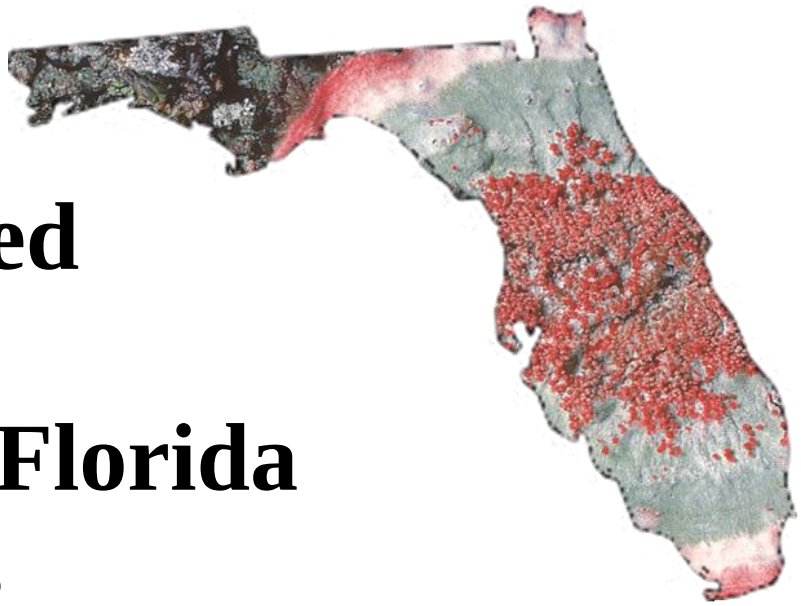
Field oriented keys to the Florida lichens



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December 12, 2015 Version
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Audience:
Ecologists, Fieldwork technicians, Citizen Scientists, Naturalists, Lichenologists, general Botanists

Potential Reviewers:
Doug Ladd
Rick Demmer
Dr. Bruce McCune
James Lendemer
Richard Harris

Introduction:

There is still much to learn about Florida macrolichens. Macrolichen diversity was first catalogued by Moore (1968), followed by Harris (1990, 1995). "Lichens of North America" also contains photographs and descriptions of many of Florida's macrolichens (Brodo et al. 2001). The aim of this book is to compliment these other resources and provide more field oriented keys to the macrolichen diversity. We hope to encourage the incorporation of lichens into field oriented ecological studies.

Many of the species included in the keys are based lists and information from Harris (1990, 1995). In a few cases with a few rare Genera, Harris' key very similar. Information was also compiled from Moore (1968), Brodo et al. (2001) and from unpublished research at Everglades National Park (Seavey- personal communication). The keys and their format are modified from Rosentreter and DeBolt 2010 (unpublished keys).

While Moore (1968) documented XXXX different ranges in Florida, and contains many excellent insights into lichen diversity in Florida. We however, are dividing Florida into three

geographic regions: The Florida Panhandle, north central Florida (Lake Okeechobee north to Jacksonville) and Everglades region (Lake Okeechobee south to the Florida Keys). The field work and basis for this key is mostly north central Florida, though many species in the other two regions are included. Observations on collections were based from collections by Roger Rosentreter, Ann DeBolt, and Barry Kaminsky. The 'format' for the "Keys to the common foliose lichens in the SE United States with an emphasis on North Central Florida" is modified from the unpublished format initially used by Jon Dey.

These keys will work for typical material. Notes on observed differences and ranges of traits in species will be mentioned. It will take some time to recognize difference between species and variation within a species.

As of November 2015, records of lichens from North America are still being placed online onto the Consortium of North American Lichen Herbaria (CNALH). We encourage you to utilize this website to map the range of species and for more information on distribution. As more records are placed online a clearer picture of Florida's unique lichen diversity will emerge.

Field Oriented keys to the Florida lichens:
These keys are focused on the macrolichens with a few easily distinguished crustose Genera.

