at rest (Fig. 2). The forewings are silvery gray crossed by three reddish brown bands when the wings with a

scattering of small dark spots. There is a brush of erect white hairs on the head, and both the forewings and hindwings have a long fringe on their edges. The legs and antennae are light brown. Sometimes the adults are observed standing with their abdomens elevated in the air higher than their heads.



Figure 2. Adult arborvitae leafminer (Michael Butler, CC BY-NC 4.0, Photo 142975683, iNaturalist).

Life History

Arborvitae leafminer has a complete life cycle of egg, larval, pupal, and adult stages. Female moths lay individual eggs on the scale-like leaves of host plants. The young caterpillars (Fig. 2) bore inside the leaves and feed on internal tissues. They overwinter as larvae inside the feeding galleries and resume feeding in the spring. Mature caterpillars pupate inside the feeding galleries (Fig. 3). Adult moths emerge through small exit holes in leaves during midsummer to mate and lay eggs. There is a single generation per year.



Figure 3. Arborvitae leafminer pupa inside feeding gallery (John A. Weidhass, Virginia Tech, Bugwood.org).

Damage

Arborvitae leafminer larvae feed on the internal tissues of leaves, which turn yellow and then brown as they dry out (Fig. 4). Scout for arborvitae leafminer by looking for discolored foliage full of dark brown frass resembling coffee grinds when cut open. Infested branchlets may have small exit holes indicating where an adult moth emerged. Older damage may appear bleached or gray as it ages.



Figure 4. Arborvitae leafminer damage (Connecticut Agricultural Experiment Station, Bugwood.org).

In general, arborvitae leafminer does not kill host plants but can cause noticeable aesthetic damage. Damaged leaves and branchlets eventually drop off the plant, but infested plants typically can produce new growth to replace the damaged foliage.

In extreme cases, heavy infestations may produce discoloration throughout the canopy, resulting in a browned or bleached appearance (Fig. 5). Repeated years of heavy infestation by arborvitae leafminer may cause branch dieback or even plant death.



Figure 5. Arborvitae heavily defoliated by arborvitae leafminer (Robert Childs, University of Massachusetts, Bugwood.org).

Control

Numerous beneficial parasitoid wasps attack arborvitae leafminer larvae. Consider leaving damaged foliage in place to allow parasitoids to emerge and attack more arborvitae leafminer larvae. This may be sufficient to keep low densities of arborvitae leafminer under control and is advisable if some amount of discoloration is tolerable on the affected plants.

Foliage discolored by arborvitae leafminers will remain on the plant until it falls off or is removed. If discoloration is not tolerable, prune out and destroy any infested foliage to ensure that leafminers do not emerge from it. Pruning may effectively reduce the arborvitae leafminer population if the infestation is small and can be reached easily.

If chemical treatment is warranted, imidacloprid is effective against larval arborvitae leafminers. However, systemic insecticides such as imidacloprid will kill the parasitoids present as well.

Note

Other species of moths in the genus *Argyresthia* attack cypress (*Cupressus* spp.), juniper (*Juniperus* spp.), and arborvitae in a manner similar to arborvitae leafminer.

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