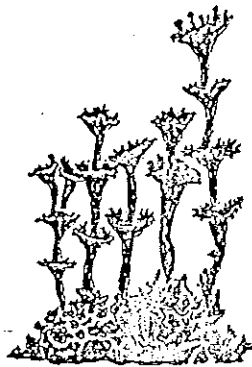


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SIMPLIFIED FIELD KEY TO MAINE MACROLICHENS



PREPARED FOR THE 1992 MEETING OF THE JOSSELYN BOTANICAL SOCIETY

BY

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ORONO, MAINE

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INTRODUCTION

This key has been prepared in the hope of making lichens more accessible. With experience, most of the foliose and fruticose lichens (macrolichens) in Maine can be identified quickly and easily in the field with the use of a hand lens. For the inexperienced, however, the process of lichen identification can be arduous indeed. There is only one popular field guide, Mason Hale's "How To Know The Lichens" (1979), and it covers all of continental United States. While it includes most of the common macrolichens of Maine, many of the species are only mentioned as part of the description of another species, and thus they are not keyed out or properly described. Furthermore, since the book is organized as one long key, it can be slow and tedious to follow a key through the whole book to find the species one is looking at.

The present key aims to make the process of lichen identification easier by using a series of short keys, 50 in all, each covering a readily defined group of lichens. The keys have been divided on the basis of obvious characters such as substrate, growth form, color of upper surface when dry, width of lobes, and presence of specialized reproductive structures. An outline of the major distinguishing characters of the 50 keys is shown in the Quick Key Index on page 2. Each key is abbreviated with a letter and a number, and this abbreviation is printed in the right hand margin for easy reference.

In order to make the key more self-contained, we have included a glossary in the back that defines all technical terms used. In the interest of space, however, references consulted have been omitted. Species names follow the "Fifth Checklist" of lichens (R. S. Egan 1987 Bryologist 90: 77-173) and its revisions in 1989, 1990, and 1991. An alphabetical species list and index at the end of the Key includes references to the particular key(s) in which the species can be found as well as the page number, if any, where the species is treated in Hale (1979). If the current species name is different from that used in Hale, the old name used in Hale is also given in brackets.

The keys have been designed to be useful in the field with only a hand lens; therefore chemical tests have been de-emphasized and microscopic characters such as spore size and color have not been used. In a few instances, the key does not come down to a unique species but instead to a pair of species (or very rarely more than a pair) differing usually only in chemistry. Although the key covers only 251 out of approximately 325 macrolichens found in Maine, it covers virtually all of the macrolichens that will be encountered; the others are all either very rare, nearly crustose, poorly understood, or only known from historical records. For reference, however, all 325 species are listed in the Index.

The key has been divided into 3 divisions based on substrate: tree, rock, and soil. While some lichens are very substrate specific, others are not, and so there is extensive duplication and cross referencing in the keys. The soil category includes lichens growing on soil, on moss over rock, at the base of tree trunks, and on rotting logs.

Colors are based on the appearance of the thallus when dry; many lichens become greener or darker when wet. The frontispiece in Hale (1979) illustrates the major colors of lichens.

QUICK KEY INDEX

Definitions

"broad"--lobes usually greater than 6 mm; "narrow"--less than 6 mm
 "neither"--neither sorediate nor isidiate
 "brown"--light greyish brown to dark brown; "black to slate"--
 black, dark olive-green, or slate gray; gelatinous when wet
 "flat"--branches flattened in cross-section; "round"--branches
 round in cross-section
 "tufted"--stalks much branched, like a bush; "podetia"--stalks
 unbranched to sparsely branched

ON TREES

<u>Foliose</u>		<u>Squamulose</u>	
T1	ORANGE	T16	SQUAMULOSE
T2	YELLOW or YELLOW-GREEN	<u>Fruticose</u>	
T3	BROWN, Broad	T17	BROWN
T4	BROWN, Narrow, Sorediate	T18	YELLOW-GREEN, Flat
T5	BROWN, Narrow, Isidiate	T19	YELLOW-GREEN, Round, Pendent
T6	BROWN, Narrow, Neither	T20	YELLOW-GREEN, Round, Tufted
T7	MINERAL-GRAY, Broad, Sorediate	T21	MINERAL-GRAY
T8	MINERAL-GRAY, Broad, Isidiate		
T9	MINERAL-GRAY, Broad, Neither		
T10	MINERAL-GRAY, Narrow, Hollow		
T11	MINERAL-GRAY, Narrow, Sorediate		
T12	MINERAL-GRAY, Narrow, Isidiate		
T13	MINERAL-GRAY, Narrow, Neither		
T14	BLACK to SLATE, Isidiate		
T15	BLACK to SLATE, Neither		

ON ROCK

<u>Foliose</u>		<u>Squamulose</u>	
R1	ORANGE	R16	SQUAMULOSE
R2	YELLOW-GREEN, Sorediate	<u>Fruticose</u>	
R3	YELLOW-GREEN, Isidiate	R17	YELLOW-GREEN
R4	YELLOW-GREEN, Neither	R18	BROWN
R5	BROWN, Broad	R19	WHITE to GRAYISH-WHITE
R6	BROWN, Narrow, Sorediate		
R7	BROWN, Narrow, Isidiate		
R8	BROWN, Narrow, Neither		
R9	MINERAL-GRAY, Broad		
R10	MINERAL-GRAY, Narrow, Sorediate		
R11	MINERAL-GRAY, Narrow, Isidiate		
R12	MINERAL-GRAY, Narrow, Neither		
R13	BLACK to SLATE, Isidiate		
R14	BLACK to SLATE, Neither		
R15	UMBILICATE		

ON SOIL

<u>Foliose</u>		<u>Fruticose</u>	
S1	YELLOW-GREEN	S5	TUFTED, YELLOW-GREEN
S2	BROWN to MINERAL-GRAY	S6	TUFTED, BROWN
S3	BLACK to SLATE	S7	TUFTED, WHITE to LIGHT GRAY
	<u>Squamulose</u>	S8	PODETIA, RED APOTHECIA
S4	SQUAMULOSE	S9	PODETIA, BROWN/NO APOTHECIA, Soredia
		S10	PODETIA, BROWN/NO APOTHECIA, No soredia

T1 FOLIOSE; ORANGE

T1

1. Soredia present
 2. Lobes narrow, dissected, and ascending, 0.1-0.4 mm wide.....Xanthoria candelaria
 2. Lobes broader (usually >0.5 mm) and more adherent to the substrate.....Xanthoria fallax
1. Without soredia or isidia; apothecia usually common
 3. Thallus with lobes flat, thin, and adherent to the substrate, >0.5 mm wide.....Xanthoria parietina
 3. Thallus small and cushion-like, with lobes and apothecia crowded together; lobes <0.5 mm...Xanthoria polycarpa

T2 FOLIOSE; YELLOW OR YELLOW-GREEN

T2

1. Thallus yellow, lobes tiny (0.1-0.5 mm wide)
 2. Sorediate; apothecia rare.....Candelaria concolor
 2. Nonsorediate; apothecia common.....Candelaria fibrosa
1. Thallus yellow-green; lobes larger
 3. Sorediate
 4. Lobes 3-10 mm; soredia forming confluent pustulate masses.....Flavoparmelia caperata
 4. Lobes narrower, 0.5-3.0 mm wide
 5. Medulla and soredia lemon yellow...Tuckermannopsis pinaestri
 5. Medulla and soredia white
 6. Soredia on margins, linear.....Tuckermannopsis oakesiana
 6. Soredia on surface or tips, orbicular.....Parmeliopsis ambigua
 3. Nonsorediate; apothecia and marginal pycnidia common.....Tuckermannopsis aurescens

T3 FOLIOSE; GRAYISH BROWN TO BROWN; LOBES BROAD

T3

1. Sorediate
 2. Soredia bright yellow.....Pseudocyphellaria crocata
 2. Soredia gray to brown
 3. Lower surface tan-tomentose with gaps showing white
 4. Lobe tips dichotomously branched; upper surface strongly reticulate-ridged.....Lobaria pulmonaria
 4. Lobe tips rounded; upper surface weakly ridged to undulating.....Lobaria scrobiculata
 3. Lower surface bare; found on tree bases over moss.....Nephroma parile
1. Nonsorediate
 5. Margins of lobes lobulate to dentate-isidiate; at base of trees.....Nephroma helveticum
 5. Neither sorediate nor isidiate
 6. Lower surface tan-tomentose
 7. White papillae scattered among tomentum; apothecia on lower surface.....Nephroma resupinatum
 7. White papillae on lower surface lacking; apothecia on upper surface.....Lobaria quercizans
 6. Tomentum not present
 8. Thallus suberect; margins of lobes with pycnidial projections or cilia; rhizines on lower surface; on branches.....Tuckermannopsis "ciliaris" group (T. ciliaris, C+; T. americana, C-,KC+; T. orbata, C-,KC-)
 8. Thallus adnate; margins and lower surface of lobes smooth; at base of trees.....Nephroma bellum

T4 FOLIOSE; GRAYISH BROWN TO BROWN; LOBES NARROW, SOREDIATE

T4

1. Bluish-black hypothallus extending beyond edges of lobes
2. Soredia in form of partly decorticated, small or elongate lobules along the lobe margins; thallus ashen blue, sometimes with fawn tinge.....*Pannaria conoplea*
2. Soredia coarsely granular; thallus brownish....*Pannaria ahlneri*
1. Bluish-black hypothallus lacking
3. Soredia diffuse over upper surface, mixed with tiny isidia, white showing where abraded.....*Melanelia subaurifera*
3. Soredia in delimited round or linear soralia
4. Upper surface of at least the lobe tips white pruinose; soredia marginal.....*Physconia detersa*
4. Upper surface lacking pruina
5. Tan or white lower surface; soredia marginal and labriform on lobe tips.....*Physiella chloantha*
5. Black lower surface
6. Medulla orange-red.....*Phaeophyscia rubropulchra*
6. Medulla white
7. Soredia coarse, isidioid.....*Phaeophyscia adiaastola*
7. Soredia powdery, round and delimited (capitate)*Phaeophyscia pusilloides*

