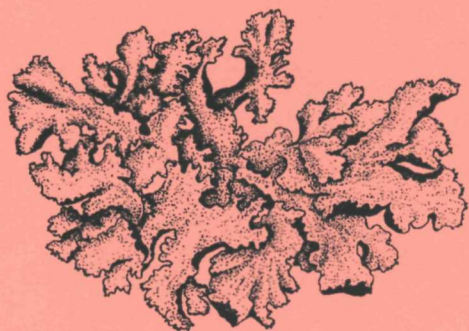


A Genus Key To The

LICHENS OF ALASKA



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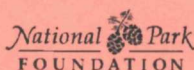


TABLE OF CONTENTS

Introduction	2
Getting Started: Important Definitions	4
Part I Quick Reference Guide	5
Part II Genus Key	9
Part III Genus Descriptions	19
Glossary	34
Index and Synonomies	36

INTRODUCTION

Alaska is truly a land of many lichens. Lichens are draped on trees, nestled in the tundra, and plastered on rocks. They are ecologically important, serving as nitrogen fixers and providing forage and nesting material. People use them as dyes and medicines. Biologically they are fascinating. Lichens are a successful alliance between members of two biologic kingdoms: fungi and algae. The fungus gives the alga a home by forming the thallus, or body, of the lichen. The alga (or sometimes cyanobacterium), sandwiched in between fungal layers, supplies food to the fungus through the process of photosynthesis. Unlike 'normal' plants, lichens have no roots, and no developed vascular system to transport water and nutrients. Instead, they get what they need directly from the atmosphere in the form of rain or dust.

About This Booklet

This is an introductory guide to assist biologists and lay people in the identification of lichens to the genus level. Learning to recognize genera is an excellent way to begin to understand lichenology. It provides a method of categorizing taxa in the field and allows users to develop an 'eye' for lichens. Although photo guidebooks exist for common lichen species (see 'Additional References' below), none of them include good workable genus keys. Also, since many lichens look superficially similar, the temptation to rely on photos can easily lead the user astray. The objective of this booklet was to provide a user-friendly guide that elucidates the differences between genera.

In this booklet, we use two approaches to the identification of lichens, a *quick reference guide* and a *genus key*. The *quick reference guide*, beginning on page 5, organizes genera by substrate, growth form, and color. Through a simple process of elimination, the field of choices can be quickly narrowed to several genera. Genus descriptions are then used to obtain final identifications.

The *genus key*, beginning on page 9, is structured to lead the reader to the most common and easily identified genera. Groups of similar-looking genera (e.g., *Melanelia* et al.) are sorted out in subkeys located in the description section.

Beginning on page 19, genus descriptions inform readers about the intrinsic difficulty/ease of accurately identifying each genus as well provide as helpful tips. This will allow readers to know when to have confidence in their determinations and when to proceed with more caution. Photos are included for the most common genera.

Area of Coverage

All but the most obscure Alaska genera are included in this guide. The booklet will be most useful to those working in 'mainland' Alaska, including all areas north and west of Yakutat. In Southeast Alaska, many species with southern oceanic influences appear, and the epiphytic lichen flora begins to resemble that of the Pacific Northwest. Users in Southeast Alaska will find this booklet most useful when supplemented by one of the excellent Pacific Northwest lichen guides listed below.

Crustose lichens, which typically require the use of a compound microscope for identification, are beyond the scope of this guide and are not included.

Additional References

Once you feel comfortable with the keys presented in this booklet, you will soon be ready to graduate to the more thorough species-level works. The Alaska standard is Thomson's *American Arctic Macrolichens* (Columbia University Press, NY). The genus key is somewhat arduous, but the species keys and range maps are good. Be aware that it is not comprehensive. Two other excellent resources, both strongly overlapping with the Alaska flora, are:

- *The Lichens of British Columbia* by Goward, McCune and DelMeidinger. British Ministry of Forests. Crown Publications, Inc. Victoria, B.C.
- *Macrolichens of the Northern Rocky Mountains* by McCune and Goward. Mad River Press Inc. Eureka, CA.

In addition, the following photo guidebooks are available:

- *Macrolichens of the Pacific Northwest* by McCune and Geiser. Oregon State University Press. Corvallis, OR.
- *Mosses, Lichens and Ferns of the Northwest North America* by Vitt, Marsh, and Bovey. Lone Pine Publishing. Edmonton, Alberta.
- *Plants of the Western Boreal Forest and Aspen Parkland* by Johnson, Kershaw, MacKinnon and Pojar. Lone Pine Publishing. Edmonton, Alberta.

A Word About Chemistry

Chemistry is an important diagnostic tool in lichenology. Chemical spot tests are performed by dabbing a small amount of reagent on a lichen and observing the color change. This booklet is unique in that it avoids the use of chemistry. This works reasonably well for genus level determinations, but for reliable species determinations, chemistry is sometimes unavoidable. Several of the references listed above give excellent overviews of the use of chemicals in lichenology, so we refer the reader there.

GETTING STARTED: Important Definitions

GROWTH FORMS

Foliose/Leaf-like

(flattened; having an upper & lower surface)



stalk

Fruticose

(round in cross section)



shrub-like



hair-like



APOTHECIA

(fruiting bodies)

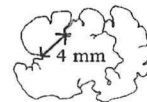
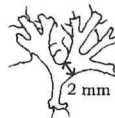


RHIZINES

(rootlike attachments on lower surface)



MEASURING LOBE WIDTH



PART I

QUICK REFERENCE GUIDE

QUICK REFERENCE GUIDE
ON ROCK

LEAF-LIKE/FOLIOSE

Whitish yellow: Asahinea



Orangish: Xanthoria

Yellow green: Arctoparmelia

Grayish: Parmelia

Blackish: Allantoparmelia
 Brodoa oroarctica
 Cetraria
 Melanelia
 Parmelia
 Physcia & look-alikes
 Umbilicaria

FRUTICOSE

HAIR

Brown: Bryoria

Black: Pseudephebe



SHRUB

Yellowish green: Ramalina

Whitish: Sphaerophorus
 Stereocaulon



QUICK REFERENCE GUIDE

ON GROUND

LEAF-LIKE/FOLIOSE

Whitish yellow: Asahinea

Yellowish: Cetraria

Green: Lobaria
Peltigera
Solorina



Greenish yellow: Nephroma arctica

Brown grey: Hypogmnia subobscura
Nephroma expallidum
Peltigera
Physconia muscigena

Brown: Cetraria
Masonhalea richardsonii

FRUTICOSE

HAIR

Yellow & Green: Alectoria

Reddish brown: Bryocaulon
Coelocaulon



Brown: Alectoria nigricans
Bryoria

STALK

White: Siphula
Thamnolia



Straw-colored: Dactylina

Gray green: Pilophorus

Various colors: Cladonia

SHRUB



Whitish: Cladina
Stereocaulon
Sphaerophorus

Greenish or Yellowish: Cladina
Evernia perfragilis

Reddish brown: Coelocaulon

QUICK REFERENCE GUIDE ON WOOD

LEAF-LIKE/FOLIOSE

Orange/Yellow: Candelaria
Cetraria pinastri
Xanthoria

Whitish: Parmelia
Physcia
Platismatia

Gray: Lobaria hallii
Parmelia
Physcia & look-alikes
Platismatia
Pseudocyphellaria

