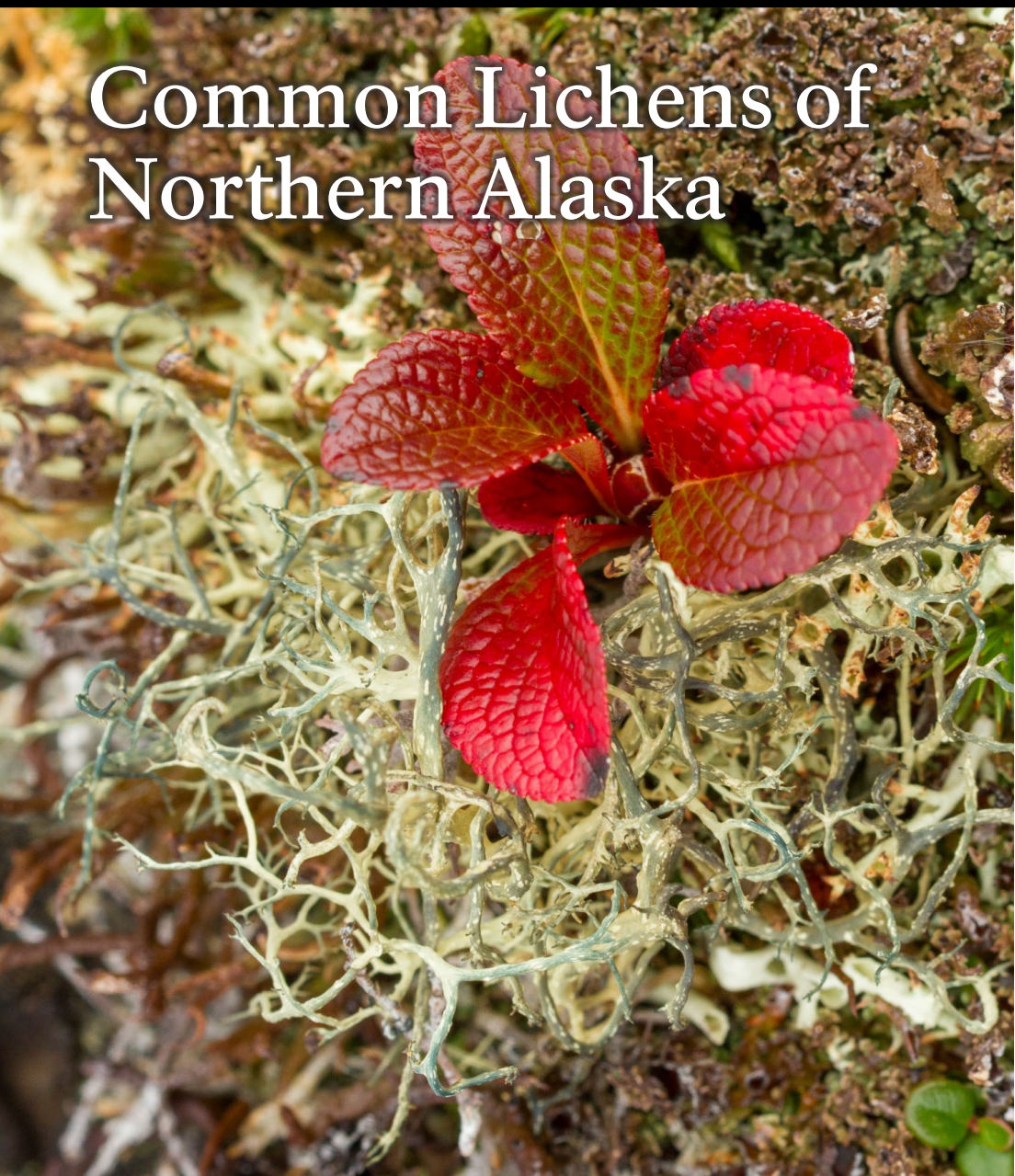


National Park Service  
Alaska Region  
Arctic Inventory & Monitoring Network



# Common Lichens of Northern Alaska



Celia J. Hampton-Miller & James Walton

May 2025

## PHOTO CREDITS

Bri B., [Creative Commons Attribution/Non-Commercial](#) (CC BY-NC): *Cetraria laevigata*

Nik Cain, public domain: *Peltigera canina*

Donald Hampton, CC BY-NC: *Masonhalea richardsonii*

Celia Hampton-Miller, public domain: *Bryocaulon divergens*

Jukka Jantunen, CC BY-NC: *Leptogium saturninum*

M. Torre Jorgenson, CC BY-NC: *Rusavskia elegans*

T. Kebert, [Creative Commons Attribution-Share Alike](#): Lichen diagram

Peter Nelson, all rights reserved: *Icmadophila ericetorum*, *Ophioparma ventosa*, *Parmelia sulcata*, *Stereocaulon paschale*, *Umbilicaria proboscidea*

Maxim Nuraliev, CC BY-NC: *Evernia mesomorpha*

Serguei Ponomarenko, CC BY-NC: *Cladonia amaurocraea*

Randal, public domain: *Hypogymnia physodes*, *Peltigera membranacea*, *Rhizocarpon macrosporum*, *Usnea* species

Marina Sutormina, CC BY-NC: *Cladonia rangiferina*

Eva Ullström, CC BY-NC: *Alectoria ochroleuca*

Preston Villumsen, CC BY-NC: *Cladonia chlorophaea*, *Loxosporopsis corallifera*

James Walton, all rights reserved: *Alectoria ochroleuca* (cover), *Arctoparmelia centrifuga*, *Asahinea chrysantha*, *Cladonia arbuscula*, *Cladonia borealis*, *Cladonia stellaris*, *Dactylina arctica* (species description & back cover), *Flavocetraria cucullata*, *Flavocetraria nivalis*, *Lobaria linita*, *Nephroma arcticum*, *Peltigera aphthosa*, *Solorina crocea*, *Sphaerophorus globosus*, *Thamnolia vermicularis*, *Vulpicida pinastri*, *Vulpicida juniperinus*

## REPRODUCTION

This guide is provided by the National Park Service as a public service and may be reproduced freely. As many photos in this guide are licensed under non-commercial Creative Commons licenses, it may not be sold for a profit.

Versions of this guide, formatted for home printers and smartphones, are available here: <https://irma.nps.gov/DataStore/Reference/Profile/2311572>

## ACKNOWLEDGEMENTS

Many thanks to those who provided feedback on drafts of the guide: Peter Neitlich, Lynn Miller, Stephanie Shapiro, Pam Sousanes, Sarah Stehn, and Eric Wald. Thanks to Laura Weaver, for help with accessibility.

