

The Outside Story



Lichen: Not Technically a Plant By: Joe Rankin

On cold winter days, feeding sticks of firewood into my woodstove, I sometimes pause, my eye caught by lichens. Splotchy circles, lacy tendrils. Soft gray, muted gray-green, black. They mottle the bark. When I look out the window next to my desk, I see splashes of lichen on the roof of my workshop, and on the stone walls across the road.

Lichens are virtually everywhere. They live in some of the harshest environments on our planet, from Antarctica to the high Arctic, deserts and high peaks, in forests tropical and temperate. They can grow not only on rock, but in it, between grains and crystals. According to Steve Selva, a lichenologist and professor emeritus at the University of Maine at Fort Kent, there's even a type that grows on barnacles. Selva has spent four decades studying lichens. He created and still contributes to and maintains the school's extensive lichen collection.

Selva's focus is on the lichens of the Acadian Forest, which stretches from the Adirondacks across northern New England and Maritime Canada and up to Quebec's Gaspé Peninsula. He's particularly fascinated by so-called "stubble lichens" – tiny species whose height is measured in millimeters, or fractions thereof. He's cataloged some 90 species in the Acadian Forest. Nobody really knows how many lichen species total there are in the northern forest. There are an estimated 13,500 to 17,000 species worldwide.

Many people assume lichens are plants, but technically speaking, they're not. They're symbionts, a composite of a fungus and an alga or cyanobacterium. The fungus provides habitat and pulls moisture from the air and the alga or cyanobacterium photosynthesizes and contributes some of its carbohydrates to the fungus. Although it may appear that the fungi are parasitizing the algae, the relationship is complex; these algae could not survive on their own.

When you look at the outside of a lichen, what you're seeing is the fungus. Cut off a piece and examine the cut edge under magnification and you'll see a green line. "The greenish layer is the algal partner," explained Selva.

Most lichens prefer to live on the sunny side of whatever it is they're growing on, the better to photosynthesize. However Selva's stubble lichens – think "beard stubble" for scale – are contrarians. They hide in the shade. You really have to look for them.

Other lichens are easier to spot: the reindeer moss (which is not a moss, despite the name) common in spruce-fir forests and subbed for trees in model

train setups; old man's beard, which grows on trees and looks like, well, you know; lungwort, a big, broad-lobed lichen that turns bright green when wet; British soldiers, whose red tops that make them look like miniature matchsticks, grow from the forest floor.

In northeastern North America, lichens grow on trees, stones, fence posts, and soil. They paint Pollackesque masterpieces on gravestones. They'll grow on abandoned cars, utility poles, telephone wires, asphalt roof shingles, stained glass windows. If you stayed still long enough, they'd probably colonize you.

Once established, however, most grow slowly, with an annual rate measured in millimeters. They get nutrients from the air, rain, fog. They do secrete acids that will etch rock, but the amounts are tiny; they're not trying to feed on their substrate.

Lest you think they don't serve a purpose, well, they are food for everything from invertebrates to small mammals to caribou and deer. Birds use lichens like old man's beard for nesting material. Some lichens fix nitrogen from the air, like legumes. "That's a big part of the nitrogen supply for the forest," said Selva.

While lichens are hardy enough to grow in the harshest environments, they're specialists. Transplant a tropical lichen from a rainforest to Labrador and it would last about as long as the tree it grew on. And lichens are not bombproof. They are so sensitive to pollution, said Selva, that they're used by scientists as barometers of air quality. Their presence, or absence,

can indicate the health of a forest ecosystem, or the air quality in your neighborhood.

As to how long lichens live, well, dating them is not as easy as counting a tree's rings. Gravestones can provide a fairly reliable metric. Lichenometricians measure the growth of particular lichens from year to year, extrapolating to reach an estimated age. Tedious business. Trees themselves can help since they can be reliably dated.

For instance, on the cliffs of the Niagara escarpment in Ontario, there are eastern white cedars that are among the oldest trees in the world, their life spans measured in centuries. It's not inconceivable, said Selva, that the lichens growing on them are almost as old.

Joe Rankin writes on nature, forestry and sustainability from his home in Maine. The illustration for this column was drawn by Adelaide Tyrol. The Outside Story is assigned and edited by Northern Woodlands magazine: northernwoodlands.org, and sponsored by the Wellborn Ecology Fund of New Hampshire Charitable Foundation: wellborn@nhcf.org

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