Green gray: Parmelia
Platismatia

Blue green: Lobaria pulmonaria

Yellowish Tinge: Lobaria

Brown: Cetraria
Melanelia
Nephroma
Peltigera
Phaeophyscia
Physconia
Pseudocyphellaria
Sticta

Olive: Melanelia
Phaeophyscia
Physconia

Blackish: Physcia & look-alikes
Sticta



FRUTICOSE

HAIR

Yellow: Alectoria
Ramalina thrausta
Usnea

Brown: Bryoria



SHRUB

Whitish: Sphaerophorus

Yellow: Usnea

Greenish yellow: Evernia
Ramalina



STALK

Various colors: Cladonia



PART II

GENUS KEY

GENERAL KEY

- 1a. Growing on tundra, ground, humus, or sod over rock - **KEY I** (p. 12)
1b. Growing on rock or wood.....2
- 2a. Growing on rock - **Key II** (p. 15)
2b. Growing on wood - **Key III** (p.16)

TIPS

- *All colors refer to dry specimens unless otherwise noted.*
- *Specimens growing in exposed alpine locations commonly lose their true colors and turn dark brown (e.g., Lobaria, Peltigera, Nephroma, Parmelia).*
- *Try checking sheltered lobes for true color.*
- *Carefully remove debris from the underside of fresh specimens for a clearer view of lower surface structures.*
- *A 10x hand lens is necessary to clearly evaluate the presence of some characters. Use of a hand lens is especially important when specifically noted in text.*

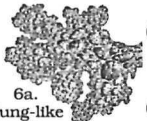
ON GROUND

KEY I

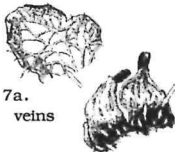


foliose

- 1a. **'FOLIOSE' LICHEN**, that is, clearly flattened with an obvious upper and lower surface (leaf-like) (NOTE: lichens with narrow channeled lobes are included here).....2
- 2a. Gelatinous (becoming jello-like when wetted); always dark; thin - **Collema et al. subkey** (p. 23)
- 2b. Not gelatinous; variously colored.....3
- 3a. Lower surface bright orange or apothecia sunken or both; upper surface green - **Solarina**
- 3b. Lower surface not orange; apothecia not sunken; color various.....4
- 4a. Lobes wide, broad (>1 cm wide), relatively large; with or without darkening veins underneath; dark warts sometimes present on upper surface.....5
- 5a. Lower surface smooth and hard-surfaced, not at all cottony, black or with brown toward margins; upper surface grayish white (occasionally mottled with black) to yellowish - **Asahinea**
- 5b. Lower surface either cottony (use hand lens) or whitish tan toward margins or both; usually some shade of green (check sheltered lobes).....6
- 6a. Upper surface with network of raised ridges and depressions (lunglike); bright green esp. when wet, occasionally very dark brown in sunny, exposed habitats - **Lobaria linita**
- 6b. Upper surface flat, lacking lunglike texture and ridges; color various.....7
- 7a. Lower surface cottony (use hand lens), rhizines (rootlike holdfasts) present - these can be separate, in tufts, or confluent into dense mats (especially toward center); usually with raised (often darkened) veins below; apothecia, when present, located on tips of upright lobes - **Peltigera**
- 7b. Lower surface hard, not cottony (use hand lens); rhizines absent; veins absent; apothecia, when present, located on underside of lobe tips - **Nephroma arcticum/expallidum**
- 4b. Lobes narrow (<8mm), often long and thin, sometimes channeled or lobes round and small (<2mm wide).....8
- 8a. Lobes hollow; inconspicuous; alpine - **Hypogymnia subobscura**
- 8b. Lobes solid, not hollow; size & habitat various.....9



6a. lung-like



7a. veins



7b.

apothecia underneath

ON GROUND (cont.)

9a. Lobes often elongate and +/- narrow (<8mm); flat, channeled, or undulating; apothecia uncommon.....10

10a. Lower surface lacking rhizines (marginal 'eyelashes' may be present); upper surface brown or yellowish; lacking pruina (white granular frosting).....11

11a. Upper surface brown, lower surface brown with distinctive wide whitish patches; margins smooth; "tumbleweed"; not attached to substrate - **Masonhalea richardsonii**

11b. Upper surface and lower surface +/- similar in color, never with large, distinctive white patches below; attached to substrate; lobes channeled or flat; sometimes with marginal projections (eyelashlike); yellowish, brown, or brownish black; extremely common - **Cetraria**

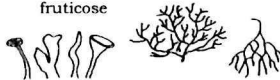
squarrose



10b. Lower surface with squarrose rhizines; upper surface gray brown to brown or olive, often white-pruinose (with white granular frosting); common in calcareous areas - **Physconia muscigena**

9b. Lobes round and small (<2mm wide); apothecia common - **Pannaria et al. subkey** (p. 26)

fruticose



1b. 'FRUTICOSE', that is, lobes round (or slightly flattened) in cross section, lacking an obvious upper and lower surface: hair-like, shrub-like or club-like lichens.....12

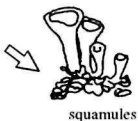
12a. Stalk-like (including stalk, cup, and horn lichens).....13



stalk-like

13a. Stalks hollow inside14

14a. Lichen of two parts: erect stalks with tiny (1mm) leaf-like or ear-shaped flakes (squamules) scattered around the bases; topped with *red or brown fruiting bodies, or cups*, or fruiting bodies lacking; (NOTE: all lichens with cups or topped with red fruiting bodies are included here) - **Cladonia**



squamules

14b. Lichen lacking tiny leaf-like squamules; fruiting bodies absent.....15

15a. Bone white, smooth and pointed - **Thamnomia**

15b. Not as above.....16

16a. Straw-colored or greenish yellow; inflated and papery thin; rounded at top - **Dactylina**

16b. Brown or greenish (or if yellowish, not inflated and papery) - **Cladonia**

13b. Stalks solid inside (see also *Stereocaulon* under 'shrub-like').....17

17a. Chalky white; tips rounded; sides usually fluted; fruiting bodies absent; growing in moist seepages - **Siphula**

17b. Gray green with distinctive black shiny round or spherical apothecia located at the tips - **Pilophorus**

ON GROUND (cont.)