## SOURCES

Galun, Margalith, ed. [Handbook of lichenology](#). CRC Press, 1988.

Nash, Thomas H., ed. [Lichen biology](#). Cambridge University Press, 1996.

Spribille, T., Resl, P., Stanton, D.E. and Tagirdzhanova, G., 2022. Evolutionary biology of lichen symbioses. [New Phytologist](#), 234(5):1566-1582.

# Common Lichens of Northern Alaska

Celia J. Hampton-Miller<sup>1</sup>, James Walton<sup>2</sup>

<sup>1</sup>Arctic Inventory & Monitoring Network  
National Park Service  
4175 Geist Rd  
Fairbanks, AK 99708  
contact: [cjmiller3@alaska.edu](mailto:cjmiller3@alaska.edu)

<sup>2</sup>Denali National Park & Preserve  
PO Box 9  
Denali Park, AK 99755



**TABLE OF CONTENTS**

Photo credits, acknowledgements, sources.....i

About This Guide..... 1

About Lichens.....2

    What is a lichen?.....2

    Are lichens parasites?.....2

    How fast do lichens grow? .....2

    Are lichens edible?.....3

    Why are lichens such variable colors .....3

    Does stepping on lichens kill or injure them? .....4

    Why are lichens only found in certain places?.....4

    How are lichens important ecologically?.....4

    How can I tell lichens apart from mosses or other fungi?.....5

    How can I learn to recognize different species of lichen?.....6

Glossary .....9

The Lichens

    Ground-dwelling species.....12

    Tree-dwelling species.....20

    Rock-dwelling species.....22

    Additional Resources.....24

Species Index.....25



## ABOUT THIS GUIDE

This booklet is intended for use by beginners in Alaska north of the Alaska Range. It includes 39 species descriptions, plus over 30 additional species noted in the 'similar species' sections. It will likely be a useful starting point for naturalists in Southwest and Southcentral Alaska, but the species selected and 'similar species' described are not tailored to those areas. We highly recommend those in Southeast Alaska look at resources for that region and the Pacific Northwest in the Additional Resources.

Using a handlens (also called a loupe) or magnifying glass to look at lichens is highly recommended. This will bring you closer to the scale that these organisms live at, and help you see more details.

Technical terms are underlined and defined in the glossary. Species included in the guide are ***bold and italicized***, while species mentioned in comparison are simply *italicized*.

Species are grouped by where they grow (ground, bark or rock) and then listed alphabetically by scientific name. We present common names for convenience, but these are not universally used.

As this guide is intended for the curious but untrained beginner, we are attempting a balance between providing accurate information and making sure the language is clear. Some biological details have been simplified, and many rare species are not included in the potential look-alikes. If a specimen you are looking at doesn't fit the descriptions, we encourage you to seek out more information. Inevitably, recognizing lichens takes practice.

There is an incredible diversity of lichens in Alaska, and many species which have yet to be described by scientists. This guide presents just a glimpse into the most abundant part of the lichen flora in this region. Whether you live in Alaska or are passing through, we hope it encourages you to learn more about the ecology, biology and diversity of these unusual and underappreciated organisms.

# ABOUT LICHENS

## What is a lichen?

Lichens are **symbiotic organisms**. They are composed primarily of a mycobiont, a multi-celled fungus, and a photobiont, a photosynthetic partner, which is either a green algae or cyanobacteria. Other single-celled fungi and microorganisms likely play important roles in the symbiosis that are yet to be fully understood.

Lichens (with some exceptions) have distinct layers where the symbionts occur (Fig 1). The upper layer, the cortex, is hard-packed fungal tissue, and is often shiny. It contains the multi-cellular mycobiont, single-celled yeasts and bacteria. Below that, the photobiont occurs in a single layer. Below that is another, looser layer made of fungal tissue, which allows for gas exchange. Some lichens have another cortex on the lower surface, some do

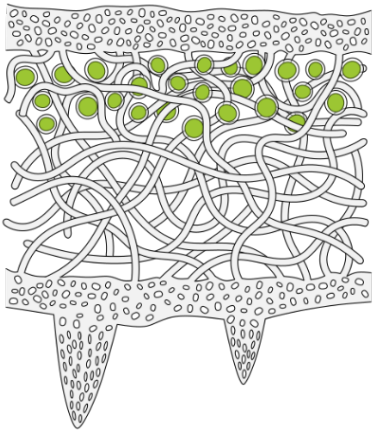


Figure 1. Lichen diagram. a: upper cortex, b: photobiont layer, c: medulla, d: lower cortex, e: rhizines.

not. Carefully breaking a lichen open with a fingernail can reveal these layers (look closely with a handlens).

About 20,000 species of lichen have been described by scientists. This represents about 20% of all known fungal species. And there are many more that have yet to be discovered.

**Are lichens parasitic? Do they hurt trees they grow on?**

**No, lichens are not parasites!** Because they photosynthesize, lichens produce their own energy. They do not harm the trees they grow on. Lichens

have a range of fungi that parasitize them, but they are not pathogenic.

## How fast do lichens grow?

**Very slowly!** The algae and cyanobacteria found in lichens can usually be cultured in test tubes and grow rapidly. The lichen-forming fungi, on the other hand, grow very sluggishly on petri dishes, if at all. Some scientists believe this is because coordinating growth between such different symbiotic partners is difficult.

An alternative hypothesis is that their slow growth is a trade-off that lets them withstand environmental stress. Lichens can survive going from saturated with water to bone dry in seconds, which would kill most plants and animals. Instead of putting all the products from photosynthesis into growing bigger, lichens may create anti-desiccation compounds that protect their cells when they are dried out. This would necessarily mean that they can't grow as fast as plants.

## Are lichens edible?

Generally speaking, **no, lichens are not edible**. Because they are so slow-growing, lichens heavily invest in toxic chemical compounds that protect them from herbivores. Lichens are an important part of the winter diet of caribou, but these animals are specially adapted to eat lichens. Lichens are used in certain traditional foods by Alaska Natives and others, but these have to be carefully processed to remove the toxins. Unlike mushrooms, there are no lichens that are delicious edibles.

