

Lichens in the Preserve: a guide for beginners

UW-Madison Lakeshore Nature Preserve

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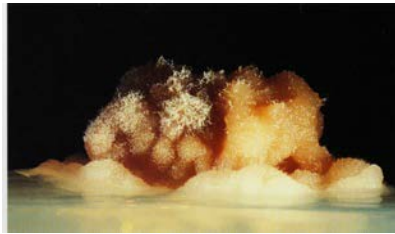
**Photos by Marie Trest, Andrew Khitsun, John Wolf,
Susan Will-Wolf, and others**

Overview

- A brief introduction: Lichen biology and ecology
- Beginners' guide: Lichens in the Lakeshore Nature Preserve
- Additional resources

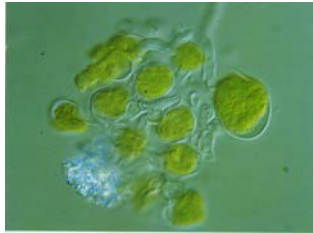
A brief introduction: Lichen biology and ecology

The classic lichen symbiosis:



fungus

+



algae

=



lichen

This set of images is from the book "Lichens" by William Purvis, 2000

From recent studies – many lichens might need bacteria also, to produce all their identifying characteristics.

Most people are familiar with mushrooms and shelf fungi; they are in the "basidiomycete" group of fungi, that produce their microscopic spores on tiny clubs or "basidia."

MOST LICHENS are in the "ascomycete" group of fungi, that produce their microscopic spores in tiny elongated sacs or "asci." This group is often inconspicuous; it also includes a lot of plant disease fungi.

- Lichens grow where plants don't. They are often quite small!
- Lichens grow on 3 important surfaces (substrate):
 - on bark or wood
 - on rock
 - on soil (especially in dry places)
 - Many lichen species grow on only one of these surfaces
- Lichens have 3 major growth forms – the individual body (thallus) is:
 - foliose = leafy, flat; with an obvious top and bottom side.
 - fruticose = tufted or stringy
 - crustose = at least the bottom layer embedded in the surface
 - Examples of each are on the next 3 pages

**Common
greenshield**
(*Flavoparmelia
caperata*)

**Foliose =
Leafy, flat**

(has an underside
you can tell is not
embedded in the
surface)

You may well see all
these species in the
Preserve, though
they might not be as
large or obvious.

Common name (with
scientific name in
parentheses)

**Mealy
rosette lichen**
(*Physcia millegrana*)



Photo by Andrew Khitsun



Photo by Troy McMullin

Poplar sunburst lichen
(*Xanthomendoza hasseana*)

The round orange cups are
fruit bodies; these most
common lichen fruit
bodies are called
apothecia.



Photo by Marie Trest

Fruticose = 3-D stalked, tufted, or stringy

Boreal oakmoss lichen
(*Evernia mesomorpha*)



Sinewed Ramalina
(*Ramalina americana*)

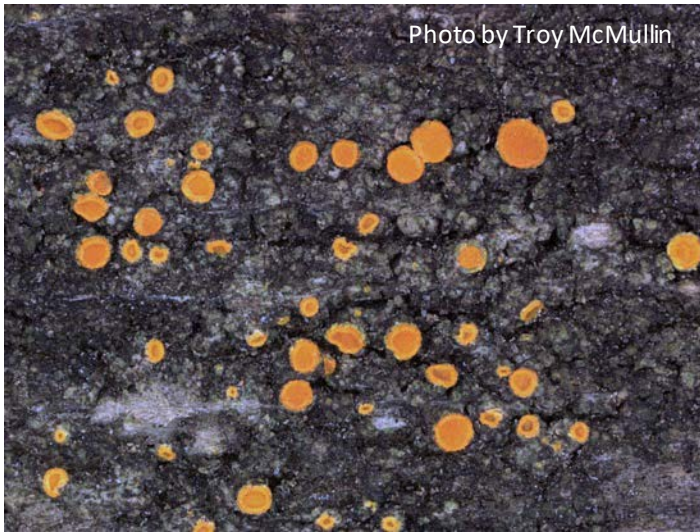


Mealy pixie-cup
(*Cladonia chlorophaea*)

This is an example of a 3-D stalked lichen; the only kind of fruticose lichen you are likely to see in the Preserve

Crustose = embedded in substrate

You can see all three of these groups in the Preserve.