12b. Hair-like (filamentous) or shrub-like.....18

hair-like



18a. Hair-like19

19a. Yellow & green or mostly yellow - **Alectoria ochroleuca**

19b. Black or brownish - **Bryoria et al. subkey** (p.19)

18b. Shrub-like20

shrub-like



20a. Stalks hollow, richly branched; 'reindeer lichens' - **Cladina** and a couple of tricky *Cladonias*: **subkey** (p. 23)

20b. Stalks not hollow; otherwise not as above.....21

21a. White, cream, gray, orangish tan or pale yellowish.....22

22a. Widespread throughout Alaska; extremely common.....23

23a. Stalks lumpy, at least partially covered with minute cauliflowerlike outgrowths; branches fuzzy, not glossy; sometimes pinkish but never orangish tan - **Stereocaulon**

23b. Stalks smooth and glossy; sometimes with orangish tan coloring, sometimes white to gray white - **Sphaerophorus**

22b. Northern and northwestern Alaska; uncommon; pale yellowish; branches hard, brittle - **Evernia perfragilis**

21b. Reddish brown to brown; commonly with stubby projections - **Coelocaulon**

ON ROCK

KEY II



- 1a. **'FOLIOSE'**, that is, clearly flattened with an obvious upper and lower surface (leaf-like) (NOTE: lichens with narrow raised ridges along margins key here).....2
- 2a. Attached only by a central holdfast (like a small umbilical cord) - **Umbilicaria et al. subkey** (p. 31)
- 2b. Central holdfast lacking; attached broadly to substrate.....3
- 3a. Orange or bright yellow; lobes narrow, delicate - **Xanthoria**
- 3b. Otherwise colored.....4



- 4a. Black or dark brown; often small; sometimes with narrow raised ridge along margins - **Melanelia et al. subkey** (p. 26)
- 4b. Yellowish green, whitish, grayish, gray brown, or olive; size various.....5

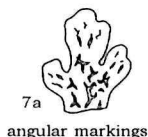
5a. Medium or large in size, often forming irregular mats (mats > 2 cm across).....6

6a. Rhizines (rootlike holdfasts) absent; upper surface sometimes with network of raised ridges and depressions (lunglike); lobes broad (gen. 10 mm+) - **Asahinea**

6b. Rhizines present, sometimes few; never with lunglike texture; lobes narrow (<5mm).....7



6b. rhizines (cross section)



7a angular markings

7a. Upper surface with pale angular markings (hand lens helpful); grayish, whitish, blackish, never yellow green - **Parmelia**

7b. Upper surface lacking pale angular markings; yellowish green - **Arctoparmelia** (or *Xanthoparmelia coloradoensis*)

5b. Small and sometimes fairly inconspicuous, usually forming coinlike circles - **Physcia et al. subkey** (p. 29)



fruticose

1b. **'FRUTICOSE'**, that is, lobes round (or slightly flattened) in cross section: hair-like or shrub-like lichens.....8

8a. Black; forming jet black, fine, richly or sparsely branched, prostrate flat mats on siliceous rock - **Bryoria et al. subkey** (p. 21)

8b. White, cream, gray, greenish, orangish tan, or pale yellow.....9

9a. Branches solid, not hollow; widespread.....10

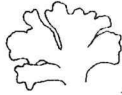
10a. Stalks lumpy with minute cauliflowerlike outgrowths; main branches sometimes fuzzy, not glossy; never orangish tan, sometimes pinkish - **Stereocaulon**

10b. Stalks smooth and glossy; gray white or with some orangish tan coloring, never pinkish - **Sphaerophorus**

9b. Branches hollow with oval perforations; coastal - **Ramalina**

ON WOOD

KEY III



foliose

1a. '**FOLOIOSE**', that is, clearly flattened with an obvious upper and lower surface.....2

2a. Orange or bright yellow - **Xanthoria et al. subkey** (p. 33)

2b. Otherwise colored (NOTE: pale yellow specimens are included here).....3

3a. Lobes hollow inside - **Hypogymnia**

3b. Lobes leaf-like, never hollow.....4



4a. apothecia underneath

4a. Apothecia located on underside of lobe tips - **Nephroma**

4b. Apothecia located on upper surface or along margins, or apothecia absent, never on lower surface.....5

5a. Lobes wide (generally > 1cm wide); relatively large lichen.....6

6a. Lower surface smooth and hard-surfaced, not at all cottony (use hand lens); rhizines few; upper surface whitish, grayish or pale greenish gray, lower surface black, brown, white or with patches of these colors - **Platismatia**

6b. Lower surface tomentose (fuzzy) or cottony, never smooth and hard (use hand lens); rhizines abundant or few; colors various.....7



7a. veins

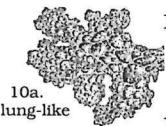


7a. Veins or pale spots present underneath.....8

8a. Undersurface with distinct veins, abundant rhizines - **Peltigera**

8b. Undersurface with pale spots, no veins, rhizines sparse or absent.....9

9a. Spots > 1.5 mm wide, oval or elongated.....10



10a. lung-like

10a. Upper surface with a network of raised ridges and depressions (lunglike); lower surface with dense, minute erect hairs (use hand lens), spots somewhat shiny and pale - **Lobaria**

10b. Upper surface flat, lacking network of ridges and depressions; lower surface cottony, but not erect dense hairs, spots also cottony (use hand lens) - **Peltigera**

9b. Spots smaller, round, forming distinct white or yellow craters; coastal - **Pseudocyphellaria and Sticta subkey** (p. 30)

7b. Veins and/or pale spots indistinct or absent. Rhizines present, separate, in tufts, or confluent into rows or mats; warts present on upper surface or absent - **Peltigera**



7b. rhizines (cross section)

ON WOOD (cont.)

- 5b. Lobes of medium or narrow width (generally < 1 cm).....11
 - 11a. Lobes of medium width (generally 3+ mm).....12
 - 12a. Lobes erect or suberect, that is, rising off the substrate so that much of the lichen is free from the substrate.....13
 - 13a. Brown; upper and lower surfaces mostly alike or similar in color; occurring throughout Alaska - **Cetraria (=Tuckermannopsis)**
 - 13b. Upper and lower surface unlike in color: upper surface whitish, grayish or pale greenish gray, lower surface black, brown or white or with patches or these colors; coastal conifer forests - **Platismatia herrei**
 - 12b. Lobes closely appressed to substrate.....14
 - 14a. Brownish or olive.....15
 - 15a. Thin, often difficult to peel off branch; rhizines present; brown, usually with some olive coloring - **Melanelia**
 - 15b. Thick, easily removed from branch; rhizines absent; upper surface brown; lower surface tan, never olive - **Nephroma parile**
 - 14b. Gray, white, or greenish gray often with angular white markings - **Parmelia**



14b.

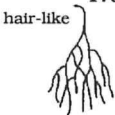
11b. Lobes narrow in width (gen. < 2 mm) - **Physcia et al. subkey** (p. 29) angular markings

1b. **FRUTICOSE**, that is, round (or slightly flattened) in cross-section: hair-like, shrub-like or stalk-like lichens.....16



stalk-like

- 16a. Stalk-like (including stalk, cup and horn lichens); *topped with red or brown fruiting bodies, or cups, or fruiting bodies lacking*; especially around tree bases and dead wood - **Cladonia**
- 16b. Hair-like or shrub-like; otherwise not as above.....17



hair-like

- 17a. Hair-like (filamentous).....18
- 18a. Yellow19
 - 19a. Containing an elastic, white cord when stretched gently lengthwise - **Usnea**
 - 19b. Lacking central strand - **Alectoria and Ramalina thrausta subkey** (p.20)
- 18b. Black or brownish - **Bryoria**



shrub-like

- 17b. Shrub-like20
 - 20a. Yellow to yellowish green (somewhat pale or translucent yellow in *Ramalina roesleri*).....21
 - 21a. Lacking elastic cord when stretched lengthwise; sometimes somewhat flattened - **Evernia and Ramalina subkey** (p. 25)
 - 21b. Containing an elastic, white cord when stretched gently lengthwise - **Usnea**
 - 20b. White, cream, gray or orangish tan; stalks smooth and glossy - **Sphaerophorus**

PART III

GENUS
DESCRIPTIONS

Alectoria (photo page 22)

Hair-like, pendulous or decumbent, **yellow**; usually with pseudocyphellae; epiphytic on wood, less frequent on tundra. Common. Four main species in Alaska.