T5 FOLIOSE; GRAYISH BROWN TO BROWN; LOBES NARROW, ISIDIATE

T5

1. Conspicuous blue-black hypothallus surrounding thallus of small squamulose lobes.....*Parmeliella triptophylla*
1. No hypothallus visible
2. Isidia tiny and mixed with diffuse laminal soredia, white when rubbed off.....*Melanelia subaurifera*
2. Isidia larger, often branched, not mixed with soredia
3. Isidia thin and cylindrical
4. Thallus uniformly brown, no white reticulate markings.....*Melanelia fuliginosa*
4. Thallus brown only on lobe tips, which are reticulately ridged with white markings..*Parmelia saxatilis*
3. Isidia flattened and lobulate.....*Melanelia exasperatula*

T6 FOLIOSE; GRAYISH-BROWN TO BROWN; LOBES NARROW, NEITHER

T6

1. Lower surface with bluish black tomentum.....*Pannaria rubiginosa*
1. Lower surface without bluish black tomentum
2. Pycnidial projections on lobe margins and apothecia; thallus suberect
3. Thallus 2-6 cm wide, lobes usually >0.6 mm wide (see key T3).....*Tuckermannopsis "ciliaris" group*
3. Thallus cushion-like, 1-2 cm wide; lobes <0.6 mm
4. Lobes finely divided at tips.....*Tuckermannopsis fendleri*
4. Lobes entire.....*Tuckermannopsis sepincola*
2. No pycnidial projections; thallus clearly foliose
5. Thallus brown, not changing in color when wet
6. Apothecia flat when mature, with thin margins, present to the edges of the lobes.....*Melanelia septentrionalis*
6. Apothecia cup-like with thick and crenulate margins, not present to the edge of lobes.....*Melanelia halei*
5. Thallus grayish brown, turning green when wet
7. Lobe margins and rims of apothecia lobulate; lower surface tan.....*Anaptychia palmulata*
7. Lobe margins and apothecial margins entire, without lobules; lower surface black...*Phaeophyscia ciliata*

T7 FOLIOSE; MINERAL-GRAY, LOBES BROAD, SOREDIATE T7
 (For *Peltigera* species which may be found at the base of trees or on fallen logs, see Soil Key S2)

- 1. White spots (pseudocyphellae) visible on upper surface (may need lens)
- 2. Tan lower surface.....*Punctelia subrudecta*
- 2. Black or dark brown lower surface.....*Cetrelia* spp.
 (*Cetrelia chicitae* C- and *Cetrelia olivetorum* C+)
- 1. No white spots on the upper surface
- 3. Lower surface tan-tomentose with gaps showing white
- 4. Lobe tips dichotomously branched; upper surface strongly reticulately ridged.....*Lobaria pulmonaria*
- 4. Lobe tips rounded; upper surface weakly ridged to undulating.....*Lobaria scrobiculata*
- 3. Lower surface bare or with rhizines, not tomentose
- 5. Long cilia present on lobe margins; soredia on revolute lobe tips.....*Parmotrema chinense*
- 5. Long cilia lacking
- 6. Lobes broad and ascending; soredia becoming granular or subsidiate in dissected lobe margins.....*Platismatia glauca*
- 6. Lobes narrower and appressed; soredia laminal and diffuse.....*Myelochroa aurulenta*

T8 FOLIOSE; MINERAL-GRAY; LOBES BROAD, ISIDIATE T8

- 1. Isidia dense, laminal, often branched, and apically ciliate.....*Parmotrema crinitum*
- 1. Isidia/soredia on lobe margins; without cilia.....*Platismatia glauca*

T9 FOLIOSE; MINERAL-GRAY; LOBES BROAD, NEITHER T9

- 1. Thallus subfruticose, with sharp reticulate ridges on upper surface of lobes.....*Platismatia tuckermanii*
- 1. Thallus flattened, with smooth upper surface.....*Lobaria quercizans*

T10 FOLIOSE; MINERAL-GRAY; LOBES NARROW, HOLLOW AND INFLATED T10

- 1. Sorediate; apothecia rare
- 2. Upper surface more or less uniformly perforated with holes; soredia capitate on short cylindrical stalks.....*Menegazzia terebrata*
- 2. Upper surface entire
- 3. Soredia labriform on relatively broad lobe tips.....*Hypogymnia physodes*
- 3. Soredia ring-shaped on ends of narrow suberect lobes.....*Hypogymnia tubulosa*
- 1. Nonsorediate
- 4. Lower surface with thick, spongy layer of tomentum; lobes solid but sometimes appearing inflated.....*Anzia colpodes*
- 4. Lower surface without spongy tomentum; lobes hollow
- 5. Lobes narrow; apothecia common.....*Hypogymnia krogiae*
- 5. Lobes generally broader and somewhat fan-shaped; usually sorediate; apothecia rare.....*Hypogymnia physodes*

T11 FOLIOSE; MINERAL-GRAY; LOBES NARROW, SOREDIATE
 (If bluish-black hypothallus present, see Tree Key T4, Pannaria)

T11

1. Black or dark brown lower surface
 2. Medulla pale yellow, yellow, orange or red
 3. Lobes 2-6 mm wide, loosely adnate.....*Myelochroa aurulenta*
 3. Lobes 1-2 mm wide, closely annate
 4. Medulla orange-red to red.....*Phaeophyscia rubropulchra*
 4. Medulla pale yellow to salmon orange; lobe margins white and ecorticate; lobe tips usually pruinose.....*Pyxine sorediata*
 2. Medulla white
 5. Ciliate
 6. Cilia long; lobes linear-elongate and suberect.....*Everniastrum catawbiense*
 6. Cilia short; lobes broader and loosely adnate.....*Myelochroa aurulenta*
 5. Cilia lacking
 7. Upper surface of lobes with reticulate white markings.....*Parmelia sulcata*
 7. Upper surface without reticulate white markings
 8. Soralia marginal; upper surface of lobe tips pruinose.....*Physconia detersa*
 8. Soralia laminal or terminal
 9. Lobes 2-5 mm wide; soredia in broad diffuse patches on surface.....*Myelochroa aurulenta*
 9. Lobes 0.3-1.5 mm wide
 10. Soredia coarse and isidioid, marginal and terminal.....*Phaeophyscia adiantola*
 10. Soredia powdery and capitate.....*Phaeophyscia pusilloides*
 1. White or tan lower surface
 11. Margins of lobes dissected, breaking up into granular soredia.....*Physcia millegrana*
 11. Lobes without dissected margins
 12. Cilia or laterally projecting rhizines on lobe margins
 13. Lobes suberect with apical soralia
 14. Lobes with helmet-shaped inflated tips, sorediate on the inside.....*Physcia adscendens*
 14. Lobes with terminal labriform soralia.....*Physcia tenella*
 13. Lobes linear and flat with marginal soredia; at least some of lower surface white cottony.....*Heterodermia speciosa*
 12. Cilia or projecting rhizines lacking on lobe margins
 15. Upper surface with white pores (pseudocyphellae) or mottled with white spots
 16. With pseudocyphellae; found only on trees.....*Punctelia subrudecta*
 16. With mottled white spots; usually on rocks.....*Physcia caesia*
 15. Upper surface without pseudocyphellae or mottled white spots
 17. Thallus greenish or brownish gray; soredia marginal labriform and greenish.....*Physiella chloantha*
 17. Thallus whitish gray; soredia white-powdery in round soralia.....*Parmeliopsis hyperopta*

T12 FOLIOSE; MINERAL-GRAY; LOBES NARROW, ISIDIATE

T12

1. Thallus loosely attached and subfruticose; lobes suberect.....*Pseudoevernia consocians*
1. Thallus clearly foliose; lobes adnate
 2. White spots (pseudocyphellae) on upper surface.....*Punctelia rudecta*
 2. Without white spots
 3. Isidia flattened and squamulate; lower surface white and fibrous, lacking a cortex...*Heterodermia squamulosa*
 3. Isidia not squamulate; lower surface cortical
 4. White or tan lower surface.....*Imshaugia aleurites*
 4. Black or dark brown lower surface
 5. Surface of lobe tips with reticulate pattern of white lines (pseudocyphellae)
 6. Squarrosely branched rhizines present.....*Parmelia squarrosa*
 6. Rhizines unbranched or branched simple dichotomously; not squarrose.....*Parmelia saxatilis*
 5. White reticulate markings absent
 7. Medulla orange-red; coarse soredia present, sometimes isidioid.....*Phaeophyscia rubropulchra*
 7. Medulla white - see couplet 6 above