Some lichens can be used for dyes and herbal medicine—but be careful! By collecting a lichen, you are killing the whole organism, which could be decades or hundreds of years old. No collection of lichens is allowed on National Park Service lands. Make sure you know where you're collecting and be conscientious: collect an amount that won't hurt the population, or other people's enjoyment of wild spaces.

## Why are lichens such variable colors?

One of the first things people notice is the variety of vivid yellows, reds, oranges, greens, blacks and browns found in lichens. These are a side effect the above-mentioned toxins in lichens—a variety of chemical compounds produced by the fungal partner. These **chemical compounds protect the lichen from harmful UV radiation, deter herbivores and pathogens, help absorb toxic metals**, and likely many more biological functions we don't yet understand.

While plants can protect themselves from UV and other stress by actively repairing their cells, lichens are exposed to the most stress when they are dried out and dormant. Thus, the protective compounds must be present all the time. Different colorful compounds can be helpful in different environments, or with different photobionts.

Many lichens are a light mint or yellow green—this is not a result of the color of the algae! All the color you see when you look at a lichen is produced by the fungus, typically in the cortex or right above the photobiont layer. If a lichen does not have a cortex (true of the reindeer lichens and the undersurface of some species) it will usually be some shade of white—the natural color of the fungal tissue. Lichen fruiting bodies (apothecia, see page 7) are usually a different color than the rest of the lichen. It's likely that the photobiont needs different kinds of protection from environmental stress than the spore-producing apothecia, which are purely fungal tissue.

## Does stepping on lichens kill or injure them?

It depends. Lichens can survive being broken—and in many species this is a way they spread. But fragmentation does reduce growth and it can take decades for them to recover. In general, **try to avoid stepping on lichens when they are dry**. If there's a trail, stay on it. Walking over lichens enough times will kill them, and it's best to limit the damage.

All the same, Alaska is a large state and there are many lichen-rich areas that are inaccessible to people. Human hikers have far less impact on lichens than caribou, development, pollution, and climate shifts.

## Why are lichens only found in certain places?

Because of their incredibly slow growth rates, lichens can only survive in places where they can't be outshaded and outcompeted by fast-growing plants. They don't have roots, but do have incredibly strong anchoring abilities, so they can grow in places where there is no soil. They can stay dormant for years if conditions are bad and then rapidly rehydrate and begin growing. They can also photosynthesize in sub-freezing temperatures.

Lichens, then, are found **in low-nutrient, high-stress environments: rock, tree bark, dead wood, and alpine and arctic tundra**. Lichens make up such a large amount of the ground cover in Alaska and other high latitude locations because the cold, short growing season means they have a competitive edge against plants. (In the tropics, where many vines and other plants compete for space on tree trunks, some lichens are found on or even *inside* evergreen tree leaves.)

Like all living organisms, lichens need water. They can get this in the form of precipitation, fog, or humidity. However, most lichens don't photosynthesize well when waterlogged. Wet environments—like bogs and fens—tend to be dominated by mosses, primitive plants that thrive in high-moisture environments.

Another factor that controls lichen distribution is air pollution. Lichens don't have a waxy outer cuticle like our skin or plants—whatever chemicals are in the air, they directly absorb. This means they can't survive in areas of high air pollution, like cities, around power plants, or other major industries.

## How are lichens important ecologically?

Lichens are primary producers—they take energy from the sun and produce carbohydrates. They are at the base of the food chain and provide food for

grazers (notably caribou) as well as decomposers when they die. Lichens also serve as habitat for invertebrates and other organisms.

Lichens are also important for primary succession. They can grow on bare rock after volcanic eruptions, or glacial retreat exposes new ground. By growing on rock or sand, they build up organic matter and help create soil.

Lichens that contain cyanobacteria are nitrogen-fixers. They can take atmospheric nitrogen and break its strong chemical bonds to produce nitrate. Nitrogen is an important nutrient that is used in all proteins, DNA, RNA and cell membranes. Lack of nitrogen in the soil often limits plant and animal growth, and lichens are important sources of nitrogen in boreal and arctic ecosystems. They are also important contributors to water and carbon cycling.

For humans, lichens are used to monitor air pollution. Lichens are used in traditional herbal remedies and food in some cultures, and many lichen compounds are being studied for medicinal purposes.

Lichens are part of the complex web of life, and more than being just 'useful' they are part of the rich natural heritage of our ecosystems.

### **How can I tell lichens apart from mosses or other fungi?**

This can be tricky, because lichens have a wide range of body plans, anatomical structures and colors. Sometimes it's easiest to start out by pointing out what they *don't* have.

Unlike mosses, lichens do not have stems or leaves. To identify mosses, look for their simplified leaves attached to stems (Fig 2). Moss leaves are a single cell thick. Try to take them apart and hold a single leaf up to the light—it should be translucent.



Figure 2. A single moss plant, with tiny, translucent leaves. (Fingertips for scale.)

Unlike other fungi, lichens do not have a mat of fungal hyphae embedded in the ground or wood. Lichens' fruiting bodies last for many years—they don't pop up for a few days and then rot, like mushrooms. One of the easiest ways to recognize a lichen vs a non-lichenized fungus is the texture. Lichens are tougher, and papery or brittle when dry. They are not slimy, mushy, gooey or otherwise easy to crumble. (There are a handful of mushroom-forming fungi that symbiotically associate with algae. These do have mushrooms, and don't have the complex tissue layers that most lichens have.)

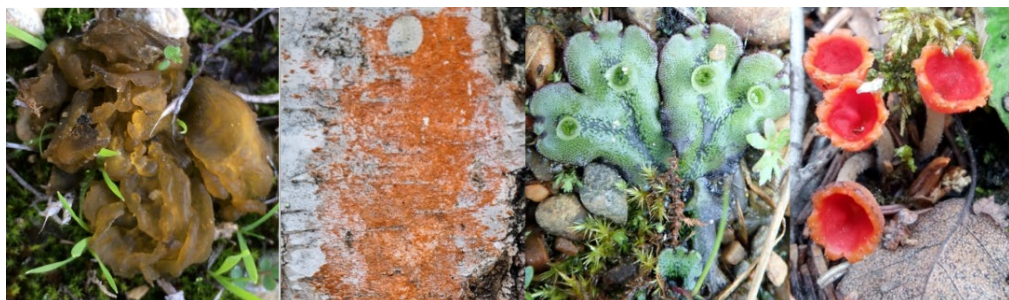


Figure 3. Some organisms that are **not** lichens: Free-living cyanobacteria (*Nostoc commune*), free-living green algae on a birch tree (*Trentepohlia* sp., photo CC BY-NC Michał S.), common liverwort (*Marchantia polymorpha*), rosy goblet (*Microstoma protractum*, non-lichenized fungi).