Firedot lichen
(*Caloplaca* species)

Left: most have orange or red fruit bodies, usually on gray or yellow crust. Different species are found on bark and rock

Common script lichen
(*Graphis scripta*)

Below: you might see this species on shaded tree trunks in the Preserve.



Boulder lichen
(*Porpidia* species)

on rocks, even on concrete



Photo by John Wolf

Beginners' guide: Lichens in the Lakeshore Nature Preserve

- Most lichens in the Preserve are found on bark and wood: on tree trunks, on relatively fresh branches fallen from the canopy, or on long-down (often mossy) logs on the ground.
- Rocks in the Preserve are bedrock along the lake edge, scattered boulders left by glaciers in other areas, or boulders or rock walls. Lichens on rocks are generally slow growing and need many years to recover from climbing damage.
- **SPECIAL NOTE:** The Stone wall at the Picnic Point entrance is a geological and historical treasure. If you look for lichens there, please don't climb on it! While many stones are hard, the sedimentary rocks are easily weathered by feet scrambling up the wall.
- **Please stay on or very close to Preserve paths or roads.** Bring a hand lens or portable magnifier if you have one. **Please don't collect or remove** any lichens from anywhere during your walks!!
- Many lichens can be identified to group or genus just by looking; only a few can be identified to species this way. Species notes reflect this.
- Autumn, winter, and spring are great times to observe woods structure. While you are looking for lichens then, take the time to look around through the woods. Note scattered large oaks with their spreading large branches and knobs on trunks where old branches were. This is a sure sign they started life in the open. The smaller straight-trunked trees grew later and closed in Preserve forests.
- Note shelf fungi growing on tree trunks, snags, and downed logs. Note the many shades of green mosses growing on tree trunks and bases, and on downed logs. Many of them have fruiting "sporophytes" rising above the green. Mosses and fungi are most easily visible in early spring and autumn after the first frosts. Once the ground leafy plants have grown up, mosses and shelf fungi are often hidden from view.
- The lichens mentioned here are only a small selection of those that grow in the Preserve. Happy Hunting!
- The last page of this file has some references if your interest has been piqued to explore lichens further.

Lichens on rocks

Many of the pictures are from the Picnic Point area of the Lakeshore Nature Preserve; also look for these on isolated rocks anywhere you find them near Preserve trails.

Lichens on the stone wall, page 1, at the entrance to Picnic Point – remember, don't climb!



Photo by John Wolf

Common goldspeck lichen – a crust lichen,
(probably *Candelariella vitellina*)

The strong yellow patch in the image is ~3 inches wide. Mostly what you can see here are small granules of lichen thallus.

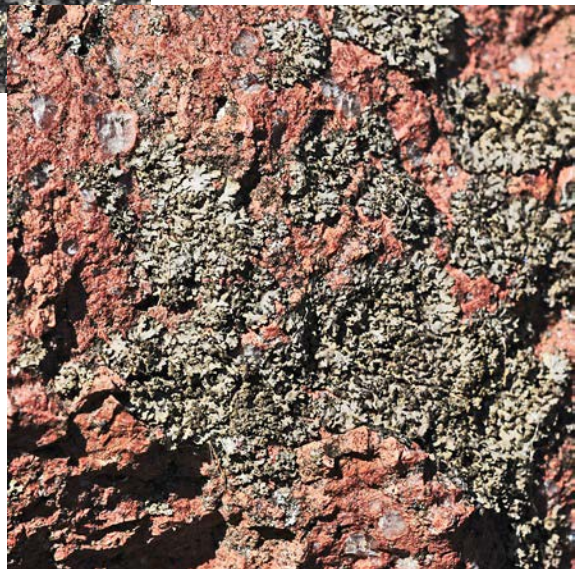
Lichens on the Picnic Point stone wall, page 2 – again, don't climb!



The 6-inch-wide image at left is probably a leafy **Powder-tipped shadow lichen** (*Phaeophyscia adiastrum*), with pale to brownish gray upper side, loosely arranged lobes, and powdery granules along lobe edges. Its dark underside is not seen here. A few white-rimmed fruit bodies are at top center. It grows on both rocks and trees.