Only one species, *A. nigricans*, is dark colored, and it is distinguished by the light tan color at the base.

A. ochroleuca is green and yellow and very common in arctic tundra habitats. *Alectoria* is superficially similar to *Usnea*, but lacks rubberband-like central cord. The subkey below separates *Alectoria* from *Ramalina thrausta* on wood.

Subkey: Alectoria and Ramalina thrausta

HAIR-LIKE/YELLOWISH-GREEN/ON WOOD



- 1a. Tips hooked or curled into tiny soralia (like fiddleheads); uncommon; coastal - **Ramalina thrausta**
- 1b. Tips lacking curled or hooked fiddleheads; common; coastal to inland - **Alectoria**

Allantoparmelia

Small, blackish, with narrow lobes, foliose, lacking rhizines, underside pale; occurs only on rock.

Fairly common; two common species in Alaska. With practice, *Allantoparmelia* is readily distinguishable from other dark rock species (e.g., *Cetraria hepaticum*, *C. commixta*, *Melanelia stygia*). See Melanelia et al. subkey (p.26) for distinguishing features.

NOTE: Thomson's *American Arctic Lichens* lumps *Allantoparmelia* into *Melanelia*.

Arctoparmelia (photo page 22)

Medium sized, foliose, often forming mats over rock; lobes narrow (<3 mm wide), **yellow green**, closely attached to substrate, rhizines unbranched; one species forms concentric rings. Occurs only on rock, where it is common. Easily recognized by its color and substrate. *Xanthoparmelia coloradoensis*, with somewhat broader lobes and loosely appressed, is very similar to *Arctoparmelia* and occurs in similar habitats (although less common in the north). Although both genera are readily discernible to the trained eye, a UV test is the best way to be sure. *Parmelia* is similar but is never yellow green and often has branched rhizines.

Alaska's three species of *Arctoparmelia* are separated from one another by the color of the undersurface and presence of soredia.

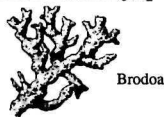
NOTE: Thomson lumps *Arctoparmelia* into *Xanthoparmelia* (*X. coloradoensis*=*X. taractica* in *Alaska*).

Asahinea

Medium to large, foliose, with broad lobes; upper surface **yellowish or white** mottled with black, or becoming mostly black, sometimes with a network of raised ridges and depressions (see also *Lobaria*, etc.); lower surface black in the center and brown marginally; rhizines absent, apothecia rare. Two species in Alaska, distinguished by color of upper surface and presence of isidia. Common on rock and tundra. Easily recognized with practice; not to be confused with *Platismatia* (which occurs primarily on wood).

Brodoa oroarctica

Small, dark, foliose; lobes narrow (<2mm wide), **thickened** and puffy, **solid**; rhizines absent. On arctic-alpine, noncalcareous rock. See [Melanelia et al. subkey](#) (p. 26) for similar genera. *Brodoa* used to be in the genus *Hypogymnia*.



Bryocaulon divergens

Hair-like, very shiny, **reddish brown with long white oval pits** (pseudocyphellae), found only on tundra. Fairly common; one species in Alaska. See [Bryoria et al. subkey](#) (p. 21) for similar genera.

Bryoria

Hair-like, brown (not black), pendent or prostrate, occurring on trees, tundra and occasionally rock. A relatively large, common, and rather complex genus. Easily confused with *Alectoria nigricans*, *Bryocaulon* (which has conspicuous dots), and *Pseudophebe* (which is black); see [Bryoria et al. subkey](#) (this page) to distinguish.

Common Alaska species include five or six epiphytes and two tundra species.

Subkey: Bryoria et al.

HAIR-LIKE (OR SHRUBBY)/BROWNISH/ON GROUND OR ROCK

1a. On rock

2a. Black, forming richly branched, prostrate mats on siliceous rock -

Pseudophebe

2b. Brownish, sparsely branched, prostrate or erect - **Bryoria**

1b. On ground (including sod over rock)

3a. Erect, usually somewhat flattened in cross section; with short, stout flattened branches; commonly with short projections and oval white spots (pseudocyphellae); brittle - **Coelocaulon**

3b. Filamentous, mostly round in cross section; with long, thin hair-like branches; lacking short projections

4a. Pale brown or straw colored at base, dark at branch tips, never reddish; usually with white elongated patches (pseudocyphellae) - **Alectoria nigricans**

4b. Brownish or reddish-brown throughout

5a. Brown, lacking reddish tint, not conspicuously covered with white spots (pseudocyphellae) - **Bryoria**

5b. Reddish brown, very shiny, usually conspicuously covered with white spots (pseudocyphellae) - **Bryocaulon divergens**

Cetraria (photo page 22)

Small to large sized, foliose, often with narrow and/or **channeled lobes**. This large genus takes on a variety of colors and forms and is generally distinguished by having two of the following three characteristics: upper and lower surfaces similar in color; rhizines absent or sparse; loosely attached to substrate or semi-erect. Some species have **marginal eyelash-like projections**.

Colors include lemon yellow, light yellow, brownish and blackish.

Extremely common and showy in tundra habitats; common but somewhat less showy on wood and rock.

Important ungulate forage; six common (and up to 16 total) species exist in Alaska, many of which are easily identified with practice.

NOTE: Bright yellow *Cetrarias* are now in the genus *Vulpicida*; nonyellow epiphytic

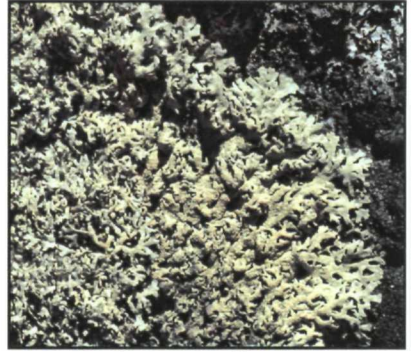
Cetrarias are now in the genus *Tuckermannopsis*.



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Alectoria sarmentosa



Alectoria ochroleuca



Arctoparmelia



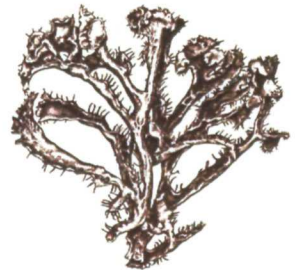
Cetraria cucullata



Cetraria



Cetraria



Cetraria ericetorum

Cladina (photo page 22)

"Reindeer Lichens." Shrubby, whitish, gray, greenish or yellowish, lacking apothecia. Extremely common and showy in tundra habitats; some species are readily recognized in the field, whereas others require the use of chemistry (e.g., *Cladina mitis* vs. *C. arbuscula*). Important ungulate forage; the name 'reindeer lichen' generally refers to the genus as a whole rather than a certain species within the genus.