Identifying lichens takes practice. Compare what you see in this guide to mushroom hunting guides and other naturalist books. If you're looking at a strange organism and stuck on what it could be, also consider non-lichenized fungi, liverworts, slime molds, rusts and plant galls.

### **How can I recognize different species of lichen? (A brief intro to lichen anatomy)**

Lichens are commonly divided into three body plans (Figure 4). Note: these are not true evolutionary groups (like bats or birds), instead they are useful ways to talk about common features lichens share.

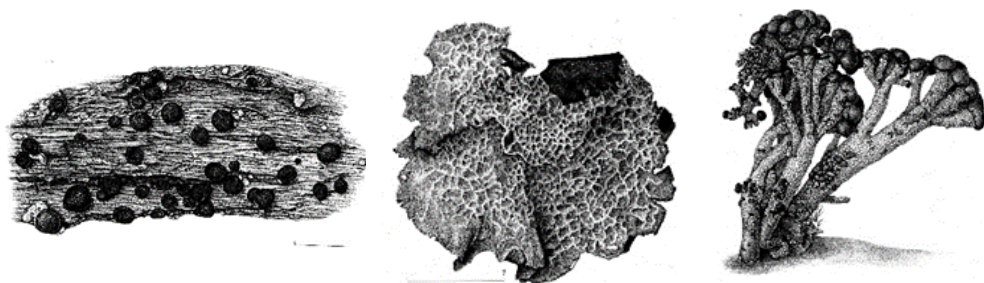


Figure 4. A crustose, foliose and fruticose lichen. Drawings © Lucy Taylor.

The first type of lichen is crustose (Fig 4a). This is the lichen body plan that evolved first, and 80% or more of all lichen species are crusts. Crustose lichens have an upper cortex, but are attached to the substrate like paint, and don't have a distinct lower surface. The next body plan is foliose, or leaf-like (Fig 4b). These are lichens that are more or less two-dimensional—they have an upper and lower surface (or front and back). The third body plan is fruticose, or shrub-like. These lichens are essentially three-dimensional. They typically do not have a distinct front and back surface (Fig 4c).

All lichens have a thallus, the vegetative body that contains photobionts. In addition, almost all lichen species also have some sort of reproductive structures (though many individuals you see will not). Lichens also reproduce by fragmentation. Three main reproductive structures are apothecia, isidia and soredia (Table 1, Figure 5).

Table 1.

| Structure        | Type    | Spreads         | Description                                                                                                                                                                                                                                             |
|------------------|---------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Apothecia</u> | Sexual  | Only the fungi  | These cup, button, disk or dot-like structures are the fruiting body of the fungi (similar to a mushroom). They produce single-celled spores. They arise after sexual recombination, allowing for genetic diversity, but don't disperse the photobiont. |
| <u>Isidia</u>    | Asexual | Whole symbiosis | Outgrowths of the cortex that contain the photobiont. They can be many shapes—tiny cylinders or small globes are common. They contain the whole lichen and produce a clone of the parent. They are often shiny.                                         |
| <u>Soredia</u>   | Asexual | Whole symbiosis | Soredia are produced when the cortex disintegrates into a powder. This produces a fine dust that can be windborne and establish a new lichen. Like isidia, this is a clonal, whole-symbiosis form of reproduction.                                      |



Figure 5a. Red apothecia (fruiting bodies) on the yellow thallus of *Ophioparma ventosa*.

5b. Isidia (coral-like propagules) on *Loxosporopsis corallifera*.

5c. Yellow soredia (dust-like propagules) on the edges of *Vulpicida pinastri*.

Usually a species has only one type of reproductive structure (either apothecia, soredia or isidia). Apothecia are usually round in outline and a different color than the thallus (Fig 5a). The placement and shape of soredia or isidia can help identify the species.

Some species have cephalodia (Fig 6a), which are pockets or freckles of cyanobacteria in a lichen which mainly contains green algae. (Such three-part lichens can rely on more productive green algae for the bulk of their photosynthesis, but also have the advantage of nitrogen fixation—they can be compared to hybrid cars.) Cephalodia come in a variety of shapes—freckles, spots, lumps or smudges—but are always dark, and distinct from the rest of the thallus.

Other key characters include rhizines (root-like projections of the lower surface, fig 6b) and pseudocyphellae (openings in the cortex which expose the inner fungal tissue, fig 6c).



Figure 6a. Blue-black **cephalodia** (cyanobacteria pockets) on *Peltigera aphthosa*.



6b. **Rhizines** on the underside of *Peltigera membranacea*.



6c. White **pseudocyphellae** (cortical openings) on the edges of *Cetraria laevigata*.

Many lichens are not able to be distinguished to species in the field or from photographs, and are separated by microscopic features or chemical tests. These are beyond the scope of this guide, and we encourage you to look at the books and keys in **Additional Resources**.

# GLOSSARY

Apothecia – the fungal fruiting body, which produces single-celled spores. Typically more or less round in outline, it can be flat, concave or convex, and have a distinct rim or not. Spores are contained in a structure called an 'ascus,' which shoots them into the air.

Cephalodia – A 'pocket' of fungal tissue which contains cyanobacteria on a lichen that has green algae as its main photobiont. Cephalodia are dark in color.

Cortex – An outer layer of densely packed fungal tissue. Contains other symbiotic partners, such as single-celled yeasts, and often contains secondary chemicals and pigments.

Crustose – A lichen that is closely appressed to the substrate, like paint, without a lower cortex. Cannot be removed from the substrate without destroying the lichen.

Cyanobacteria – single-celled or filamentous bacteria that are capable of photosynthesis as well as nitrogen-fixation. Cyanobacteria are not as productive photosynthesizers as green algae, and need liquid water and light in order to fix nitrogen. The most common cyanobacteria photobiont are members of the genus *Nostoc*, which can also live independently.

Genus – group of closely related species. For example, horses and zebras are in the same genus. The genus name is the first part of any scientific name: the deadman's finger lichen *Dactylina arctica* is in the genus *Dactylina*.

Green algae – single-celled photosynthetic eukaryotic organisms. The evolutionary ancestor of all land plants. Many green algae found as lichen photobionts are also found free-living, growing on bark or rocks.

Foliose – leaf-like lichens. Have an upper and lower surface (or front and back side).