Photos by John Wolf

The image at right, ~4 inches across on a red rock near the picture above, is of the same lichen species. The long white patches are places where the grayish top layer was eroded or eaten off by slugs or insects.



Lichens on the Picnic Point stone wall, page 3 – again, don't climb!



These whitish patches are probably a **Sunken disk lichen** (*Aspicilia* sp.); a closeup is below. This is possibly not the same species as the patches of the same genus found on the isolated boulder shown on the next page.

The image at left is ~8 inches wide.



This closeup shows the sunken dark fruit body disks. This image is ~2 inches wide.

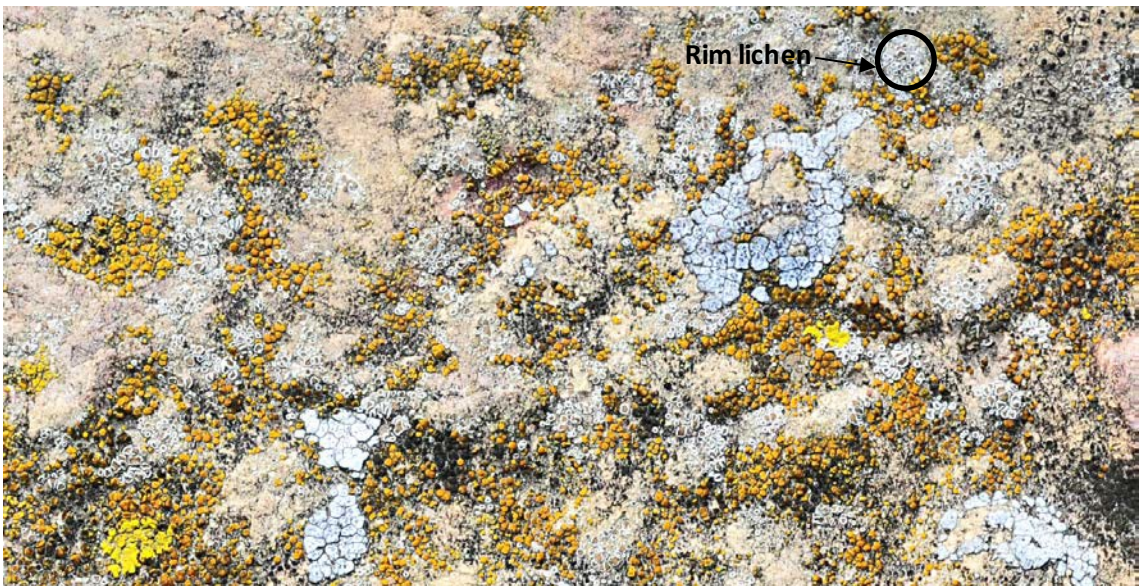
Lichens on the isolated boulder near the entrance to Picnic Point, page 1 – remember, don't climb!

This boulder is a **lichen treasure-trove**, with maybe 20 different species on it!



Spend as much time as you can looking for different kinds. Most lichens are patches no more than 1 inch across. Most are embedded crustose lichens, and most have tiny fruit bodies showing. Look at this mini habitat of many lichens competing for space and position, and feel mighty! This and the next two pages have close-up pictures with notes.