Due to their shrubby appearance and lack of apothecia, 2-3 *Cladonias* (e.g., *C. uncialis*) can be easily mistaken as *Cladinas* - see subkey (this page).

NOTE: Thomson's *American Arctic Macrolichens* lumps *Cladina* with the genus *Cladonia*.

Subkey: Cladina and Cladonia

SHRUB-LIKE/LACKING APOTHECIA

- 1a. Surface completely dull and fibrous, cobwebby (decorticate; use hand lens); lacking small leaf-like or ear-like squamules or flakes; never with fleshy apothecia on tips; lacking cups - **Cladina**
- 1b. Surface mostly or at least partly smooth, hard (corticate; use hand lens); tiny leaf-like or ear-like squamules often present around base; sometimes tipped with red or brown apothecia, or apothecia lacking; cups present or absent - **Cladonia**

Cladonia (photo page 22)

Cup and stalk lichens. All lichens **topped with either cups or distinctive red fruiting bodies** (e.g., British Soldiers) belong to this genus, however, some *Cladonias* are topped with brown fruiting bodies **or lack cups and/or colored fruiting bodies altogether**, consisting only of a stalk. Look for tiny leaf-like squamules around the base of many species (no other genus has these).

Extremely common on ground and wood in all habitats. A large and variable genus; some species are easily recognized in the field, whereas others take a good deal of practice. See *Cladina* subkey to separate shrubby *Cladonias* from *Cladina*.

Coelocaulon

Tufted, shrub-like or hair-like, semi-erect; **reddish brown**, smooth to more-or-less furrowed, with circular to elongate white patches (pseudocyphellae); commonly with short lateral projections.

Two species in Alaska; on soil or gravelly tundra. Occasional to uncommon; easily overlooked. Possibly confused with other dark fruticose genera - refer to the Bryoria et al. subkey (p. 21).

Collema and Leptogium

Gelatinous lichens (turning **jellolike when wet**); blackish or greenish black. The gelatinous lichens can easily be recognized by the lack of a whitish (hyphal) layer in cross section (use hand lens) and are fairly uniformly dark throughout. There are many species, but the taxonomy is based on compound microscope work and is beyond the scope of this book. One easily recognized species, *Leptogium saturninum*, commonly grows on riparian hardwoods and is distinguished by white tomentum on the lower surface.

Dactylina (photo page 24)

"Dead Man's Fingers"; **yellow brown, fingerlike, hollow**, somewhat inflated. Common in tundra habitats. Four species in Alaska: the taller taxa, *D. arctica* and *D. beringica*, require chemical test to distinguish; *D. ramulosa* is short and is easily recognized by its violet or pinkish hue and pruina and is common in calcareous habitats.



Cladina rangiferina



Cladonia transcendens



Cladonia fimbriata



Cladonia ecmocna



Dactylina



Hypogymnia



Lobaria linita



Masonhalea richardsonii

Dermatocarpon

Small to medium sized, foliose, usually attached by a **central holdfast** ('umbilical cord'); upper surface smooth, gray, brown, greenish, often with a whitish cast from granular pruina. **Scattered immersed dots** (perithecia) are diagnostic; apothecia absent. On rock, occasional; refer to Umbilicaria et al. subkey (p. 31) to distinguish from similar genera.

Evernia

Shrub-like, dull green, usually with copious **granular greenish soredia/isoridia emanating from cracks**, apothecia absent. Most common is *E. mesomorpha*, which generally occurs on conifers throughout the state. See subkey (this page) to distinguish from *Evernia*. Another species, *E. perfragilis*, with hard, brittle branches, occurs on calcareous soil in the arctic and is much less common.

Subkey: Evernia and Ramalina

SHRUB-LIKE/YELLOW TO YELLOW-GREEN/ LACKING CENTRAL CORD/ ON WOOD

- 1a. Dull green; not hollow; granular greenish powder (soredia) scattered over much of surface; apothecia absent - **Evernia mesomorpha**
- 1b. Pale greenish-yellow; usually flattened toward apothecia, hollow with scattered perforations; powder (soredia) absent; apothecia almost always present - **Ramalina dilacerata**

Hypogymnia (photo page 24)

Small to medium sized, foliose; with **hollow lobes** that are often long and narrow; lower surface black and commonly strongly wrinkled; upper surface often appearing rimmed with black from lower surface. Common on wood, occasional on rock, soil, or humus. *H. subobscura* occurs on tundra and is easily overlooked.

Several species occur, some confined to southern or southwest Alaska and some common in boreal forests throughout the state. Look for the hollow lobes.

Lobaria (photo page 24)

Medium to large, foliose, upper surface often with a coarse **network of raised ridges** and depressions; lower surface fuzzy (tomentose) with diagnostic **pale oval patches** that are less fuzzy. *Lobaria linita*, which is bright green when wet, commonly occurs on tundra throughout the state. Other Lobarias range in color from green to blue green, gray or yellow tinged and are epiphytic on trees: *L. scrobiculata* and *L. hallii* are occasional throughout Alaska, *L. pulmonaria* is restricted to forests in southern Alaska.

Pseudocyphellaria, which occurs on trees, also may have a network of raised ridges on upper surface, but the patches on lower surface are small and circular. Some *Platismatia* (trees or ground) and *Asahinea* (ground or rock) also have raised networks, but lack patches underneath. See specific genus descriptions.

Masonhalea richardsonii (photo page 24)

"Tumbleweed Lichen," medium to large in size, **curling into ball-like masses** when dry; upper surface dark brown (olive colored when wet); lower surface brown with showy whitish patches. This is known as a vagrant lichen, blowing with the wind and coming to rest in low-lying depressions. Easily recognized; primarily occurring in central and northern Alaska. A monotypic genus (containing a single species).

Melanelia

Small to medium sized, foliose, common on twigs where they are brown to olive in color; on rock they are dark brown to blackish. *Melanelias* are common, but sometimes overlooked. Several genera of small dark lichens occur on rock (including *M. stygia*) - these are separated in the subkey below.

NOTE: Thomson's *American Arctic Lichens* lumps *Melanelia* with *Parmelia*.

Subkey: *Melanelia* et al.