Fruticose – shrub-like lichens. Similar from multiple angles (but often have a top and bottom).

Isidia – projections of the cortex which contain both mycobiont and photobiont. Can be various shapes; commonly cylinders or globes. Disperses the lichen clonally.

Macrolichen – an informal group that includes fruticose and foliose lichens and excludes crusts.

Medulla – the largest layer in a lichen thallus, located below the photobiont layer. Made up of loosely packed fungal tissue. Usually white, sometimes yellow.

Moss – early land plants with single-cell thick leaves and no roots or vascular tissues. Grow in similar habitats as lichens to similar sizes, and are also able to tolerate desiccation.

Mycobiont – the multicellular fungal partner of the lichen symbiosis. Almost always an ascomycete fungus (cup-forming fungus).

Peltate – attached at a central point, like a mushroom or umbrella.

Photobiont – the single-celled photosynthetic partner of the symbiosis. Either green algae or cyanobacteria. Some lichens have both (see: cephalodia).

Pseudocyphellae – an opening in the cortex which exposes the lower fungal layers (medulla). Allows for gas exchange.

Rhizine – a projection of the lower surface into a root or hair-like structure. Sometimes branched. Found exclusively on foliose lichens. Helps anchor the lichen to its substrate, allow air flow beneath the lichen, and increases surface area for water absorption.

Soredia – a disintegration of the cortex into a dust-like powder. Contains all symbiotic partners. They are spread by wind. Disperses the lichen clonally.

Squamule – small scale-like pieces of the thallus, with an upper cortex. Lichens can have squamules attached to stem-like structures (particularly in *Cladonia* and *Stereocaulon*), or the whole thallus can be made up of squamules.

Thallus – the body of the lichen. Contains all partners of the symbiosis and carries out vegetation growth. Can come in many different shapes.

Vascular plants – what are commonly thought of as plants. Examples include horsetails, ferns, pine trees and daisies. Have true leaves and roots, and stems with cells specialized for water transport (vascular tissue).

Veins – raised, often branching, ridges of tissue. Commonly found on the underside of *Peltigera*.

# THE LICHENS



### Green witch's hair lichen

*Alectoria ochroleuca* – fruticose

**Description:** This hair lichen is much-branched and grows on rock and the ground in the tundra. It is mainly yellow, and the tips can turn dark green. It has regular raised, oval bumps the same color as the thallus (look with a handlens).

**Similar species:** Grey witch's hair (*Alectoria nigricans*) has similar branching and bumps, but it is pinkish to grey at the base and black at the tips.



### Heath foxhair lichen

*Bryocaulon divergens* – fruticose

**Description:** This hair lichen often forms dense mats in tundra. Its color is orange or chestnut brown if in the shade, to black-brown in full sun. It has prominent white pseudocyphellae (look with a handlens).

**Similar species:** Tundra horsehair lichen (*Bryoria nitidula*) is a similar dark hair lichen but does not have the white patches. The genus *Pseudephebe* grows closely attached to rock and with much smaller branches (~.1 mm wide).



### Arctic rag lichen

*Asahinea chrysantha* – foliose

**Description:** Found in arctic and alpine tundra across Alaska, typically over rocks or on the ground. The lobes are rounded. It has a net-ridged, light yellow upper surface and a brown to black smooth undersurface.

**Similar species:** Crinkled snow lichen (*Flavocetraria nivalis*, page 16) has a yellow undersurface. Scholander's rag lichen (*Asahinea scholanderi*) grows closely appressed to rock and has isidia over the upper surface.

### Striped iceland lichen

*Cetraria laevigata* – foliose

**Description:** Found in tundra, bogs, and shrubby habitats. Grows semi-upright. It has small spines along the edges, and near-continuous white pseudocyphellae near the edge of the thallus. In full sun it is brown, shaded it is tan to green.

**Similar species:** Iceland lichen (*Cetraria islandica*) is similar, but has white pseudocyphellae pock-marked along the back, not just the edge. Alaska has several other brown *Cetraria* species; see the keys in **Additional Resources**.



### Pixie lichens

*Cladonia* species – fruticose

(Pictured: *Cladonia chlorophaea*)

**Description:** Pixie lichens are a large and variable genus, with ~90 species in Alaska. They are usually yellow, green or brown. Key features to distinguish different species include: a yellow cast, the presence of cups, soredia, apothecia (and the color of the apothecia), branching patterns, basal squamules, and chemical tests.

**Similar species:** These are the only lichens that form cups on stalks. Many species also grow over logs or trees.



### Quill lichen

*Cladonia amaurocraea* – fruticose

**Description:** Quill lichen is a widespread, highly variable pixie cup lichen. It grows in bogs and tundra. It has a distinct yellow-green color with brown tips. Its shape is highly variable: it can be unbranched (forming long points, typically found in bogs), much-branched, or branched and cupped.

**Similar species:** Thorn lichen (*Cladonia uncialis*) is thicker with larger holes in the axils, a lighter yellow, & never forms cups or long points.





### Yellow reindeer lichen

*Cladonia arbuscula* – fruticose

**Description:** This species is much-branched, lacks a hard cortex and is pale yellow. It is an important part of caribou's winter diet. It is found in woodlands and the tundra.

**Similar species:** Grey reindeer lichen (*Cladonia rangiferina*, below) is also much branched, but lacks the light yellow cast and has a 'wind-swept' appearance. It helps to hold two specimens side by side to see the difference in color. See also *Cladonia stellaris*, facing.



### Boreal cup lichen

*Cladonia borealis* – fruticose

**Description:** This is one of our most common red-fruited lichens. It has small squamules on the podetia. It glows blue under UV light.

**Similar species:** There are several other species of pixie lichen (*Cladonia*) in Alaska, some of which have red apothecia. Note: British soldier lichen (*Cladonia cristatella*) is an eastern species that does not occur in the state.



### Grey reindeer lichen

*Cladonia rangiferina* – fruticose

**Description:** Grey reindeer lichen is much-branched, and typically has a 'wind-swept' appearance, with branch tips bent one direction. It lacks a yellow cast and turns brown at the base. It is found in woodlands and the tundra.

**Similar species:** Black-footed reindeer lichen (*Cladonia stygia*) is just as common as grey reindeer lichen in northern Alaska. It blackens at the base. See also yellow reindeer lichen, above.