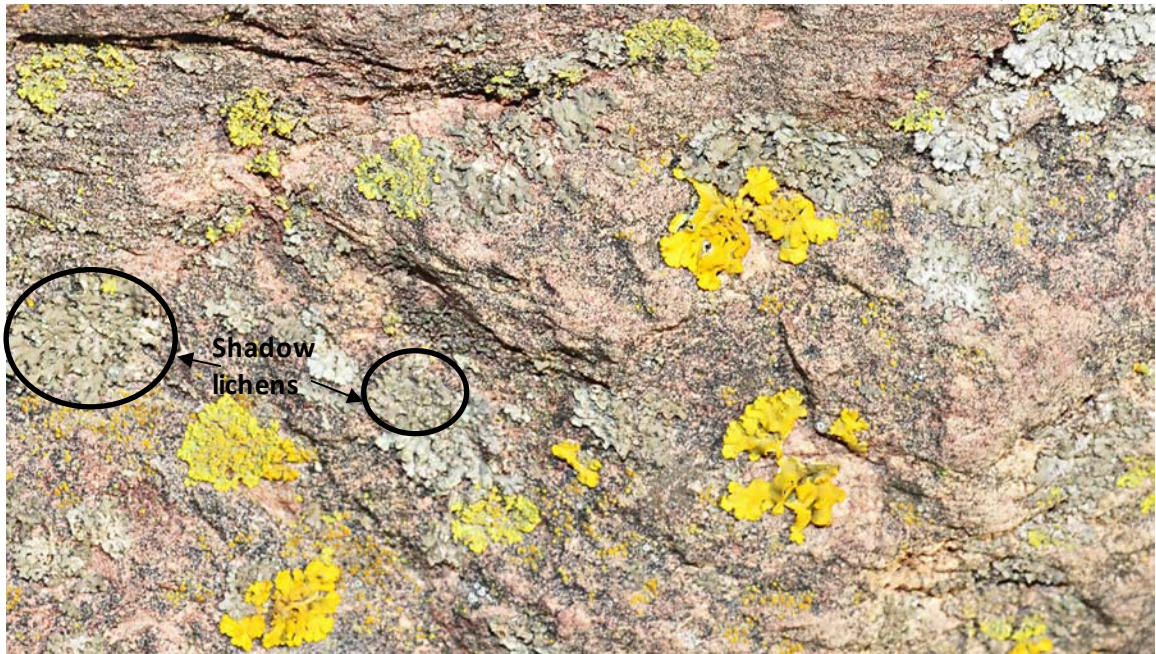
Photo by John Wolf



This closeup shows mostly embedded/crustose lichens. The largest strong white **Sunken disk lichen** (*Aspicilia* sp.) is ~½ inch wide; smaller ones are scattered around. To the upper right (circled), right, and lower right of this white lichen are several grayish white **Rim lichens** (*Lecanora* sp.) with white rings (fruit bodies) having brownish centers. Next to them at far upper right, a tan lichen with black dots (also fruit bodies) might be a **Button lichen** (*Buellia* sp. or close relative). The clusters of small bright orange circles are fruit bodies of **Firedot lichens** (*Caloplaca* species) with most of their thallus embedded right in the rock.

Lichens on the isolated boulder near the entrance to Picnic Point, page 2 – again, don't climb!