FOLIOSE/BLACKISH/ ON ROCK

- 1a. Rhizines absent (marginal cilia sometimes present)
 - 2a. Lobes flat to channeled; marginal (sometimes branched) cilia present -
Cetraria nigricans
 - 2b. Lobes strongly convex (rounded above); marginal cilia absent
 - 3a. Lobes thickened and puffy, 2mm wide; sheltered lobes grayish;
medulla K- & P- ***Brodoa oroarctica***
 - 3b. Lobes not puffy, 1.5mm wide; sheltered lobes black; medulla K+ &
P+Y - ***Allantoparmelia***
- 1b. Rhizines present below (check near lobe tips)
 - 4a. Lobes channeled with raised ridges along margins; small barrel-shaped
projections along margins (hand lens); pseudocyphellae (elongate thin
whitish or dark spots) mostly confined to margins (hand lens) -
Cetraria hepaticum/commixta
 - 4b. Lobes seldom channeled; small barrel-shaped projections absent;
pseudocyphellae (elongate whitish spots) scattered over surface (hand
lens), not only confined to margins - ***Melanelia***

NOTE: If specimen does not key here, try referring to the *Physcia* et al. subkey (p. 27). While *Physcia* look-alikes are often grayish or whitish, they can become black or dark brown in extreme habitats

Nephroma (photo page 28)

Medium to large sized, foliose; rhizines sparse or lacking, veins absent; this is the only genus with **apothecia located on the underside of the lobe tips**. Most *Nephromas* occur on wood and are common throughout Alaska. In tundra habitats, *Nephroma arcticum* is common and showy, it is yellowish green, occasionally apotheciate, and often has dark warty spots visible on the upper surface. *N. expallidum* also occurs on tundra, it is dull green or brownish and not as showy or common as *N. arcticum*. One brown species, *N. parile*, occurs on rock; the remaining five species occur on wood. Epiphytic species without apothecia can be distinguished from *Peltigera* by the absence of veins below and from *Lobaria*, *Sticta*, and *Pseudocyphellaria* by the absence of dots or light patches below.

Pannaria

Small to tiny squamules, gray, brown, or blue gray. Apothecia often appear **beaded** around the edges. Easily overlooked, occasional on wood and humus or rock. See subkey (this page).

Subkey: *Pannaria* and *Psoroma*

FOLIOSE/ WITH TINY ROUND LOBES/ ON GROUND

- 1a. Lichen dark gray-brown to bluish when wet (i.e., blue green algal component) -
Pannaria
- 1b. Lichen bright green when wet (green algal component) - ***Psoroma***

Parmelia (photo page 28)

Medium sized, foliose; upper surface gray, white, greenish gray or brownish, lower surface black with **abundant rhizines**. Most species have **pale angular markings** on the upper surface - it is very helpful to learn to recognize this characteristic.

Parmelia is just one genus in a group that is known as the "Parmelioid" lichens (as opposed to "Cetrarioid" - see *Cetraria*) having at least two of the following three characteristics: upper and lower surfaces unlike in color; rhizines abundant; tightly attached to substrate.

Of the four Alaska species, *Parmelia sulcata* is most common, occurring on trees throughout the state. *P. omphalodes* and *P. saxatilis* commonly form largish mats over rock.

NOTE: Thomson's *American Arctic Macrolichens* lumps *Allantoparmelia* and *Melanelia* in with *Parmelia*.

Parmeliopsis

Small to medium sized, foliose, with narrow lobes (1mm wide), closely appressed to substrate; upper surface whitish gray or pale yellowish green with round head-shaped clusters of powdery soralia; lower surface brown black with rhizines.

Best distinguished by the narrowness of the lobes and presence of **head-shaped soralia**.

Only on trees, most often conifer bark; two species in Alaska.

Peltigera (photo page 28)

Medium to large sized, foliose; lower surface cottony (due to lack of lower cortex), usually with raised veins, often with rhizines; upper surface green, gray green, or brownish.

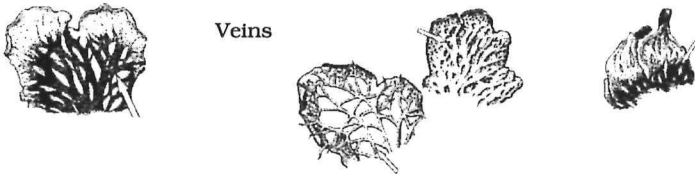
Apothecia, when present, large and positioned along the tips of raised lobes.

Veins on the lower surface (often obvious, but sometimes indistinct or even absent) are a good marker character - only *Peltigera* and the orange-bottomed *Solorina crocea* display this feature.

A large and prevalent genus in Alaska; primarily terrestrial on forest floor or tundra, some species occur on wood. *Peltigera aphthosa* and *P. leucophlebia* are extremely common and can be recognized by their bright green color when wet and the dark warts on the surface.

A good genus to know; taxonomy can be a bit confusing, but excellent keys now exist.

NOTE: Thomson's key is much simplified and does not include many species now recognized.



Phaeophyscia

Small, foliose, narrow lobes (<2mm broad), sometimes with pale hairs on margins, usually lacking white granular frosting (pruina); upper surface brown, greenish brown, gray or blackish, lower surface brown to black or rarely pale. **Rhizines usually unbranched** and never squarrosely branched. On rock or wood; three common species in Alaska.

Phaeophyscia is similar to *Physcia* and *Physconia*. See discussion in *Physcia* description and refer to [Physcia et al. subkey](#) (page 29).



Parmelia saxatilis



Nephroma arctica



Parmelia sulcata



Peltigera britannica



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Peltigera neopolydactyla



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Peltigera membranacea

Physcia

Small, foliose, narrow lobes (<2mm broad), sometimes with marginal cilia, **lacking pruina** (but sometimes with a scattering of lighter patches); upper surface white to pale or dark gray, lower surface white to pale brown. **Rhizines unbranched**. On rock or wood, four common species in Alaska.

Phaeophyscia and *Physconia* are segregates of *Physcia* and thus a similarity exists. These genera are distinguished by chemistry, rhizines and pruina. Chemistry is used to separate *Physcia* (cortex K+Y), and the other two are separated by rhizines and pruina. See subkey (this page).

Subkey to *Physcia* et al.

FOLIOSE/ LOBES NARROW (<3 MM)/ ON WOOD OR ROCK

- 1a. Upper surface with round head-shaped clusters of powdery soralia (hand lens helpful); yellowish green or whitish gray; generally on wood - **Parmeliopsis** (or *Physcia caesia* if on calcareous rock)
- 1b. Upper surface lacking head-shaped clusters, sorediate or not; white to pale or gray, brown, olive or blackish, not yellowish green; on wood or rock
 - 2a. Upper surface white to pale grayish or rarely dark grayish (never distinctly brownish), often pale-spotted maculate (hand lens helpful); rhizines unbranched; lower surface pale - **Physcia**
 - 2b. Upper surface partly distinctly brownish at maturity; not pale-spotted/maculate; rhizines unbranched or woolly branched; lower surface dark or occasionally pale
 - 3a. Rhizines unbranched or only sparsely branched at maturity; upper surface generally lacking white pruina (frosting) - **Phaeophyscia**
 - 3b. Rhizines densely woolly-branched (with many right-angled branchlets, i.e., squarrose) at maturity; upper surface generally distinctly white-pruinose (check lobe tips; hand lens helpful) - **Physconia**

Physconia

Small, foliose, narrow lobes (<3 mm broad), lacking marginal cilia, usually with thick **white granular frosting** (pruina - check lobe tips); upper surface gray, olive, brown, lower surface black or brownish, with black **squarrose rhizines**. On rock or wood; two common species in Alaska. *Physconia* is similar to *Physcia* and *Physconia*. See discussion in *Physcia* description and refer to *Physcia* et al. subkey (this page).