T13 FOLIOSE; MINERAL-GRAY; LOBES NARROW, NEITHER

T13

1. Thallus subfruticose to fruticose; lobes adnate to erect.....*Pseudoevernia cladonia*
1. Thallus clearly foliose; lobes adnate
 2. Lower surface with thick, black, spongy tomentum.....*Anzia colpodes*
 2. Lower surface without thick black tomentum
 3. Margins and sometimes upper surface of lobes with numerous squamulate lobules; lower surface white and fibrous, lacking a cortex; apothecia rare.....*Heterodermia squamulosa*
 3. Squamulate lobules absent or, if present, lower surface cortical; apothecia common
 4. Lower surface black or dark brown
 5. Thallus grayish brown; rhizines often radially projecting around apothecia; upper surface smooth.....*Phaeophyscia ciliata*
 5. Thallus mineral-gray, rhizines not radially projecting; upper surface often wrinkled.....*Myelochroa galbina*
 4. Lower surface white to tan
 6. Margins of lobes and apothecia with linear squamulate lobules; upper surface of lobe tips can be white pruinose.....*Anaptychia palmulata*
 6. Margins of lobes entire; upper surface not pruinose
 7. Upper surface with mottled white spots.....*Physcia aipolia*
 7. Upper surface without mottled white spots
 8. Apothecia common
 9. Apothecia blackish to white pruinose.....*Physcia stellaris*
 9. Apothecia pale or orange brown.....*Imshaugia placorodia*
 8. Apothecia not present; marginal soralia usually present.....*Heterodermia speciosa*

T14 FOLIOSE; (GREENISH) BLACK TO SLATE-GRAY (GELATINOUS); ISIDIATE T14

1. White tomentum on lower surface
 2. Tomentum very short, hard to see with hand lens; lobes apically dissected to isidiate.....*Leptogium laceroides*
 2. Tomentum long, hairs up to 1 mm or longer, obvious with a hand lens
 3. Thallus slate-gray; isidia cylindrical....*Leptogium hirsutum*
 3. Thallus black; isidia granular.....*Leptogium saturninum*
1. Without tomentum on lower surface
 4. Lobe surface with numerous, narrow, longitudinal wrinkles visible with hand lens; isidia granular, sparse to abundant.....*Leptogium milligranum*
 4. Lobe surface smooth, pustulate or ridged, without fine longitudinal wrinkles; isidia usually abundant
 5. Thallus bluish slate-colored; lobe surface smooth; isidia cylindrical to clavate to lobulate*Leptogium cyanescens*
 5. Thallus dull greenish or brownish black
 6. Some of isidia in mature part of thallus squamiform*Collema flaccidum*
 6. Isidia cylindrical to globose
 7. Thallus surface markedly pustulate and ridged; isidia mostly cylindrical.....*Collema furfuraceum*
 7. Thallus surface not markedly pustulate; isidia mostly globular.....*Collema subflaccidum*

T15 FOLIOSE; (GREENISH) BLACK TO SLATE-GRAY (GELATINOUS); NEITHER T15

1. Bluish slate-colored; surface of lobes finely and irregularly wrinkled.....*Leptogium corticola*
1. Brown, brownish-black, or greenish black; lobes without fine wrinkles
 2. Lobes much divided, up to 0.2 mm broad, flattened to almost round, often short and crowded and appearing as clustered coralloid outgrowths.....*Leptogium tenuissimum*
 2. Lobes larger
 3. Thallus 2-6 cm broad with lobes expanded and separate.....*Collema nigrescens*
 3. Thallus 2-3 cm with lobes small, crowded and fused, forming a cushion with interstices; covered with small apothecia.....*Collema leptaleum*

T16 SQUAMULOSE

T16

(For *Cladonia* species formed at base of trees or on rotting logs without podetia so only mineral-gray squamules are present, see Soil Key S5)

1. Conspicuous blue-black hypothallus surrounding squamules with isidia on margins.....*Parmeliella triptophylla*
1. Without blue-black hypothallus
 2. Lobes much divided, crowded, and appearing as clustered, coralloid outgrowths.....*Leptogium tenuissimum*
 2. Squamules not divided, imbricate, around 1.0 mm long, and sorediate on margins of lower surface*Hypocenomyce scalaris*

T17 FRUTICOSE; YELLOW-GREEN; ROUND IN CROSS-SECTION; PENDENT

T17

1. Branches loosely filled with medullary hyphae, a central dense cord lacking
 2. Apices of branches thin and tipped with soredia or granules, often hooked (use lens); black pycnidia not present.....*Ramalina thraustra*
 2. Apices of branches not hooked or tipped with soredia; black pycnidia usually present; pseudocyphellae common; white and raised, ovoid to elongate.....*Alectoria sarmentosa*
1. Branches with distinct, dense central cord
 3. Sorediate
 4. Branches, including main branches, with fine to coarse, white papillae, becoming sorediate....*Usnea ceratina*
 4. Branches with abundant, isidia-like fibrils; soralia sometimes isidiate.....*Usnea filipendula*
 3. Non-sorediate
 5. Cortex eroding away on the main branches; numerous long lateral fibrils present.....*Usnea longissima*
 5. Cortex present and continuous; lateral fibrils less numerous or absent
 6. Surface of main branchlets smooth except for annular rings.....*Usnea trichodea*
 6. Surface of main branchlets not smooth
 7. Branches coarse, with fine to coarse papillae.....*Usnea ceratina*
 7. Branches fine, rugose and pitted and without papillae.....*Usnea cavernosa*

T18 FRUTICOSE; YELLOW-GREEN; ROUND IN CROSS-SECTION; TUFTED

T18

1. Soredia and isidia lacking; apothecia common, with fibrils radiating from disk edge.....*Usnea strigosa*
1. Sorediate, isidiate, or isidiate-sorediate
 2. Sorediate only
 3. Branches with papillae becoming sorediate.....*Usnea ceratina*
 3. Smaller branches with numerous flat or convex soralia containing granular soredia.....*Usnea fulvovireagens*
 2. Isidiate or isidiate-sorediate
 4. Isidiate only; branches covered with isidia; papillae absent.....*Usnea hirta*
 4. Soredia present
 5. Raised isidiate-sorediate patches present
.....*Usnea subfloridana*
 5. Isidiate-sorediate patches absent; branches mostly with isidia or sorediate isidia; usually pendent.....*Usnea filipendula*

T19 FRUTICOSE; YELLOW-GREEN; FLATTENED IN CROSS-SECTION

T19

1. Sorediate
 2. Soredia diffuse, granular to subsidiolate; surface of branches irregularly wrinkled....*Evernia mesomorpha*
 2. Soredia in distinct marginal or apical soralia
 3. Branches hollow and sometimes perforated; tips attenuated with isidiate soredia at tips....*Ramalina roesleri*
 3. Branches not hollow
 4. Soredia forming broad white patches over the exposed medulla.....*Ramalina pollinaria*
 4. Soredia not forming broad white patches
 5. Soredia farinose and restricted to delimited lateral soralia; lobe tips not finely divided.....*Ramalina farinacea*
 5. Soredia granular, irregularly spreading over adjacent areas; lobe tips finely divided.....*Ramalina intermedia*
 1. Nonsorediate; apothecia common
 6. Branches somewhat rounded, to 1.5 mm wide, hollow and perforated.....*Ramalina dilacerata*
 6. Branches broad and strap-shaped, 2-10 mm wide, solid, surface smooth to striate.....*Ramalina americana*

T20 FRUTICOSE; BROWN

T20

1. Soralia present; tufted to subpendent
 2. Soralia projecting tufts of isidioid spinules.....*Bryoria furcellata*
 2. Soralia without projecting isidioid spinules
 3. Thallus grayish green to pale brown with basal branches darker; K+*Bryoria nadvornikiana*
 3. Thallus brown; K-*Bryoria fuscescens*
1. Soralia absent; subpendent to pendent
 4. Thallus greenish gray to gray; K+*Bryoria capillaris*
 4. Thallus pale to dark brown; K-*Bryoria trichodes*

T21 FRUTICOSE; MINERAL-GRAY

T21

1. Isidiate.....*Pseudoevernia consocians*
1. Isidia (and soredia) lacking.....*Pseudoevernia cladonia*

R1. FOLIOSE; ORANGE

R1

1. Soredia or isidia present; apothecia usually absent
2. Thallus closely adherent to rock; central part with laminal, coarse, bulbous isidia, some of which break up into glomeruli and coarse sorediaXanthoria sorediata
2. Thallus lobes narrow, dissected, and ascending, 0.1-0.4 mm wide; laminal coarse isidia absent but granular soredia present at lobe margins...Xanthoria candelaria
1. Soredia and isidia absent; apothecia usually present
3. Lobes flat, thin, and adherent to substrate, often with thickened edges giving lobe tips a concave appearance.....Xanthoria parietina
3. Lobes appearing thicker, with tips convex and proximal parts arched.....Xanthoria elegans

R2. FOLIOSE; YELLOW-GREEN; SOREDIATE

R2

1. Lobes relatively broad, 3-10 mm wide
2. Soredia on surface of lobes.....Flavoparmelia caperata
2. Isidia on surface of lobes pustulate, sometimes breaking open to appear sorediate...Flavoparmelia baltimorensis
1. Lobes narrower, 1-3 mm wide
3. With large capitate soralia.....Arctoparmelia incurva
3. With marginal soralia.....Tuckermannopsis oakesiana

R3. FOLIOSE; YELLOW-GREEN; ISIDIATE

R3

1. Lobes 3-10 mm wide; isidia pustulate, sometimes breaking open to appear sorediate.....Flavoparmelia baltimorensis
1. Lobes 1-3 mm wide; isidia not breaking open
2. Lower surface black with brown only at the margins.....Xanthoparmelia conspersa
2. Lower surface uniformly tan to dark brownXanthoparmelia plittii

R4. FOLIOSE; YELLOW-GREEN; NEITHER

R4

1. Lower surface white.....Arctoparmelia centrifuga
1. Lower surface not white
2. Lower surface black, except brownish at margin (stictic and norstictic acid).....Xanthoparmelia cumberlandia (salazinic acid).....Xanthoparmelia somloensis
2. Lower surface uniformly tan to dark brown (stictic and norstictic acid).....Xanthoparmelia angustiphyllo (salazinic acid).....Xanthoparmelia tasmanica