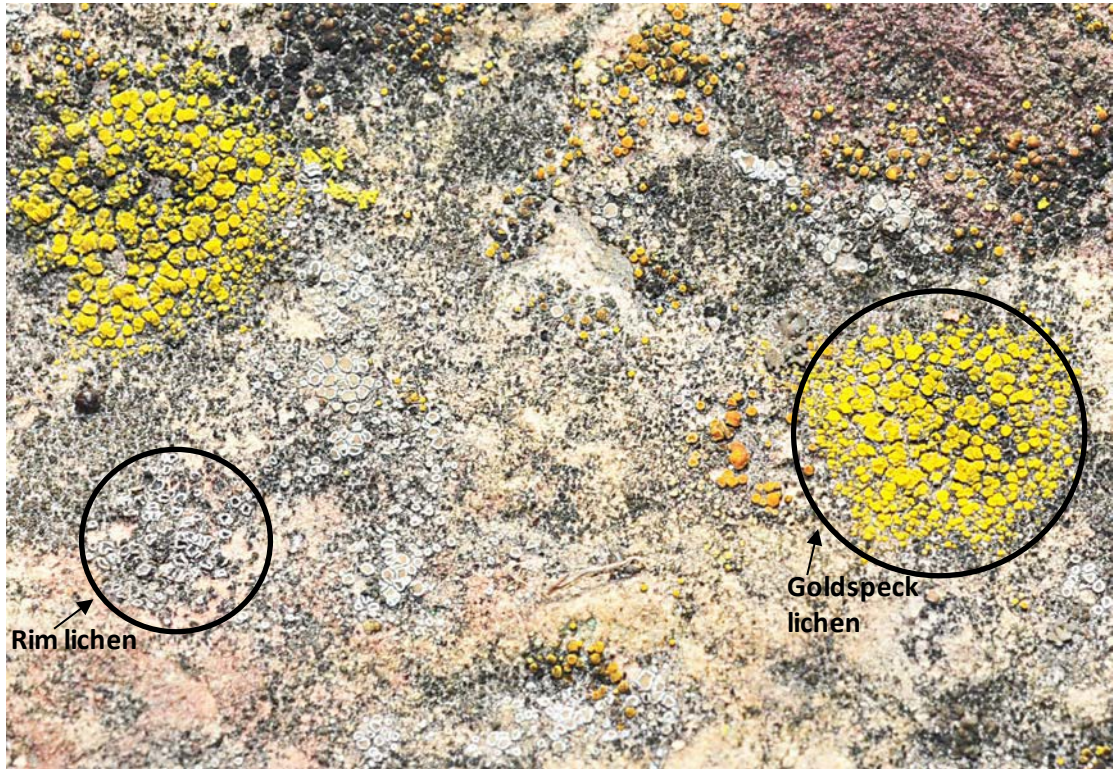
Photo by John Wolf



In this closeup there are several small leafy (foliose) lichens. The bright yellow/orange **Sunburst lichen** (*Xanthomendoza* sp.) in the upper half is $\sim\frac{3}{4}$ inch wide; several more are lower. There are also a couple of small individuals of this group in the closeup on **isolated boulder, page 1**. Several smaller and paler yellow to greenish **Lemon lichens** (possibly *Candelaria concolor*, though that species is mostly on bark) are scattered in the upper half, and elsewhere. Small bone white **Powder-tipped rosette lichens** (*Phycia dubia*) are at upper right and left center. The two ovals outline brownish gray leafy **Shadow lichens** (*Phaeophyscia* sp.); several others are scattered around. The very dark gray tiny lobes in the crack just above the smaller oval might be the **Dark shadow lichen** (*Phaeophyscia sciastra*), one of the smallest of this group. If you have really good eyesight or zoom in on the image, you can see very small yellow circles with orange centers – fruit bodies of crustose **Goldspeck** or possibly **Firedot lichens**.

Lichens on the isolated boulder near the entrance to Picnic Point, page 3 – again, don't climb!

Photo by John Wolf



This closeup shows only embedded/crustose lichens. The bright yellow patches of a **Goldspeck lichen** are each $\sim\frac{3}{4}$ inch across. This might be the same species as found on the **stone wall, page 1**, but with less thallus and more fruit bodies. Below the left **Goldspeck lichen** is one species of **Rim lichen** circled; its fruit bodies have somewhat ragged pale edges and gray to dark centers. This might be the same species as in the closeup on **isolated boulder, page 1**. To its upper right is another **Rim lichen** that has fruit bodies with less ragged edges and pale centers. It might be the same or a different species; one would need to check with a microscope. Orange fruit bodies of **Firedot lichens** are scattered around the image.

Lichens on wood and bark

Lichens on dry wood: These lichens are growing on the **wooden rails** of the pedestrian maze gate at the entrance to Picnic Point. Count how many tiny LEAFY LICHEN species there appear to be. This gate was completely rebuilt just a few years ago; these are relatively fast-growing lichens! Also look for these on any dry shaped wood in the Preserve.



Photo by John Wolf

Sunburst lichens (1/2 inch wide) are strong orange.

Tiny **Lemon lichens** (*Candelaria* species) are pale yellow. A **Rosette** lichen just left of lower center is bone gray/white.

The many tiny **Shadow lichens** (*Phaeophyscia* sp.) are brownish gray with black edges.

Lichens on tree bases and downed mossy logs, page 1



This 4-to 5-inch-wide mossy log is colonized by **Bottlebrush frost lichens** (*Physconia deterosa* or a very close relative). This lichen likes shade; it is usually found low on tree trunks and old logs.

The closeup below, ~3 inches across, shows the pale powdery (hence “frost”) coating on the tips of brownish lobes. “Bottlebrush” refers to the shape of root-like fibers on the underside.



Photo by John Wolf

Lichens on tree bases and downed mossy logs, page 2

Photo by John Wolf



In the above photo, small individuals of the brownish to grayish **Powder-tipped shadow lichen** are nestled among the mosses or growing directly on bark at the base of this oak tree. This lichen loves shade. It grows on both tree bases and rocks (remember the rock wall picture), usually with mosses. Image ~1 ft wide.