Pilophorus

Gray green stalks, branched, **not hollow**; with shiny black terminal apothecia. Uncommon, on rocks and gravels. *P. robustus* is widespread in Alaska. A few others also occur in southern coastal areas. *Cladonia* differs in having hollow stalks.

Platismatia

Medium to large, foliose, lobes broad (narrow in *P. herrei*), unkempt-looking; upper surface sometimes wrinkled or ridged, white, gray or greenish gray in shady areas; lower surface black, brown, or occasionally with patches of white; rhizines few or absent. Several species occur in Alaska, mostly in the south, on trees; *P. glauca* is the most prevalent, and can be recognized by lacerated margins. *Asahinea* is superficially similar, but does not occur on wood; see *Lobaria* description for other lichens with lung-like ridges and depressions.

Pseudephebe

Hair-like, black, prostrate, much-branched, round or slightly compressed in cross section; common on rock, two species in Alaska. *Bryoria* differs in having brown coloration and (usually) pseudocyphellae. *Allantoparmelia* differs in having very irregular, thickened, nodulose branches and sometimes brown coloration.

Pseudocyphellaria

Medium to large, foliose; upper surface gray or brown, usually with a network of ridges; lower surface densely fuzzy (tomentose) with white or yellow **unrimmed round spots** (pseudocyphellae). Three species on trees in southern Alaska; *P. crocata* is the most distinctive with bright yellow soralia on the upper surface. *Pseudocyphellaria* (spots unrimmed = 'pseudocyphellae') and *Sticta* (spots rimmed = 'cyphellae') are the only genera with circular spots beneath. *Lobaria* has larger, elongate bare patches on the bottom, not to be confused with rimmed or unrimmed spots. See *Lobaria* discussion for other genera with ridge network.

Subkey: Pseudocyphellaria and Sticta

FOLIOSE/ LOBES BROAD/ SMALL ROUND SPOTS BELOW/ COASTAL/ ON TREES

- 1a. Spots on lower surface distinctly recessed, forming craters with well defined rims, white (= cyphellae; hand lens) - **Sticta**
- 1b. Spots on lower surface plane or raised, plug-like, not recessed, white or yellow (=pseudocyphellae; hand lens) - **Pseudocyphellaria**



Psoroma

Psoroma hypnorum

Small, squamulose; similar to *Pannaria pezizoides*, but green when wet. Common but inconspicuous. See *Pannaria* subkey (p. 26).

Ramalina

Shrub-like (or *R. thrausta* hair-like on wood), greenish or yellow green; branches usually hollow with oval perforations, often appearing translucent/cartilaginous. Occasional to common. Of the three wood species, *R. dilacerata* is most common with its flattened branches and presence of apothecia. Two species common on rock are mainly restricted to coastal areas. For wood species, refer to *Evernia/Ramalina* subkey.

NOTE: Thomson's *American Arctic Macrolichens* segregates some species of this genus into *Fistulariella*.

Siphula

Stalk-like, erect, white or yellowish gray, **solid** inside (not hollow), **furrowed** (longitudinally wrinkled); occasional, in moist seepages, one species in Alaska. Easily recognized.

Solorina (photo page 32)

Medium sized, foliose; upper surface greenish, lower surface whitish (or orange), usually fuzzy, more or less rhizinate; apothecia sunken. *S. crocea* is the only lichen with a bright orange underside and green upper surface; it is fairly common on moist soils and is the only *Solorina* with veins beneath. The other four species in Alaska also occur on the ground, are less common, and can be recognized by **sunken apothecia** over the upper surface.

Sphaerophorus (photo page 32)

Shrub-like, white, light gray, cream or orangish tan, shiny. Very common on rock, alpine sod over rock and throughout Alaska, two species. *S. globosus* can often be recognized by the orangish tan coloration on exposed branches.

Stereocaulon (photo page 32)

Shrub-like, white, gray or cream, always with many tiny cauliflowerlike projections; apothecia present or absent. Fragile when dry. Very common on soil, tundra, gravel and rock throughout Alaska. The many species in this genus can be difficult to distinguish from one another.

Sticta

Medium to large, foliose; upper surface black or brown, sometimes with granular, dark or white isidia or soredia; lower surface with light to dark brown fuzz (tomentum) and sparse, rounded, rimmed spots or craters. Four of Alaska's five species occur on trees in southern and southcentral areas. See *Pseudocyphellaria* for discussion and subkey (p. 23).

Thamnolia (photo page 32)

Stalk-like, **bone white, hollow**, pointed, usually unbranched; apothecia absent. Alaska's two species can be distinguished only by chemistry and are quite common in arctic-alpine areas. They are easily recognized by their bon -white color and hollow stalks.

Tuckermannopsis

This is the currently accepted name for nonyellow epiphytic *Cetrarias* (see p. 21).

Umbilicaria (photo page 32)

Medium to large, foliose, rounded, attached to substrate by a **single holdfast** ('umbilical cord'). Upper surface smooth, ridged or wrinkled, brown, gray or black, lower surface pale brown to black. Apothecia often present, many apothecial disks are distinctive in having a network of ridges and furrows (use hand lens).

Thomson's *American Arctic Lichens* lists several other umbiliculate lichens including *Actinogyra*, *Agyrophora* and *Omphalodiscus*. These are much less common than *Umbilicaria* and are now considered as members (subgroups) of the genus *Umbilicaria*. They are distinguished by the surface markings on the apothecial disk, see subkey (this page). Extremely common on rock, 15 common species in Alaska. See subkey (this page) to distinguish from *Dermatocarpon*.

Subkey: Umbilicaria et al.

FOLIOSE/ ON ROCK/ ATTACHED BY CENTRAL HOLDFAST (UMBILICAL CORD)

- 1a. Upper surface either flat, variously wrinkled, or ridged; apothecia present or not, usually lacking small black dots (perithecia) over upper surface
- 2a. Apothecia disk with one to many furrows or ridges; common
 - 3a. Apothecia disk with numerous raised furrows (hand lens helpful); extremely common - **Umbilicaria, subgroup Umbilicaria**
 - 3b. Apothecia disk with single furrow; uncommon, on rock - **Umbilicaria, subgroup Omphalodiscus**
- 2b. Apothecia disk smooth and flat, lacking furrows; uncommon - **Umbilicaria, subgroup Actinogyra & Agyrophora**
- 1b. Upper surface flat, not wrinkled or ridged; apothecia absent; upper surface with scattered immersed black dots (i.e. immersed 'flasks' = perithecia) - **Dermatocarpon**





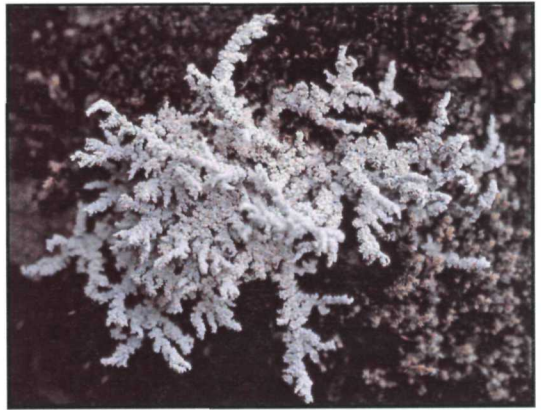
Sphaerophorus



Solorina crocea



Thamnia



Stereocaulon



Umbilicaria



Usnea

Usnea (photo page 30)

Hair-like, pendant, **yellow**, often with short, perpendicular lateral branches. *Usnea* is the only genus with a distinctive rubberband-like **elastic central cord** evident when the lichen is slowly pulled apart lengthwise. Common on wood throughout the state. Except for a few species, identification of *Usnea* to the species level is problematic; this genus is in need of further study.