R5. FOLIOSE; GRAYISH BROWN TO BROWN; LOBES BROAD
(For *Peltigera* species found on soil over rock, see Soil Key S2)

R5

1. Attached to substrate by single holdfast (umbilicate)
 2. Indistinctly umbilicate; small lobes 1.0 cm or less crowded together on wet rocks; upper surface with black dots (perithecia); turns green when wet *Dermatocarpon luridum*
 2. Distinctly umbilicate; lobes usually greater than 1.0 cm wide
 3. Upper surface with black dots (perithecia); apothecia never found *Dermatocarpon miniatum*
 3. Upper surface without black dots (perithecia); apothecia common..see Rock Key R-15: *Lasallia* and *Umbilicaria*
1. Attached to substrate by rhizines or tomentum
 4. Coarse granular soredia present *Nephroma parile*
 4. Nonsorediate
 5. Lower surface tomentose
 6. Apothecia located on lower surface of lobe tips *Nephroma resupinatum*
 6. Apothecia located on upper surface *Lobaria quercizans*
 5. Lower surface not tomentose
 7. Margins of lobes lobulate to dentate-isidiate *Nephroma helveticum*
 7. Margins of lobes entire *Nephroma bellum*

R6. FOLIOSE; GRAYISH BROWN TO BROWN; LOBES NARROW, SOREDIATE

R6

1. Medulla orange-red; soredia coarse, sometimes isidioid *Phaeophyscia rubropulchra*
1. Medulla not orange-red
 2. Soralia marginal and isidioid; thallus gray-brown to almost black *Phaeophyscia sciastra*
 2. Soralia not isidioid-like
 3. Bluish black hypothallus extending beyond lobe edges
 4. Soredia in the form of partly decorticated, small or elongate lobules along the lobe margins; thallus ashen blue, sometimes with fawn tinge *Pannaria conoplea*
 4. Soredia coarsely granular; thallus brownish *Pannaria ahlneri*
 3. Bluish black hypothallus lacking
 5. Lobe tips or entire lobes scabrid or pruinose; soredia marginal *Physconia deterosa*
 5. Lobes not pruinose
 6. Thallus light or dark brownish mineral gray, turning green when wet
 7. Soredia coarse and isidioid *Phaeophyscia adiaetola*
 7. Soredia powdery, round and delimited (capitate) *Phaeophyscia pusilloides*
 6. Thallus brown, not turning green when wet; soredia are whitish when rubbed off
 8. Soredia diffuse over upper surface, mixed with tiny isidia *Melanelia subaurifera*
 8. Soredia delimited
 9. Thallus dull; soralia mainly terminal on short ascending lobe tips *Melanelia sorediata*
 9. Outer thallus lobes shiny; soralia laminal and submarginal, appearing as blackened mounds if not abraded *Melanelia disjuncta*

R7. FOLIOSE; GRAYISH BROWN TO BROWN; LOBES NARROW, ISIDIATE

R7

1. Medulla orange-red; soredia coarse, sometimes isidioid.....*Phaeophyscia rubropulchra*
1. Medulla white
 2. Thallus light to dark brownish mineral gray
 3. White angular markings at lobe tips; isidia laminal on upper surface.....*Parmelia saxatilis*
 3. White markings lacking; isidioid soredia or isidia on lobe margins.....*Phaeophyscia sciastra*
 2. Thallus brown
 4. Isidia tiny and mixed with diffuse laminal soredia that are whitish when rubbed off.....*Melanelia subaurifera*
 4. Isidia larger and not mixed with soredia
 5. Isidia granular to elongated and inflated, club-shaped, or spatulate; lower surface brown to black.....*Melanelia exasperatula*
 5. "Isidia" really branching lobules; lower surface black.....*Melanelia panniformis*

R8. FOLIOSE; GRAYISH BROWN TO BROWN; LOBES NARROW, NEITHER

R8

1. Lower surface with a blue-black tomentum; red-brown apothecia common.....*Pannaria rubiginosa*
1. Blue-black tomentum lacking
 2. Thallus dark brown
 3. Margins of lobes with pycnidial projections and white pseudocyphellae.....*Cetraria hepatizon*
 3. Marginal pycnidial projections and white pseudocyphellae lacking
 4. Upper surface of main lobes covered with numerous, fine branching lobules.....*Melanelia panniformis*
 4. Upper surface smooth and shiny with black, immersed pycnidia.....*Melanelia stygia*
 2. Thallus light brown to mineral-gray
 5. Upper surface with reticulate white markings, often ridged.....*Parmelia omphalodes*
 5. Upper surface without reticulate white markings
 6. Thallus light brown; margins of lobes and apothecia lobulate.....*Anaptychia palmulata*
 6. Thallus brownish mineral-gray; margins without lobules.....*Phaeophyscia endococcina*

R9. FOLIOSE; MINERAL-GRAY; LOBES BROAD

R9

(For *Peltigera* species found on soil on rocks, see Soil Key S2)

1. Sorediate
 2. Pores (pseudocyphellae) on upper surface.....*Cetrelia* spp.
(*Cetrelia chicitae*, C- and *Cetrelia olivetorum*, C+)
 2. No pores on upper surface.....*Myelochroa aurulenta*
1. Nonsorediate
 3. Isidiate, often apically ciliate.....*Parmotrema crinitum*
 3. Nonisidiate.....*Lobaria quercizans*

R10. FOLIOSE; MINERAL-GRAY; LOBES NARROW, SOREDIATE

R10

1. Lobes hollow and inflated; soredia labriform..Hypogymnia physodes
1. Lobes solid
 2. Black lower surface
 3. Upper surface of lobe tips weakly reticulately ridged and white spotted; soredia laminal....*Parmelia sulcata*
 3. Upper surface lacking white markings and spots
 4. With linear, suberect lobes bearing cilia on margins; soredia laminal.....*Everniastrum catawbiense*
 4. Lobes appressed; cilia short or lacking
 5. Upper surface scabrid or pruinose, at least at lobe tips; soredia marginal.....*Physconia detersa*
 5. Upper surface plain, not pruinose
 6. Medulla orange-red to red.....*Phaeophyscia rubropulchra*
 6. Medulla white or pale yellow
 7. Lobes relatively wide, 2-5 mm; soredia in broad diffuse patches on surface*Myelochroa aurulenta*
 7. Lobes narrower, 0.5-1.5 mm
 8. Soredia coarse and isidioid*Phaeophyscia adiaastola*
 8. Soredia powdery, round and delimited (capitate).....*Phaeophyscia pusilloides*
 2. White or tan lower surface
 9. Cilia present on lobe margins (not to be confused with projecting rhizines, see 13a below)
 10. Lobes with helmet-shaped inflated tips, sorediate on the inside.....*Physcia adscendens*
 10. Lobes with terminal, labriform soralia.....*Physcia tenella*
 9. Cilia lacking
 11. Margins of lobes breaking up into granular soredia
 12. Lobes narrow (0.1-0.4 mm) and linear, surface even, without mottled white spots; medulla K+ yellow.....*Physcia subtilis*
 12. Lobes broader (0.3-1.0 mm) with mottled white spots on surface; medulla K- ...*Physcia millegrana*
 11. Margins of lobes not breaking up into granular soredia
 13. Laterally projecting rhizines at lobe margins; lobes linear and flat with apical or marginal soredia; at least some of lower surface fibrous*Heterodermia speciosa*
 13. Laterally projecting rhizines absent; lower surface cortical
 14. Upper surface with mottled white spots; soralia capitate, at least in part; medulla K+ yellow.....*Physcia caesia*
 14. Upper surface uniform, soralia mostly marginal and lip-shaped, sometimes laminal and crateriform; medulla K-*Physcia dubia*

R11. FOLIOSE; MINERAL-GRAY; LOBES NARROW, ISIDIATE

R11

1. White markings or pores on upper surface
2. Tips of lobes with white spots (pseudocyphellae)
 -Punctelia rudecta
2. Tips of lobes reticulately ridged, white marked
 - 3. Squarrosely branched rhizines present.....Parmelia squarrosa
 - 3. Rhizines unbranched or branched simple dichotomously, not squarrosely branched....Parmelia saxatilis
1. Upper surface plain
 - 4. With isidia only, medulla white.....Imshaugia aleurites
 - 4. Soredia coarse granules, sometimes isidioid; medulla red-orange.....Phaeophyscia rubropulchra

R12. FOLIOSE; MINERAL-GRAY; LOBES NARROW, NEITHER

R12

1. Margins of lobes and apothecia lobulate.....Anaptychia palmulata
1. Margins of lobes and apothecia not lobulate
 - 2. White to tan lower surface; upper surface with mottled white spots.....Physcia phaea
 - 2. Black to dark brown lower surface (sometimes tan at margin)
 - 3. Lobes hollow, appearing inflated.....Hypogymnia physodes
 - 3. Lobes solid, not appearing inflated
 - 4. Upper cortex with reticulate white markings.....Parmelia omphalodes
 - 4. Upper cortex uniform.....Phaeophyscia endococcina

R13. FOLIOSE; (GREENISH) BLACK TO SLATE-GRAY (GELATINOUS); ISIDIATE R13
(For Phaeophyscia sciastra, a nongelatinous, dark gray to black, foliose lichen, see Rock Key R6 and R7)

