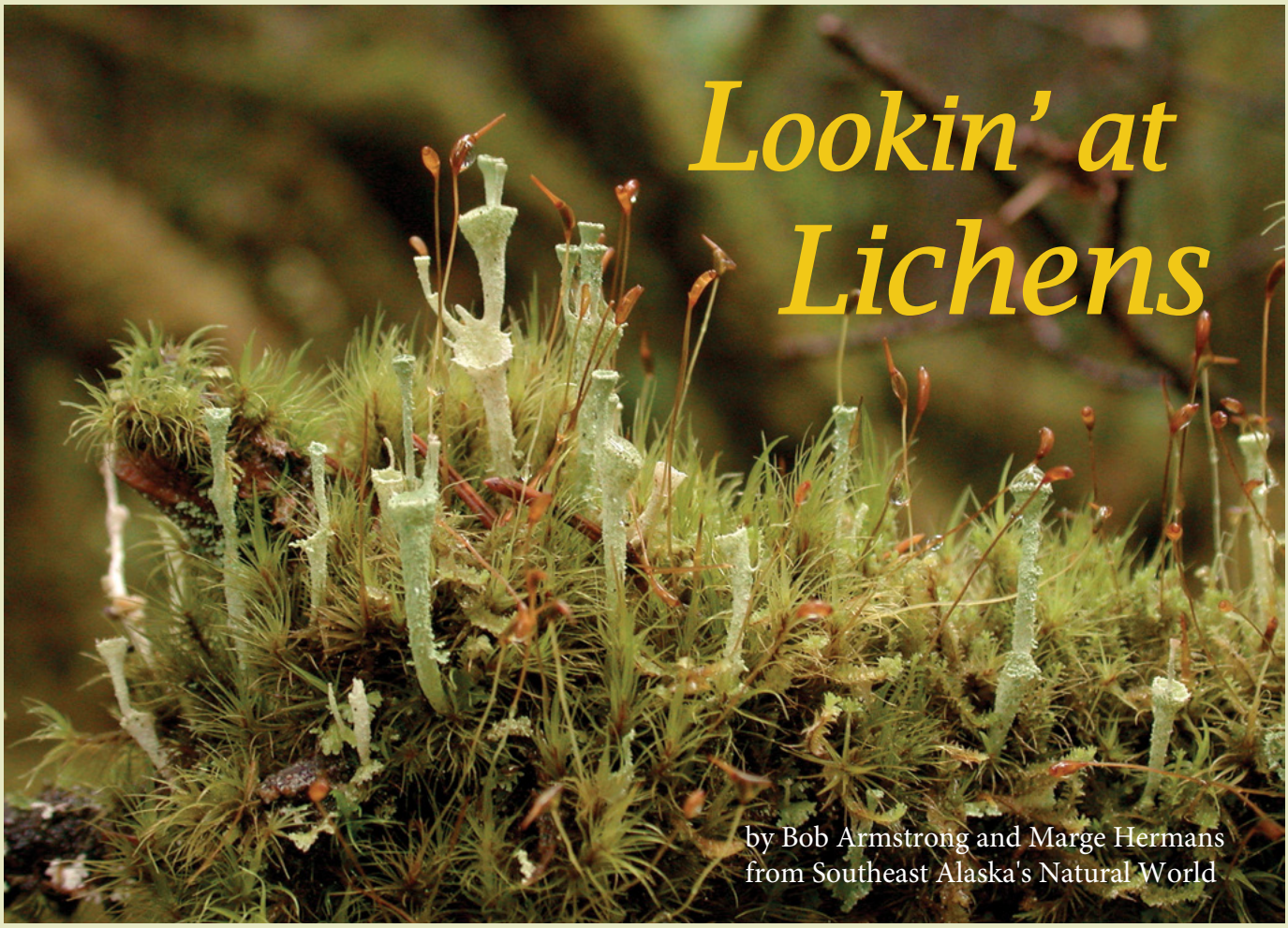

Lookin' at Lichens

by Bob Armstrong and Marge Hermans
from Southeast Alaska's Natural World

It may never compete with birdwatching, but looking at lichens can be a fascinating pastime—and a lifelong study if you get hooked on it. Southeast Alaska is a great place to see lichens. Lichenologists have counted some 500 species here, and they attribute these substantial numbers and species variety to clean air, a maritime climate with substantial moisture and moderate temperatures, and the presence of old-growth forests, which provide a variety of different habitats and further balance out light, moisture, and temperatures.

Many lichens are small. We see them snuggled against tree trunks or old exposed roots, or growing as faint patches of color on rocks and boulders. But some, like Methusela's beard or witch's hair, festoon our trees like Christmas icicles or "spider webs" hung up for Halloween. You'll find lichens along hiking trails, on glacial outwashes, or in amongst the moss in bogs. We found 25 different kinds, in fact, in just one of our backyards. And they can be seen all year round, except when they're covered with snow.

Lichens are neither plants nor fungi. They are partnerships between fungi and either algae or cyanobacteria (also called blue-green "algae") or both. Algae and cyanobacteria can conduct photosynthesis, but fungi cannot, so in lichens the fungi provide the "body" or form, while the algae or cyanobacteria produce enough carbohydrates to feed both partners.