The photo at right from Ohio shows how it looks when very healthy.

Photo by Andrew Khitsun

Lichens on tree bases, downed mossy logs, page 3 (maybe even on the ground). All are fairly uncommon in the Preserve; please do not collect.

These 3-D stalked *Cladonia* lichens all have crowded small lichen thallus lobes at the base of the stalks.



British soldier

(*Cladonia cristatella*)
stalks (left) are usually $\frac{1}{2}$ to 1.5 inches tall but can be taller. The red caps are fruit bodies.

Common powderhorn

(*Cladonia coniocraea*)
stalks (below) are usually $\frac{1}{2}$ to 1.5 inches tall but can be taller

Photo by Andrew Khitsun

Mealy pixie-cup stalks are usually $\frac{1}{3}$ to $\frac{1}{2}$ inch tall.



Photo by Marie Trest



Photo by Stephen Sharnoff

Large leafy lichens on large branches and trunks of living trees, page 1. Please replace branches where they were, after looking at the lichens.

These very large branches fell from near the top of an oak. The lichens here are starting to die back without the full light they had before branches fell.



Rough speckled shield lichen (*Punctelia rudecta*) in the left photo entirely circles a 4-inch-wide snag rising from a larger branch.

The 1.5-inch-wide closeup at right shows characteristic white dots on the lobe surfaces.

The gray or brownish center area of an individual, seen in all but the closeup, has hundreds of tiny branched finger-like stalks (isidia) rising from the surface.

This species is very common on trunks and large branches of forest trees.



This 10-inch-wide picture from central Wisconsin shows a single large healthy individual



All photos by John Wolf

Large leafy lichens on large branches and trunks of living trees, page 2.

These 4- and 5-inch wide **Common greenshield** (*Flavoparmelia caperata*) individuals on a fallen tree from central Wisconsin show adult features: Pale green without white dots, powdery granules toward the center. The dark underside is not shown. This species is common on branches and trunks of many forest tree species.



Photo by Andrew Khitsun

Sometimes **Common greenshield** gets very large...in Maryland



Photo by Marie Trest

Large leafy lichens on large branches and trunks of living trees, page 3 - juveniles. Please replace branches where they were, after looking at the lichens.



This 2-inch-wide very pale green juvenile **Common greenshield** lichen shares its pine branch with a small leafy yellow **Candleflame** (*Candelaria concolor*) lichen and several small leafy gray **Powdery rosette** lichens (*Physcia americana*), that are both more commonly found on deciduous trees.

Photos by John Wolf



Left: The overturned lobes at upper right of this 1.5-inch-wide juvenile **Rough speckled shield lichen** on a pine branch show the characteristic pale lower surface. This contrasts with the dark lower surface of **Common greenshield** and helps people distinguish the two.

Small leafy lichens on branches and trunks of living trees, page 1. Please replace fallen branches where they were.

This small leafy **Candleflame** or **Lemon lichen** is on the trunk of a hackberry with its characteristic warty ridged bark. From about 6 ft away you can see the strong yellow patches at about eye level. It is very common on branches and well-lit trunks of many deciduous tree species including street trees, but this is a particularly spectacular display.

The trunk showing in the photo on the left is ~8 inches across.

The closeup below is ~1.5 inches across. Note the many tiny branched lobes on this lichen. There are lots of small grainy specks all along the lobes, and no fruit bodies showing.



Photos by John Wolf

Small leafy lichens on branches and trunks of living trees page, 2. Please replace fallen branches where they were.

Sometimes all 3 of these small leafy lichen species are found on the same twig high in a tree. They like light; **Mealy rosette** and **Candleflame** can also stand some shade and **Hoary rosette** has a shade-loving lookalike. Check out your street trees at home!

Mealy rosette lichen (*Phycia millegrana*) sometimes has fruit bodies. It ranges from grayish in shade to bright bone white in sun, and is often found on small branches. It has tiny narrow lobes with powdery granules along the edges. Image ~1.5 inches wide.

Hoary rosette lichen

(*Phycia aipolia*) has fruit bodies and no powdery granules. It ranges from this bone gray to bright bone white in full sun.

On a 1/3-inch-wide branch



Photo by Andrew Khitsun

Candleflame or Lemon lichen is often this size on small branches.