1. White tomentum on lower surface
 - 2. Thallus slate-gray; isidia cylindrical.....Leptogium hirsutum
 - 2. Thallus dark gray to black; isidia granular.....Leptogium saturninum
1. Tomentum lacking
 - 3. Thallus bluish to brownish slate-colored
 - 4. Lobes broad and rotund; bluish slate.....Leptogium cyanescens
 - 4. Lobes narrow, apically dissected and isidiate; brownish (may appear blackish to naked eye).....Leptogium lichenoides
 - 3. Thallus dark gray to black
 - 5. Thallus distinctly ridged and pustulate; isidia cylindrical in part.....Collema furfuraceum
 - 5. Thallus surface generally even; isidia not cylindrical
 - 6. Isidia squamiform, at least in part.....Collema flaccidum
 - 6. Isidia large and globular.....Collema fuscovirens

R14. FOLIOSE; (GREENISH) BLACK TO SLATE GRAY (GELATINOUS); NEITHER R14

1. Collected submerged on rocks in streams.....Hydrotheria venosa
1. Not found submerged in streams
 - 2. Thallus bluish to brownish slate-colored
 - 3. Lobes narrow, apically dissected to isidiate.....Leptogium lichenoides
 - 3. Lobes broader, not apically dissected.....Leptogium corticola
 - 2. Thallus greenish black.....Collema nigrescens

R15. UMBILICATE

1. Thallus yellowish green; apothecia flesh-colored; thalli crowded together, appearing crustose
.....*Rhizoplaca chrysoleuca*
1. Thallus not yellowish green; apothecia not flesh-colored
 2. Upper surface with black dots (perithecia)
.....*Dermatocarpon miniatum*
 2. Upper surface without black dots
 3. Upper surface with papillate, cylindrical, or leaf-like isidia.....*Umbilicaria deusta*
 3. Upper surface without isidia
 4. Upper surface strongly pustulate
 5. Lower surface brown to tan.....*Lasallia papulosa*
 5. Lower surface black.....*Lasallia pensylvanica*
 4. Upper surface not strongly pustulate
 6. Upper surface reticulately ridged towards center; some long rhizines on lower surface
.....*Umbilicaria proboscidea*
 6. Upper surface not reticulately ridged
 7. Lower surface black, covered with dense mat of short black rhizines; upper surface plain
 8. Upper surface brownish.....*Umbilicaria mammulata*
 8. Upper surface whitish gray.....*Umbilicaria vellea*
 7. Lower surface not covered with a mat of black rhizines
 9. Lower surface with irregular plated and/or flattened rhizines
 10. Margins finely perforated and lacerated; sulcus-like cracks on upper surface
.....*Umbilicaria torrefacta*
 10. Margins entire; no cracks on upper surface
.....*Umbilicaria muehlenbergii*
 9. Lower surface smooth and bare
 11. Upper surface rugose with an intricate pattern of ridges.....*Umbilicaria hyperborea*
 11. Upper surface smooth; thallus dissected and irregularly ascending...*Umbilicaria polyphylla*

R16

R16. SQUAMULOSE

1. Conspicuous blue-black hypothallus surrounding squamules with isidia on margins.....*Parmeliella triptophylla*
1. Blue-black hypothallus and isidia lacking
.....(see Soil Key S4)...*Cladonia* spp.

R17

R17. FRUTICOSE; YELLOW-GREEN

1. Sorediate
 2. Soredia forming broad white patches over the exposed medulla, especially at lobe tips....*Ramalina pollinaria*
 2. Soredia not forming broad white patches
 3. Soredia farinose and restricted to delimited lateral soralia; lobe tips not finely divided
.....*Ramalina farinacea*
 3. Soredia granular, irregularly spreading over adjacent area; lobe tips finely divided...*Ramalina intermedia*
1. Nonsorediate....(see Soil Key S5)...*Cladonia* spp. and *Cladonia* spp.

R18. FRUTICOSE; BROWN

R18

1. On rocks in or near the water of lakes and streams; appearing as "furry" mats at waterline.....*Ephebe lanata*
1. Not associated directly with water
.....(see Tree Key T20)---*Bryoria* spp.

R19. FRUTICOSE; WHITE TO GRAYISH WHITE

R19

1. Branches or stalks covered with lobule-like, whitish phyllocladia.....*Stereocaulon* spp.
(The key below will not work for all specimens of *Stereocaulon*; some specimens seem to defy satisfactory identification)
2. Soredia in capitate soralia.....*Stereocaulon pileatum*
2. Nonsorediate
 3. Pseudopodetia covered with thick spongy tomentum; P+ orange-red.....*Stereocaulon tomentosum*
 3. Tomentum, if present, not thick and spongy; P- (or P+ pale yellow) except for *S. dactylophyllum* (P+ red)
 4. Phyllocladia cylindrical and branching (coralloid), at least in part
 5. Prostrate-decumbent, forming dorso-ventral mats; apothecia and cephalodia rare; gray tomentum often present; phyllocladia incised squamuliform to coralloid squamuliform.....*Stereocaulon saxatile*
 5. More erect, not prostrate-decumbent
 6. Phyllocladia partly grain-like and partly coralloid; apothecia usually common; P-*Stereocaulon intermedium*
 6. Phyllocladia not grain-like, usually all coralloid; P+ or P-
 7. Apothecia common; P+ red
.....*Stereocaulon dactylophyllum*
 7. Apothecia rare; P-*Stereocaulon subcoralloides*
 4. None of phyllocladia coralloid
 8. Prostrate-decumbent, forming dorso-ventral mats; apothecia and cephalodia rare; gray tomentum often present; phyllocladia incised squamuliform*Stereocaulon saxatile*
 8. More erect, not prostrate-decumbent
 9. Cephalodia conspicuous, dark brown; phyllocladia grain-like; usually on soil*Stereocaulon paschale*
 9. Cephalodia usually not conspicuous; phyllocladia not all grain-like
 10. Apothecia uncommon; phyllocladia vary from grain-like to lobate squamulose; P-*Stereocaulon glaucescens*
 10. Apothecia usually common; phyllocladia digitate squamulose; P+ red
.....*Stereocaulon dactylophyllum*
 1. Stalks lacking phyllocladia
 11. Stalks simple, topped with a reddish-brown apothecia.....*Baeomyces rufus*
 11. Stalks intricately branched.....*Cladina rangiforina*

S1. FOLIOSE; YELLOW-GREEN; LOBES BROAD

S1

1. Lobes very broad, 20-30 mm; lower surface black centrally and tan at margins.....*Nephroma arcticum*

S2. FOLIOSE; BROWN TO MINERAL GRAY; LOBES BROAD

S2

1. Apothecia round, sunken in pits in the upper surface.....*Solorina saccata*
1. Apothecia not present, or if present not sunken in pits in the upper surface.....*Peltigera* spp.
(based in part on a key in Gowan and Brodo 1988, *Bryologist* 91: 255-325)
2. Upper surface spotted by numerous gray to brown, peltate, often crenulate cephalodia; algal layer of thallus bright green, consisting of green algae
3. Lower surface with distinct, grayish brown, marginally paler veins.....*Peltigera leucophlebia*
3. Lower surface lacking distinct veins, dark centrally with paler margins.....*Peltigera apthosa*
2. Upper surface without cephalodia; algal layer of thallus dark, composed of blue-green algae (cyanobacteria)
4. Upper surface distinctly isidiate or margins finely lobulate
5. Isidia scattered on upper surface; lobe margins flat and even, without lobules
6. Isidia fine, basally constricted, granular, flattened, or weakly coralloid.....*Peltigera evansiana*
6. Isidia peltate.....*Peltigera lepidophora*
5. No isidia on upper surface; lobe margins or cracks with small lobules or lobule-like isidia
7. Lower surface without veins but with dark tomentum demarcating pale tomentose spots.....*Peltigera elizabethae*
7. Lower surface with typical dark, raised veins, paler at margins.....*Peltigera praetextata*
4. Upper surface and margins lacking isidia, although coarse lobules or regeneration squamules may be present
8. Upper surface, at least at lobe tips, distinctly tomentose
9. Thallus small (<4 cm) with small lobes (up to 10 mm broad) that in young specimens are regularly rounded and cupulate and bear coarsely granular soredia in round laminal soralia; older specimens are esorediate with apothecia borne on ascending, revolute lobes.....*Peltigera didactyla*
9. Thallus larger, with broader lobes that are always esorediate
10. Lower surface veinless.....*Peltigera malacea*
10. Lower surface with distinct veins
11. Lobes broad, (13)20-50 mm; thallus thin and pliable with margins mostly downcurving
12. Tomentum extending several cm from margins with thallus center often rough or subpruinose, not shiny and smooth; rhizines finely frayed and becoming confluent; lobes (15)20-30 mm broad.....*Peltigera canina*

(continued)