### Star-tipped reindeer lichen

*Cladonia stellaris* – fruticose

**Description:** Like the other reindeer lichens, this species is much-branched and lacks an outer cortex. It is distinguished by the dense branching, which forms even, round, 'puffball'-like heads. It is also found in a variety of woodland, heath and tundra habitats. It is pale yellow in color.

**Similar species:** See the entries for yellow and grey reindeer lichens (facing).



### Dead man's fingers

*Dactylina arctica* – fruticose

**Description:** Typically found growing upright in the tundra, dead man's fingers is a knobbly lichen, yellow to tan in color. It is unbranched or occasionally branched. If broken open it is hollow with cobwebby tendrils inside.

**Similar species:** Whiteworm lichen (*Thamnolia vermicularis*, pg 19) is a similar shape, but pure white. The related frosted finger lichen (*Dactylina ramulosa*) is much-branched with a thorny appearance and has a white-purple cast.



### Curled snow lichen

*Flavocetraria cucullata* – foliose

**Description:** Found in bogs and tundra, growing over mosses or on the ground. It is widespread across the boreal zone. The lobes are yellow, narrow, and inrolled, often fusing into a tube.

**Similar species:** Crinkled snow lichen (*Flavocetraria nivalis*, pg 16) has a similar color, but a net-ridged texture, not inrolled lobes. The rare *Flavocetraria miniscula* is much smaller (2-3 cm) and has helmet-shaped hooked tips.





### Crinkled snow lichen

*Flavocetraria nivalis* – foliose

**Description:** Crinkled snow lichen is found on tundra, often in late-lying snow areas, growing on the ground. It is widespread across the boreal zone. The lobes are broad, loosely branched, with a net-ridged texture across the thallus.

**Similar species:** Crinkled snow lichen is the only tundra-growing species that is net-ridged and light yellow on both sides.



### Pink fairy barf

*Lcmaadophila ericetorum* – crustose

**Description:** This lichen grows over moss mats (particularly peat moss, *Sphagnum*) or sometimes logs and tree bases. It is a crustose lichen. The thallus is mint green and warty. The pink apothecia do not have rims.

**Similar species:** There are several other green crustose lichens, but none of them have pink, rimless apothecia.



### Cabbage lung

*Lobaria linita* – foliose

**Description:** Grows over mossy rocks in the tundra and sometimes tree bases. Lime green to gold when wet and dull gray-green when dry. It has a prominent pattern of ridges and hollows. The underside is pale, with short brown hairs in the ridges.

**Similar species:** The lung lichens (*Lobaria*) are distinguished from other green foliose lichens by the pattern of ridges. Several species of lung lichen are common on trees, particularly in southern Alaska.

## Tumbleweed lichen

*Masonhalea richardsonii* – foliose

**Description:** This is one of the largest and most distinctive lichens in Alaska. It is found in swales in the tundra. When dry, it curls up into a ball and is easily carried by the wind. When wet, it spreads out. It is dark brown, branched, and with long white patches on the outer surface (pseudocyphellae).

**Similar species:** Tumbleweed lichen looks similar to some brown species of *Cetraria*, but it is the only lichen in Alaska that grows loose in the tundra.



## Arctic kidney lichen

*Nephroma arcticum* – foliose

**Description:** Arctic kidney lichen grows in rounded lobes in the tundra. It is pale yellow green when dry and a more vibrant mint green when wet. It is tan on the underside, darkening to the base. In the center, you can sometimes see dark blue patches (cephalodia) which contain cyanobacteria. Apothecia, when present, are large orange-tan discs.

**Similar species:** Alpine kidney lichen (*Nephroma expallidum*) is smaller, more ruffled, and browner. The tree-dwelling species of kidney lichen are brown.



## Freckle pelt

*Peltigera aphthosa* – foliose

**Description:** Alaska has three common freckle pelt lichens, found in the boreal forest and tundra. They all have veins and rhizines on the underside, are grass green when wet (grayish when dry), and have black cephalodia 'freckles' over the upper surface. In *Peltigera aphthosa* (pictured), the cephalodia are closely attached to the surface, and the edges aren't ruffled.

**Similar species:** *Peltigera leucophlebia* has strongly ruffled lobes. *P. britannica*, found south of the AK Range, has peltate cephalodia. Other species of *Peltigera* have veins & rhizines below, but no cephalodia.





### Dog pelt

*Peltigera canina* – foliose

**Description:** A large grey lichen, often found in dry or disturbed environments. The upper side often has a white mat of hairs, particularly towards the lobe tips. The rhizines on the undersurface are densely tufted.

**Similar species:** There are many grey species of *Peltigera*, distinguished by reproductive structures, vein patterns and the rhizines. The large size (lobes 2-4 cm across), downturned lobe tips, and bottlebrush rhizines are distinctive. Compare: *P. membranacea*, pg 8.



### Globe lichen

*Sphaerophorus globosus* – fruticose

**Description:** This small lichen is found in the alpine, growing mixed with other lichens & mosses. The color is a rich orange. The branches are round in cross-section and not hollow.

**Similar species:** Fragile coral lichen (*Sphaerophorus fragilis*) is greyer, less branched, and the side branches the same size as the main branch. That species is typically found directly on rock. There are two species of *Sphaerophorus* in southern Alaska which grow on trees.



### Chocolate chip lichen

*Solorina crocea* – foliose

**Description:** Chocolate chip lichen grows in rosettes on mineral soil in the tundra. It is bright green, with inset brown 'chocolate chip' apothecia. The underside is vivid orange.

**Similar species:** This is the only green lichen with an orange undersurface in Alaska. Similar lichens include pelt lichens (particularly *Peltigera venosa*) and other members of the genus *Solorina*, which also have sunken apothecia.

## Foam lichens

*Stereocaulon* species – fruticose

**Description:** The round stems are pale pink, and support many grey, shingle-like squamules. Sometimes they have brown apothecia or dark cephalodia. Found in a variety of habitats, including woodlands, tundra, and rocky or sandy riverbanks, foam lichens are vital pioneer species.

**Similar species:** The white crustose lichens *Ochrolechia frigida* and *Lepra dactylina* can look similar. Devil's matchstick (*Pilophorus* spp.) is also grey, but is topped by black apothecia.



## Whiteworm lichen

*Thamnolia vermicularis* – fruticose

**Description:** This species is found in tundra. It is pure white, pointed, unbranched or irregularly branched, and hollow on the inside. Unusually, it is exclusively clonal, and spreads solely through fragmentation.

**Similar species:** This is the only pure white, hollow lichen in Alaska. The uncommon waterfingers (*Siphula ceratites*) is also white and finger-like, but it grows in wet places (often in standing water), has blunt tips, and is solid.