Partly because they combine important characteristics of two different organisms, lichens can grow under more difficult conditions than almost any other living things. They live in deserts and

Some Cladonia *lichens form tiny "pixie cups" that help disperse particles for reproduction. This* Cladonia *is growing in a clump of moss on a fallen log.*

polar environments, withstanding extreme cold or heat. They live on mountaintops and barren rocks, absorbing water and dissolved minerals from rain and fog. During hard times they simply dry out and wait till conditions are favorable again.

They take on an amazing variety of interesting shapes and forms, and many have intriguing common names that reflect their unusual appearance. In Southeast we have lichens called forking bone, tattered rag, pincushion orange, devil's matchstick, frog pelt, pimpled kidney, and of course witch's hair and speckled horsehair.

Studies are finding that lichens serve a great many purposes in various settings. In Southeast Alaska they:

• help break down rocks to make soil;

• fix atmospheric nitrogen from the air and pass it on to trees and other plants (nitrogen is a vital nutrient and is often missing or very scarce in Southeast soils);

• provide nesting materials and camouflage for a number of birds, including thrushes, chickadees, hummingbirds, and warblers;

• during hard winters provide what may be the only available food for animals such as Sitka black-tailed deer, flying squirrels, deer mice, voles, and mountain goats; and

• serve as indicators of air quality because they readily absorb and concentrate contaminants such as sulfites, toxic metal compounds, and radioactive particles.

George Schenck, the author of *Moss Gardening,* even suggests ways to use lichens to add interesting colors and textures to gardens and landscaping—an idea that's a natural for many of us in Southeast.

We've explored some common Southeast lichens and their uses in the photos and captions below. If you'd like to know more about different types of lichens some good references are Pojar and MacKinnon's *Plants of the Pacific Northwest Coast,* which has a 20-page section on the most common lichens of our region; *Mosses, Lichens, and Ferns of Northwest North America* by Dale H. Vitt, Janet E. Marsh, and Robin B. Bovey; and the latest, most definitive word on lichens—the 800-page, color-illustrated *Lichens of North America* by Irwin M. Brodo, Sylvia Duran Sharnoff, and Stephen Sharnoff.

"Toy Soldier"

With its bright red fruits and abundant scale-like lobes, "toy soldier" (*Cladonia bellidiflora*) is one of the more easily identified small lichens in Southeast.

We usually see it amidst moss on the ground or on rotting wood.

Reindeer Lichen

Reindeer lichens, species of *Cladina* sometimes called "reindeer moss," form large mats in Southeast muskegs. Like *Usnea* lichens, they are a source of usnic acid, a mild antibiotic used in topical ointments. In other parts of Alaska they are a crucial source of carbohydrate energy for caribou in winter, when little other forage is available. Unfortunately they sometimes concentrate pollutants and pass them up the food chain to people.

Lungwort

This species of *Lobaria* belongs to a group called "lungworts" because of their resemblance to lung tissue.

Some species of *Lobaria* convert atmospheric nitrogen to forms that lichens and plants can use, and are considered good indicators of rich, unpolluted, often very old forests. In some studies *Lobaria* in old-growth forests contributed up to 50 percent of the total nitrogen output.

Lobaria lichens are comparatively high in protein. One study in Southeast found mountain goat feces in winter contained 18 to 30 percent lichen, mostly *Lobaria*. That suggests these arboreal lichens are an important survival food in times of scarcity.

Methusela's Beard

Methusela's beard (*Usnea longissima*) is common in Southeast Alaska spruce-hemlock forests. It can grow to nine feet long.

One of the most pollution sensitive lichens, *Usnea* is now nearly extinct in Europe, apparently because of widespread air pollution.

Usnea lichens look similar to *Alectoria* (witch's hair), but *Usnea* strands have a central cord that you can see if you pull one apart. *Alectoria* lichens do not.

Whiteworm Lichen

Whiteworm lichen (*Thamnolia vermicularis*) is common in the alpine in Southeast Alaska. It is unusual because it reproduces only by fragmentation. Pieces break off and are carried away, perhaps on the feet of birds or other animals, in the wind, or in avalanches.

Bull's Eye Lichens

Bull's eye lichens (species of *Placopsis*) are often the first plant-like organisms to become established in areas newly exposed by the retreat of glaciers. Their ability to help break down rocks and create soil, and to fix nitrogen from the air, helps pave the way for colonizing plants.

Crustose Lichens

These "crustlike" lichens are tightly attached to a rock in the alpine. Lichens can grow several millimeters, or hundredths of an inch, into granite, and one study reported lichens growing 16 millimeters (more than half an inch) into sandstone. Lichens help build up soil when they break down rock—both mechanically by growing between rock crystals or along cracks, and chemically by producing weak acids that eat away at rock.

Crustose lichens may grow only thousandths of an inch a year and may live for hundreds of years.

Witch's Hair, Horsehair Lichens

Witch's hair (light green *Alectoria sarmentosa*) and horsehair lichens (species of dark brown *Bryoria*) are important winter survival foods for deer. One study found fecal samples from Southeast deer in March contained as much as 43 percent lichen, and the presence of lichen correlated well with increasing snow depth.

Northern flying squirrels also eat *Bryoria,* especially in winter, and make their nests out of it.