12. Tomentum usually present only close to lobe margin; thallus center smooth and often shiny; rhizines slender and unbranched to slightly frayed towards tips, not confluent; lobes on average either larger or smaller than 20-30 mm (S2)
13. Lobes (15) 25-50 mm broad, thin and papery; rhizines very long (to 15 mm), often tomentose.....*Peltigera membranacea*
13. Lobes (13) 15-25 mm broad, moderate in thickness; rhizines to about 5 mm long.....*Peltigera praetextata*
11. Lobes less than 15 mm broad; thallus thick and brittle with margins often strongly undulating, rarely downward curving.....*Peltigera rufescens*
8. Upper surface of lobes not tomentose
14. Thallus small (<4 cm) with small lobes (up to 10 mm broad) that in young specimens are regularly rounded and cupulate and bear coarsely granular soredia in round laminal soralia; older specimens are esorediate with apothecia borne on ascending, revolute, esorediate lobes.....*Peltigera didactyla*
14. Thallus larger, with broader lobes that are always esorediate
15. Lower surface with well-defined, acutely branching, narrow, raised veins.....*Peltigera degenii*
15. Lower surface with white areas between relatively flat and broad, rounded branching veins, or veins completely lacking
16. Upper surface distinctly roughened and scabrose, appearing dull.....*Peltigera scabrosa*
16. Upper surface smooth, not scabrose, often shiny
17. Lower surface without veins but with dark tomentum demarcating pale tomentose spots: often with lobules on margins of lobes.....*Peltigera elizabethae*
17. Low veins discernible on lower surface; marginal lobules absent
18. Apothecia marginal, sessile, or on very short lobes, disks flat.....*Peltigera horizontalis*
18. Apothecia absent or raised on narrow lobes; disks saddle-shaped
19. Apothecia grayish brown to black; lobes rather narrow, 5-15 mm.....*Peltigera neckeri*
19. Apothecia reddish brown; lobes 10-30(40) mm broad
20. Lobes 20-40 mm broad; rhizines long, slender and unbranched.....*Peltigera neopolydactyla*
20. Lobes 10-20 mm broad; rhizines short (<5 mm)
21. Rhizines in concentric arcs near margins; pale areas between veins generally elongate and neatly radiating.....*Peltigera horizontalis*
21. Rhizines randomly arranged near thallus margin; pale areas between veins generally rounded or irregular, not distinctly radiating.....*Peltigera polydactyla*

S3. FOLIOSE; (GREENISH) BLACK TO SLATE-GRAY; LOBES NARROW

S3

1. Thallus lobes with swollen and plicate margins.....*Collema tenax*
1. Thallus with margins apically dissected to isidiate
 2. Lobes tiny, to 0.2 mm broad, flattened to nearly terete, appearing as clustered corolloid growths*Leptogium tenuissimum*
 2. Lobes 1-4 mm broad, with margins finely lobulate to isidiate.....*Leptogium lichenoides*

S4. SQUAMULOSE

S4

1. Squamules brown, gray, or blackish; apothecia reddish brown.....*Pannaria pezizoides*
1. Squamules yellowish, whitish or greenish gray.....*Cladonia* spp.
(included below are those species commonly forming large squamulose mats without any podetia; many other *Cladonia* species will form small patches without podetia and cannot be easily identified)
2. Squamules finely divided and incised; apothecia, if present, sessile or on very short podetia (< 1.0 mm)*Cladonia caespiticia*
2. Squamules not finely divided
 3. Squamules yellow-green above, yellow to cream below, often forming compact heads; C+ green....*Cladonia strepsilis*
 3. Squamules greenish above, whitish below; C-
 4. Squamules large and irregular, up to 7 mm X 25 mm, upper surface often rugose; K+ weakly yellow*Cladonia turgida*
 4. Squamules more uniformly strap-shaped, branching dichotomously, up to 4 mm wide, upper surface smooth; K+ yellow changing to red.....*Cladonia polycarpoides*

S5. FRUTICOSE; TUFTED; YELLOW-GREEN

S5

1. Thallus lobes flattened and strap-shaped; alpine
 2. Lobes smooth to faintly rugose, curled into channels.....*Cetraria cucullata*
 2. Lobes deeply rugose and more flattened.....*Cetraria nivalis*
1. Thallus branches round in cross-section; widespread
 3. Surface of branches dull and fibrous, lacking a cortex
 4. Main branches 2-5 mm in diameter, inflated and irregularly perforated.....*Cladonia boryi*
 4. Main branches less than 2 mm in diameter, not inflated or perforated
 5. Thallus forming compact, rounded heads....*Cladina stellaris*
 5. Thallus forming extensive entangled colonies
 6. Ultimate branches mostly in pairs
 7. Axils of branches all closed; K-*Cladina subtenuis*
 7. Axils of branches both open and closed; K+*Cladina terrae-novae*
 6. Ultimate branches mostly in 3's and 4's with some 2's

(continued)

8. Ultimate branches curved in one direction, mostly in 3's, with 2's not uncommon; widespread (S5)
 P+.....*Cladina arbuscula*
 P-.....*Cladina mitis*
8. Ultimate branches not curved in one direction but showing wide angulation, mostly in 4's with 2's rare; southern Maine.....*Cladina submitis*
3. Surface of branches shiny and corticate
19. Tips of podetia flaring into shallow cups
*Cladonia amaurocraea*
9. Tips of podetia pointed, not cup-forming
10. Main branches 1.0-1.5 mm in diameter; inside of hollow podetia smooth.....*Cladonia uncialis*
10. Main branches 2-4 mm in diameter; inside of hollow podetia rough.....*Cladonia caroliniana*

S6: FRUTICOSE; TUFTED; BROWN

S6

1. Branches flattened in cross-section
2. Forming dense tufts with many narrow, finely branched (<1 mm) apical branches.....*Cetraria delisei*
2. Apical branches wider (>1 mm) and more coarsely branched
3. White, marginal pseudocyphellae absent.....*Cetraria islandica*
3. Scattered or continuous, white, linear, marginal pseudocyphellae present
4. Lobes wide (4-10 mm); marginal pseudocyphellae not usually long and linear.....*Cetraria islandica*
4. Lobes narrower (1-4 mm); continuous linear pseudocyphellae found, at least apically
5. Marginal projections frequently branched once or several times; alpine.....*Cetraria laevigata*
5. Branched marginal projections rare; coastal dunes.....*Cetraria arenaria*
1. Branches round in cross-section
6. Thallus uniformly dark brown; numerous apical spiny projections present.....*Coelocaulon* ssp.
 (*Coelocaulon aculeatum* and *Coelocaulon muricatum*)
6. Thallus not uniformly dark brown, lacking apical spiny projections
7. Thallus hollow
8. Blunt channeled tips actually multi-branched proliferations of older cups.....*Cladonia multiformis*
8. No evidence of proliferated cups near center of tufted thallus; tips not channeled.....*Cladonia furcata*
7. Thallus solid
9. Dichotomously branched, with no distinct main stems.....*Sphaerophorus fragilis*
9. Main branches distinct, with numerous side branches.....*Sphaerophorus globosus*

S7. FRUTICOSE; TUFTED; WHITE TO GRAYISH OR GREENISH WHITE

S7

1. Branches covered with lobule-like phyllocladia...Stereocaulon ssp.
(See also Rock Key R19)
2. Primary crustose thallus persistent, of warty or elongated and incised phyllocladia, usually with abundant dark cephalodia interspersed among them; pseudopodetia 1-2 cm tall.....Stereocaulon condensatum
2. Primary thallus lacking; pseudopodetia 2-6 cm tall
 3. Tomentum on branches thick and conspicuous; phyllocladia crenate squamulose.....Stereocaulon tomentosum
 3. Tomentum less conspicuous or lacking; phyllocladia various
 4. Cephalodia abundant, dark brown and scabrid; phyllocladia small and grain-like.....Stereocaulon paschale.
 4. Cephalodia inconspicuous; phyllocladia verrucose to thickly crenulate-squamuloseStereocaulon alpinum
1. Branches of stalks smooth
 5. Surface dull and fibrous, without a cortex
 6. Basal cartilaginous layer of podetia coal black, demarcating scattered overlying whitish patches; apical surface usually brownish.....Cladina stygia
 6. Basal cartilaginous layer of podetia gray to brownish; apical surface not brownishCladina rangiferina
 5. Surface corticate, usually shiny
 7. Thallus hollow
 8. Blunt channeled tips actually multi-branched proliferations of older cups.....Cladonia multiformis
 8. No evidence of proliferated cups near center of tufted thallus; tips not channeled.....Cladonia furcata
 7. Thallus solid
 9. Dichotomously branched, with no distinct main stems.....Sphaerophorus fragilis
 9. Main branches distinct, with numerous side branches.....Sphaerophorus globosus

S8. FRUTICOSE; PODETIA; RED (PINK) APOTHECIA OR PYCNIDIA

S8

1. Podetia hollow; primary thallus squamulate
2. Podetia sorediate
3. Forming cups
 4. Primary squamules large, 5-15 mm in diameter; K+ or K-
 5. Podetia tall (2.5-8.5 cm) and slender, with longitudinal cracks and fissures; squamules only sometimes sorediate; K-Cladonia sulfurina
 5. Podetia often short and poorly formed, sometimes absent, but can be up to 4 cm tall, lacking longitudinal cracks and furrows; squamules always sorediate on undersides and margins; K+ yellow.....Cladonia digitata
 4. Primary squamules smaller, less than 5 mm; K-
 6. Podetia tall (2.5-8.5 cm) and slender, with longitudinal cracks and fissures; squamules nearly 5 mm in diameter.....Cladonia sulfurina
 6. Podetia without longitudinal cracks and fissures; or such cracks and fissures rare
 7. Cups tall and slender, 2-4(8) cm; soredia farinose; red pycnidia common but apothecia rare; squamules small (2-4 mm) or absent.....Cladonia deformis
 7. Cups short, 1-2(4) cm; soredia granular (do not confuse with verruculose areolae of Cladonia coccifera); red pycnidia and apothecia commonCladonia pleurota
3. Not forming cups
 8. Apothecia sessile on the primary squamules and on the tip of small terete podetia (up to 0.7 cm tall); primary squamules persistent, crenate or incised, usually sorediate, up to 4 mm wide.....Cladonia incrassata
 8. Podetia larger; squamules small and poorly developed, up to 4 mm but usually less, generally esorediate
 9. Podetia sometimes branched, with large corticate areas remaining; soredia granular.....Cladonia floerkeana
 9. Podetia usually simple and pointed, largely ecorticate and with farinose soredia
 - K+Cladonia macilenta
 - K-Cladonia bacillaris
2. Podetia without soredia, although areolae in Cladonia coccifera may be confused with granular soredia; apothecia common
 10. Forming cups that are usually verruculose areolate in upper part; usually alpine.....Cladonia coccifera
 10. Not forming cups; apothecia large and usually red but may be pale yellowish orange; widespreadCladonia cristatella
1. Podetia (pseudopodetia) solid; primary thallus crustose
 11. Apothecia pink, large, and orbicular.....Baeomyces roseus
 11. Apothecia reddish brown, small, and flattened..Baeomyces rufus