## Yellow lichen

*Vulpicida juniperinus* – foliose

**Description:** The name describes its most noticeable feature: a vivid saffron orange color. It grows in round clusters on rocky soil.

**Similar species:** The closely related powdered sunshine lichen (*Vulpicida pinastri*, page 21) grows on bark, and has bright yellow soredia along the edge. There are several paler yellow foliose lichens: see *Asahinea chrysantha*, *Flavocetraria cucullata* and *Flavocetraria nivalis*.





### Boreal oakmoss

*Evernia mesomorpha* – fruticose

**Description:** One of the most common lichens in the boreal forest. The thallus is mint green, and becomes covered with soredia as it ages. It is solid and white on the inside, without a stretchy central strand. It is usually evenly branched, lumpy and irregular if parasitized.

**Similar species:** Bushy lichens (*Ramalina* species) are a similar color, but +/- hollow, and not covered in soredia. Also see old man's beard (*Usnea*, facing).



### Hooded tube lichen

*Hypogymnia physodes* – foliose

**Description:** This lichen is light grey to greenish above, black below, and hollow. It can grow in a rosette or hang from twigs, bark and wood. In mature individuals, the tips flare open and display patches of powdery soredia inside (look with a hand lens).

**Similar species:** There are several other species of tube lichen in northern Alaska. They are typically brown (*Hypogymnia bitteri* and *H. austerodes*) and do not flare open at the tip. Some species grow on tundra (common: *H. subobscura*).



### Bearded jellyskin

*Leptogium saturninum* – foliose

**Description:** Typically found on aspen or cottonwood trees, this black lichen is gelatinous when wet. Its symbiotic partner is a cyanobacteria. The undersurface is densely covered with white hairs. The upper surface has round isidia.

**Similar species:** There are many less common jelly lichens (family Collemataceae) in Alaska, but the combination of a hairy white underside and round isidia is diagnostic for this species.

## Shield lichen

*Parmelia sulcata* – foliose

**Description:** This lichen grows in rosettes on bark and wood, occasionally on rock. The upper surface is light gray to greenish and mottled with white ridges; these disintegrate into soredia at maturity. The lower surface is covered in black rhizines, looking like velcro.

**Similar species:** Other *Parmelia* species lack soredia. Other pale foliose lichens on bark (*Physcia*, *Physconia*, *Imshaugia*, *Parmeliopsis*) lack this mottled appearance.



## Old man's beard

*Usnea* species – fruticose

**Description:** Many species of old man's beard are commonly found on trees throughout Alaska. They are a pale yellow green on the outside. They have a central branch, with many smaller, perpendicular side branches. If you pull apart the lichen carefully, the central elastic cord will stretch.

**Similar species:** No other lichens have a central elastic cord. Individual species are separated by chemistry, branching patterns, and reproductive structures. Look for Methuselah's beard (*Usnea longissima*), which can grow several yards long, south of the Alaska Range.



## Sunshine lichen

*Vulpicida pinastri* – foliose

**Description:** This yellow or green lichen forms rosettes on bark. It grows on a variety of species, from small shrubs to large trees. Mature individuals have bright yellow soredia along the edge of the thallus. It often has parasitic fungi (black flecks).

**Similar species:** See yellow lichen (*Vulpicida juniperinus*, page 19).





## Concentric ring lichen

*Arctoparmelia centrifuga* – foliose

**Description:** This species grows outward from a central point, and then dies in the center, forming a ‘bullseye.’ The young, outer lobes are pale yellow, the old, inner lobes are brown or grey. Undersurface is pale with scattered rhizines.

**Similar species:** This is the most common of the ring lichens in Northern Alaska. The others either have soredia (*Arctoparmelia incurva* and *A. subcentrifuga*) or a dark undersurface (*Arctoparmelia separata*, look under old lobes).



## Alpine bloodspot lichen

*Ophioparma ventosa* – crustose

**Description:** Found on acidic rocks in the alpine. The thallus is pale yellow and warty. As the common name implies, it has vivid red apothecia. The apothecia are irregularly round, with white margins. Sometimes the upper red layer of the apothecia will be eaten away by invertebrates, leaving yellow tissue beneath.

**Similar species:** Aside from the closely related Lapland bloodspot lichen (*Ophioparma lapponica*, distinguished by microscopic features), this is our only yellow lichen on rock with red apothecia.



## Orange boulder lichen

*Porpidia flavicunda* – crustose

**Description:** This crustose lichen often first appears to be a rust stain on rock. It has a thick orange-to-yellow thallus. Apothecia are irregular, with a black rim and grey center.

**Similar species:** Alaska has other rock-dwelling orange crusts (including *Lecidea lapicida* and other *Porpidia* species). But the grey, wavy-margined apothecia are distinctive.

## Map lichen

*Rhizocarpon* species – crustose

Pictured: *Rhizocarpon macrosporum*

**Description:** Bright yellow-and-black lichens are often all called *Rhizocarpon geographicum*, but there are actually several species that look similar to the naked eye. Map lichens have an underlying black thallus (look at the edges) and raised yellow patches on top, split into polygons like cracked mud. The apothecia are black, in between the yellow patches.

**Similar species:** There are several brown, black, gray and even orange species of map lichens on rock.

## Elegant sunburst lichen

*Rusavkia elegans* – foliose

**Description:** This bright orange lichen grows closely appressed to rock. It's often found near bird perches, its growth fertilized by bird dung. It forms rosettes with evenly branched of narrow lobes. Round apothecia are often present at the center, the same bright orange as the thallus, with a slightly lighter rim.

**Similar species:** This is our most common orange, lobed lichen. Other species grow over bark, or do not have apothecia.

## Rock tripe

*Umbilicaria* species – foliose

Pictured: *Umbilicaria proboscidea*

**Description:** Rock tripes attach to rock from a central navel-like holdfast. They are circular or tattered and irregular. Apothecia are common, they look like black buttons with many concentric rings of tissue. Most species of rock tripe are black, gray or brown. Several species have white ridges at the center.

**Similar species:** Species are distinguished by texture, rhizine presence & shape, color, and apothecia shape. Rock tripes are by far the most common lichens on rock with a central holdfast.



## ADDITIONAL RESOURCES

### General resources

[The Lives of Lichens: A Natural History](#) by Robert Lücking & Toby Spribille: A plain language deep dive into the ecology, biology and natural history of lichens, illustrated with gorgeous color macrophotography.