On a 1/2-inch-wide branch



Small leafy lichens on bark of branches from living trees

page 3. Please replace fallen branches where they were.



The ½-inch-wide oak branch at left shows pale gray/white **Hoary rosette** lichens that grew in full sun, with a small yellow **Candleflame** lichen in between.

The ½-inch-wide branch below shows a small orange **Hooded sunburst** lichen (*Xanthomendoza fallax*) growing with a **Hoary rosette** lichen. The paler yellow edge near its lower right is a “hood.”



Photo by John Wolf

Small leafy lichens on bark of branches from living trees, page 4. Please replace fallen branches where they were.

This 1- inch-wide pine branch has larger gray **Powdery rosette lichens** mixed with smaller greenish yellow **Candleflame** lichens. Possibly city dust on the acid pine bark supports these lichens more often found on deciduous trees with less acidic bark.



Photo by John Wolf

Less common leafy lichens on branches and trunks of living trees.

These are found mostly on trunks and large branches of deciduous trees in wooded areas.



Photo by Andrew Khitsun

Medium size gray **Powdery axil-bristle lichen** (*Myelochroa aurulenta*) has granules on upper surfaces and U-shaped sinuses between lobes.



Photo by Stephen Sharnoff

Small brownish gray **Orange-colored shadow lichen** (*Phaeophyscia rubropulchra*) has granules on edges; the closeup below shows the characteristic orange middle layer.



Photo by Lynda Miller

Small brownish gray **Pompon shadow lichen** (*Phaeophyscia pusilloides*) has granules in pale green upturned globes.



Photo by Andrew Khitsun

Crust lichens on branches and trunks of living trees. These are found mostly in wooded areas.

The “dust” lichens all have a surface of powdery granules. Several species groups unrelated to each other have similar appearance, and some also have other structures.



The **Fluffy dust lichen** (*Lepraria finkii*) has ONLY powdery granules, no other structures. It is found on tree bases, shaded rocks, and over mosses. This picture is about 5 inches wide.

Both photos by Andrew Khitsun



The **Mapledust lichen** (*Lecanora thysanophora*), left, has this characteristic white fibrous edge when it is at its best (~2 inches wide here), but often has only the interior powdery granules showing. It is found on shaded tree trunks. Note it is in the same group/genus as the **Rim lichens**.

The tiny crust **Rim lichens** are also found on tree branches and trunks; see notes about them on the pages covering the isolated boulder.

Resources for learning about lichens

- Troy McMullin and Frances Anderson's book for beginners, "Common Lichens of Northeastern North America," is reviewed on the New York Botanical Garden (NYBG) website [Learning about Lichens...](#)
- [LichenLand](#) provides several fun online ways for beginners to learn about lichens; it features lichens of the Pacific Northwest.
- The web site [Lichens of North America Information](#) introduces the book of the same name, with keys by Irwin Brodo and stunningly beautiful pictures of lichens taken by Stephen and the late Sylvia Sharnoff. The lichen common names were taken from this book. The site also has other lichen resources.
- The United States Forest Service has a great website about [lichens](#), covering the entire country. It includes several sub-sites about lichens, lichen identification, and a lichens photo gallery.
- All of the sites linked above include links to other lichen resources.
- The Wisconsin State Herbarium (WIS) has a huge collection of [lichens](#); most of its Wisconsin specimens are databased through the Consortium of North American Lichen Herbaria (CNALH) portal. The above link gives local notes and easy access to CNALH with lots of pictures and information. Enter a species name, and choose Wisconsin to search. WIS also has other information about local lichens.
- The [North American lichen checklist](#) web site has the full scientific names of all the lichens recorded for North America, if you are interested.

Friends of Lakeshore Nature Preserve members MJ and Thomas Morgan are working to identify all the lichens found in the Preserve. Contact the Friends at preservefriends@gmail.com for more information.

THANKS to Andrew Khitsun (Madison resident), Troy McMullin, Lynda Miller, William Purvis, Stephen Sharnoff, Marie Trest (UW-Madison Botany), and John Wolf (Madison resident) for images either given to Susan Will-Wolf or made publicly available under creative commons agreements (see CNALH above). Will-Wolf took the unattributed pictures.