S9. FRUTICOSE; PODETIA; BROWN/NO APOTHECIA; SOREDIATE

S9

1. Podetia forming distinct cups
 2. Cups deep, stout to elongate, proliferating on edges or not
 3. Soredia farinose, cups not proliferating
 4. Podetia slender; cups less than 5 mm wide; sorediate throughout.....*Cladonia fimbriata*
 4. Podetia with wider cups, often 5 or more mm wide; soredia largely restricted to upper third of podetia.....*Cladonia humilis*
 3. Soredia granular..... *Cladonia chlorophaea* group (4 species in this group occur in Maine and can be distinguished only with thin-layer chromatography: *C. chlorophaea*, fumarprotocetraric acid only; *C. grayi*, grayanic acid; *C. merochlorophaea*, merochlorophaeic acid; and *C. cryptochlorophaea*, cryptochlorophaeic acid)
 2. Cups shallow, usually small
 5. Cups open, funnel-like with inrolled margins; soredia farinose.....*Cladonia cenotea*
 5. Cups not funnel-like, without inrolled margins
 6. Soredia granular; cups with dentate or proliferating margins.....*Cladonia rei*
 6. Soredia farinose; cups, where present, tiny and poorly formed
 7. Primary squamules conspicuous, 2-5 mm, with podetia arising from centers; podetia less than 3 cm long, sorediate throughout..*Cladonia coniocraea*
 7. Primary squamules usually disappearing; podetia much longer, 2-12 cm, sorediate only near the tip, often in definite patches.....*Cladonia cornuta*
1. Podetia not forming cups or only forming them rarely
 8. Podetia unbranched, < 5 cm tall
 9. Primary squamule margins granular sorediate; podetia less than 1 cm tall.....*Cladonia parasitica*
 9. Primary squamules not granular sorediate; podetia more than 1 cm tall
 10. Primary squamules conspicuous, 2-7 mm long
 11. Podetia decorticate, with farinose soredia, arising from center of primary squamules....*Cladonia coniocraea*
 11. Podetia sparsely granular sorediate, densely or loosely covered with squamules similar to the primary squamules.....*Cladonia acuminata*
 10. Primary squamules small, less than 2 mm long
 12. Podetia blunt, with farinose soredia merging at base with coarse, isidioid granules and minute squamules.....*Cladonia cylindrica*
 12. Soredia granular throughout podetial extent.....*Cladonia ramulosa*
 8. Podetia long and slender, often branched several times, 3-12 cm tall
 13. Open axils; much branched
 14. Soredia coarsely granular.....*Cladonia scabriuscula*
 14. Soredia farinose.....*Cladonia farinacea*
 13. Closed axils; little branched
 15. Mostly corticate; farinose soredia only near the tip, often in definite rounded patches.....*Cladonia cornuta*
 15. Mostly decorticate and covered with farinose soredia.....*Cladonia subulata*

S10. FRUTICOSE; BROWN/NO APOTHECIA; NONSOREDIAE

S10

1. Primary thallus crustose and persistent
2. Podetia (pseudopodetia) solid.....*Baeomyces rufus*
2. Podetia hollow and inflated.....*Pychnothelia papillaria*
1. Primary thallus squamulose, sometimes evanescent
3. Forming cups
 4. Cups proliferating from the center
 5. Cups gradually expanding from stalks; podetia usually completely corticate; neutral soils
.....*Cladonia cervicornis* ssp. *verticillata*
 5. Cups abruptly expanding from stalks; podetia becoming distinctly areolate or partially decorticate; acid soils.....*Cladonia rappii*
 4. Cups proliferating from the margins or not at all
 6. Cups coarse and stout, covered with greenish areoles and peltate squamules.....*Cladonia pyxidata*
 6. Cups more attenuated, areoles not conspicuous
 7. Centers of cups closed
 8. Cups large, greater than 5 mm wide, with margins dentate or proliferating; apothecia common.....*Cladonia gracilis* ssp. *turbinata*
 8. Cups smaller, usually less than 5 mm wide, sometimes absent; podetia slender and tall
 9. Podetia robust, 1.5-3 mm thick, 6-10 cm tall
.....*Cladonia maxima*
 9. Podetia thin, 1-1.5 mm thick, 3-6 cm tall
.....*Cladonia gracilis* ssp. *gracilis*
 7. Centers of cups open or perforated
 10. Cups perforated
 11. Podetia yellowish green, richly branched
.....*Cladonia amaurocraea*
 11. Podetia greenish white to brown, variously branched; cup membrane perforated with holes
.....*Cladonia multiformis*
 10. Cups open and gaping
 12. Podetia finely and densely squamulose
.....*Cladonia squamosa*
 12. Podetia with squamules either coarse or sparse
 13. Basal squamules large, 5-25 mm long; podetia lacerated and perforated.....*Cladonia turgida*
 13. Basal squamules small, 1-4 mm, or lacking
 14. Podetia relatively short, less than 5 cm, usually with numerous coarse squamules; K-, P+ yellow.....*Cladonia atlantica*
 14. Podetia usually taller, to 10 cm, with few squamules
K+ yellow, P+ orange-red.....*Cladonia subsubulata*
 - K-, P-*Cladonia crispata*
 3. Not forming cups
 15. Podetia simple to branched, usually well developed
 16. Podetia richly branched; axils open
 17. Yellowish green.....see Soil Key S5
 17. Greenish white to brown
 18. Blunt channeled tips actually multi-branched proliferations of older cups.....*Cladonia multiformis*
 18. No evidence of proliferated cups near center of thallus; tips not channeled.....*Cladonia furcata*
 16. Podetia simple or moderately branched; axils open or closed

(continued)

19. Podetia finely and densely squamulose..Cladonia squamosa
19. Podetia with squamules either coarse or sparse
20. Primary squamules conspicuous and large, 4-25 mm long
21. Podetia lacerated and perforate; squamules very large, often free of substrate.....Cladonia turgida
21. Podetia entire; squamules 5-15 mm long and strap-shaped; attached to soil
22. Squamules 5-15 mm long; K+ yellow changing to red.....Cladonia polycarpoides
22. Squamules mostly near 5 mm long; K-.....Cladonia sobolescens
20. Primary squamules smaller, 1-4 mm long, or absent
23. Podetia bone-white, pointed, and wormlike; no squamules; alpine.....Thamnolia subuliformis
23. Podetia not bone-white, pointed and wormlike
24. Podetia tall, 3-10 cm
25. Podetia moderately branched, often tipped with apothecia.....Cladonia subsubulata
25. Podetia unbranched or sparsely branched, ending in a point, cup, or larger apothecia
26. Podetia robust, 1.5-3 mm thick, 6-10 cm tall.....Cladonia maxima
26. Podetia thin, 1-1.5 mm thick, 3-6 mm tall.....Cladonia gracilis ssp. gracilis
24. Podetia shorter, usually < 3 cm
27. Apothecia tan or flesh-colored.....Cladonia botrytes
27. Apothecia brown to black
28. Apothecia small, less than width of podetia, usually covered with coarse squamules.....Cladonia atlantica
28. Apothecia larger, as wide as or wider than podetia; podetial squamules small or lacking
29. Podetia usually unbranched; apothecia smaller than or only slightly exceeding width of podetia.....Cladonia brevis
29. Podetia branched apically; sides markedly fissured and torn; apical apothecia clearly wider than subtending podetia.....Cladonia cariosa
15. Podetia barely developed, very short, or lacking (included below are those species commonly forming large squamulose mats with few if any podetia; many other Cladonia species will form small patches without podetia and cannot be easily identified)
30. Squamules finely divided and incised; apothecia, if present, sessile or on short podetia (< 1 mm).....Cladonia caespiticia
30. Squamules not finely divided
31. Squamules yellow-green above, yellow to cream below, forming compact heads; C+ green.....Cladonia strepsilis
31. Squamules greenish above, whitish below; C-
32. Squamules large and irregular, up to 7 mm wide and 25 mm long, upper surface often rugose; K+ weakly yellow.....Cladonia turgida
32. Squamules more uniformly strap-shaped, branching dichotomously at their ends, up to 4 mm wide, upper surface smooth; K+ yellow changing to red.....Cladonia polycarpoides

