

An enriching tale on old forests and air quality

NOVA SCOTIA NATURALLY

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Several years ago, after deciding to go back to school to study forestry in eastern Ontario and finding myself amidst a tree identification course, I was bewildered by the blandness of tree bark.

I was studying just outside of Ottawa and only a few months removed from a forestry-based internship at a research institute in southwest Nova Scotia.

"What's wrong with the tree bark?" I asked my professors and colleagues. To most of them, the bark looked fine. And truth be told, it was the lone Nova Scotian in the class that seemed a bit off.

I returned to Nova Scotia during the holidays and, sure enough, was welcomed by shockingly colourful and textured trees. But it was more than just a difference in bark colour or texture.

Upon closer inspection, the

bark of mature trees supported an array of lichens. A dozen species or more on a single tree, many dozens in a forest. Hundreds in our little province!

In fact, Nova Scotia's high lichen diversity is made possible by high amounts of rainfall and humidity, a wide range of different habitats and by (historically) larger tracts of mature and old forests. It is even argued by some expert researchers that some of these forests should be considered rainforests.

Lichens are one of nature's best examples of symbiosis, a term used to describe two organisms living together and helping each other survive. A lichen is comprised of a fungus species and a species of green or blue-green algae; together they form a rootless structure, often resembling leaves.

Although this sounds like a tenuous existence, this symbiotic partnership has proven itself in nature, with fossil records going back as far as 600 million years. Some individual lichens can live for thousands of years.

One of lichens' major ecological advantages is that they can metabolically shut down, meaning that they can survive without water for very long periods of time. Astonishingly, lichens have been fully exposed to the vacuum of outer space for a few weeks and once returned to Earth have thrived to tell the tale of their brilliant evolutionary traits.



Yellow lichens are slowly covering a gravestone. ALAIN BELLIVEAU

The hundreds of species in our province take many shapes: the bright yellow Sunburst lichens that grows on rocks, the Old Man's Beard you see hanging from old trees and the common Lungwort lichens that look like big, green, leathery leaves hanging from the bark of maples. They grow in almost every terrestrial habitat imaginable, even in our concrete and steel urban jungle.

However, despite their incredible adaptations and range of

habitats, lichens — particularly those at risk of extirpation, like the Boreal Felt Lichen — face direct threats from the large-scale removal of mature trees (e.g., clearcutting, land development) and the introduction of exotic slugs that graze on lichens.

They also face indirect threats like rapid climate change and the presence of air pollutants coming from the U.S. and Ontario.

Lichens, like people, are dependent on good air quality and they accumulate air pollutants. With

too many pollutants accumulated, they get sick and die.

Researchers have noted the staggering lichen diversity drops off as one approaches an urban or industrial centre. In fact, it's a great science project for kids: estimate how many species you believe are on a few trees in your downtown area, then do the same in a park setting outside town.

Go for a hike, let them tell you about it. They told me about it in eastern Ontario where, even though there are far fewer clearcuts, the air quality isn't great and the humidity levels and amount of precipitation are usually significantly less, all of which lead to fewer lichen species.

It took 1,000 kilometres of travel and an obsession about trees, but I had learned something new and important about our province: It's a unique hot spot for lichens that require old, intact forests and good air quality.

Lichens are communicators and bio-indicators, they're spacewalkers, they're rainforest aficionados, they're the epitome of a working relationship, they're harmless to trees, they once nourished now-extirpated herds of thousands of caribou in Nova Scotia, they can heal your ills and they dapple trees and rocks with colours and textures throughout the year.

Perhaps most importantly, they symbolize life's dependence on a healthy environment — and the collapse that can occur otherwise.