

BOGDIVERSITY THURSDAY



—*from Head Naturalist Clinton*

Leafminers

POST #81—October 26, 2023

As leaves continue to fall in our area, it is time to think back on some really cool organisms that utilize leaves. No, we are not going to consider four-legged herbivores for this post. Instead, we are considering six-legged herbivores... Leafminers!

Leafminers are a group of insects that live their early life stages between the tissues of leaves or bark of trees and shrubs. Whether they are sawflies, moths, beetles, or flies these insects leave conspicuous marks on leaves, often being host plant specific. If you have a keen eye and an interest in plants, you may have noticed squiggles on aspen leaves, blotches on hazel leaves, or even slight discolorations at the edge of a goldenrod leaf.

According to Charley Eisman's tome *Leafminers of North America*, there are well over 2000 species of leaf mining, stem mining, or fruit mining insects in North America. Moths and flies make up a large majority of the mining species, but there are around 200 species of beetle and 37 species of sawfly that mine leaves, stems, or fruits during the larval stages of their lifecycle.

But why have such an odd life cycle? Isn't living between the cellular layers of leaves a bit limiting in how successful an individual organism can be? Sort of! Mold and fungi are still a big risk for failure of the larvae, but living between the tissues of a leaf offers some protection for the insects that do so, especially protection from bird predators. Cryptic mines hide squishy larvae from the beaks of kinglets, chickadees, and warblers. Though these mines help dodge avian predators, there are other insects that seek out mines for the larvae inside (especially parasitic wasps!). The mines made by larvae don't impact the leaf's ability to photosynthesize and rarely harm the leaf being mined. Interestingly enough, both terrestrial and aquatic plants can be mined by insects.

The mines pictured below show some of the more obvious mines seen in our area. Showcased below are blotch mines and linear mines made by one species of sawfly, two species of fly, and two species of moth! We are continuing to document leaf mining species in our area, even as the leaves fall. Our newest addition to the species list was a leafminer found during yesterday's boardwalk work day! The leafminer, a moth in the *Ectoedemia populella* group, leaves tell-tale green islands of color on aspen leaves, making them easy to see if you look closely! Wildly diverse, beautifully constructed, sometimes cryptic, and definitely all around us, I hope this post inspires you to check out the next splotch you see on a leaf closer!

More information and identification notes are included in the photos below!

(Photos by Head Naturalist Clinton)



The tiny little brown dot at the base of the green is the leaf mine in question! This is the newest addition to the species list, a moth in the *Ectoedemia populella* group. The green islands left on the leaf as color changes is likely due to the disruption of the cells by the leaf mine, so the color doesn't get extracted from the leaf by the tree. Cool! This moth uses aspen as its host.



The brown blotch along the edge of this leaf was made by Hawthorn Leaf-mining Sawfly! There are plenty of sawflies that externally feed on leaves, but there are also a few species that mine the inside of leaves. As the name suggests, this species uses Hawthorn species as its host.



While these mines are not easy to see during the middle of the summer, early in the season you can find the mines of *Phyllonictis insignis* on the leaves of Sweet Coltsfoot! This fly makes quite narrow mines along the margins of the leaves of coltsfoot.



A very commonly seen leaf mining fly in our area is *Phytomyza agromyzina*. This species makes lovely, serpentine mines along the outer edges of Bunchberry leaves.



Our last leaf miner to consider is a moth that uses poison ivy as its host! Poison Ivy Leaf-miner Moth makes big, blotchy mines on poison ivy leaves. The larvae are adapted to not be irritated by the chemistry of the leaves.