GLOSSARY OF LICHEN TERMS

- Annular (soralia): soredia in shape of a ring
Annular ring (Usnea): circumferential break in cortex
Apical (soralia): soredia at the terminal part of a lobe
Apothecia: disk-shaped or cup-shaped fruiting bodies of a lichen (or non-lichenized ascomycetes) containing spore-filled sacs
Apothecial: pertaining to apothecia
Areoles, Areolae: individual segments on the surface of the lichen thallus divided one from another by depressions or cracks
Areolate: characterized by having areolae
Axils open and closed (Cladonia): the upper angle or notch between the branches, either opening into the hollow interior or closed
C: a solution of calcium hypochlorite used for chemical tests, now usually replaced by sodium hypochlorite in liquid bleaches (e.g. Chlorox)
Capitate (soralia): soredia that are apical and in a semiglobular shape
Cephalodia (Peltigera, Stereocaulon, and Lobaria): localized group of blue-green algae and associated fungal tissue growing externally (Peltigera and Stereocaulon) or internally (Lobaria) on or in a thallus with green algae
Cilia: slender, hair-like outgrowths along margins of lobes
Ciliate: having cilia
Clavate (isidia): club-shaped, with an enlarged tip tapering to base
Corolloid (isidia and phyllocladia): richly branched like a coral with cylindrical branches
Cortex: the outermost layer of the thallus consisting of tightly compressed hyphal cells.
Cortical: having a cortex
Crateriform (soralia): in the form of a crater
Crenate: with rounded teeth along the edge
Crenulate: finely crenate
Crustose: a type of lichen growth form characterized by a strongly adhering crust in intimate contact with the substrate, lacking a lower cortex or rhizines
Dichotomous: dividing into 2 parts, such as the branching pattern of a fruticose thallus, foliose lobes, or rhizines
Entire: smooth and unbroken, e.g. the edge of a lobe
Esorediate: lacking soredia
Farinose (soredia): having soredia of small size, appearing under a lens as a fine powder (in contrast to granular)
Fibrils (Usnea and Bryoria): short, thin, lateral branches, at right angles to main branches
Foliose: a type of lichen growth form characterized by a dorsiventral, leaf-like thallus with the lower surface largely free of the substrate, at least in part; upper surface is different in some way from lower surface (unlike the fruticose growth form)
Fruticose: a type of lichen growth form characterized by a thallus that has erect stalks or is shrubby or is filamentous and pendulous; attached only at the base and with branches either flattened or round in cross-section; unlike the foliose growth form, little difference between upper and lower surface of branches
Gelatinous (Collema and Leptogium): becoming jelly-like when moistened because of the very high water holding capacity of the thallus
Granular (soredia): having soredia of a size large enough so that under a lens soredia each appear as distinct granules (in contrast to farinose)

Hyphae: microscopic filaments of fungal cells which collectively make up the lichen thallus

Hyphal: pertaining to hyphae

Hypothallus: a layer of hyphae found under the thallus of certain lichens, often tomentum-like; can extend out beyond the thallus edge

Isidia: small outgrowths (individual ones difficult to see without lens) from the upper cortex, functioning as vegetative dispersal units, always covered with a cortex; can be clavate, corolloid, granular, lobulate, peltate, spatulate, or squamiform

K: concentrated solution of potassium hydroxide used for chemical tests

KC: a chemical test using the K reagent followed by the C reagent at the same spot

Labriform (soralia): lip-shaped with soredia on lower, upturned surface

Laminal (soralia): soredia on the upper surface of the thallus away from the margin

Lobe: a rounded or strap-shaped division of a foliose thallus

Lobulate (isidia): resembling small lobules

Lobule: a small lobe forming along the margin or upper surface of a larger lobe

Marginal (soralia): soredia located along the lobe margin

Medulla: inner part of thallus, made up of loosely interwoven hyphae

Medullary: pertaining to the medulla

P: a solution of paraphenylenediamine used for chemical tests

Papillae: small, rounded bumps on the surface of the filaments in *Usnea*

Perithecia: flask-shaped fruiting bodies of certain lichens, with an apical pore and often immersed in the thallus, containing spore-filled sacs; usually only the pore is visible as a dot on upper lobe surface

Phyllocladia (Stereocaulon): small, granular, lobed leaflike, or corolloid appendages on branches

Plicate (Collema): folded or pleated

Podetia: upright, simple or branched, hollow structures formed by tissue of apothecial origin; in *Cladonia*, *Cladonia*, and *Pycnothelia*

Primary squamules (*Cladonia*): the squamulose thallus from which the podetia arise

Pruina: a fine, white, powder-like covering on the upper cortex or on the disk of apothecia

Pruinose: with pruina

Pseudocyphellae: round or elongate openings in the upper or lower cortex where the medullary hyphae come to the surface, usually lighter in color and appearing as spots or lines

Pseudopodetia: upright structures which resemble the podetia of *Cladonia* and *Cladonia* but are either not hollow or not of apothecial origin; found in *Baeomyces*, *Sphaerophorus*, *Stereocaulon*, and *Thamnolia*

Pycnidia: small, immersed, flask-shaped structures in which special spores (called pycnidiospores or conidia) are produced which are thought to function either in sexual reproduction or for vegetative dispersal

Revolvate: with margins rolled backwards or downwards

Rhizines: compressed strands of hyphae arising from the lower surface of many foliose lichens, serving for attachment to the substrate

Rugose: having a wrinkled surface

Scabrose: having a rough surface

Soralia: localized group of soredia; can be annular, apical, capitate, crateriform, labriform, laminal, or marginal

Soredia: vegetative dispersal units consisting of a few algal cells surrounded by hyphae and not covered by cortex; can be farinose (powdery) or granular

Spatulate (isidia): having a broad, rounded end and a narrow attenuate base

Squamiform (isidia): having the form of a squamule
Squamule: small scale-like thallus lacking a lower cortex or rhizines
Squamuliform (phyllocladia): having the form of a squamule
Squamulate: provided with squamules, as for example the podetia of
Cladonia
Squamulose: a type of lichen growth form characterized by aggregations
of crowded squamules
Squarrose: branching at right angles, as the short side branches of
certain rhizines
Striate: having superficial furrows and ridges
Terete: approximately circular in cross-section
Thallus: the vegetative body of a lichen, consisting of both fungus and
algae
Tomentose: covered with a tomentum
Tomentum: a felt-like mat of hyphae on the upper or lower surface of
the thallus
Veins (Peltigera): raised, branching, rib-like structures on the lower
surface
Verrucose (verruculose): with small wart-like growths on the surface

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Hypogymnia vittata (Ach.) Parr; H 73
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 (*Parmeliopsis aleurites* (Ach.) Nyl.)
Imshaugia placorodia (Ach.) S. F. Meyer, T13; H 116
 (*Parmeliopsis placorodia* (Ach.) Nyl.)
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 [Parmelia disjuncta Erichs.]
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Melanelia stygia (L.) Essl., R8; H 145
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Nephroma bellum (Sprengel) Tuck., T3, R5; H 135
Nephroma helveticum Ach., T3, R5; H 134
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Nephroma parile (Ach.) Ach., T3, R5; H 120
Nephroma resupinatum (L.) Ach., T3, R5; H 131
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Pannaria ahlneri P. Jørg., T4, R6; H 123
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Pannaria leucophaea (Vahl) P. Jørg.; H 233
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Pannaria pezizoides (Weber) Trevisan, S4
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Pannaria rubiginosa (Ach.) Bory, T6, R8; H 143
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 [Parmeliella triptophylla (Ach.) Müll. Arg.]
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Parmotrema crinitum (Ach.) M. Choisy, T8, R9; H 68
Peltigera apthosa (L.) Willd., S2; H 49
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Peltigera membranacea (Ach.) Nyl., S2; H 51
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Phaeophyscia hispidula (Ach.) Moberg; H 124
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 [*Physconia pulverulenta* (Schreb.) Poelt]
Physconia perisidiosa (Erichsen) Moberg
Phytoconis viridis (Ach.) Redh. & Kuyper
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Pseudevernia consocians (Vainio) Hale & Culb., T12, T21; H 88
Pseudocyphellaria crocata (L.) Vainio, T3; H 55
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Punctelia rudecta (Ach.) Krog, T12, R11; H 58
 [*Parmelia rudecta* Ach.]
Punctelia subrudecta (Nyl.) Krog, T7, T11; H 56
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Pyxine sorediata (Ach.) Mont., T11; H 86
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 Ramalina calicaris (L.) Fr.
 Ramalina dilacerata (Hoffm.) Hoffm., T19; H 211
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 Ramalina farinacea (L.) Ach., T19, R17; H 207
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 Ramalina pollinaria (Westr.) Ach., T19, R17; H 206
 Ramalina roesleri (Hochst. ex Schaerer) Hue, T19; H 205
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 Ramalina thrausta (Ach.) Nyl., T17; H 215
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 Stereocaulon dactylophyllum Flörke, R19; H 223
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 Stereocaulon nanodes Tuck.; H 223
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 [Cetraria halei Culb.]
 Tuckermannopsis aurescens (Tuck.) Hale, T2; H 47
 [Cetraria aurescens Tuck.]
 Tuckermannopsis ciliaris (Ach.) Gyelnik, T3, T6; H 134
 [Cetraria ciliaris Ach.]
 Tuckermannopsis fendleri (Nyl.) Hale, T6; H 139
 [Cetraria fendleri (Nyl.) Tuck.]
 Tuckermannopsis oakesiana (Tuck.) Hale, T2, R2; H 36
 [Cetraria oakesiana Tuck.]
 Tuckermannopsis orbata (Nyl.) Lai, T3, T6; H 134
 [Cetraria orbata (Tuck.) Nyl.]
 Tuckermannopsis pinastri (Scop.) Hale, T2; H 35
 [Cetraria pinastri (Scop.) S. Gray]
 Tuckermannopsis sepincola (Ehrh.) Hale, T6; H 139
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 Umbilicaria mammulata (Ach.) Tuck., R15; H 161
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 [Umbilicaria muhlenbergii (Ach.) Tuck.]
 Umbilicaria polyphylla (L.) Baumg., R15; H 167
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Xanthoparmelia conspersa (Ehrh. ex Ach.) Hale, R3; H 39
Xanthoparmelia cumberlandia (Gyelnik) Hale, R4; H 42
Xanthoparmelia plittii (Gyelnik) Hale, R3; H 40
Xanthoparmelia somloensis (Gyelnik) Hale, R4; H 43
 [*Xanthoparmelia taractica* (Krempfh.) Hale]
Xanthoparmelia tasmanica (J. D. Hook & Taylor) Hale, R4; H 44
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