Vulpicida

This is the currently accepted name for bright yellow *Cetrarias* (see p.21).

Xanthoria (photo page 30)

Small, foliose, narrow lobes, usually tightly appressed, (one rock species *X. candelaria*, is shrubby and erect); upper surface orange to yellowish orange, lower surface white, orange or yellow, rhizines sometimes present. Common on rock and wood throughout the state and can be distinguished from the less common *Candelaria* using characters in the *Xanthoria* et al. or more reliably by chemistry. Of the four to five species in Alaska, perhaps the most common is *X. elegans*, a bright orange species widespread on calcareous rocks as well as on bird perches due to the typically high nitrogen content.

Subkey: Xanthoria et al.

FOLIOSE/ YELLOW OR ORANGE/ ON WOOD

- 1a. Semi-erect and more or less loosely attached to substrate; yellow with bright yellow powder (soredia) along lobe margins (hand lens helpful); very common - **Vulpicida pinastri (=Cetraria pinastri)**
- 1b. Closely appressed to substrate (except for *Xanthoria candelaria*); lacking yellow powder on margins
 - 2a. Orange or yellowish-orange; K+ purple; on wood or rock; throughout Alaska - **Xanthoria**
 - 2b. Light yellowish; K-; on wood; coastal - **Candelaria**

Xanthoparmelia

One common species in Alaska, *X. coloradoensis*. See *Arctoparmelia* for description.

GLOSSARY

apothecia: spore-producing fruiting body. Often disk-shaped; dark colored. See p. 4 for additional illustrations.



apothecial disk: the upper surface of an apothecia.

cilia: threadlike projections from the margin.

cortex: the hardened outer surface (or 'skin'); sometimes shiny; usually pigmented; most lichens have this.

crustose: tightly attached to substrate as though it were painted on; generally lacking lower cortex and rhizines; taxonomy based largely on spore characters, not covered in this key.

cyphellae: crater-like pores on the under surface of *Sticta*; lined with differentiated cells to appear rimmed.



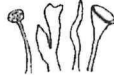
decorticate: lacking a cortex; appearing cobwebby (or cottony) when observed with hand lens.

epiphytic: growing on trees, bark, or wood.

filamentous: finely hair-like.

foliose: leaf-like, flattened, growth form in which the lobes have both upper and lower surfaces.

fruticose: hair-like, shrub-like, or stalk-like growth form characterized by branches that are round (or slightly flattened) in cross section (as opposed to foliose lichens which are flat).



stalk-like



hair-like



shrub-like

gelatinous: appearing jellolike when wet due to lack of the usual structural layering of most lichens; always dark to black in color.

isidia: tiny, hard-surfaced fingerlike outgrowths on a lichen surface containing algal and fungal cells; a common asexual reproductive feature similar to 'soredia'.

lobe: flattened branch of a foliose lichen; NOT the same as the width of the lichen itself. See p. 4 for additional illustrations.



maculate: small, light colored spots on the upper surface, usually caused by differences in the thickness of the cortex; in this case, diagnostic of *Physcia*.

pruina: whitish, granular frosting on the surface of some lichens; formed by superficial chemical deposits.

pseudocyphellae: a broad term referring to (usually small) breaks in the upper or lower surface; these may be round, irregular, crack-like or angular; usually whitish inside, but sometimes concolorous with the rest of the lichen. Hand lens is helpful.



rhizines: root-like structures arising from the lower surface; serve to attach lichen to its substrate (not all species have them). Can be simple, forking, tufted, or squarrose.



soralia: see 'soredia'.

soredia: tiny powdery grains composed of both fungal and algal cells. Soredia are a very common form of asexual reproduction; they erupt through the surface of the lichen and can be scattered over the surface of the lichen or grouped into discreet patches called 'soralia'.

squamules: tiny flakes or scales that are often rounded or ear-shaped; diagnostic of the genus *Cladonia* (as used here).



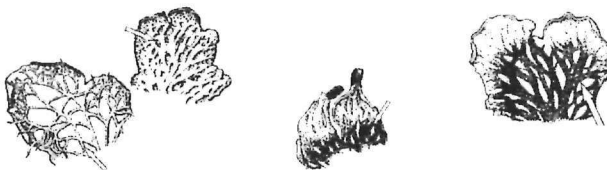
squarrose: a form of branching often used in reference to rhizines with have lateral branchlets radiating from the main axis at right angles (see 'rhizines').



tomentose/tomentum: with fine, short fuzz or minute hairs.

UV Test: exposure to ultraviolet light causes some lichens to become fluorescent. This is one of the suite of techniques used to determine lichen chemistry.

veins: raised strands on the lower surface; usually darkened; sometimes raised and distinct or low and indistinct. An important character for the genus *Peltigera* in particular.



INDEX AND SYNONOMIES

NOTE: Although Thomson's *American Arctic Lichens* is the standard reference text for Alaska, several genus names have been changed since its publication in 1984. The following list reflects these changes.

Alectoria
Arctoparmelia (= Xanthoparmelia in Thomson)
Allantoparmelia (= Parmelia in Thomson)
Asahinea
Brodoa (= currently accepted name for Hpogymnia oroarctica)
Bryocaulon (= Cornicularia in Thomson)
Bryoria
Cetraria (= Vulpicida for bright yellow species;
= Tuckermannopsis for nonyellow, epiphytic Cetraria)
Cladina (= Cladonia in Thomson)
Cladonia
Coelocaulon (= Cornicularia in Thomson)
Collema
Dactylina
Dermatocarpon
Evernia
Hypogymnia (our only solid-lobed species, H. oroarctica, is now Brodoa oroarctica)
Leptogium
Lobaria
Masonhalea
Melanelia (= Parmelia in Thomson)
Nephroma
Omphalodiscus
Pannaria
Parmelia
Parmeliopsis
Peltigera
Phaeophyscia
Physcia
Pilophorus
Physconia
Platismatia
Psuedephebe
Pseudocyphellaria
Psoroma
Ramalina (= Fistulariella and Ramalina in Thomson)
Siphula
Solorina
Sphaerophorus
Stereocaulon
Sticta
Thamnolia
Tuckermannopsis (= currently accepted name for nonyellow epiphytic Cetraria)
Umbilicaria (= Omphalodiscus, Agyrophora, Actinogyra in Thomson)
Usnea
Vulpicida (= currently accepted name for bright yellow Cetraria)
Xanthoria
Xanthoparmelia (X. coloradoensis = X. taractica in Thomson)

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