[Lichens of North America](#) by Irwin Brodo, Sylvia Duran Sharnoff & Stephen Sharnoff: A large coffee table book, it has great introductory material on lichens, keys, beautiful color photos, and descriptions of hundreds of lichens from across the continent.

### Other beginner resources for Alaskans

[Common Cryptogams of Interior Alaska](#) by Gary A. Laursen & Rodney Seppelt: Color guidebook, includes mushrooms, lichens, mosses and liverworts. Includes 12 lichens and more technical detail than this guide.

[Lichens Around Mendenhall Glacier](#) by Chiska C. Derr & Robert Hasselbach: great introductory resource for Southeast Alaska.

[Lichens of Alaska's South Coast](#) by Karen Dillman: Forest Service brochure, includes 31 lichens common to SE Alaska.

### Technical books and keys useful for Alaska

[Compendium of Lichens and Associated Fungi of Alaska](#): List of all lichens reported in the scientific literature for Alaska. A good resource for checking a species reported range, but does not come with keys. Free PDF available online.

[Lichens of British Columbia](#), [Volume 1](#) and [Volume 2](#) by Trevor Goward: Illustrated keys, often include Alaskan species. PDFs available free online.

[Macrolichens of the Pacific Northwest](#) by Bruce McCune and Linda Geiser: Paperback book with keys, descriptions & photos.

[Microlichens of the Pacific Northwest](#), Volumes 1 & 2. by Bruce McCune: Keys, photos, and descriptions of crustose lichens. Volume 1 has a superb illustrated glossary.

[Keys to the Lichens of North America](#) by Irwin Brodo: One of the most complete keys available. No photos.

### Websites

[The British Lichen Society](#): resources for chemical spot tests and a more complete glossary of anatomical terms.

[Ways of Enlichenment](#): Includes writing about lichens, and one of the best lichen photo galleries available online, with all IDs verified by experts. Based in British Columbia.

[iNaturalist](#): A website for uploading and identifying species observations. Good source of photos and locations of many lichens, and feedback on your IDs, but remember: many species cannot be identified from photos. IDs are often incorrect. For observing lichens, always take pictures of the upper and lower surface!

# SPECIES INDEX

|                                       |    |                                     |    |
|---------------------------------------|----|-------------------------------------|----|
| <i>Alectoria ochroleuca</i> .....     | 12 | Freckle pelt.....                   | 17 |
| Arctic rag lichen.....                | 12 | Dog pelt.....                       | 18 |
| Arctic kidney lichen.....             | 17 | <i>Peltigera aphthosa</i> .....     | 17 |
| <i>Arctoparmelia centrifuga</i> ..... | 22 | <i>Peltigera canina</i> .....       | 18 |
| <i>Asahinea chrysantha</i> .....      | 12 | Pink fairy barf.....                | 16 |
| Bloodspot lichen, alpine .....        | 22 | Pixie lichens                       |    |
| Boreal oakmoss.....                   | 20 | Boreal cup lichen.....              | 14 |
| <i>Bryocaulon divergens</i> .....     | 12 | Quill lichen.....                   | 13 |
| Cabbage lung.....                     | 16 | <i>Porpidia flavicunda</i> .....    | 22 |
| <i>Cetraria laevigata</i> .....       | 13 | Reindeer lichens                    |    |
| <i>Cetraria cucullata</i> .....       | 15 | Grey reindeer lichen.....           | 14 |
| <i>Cetraria nivalis</i> .....         | 16 | Star-tipped reindeer lichen.....    | 15 |
| Chocolate chip lichen.....            | 18 | Yellow reindeer lichen.....         | 14 |
| <i>Cladonia</i> .....                 | 13 | <i>Rhizocarpon</i> .....            | 23 |
| <i>Cladonia amaurocraea</i> .....     | 13 | <i>Rusavskia elegans</i> .....      | 23 |
| <i>Cladonia arbuscula</i> .....       | 14 | Rock tripe.....                     | 23 |
| <i>Cladonia borealis</i> .....        | 14 | Shield lichen.....                  | 21 |
| <i>Cladonia rangiferina</i> .....     | 14 | Snow lichen                         |    |
| <i>Cladonia stellaris</i> .....       | 15 | Crinkled snow lichen.....           | 16 |
| Concentric ring lichen.....           | 22 | Curled Snow lichen.....             | 15 |
| <i>Dactylina arctica</i> .....        | 15 | <i>Solorina crocea</i> .....        | 18 |
| Dead man's fingers.....               | 15 | <i>Sphaerophorus globosus</i> ..... | 18 |
| <i>Evernia mesomorpha</i> .....       | 20 | <i>Stereocaulon</i> .....           | 19 |
| <i>Flavocetraria cucullata</i> .....  | 15 | Sunburst lichen, elegant.....       | 23 |
| <i>Flavocetraria nivalis</i> .....    | 16 | Sunshine lichen.....                | 21 |
| Foam lichens.....                     | 19 | <i>Thamnolia vermicularis</i> ..... | 19 |
| Globe lichen.....                     | 18 | Tube lichen, hooded.....            | 20 |
| Heath foxhair lichen.....             | 12 | Tumbleweed lichen.....              | 17 |
| <i>Hypogymnia physodes</i> .....      | 20 | <i>Umbilicaria</i> .....            | 23 |
| Iceland lichen, striped.....          | 13 | Usnea.....                          | 21 |
| <i>Icmadophila ericetorum</i> .....   | 16 | <i>Vulpicida juniperinus</i> .....  | 19 |
| Jellyskin, bearded.....               | 20 | <i>Vulpicida pinastri</i> .....     | 21 |
| <i>Leptogium saturninum</i> .....     | 20 | Whiteworm lichen.....               | 19 |
| <i>Lobaria linita</i> .....           | 16 | Witch's hair, green.....            | 12 |
| Map lichen.....                       | 23 | <i>Xanthoria elegans</i> .....      | 23 |
| <i>Masonhalea richardsonii</i> .....  | 17 | Yellow lichen.....                  | 19 |
| <i>Nephroma arcticum</i> .....        | 17 |                                     |    |
| Old man's beard.....                  | 21 |                                     |    |
| <i>Ophioparma ventosa</i> .....       | 22 |                                     |    |
| Orange boulder lichen .....           | 22 |                                     |    |
| <i>Parmelia sulcata</i> .....         | 21 |                                     |    |
| Pelt lichens                          |    |                                     |    |