Introductory Key

1) Thallus fruticose…**Key 1**
1) Thallus foliose… 2

2) Thallus yellow or orange… **Key 2**
2) Thallus green, gray, brown, or black… **Key 3**

Key 1- Fruticose

1) Thallus yellow to orange… ***Teloschistes exilis***
1) Thallus some shade of green, or reddish in one *Usnea* species… 2

2) Thallus composed of squamules and podetia, thallus hollow. Usually growing on sand, or decomposing wood, rarely found on small fallen litter… ***Cladonia***
2) Thallus erect or pendant or hairlike, growing on live bark, common on fallen litter… 3

3) Thallus hairlike, green, with yellow to orange to brown apothecia… ***Coenogonium*** (not treated)
3) Thallus erect or pendant, apothecia green… 4

4) Usually pendant (1 state wide common shrubby species), thallus with a central cord, with a solid axis that is hollow or solid… ***Usnea***
4) Usually shrubby (2 southern Florida pendant species), thallus without a central cord, always solid… ***Ramalina***

Key 2: Some shade of yellow or orange:

1) Lobes larger, 1-10 mm, Apothecia large <2mm, brown, known from the Panhandle... ***Vulpicida viridis***
1) Lobes smaller, fruitcose or tightly adhered to the bark. Apothecia small, orange, throughout Florida…2
2) Thallus fruitose …… ***Teloschistes exilis***
2) Thallus foliose tightly adhered to the bark ***…....Candelaria concolor***

Key 3: Some shade of green to gray/green:

Key applies to thallus color when dry

1) Thallus a shade of brown, olive, black, or bluish gray… 2
1) Thallus a shade of green to gray and white, not dark... 11

2) Lower side with yellow or white spots (with pseudocyphellae or cyphellae) … 3
2) Lower side without yellow or white spots (lacking pseudocyphellae or cyphellae)… 4

3) Lower side with white spots (cyphellae), never with yellow spots (pseudocyphellae)… ***Sticta***
3) Lower side not with white spots (cyphellae), with yellow spots (pseudocyphellae)… ***Pseudocyphellaria aurata***

4) Lower side with veins, veins broad and light to dark brown in color, lower side white between veins, along rivers that flood seasonally, known from 3 locations in Florida… ***Peltigera polydactylon***
4) Lower side without veins, lower side color various… 5

5) Lobes small, under 3 mm… **Physciaceae key**
5) Lobes large, above 3 mm… 6

6) Lower side tomentose, with clumps of rhizines; upper cortex olive to brown color, apothecia or lobules present, no soredia or isidia present… ***Lobaria***
6) Lower side not tomentose, upper cortex various colors, soredia or isidia present… 7

7) Thallus brown with large flat brown apothecia on lower side and/or flattened isidia on upper cortex… 8
7) Thallus brown, black, olive or blue gray, without large flat brown apothecia on lower side or without flattened isidia… 9

8) Lower surface not tomentose , with large flat brown apothecia on lower side and flattened isidia on upper surface... ***Nephroma helveticum***
8) Tomentose lower surface, without large flat brown apothecia on lower side, with flattened isidia on upper surface... ***Lobaria tenuis***

9) Gelatinous, jelly-like when wet, non-stratified thallus... ***Leptogium*/*Collema*/*Physma*** (see key under *Leptogium*)
9) Not gelatinous or jelly-like when wet, stratified thallus... 10

10) Apothecia red with white rim (lecanorine), isidia never present… ***Pannaria***
10) Apothecia tan to brown, lacking a white rim or isidia present… ***Coccocarpia***

11) Tomentose lower side, clumps of rhizines; pale underside; red apothecia or marginal lobules present… **Lobaria**
11) Not tomentose, rhizines present or not; red apothecia not present; lobules not present… 12

12) With cilia (true cilia, not rhizines)… 13
12) Without cilia… 14

13) Lobes wider than longer... **Parmeliaceae key**
13) Lobes longer than wider... **Physciaceae key** (*Heterodermia*)

14) On sandstone, one location in Florida… ***Xanthoparmelia conspersa***
14) On bark, or moss, never on rock… 15

15) Upper cortex with white dots (pseudocyphellae)… ***Punctelia rudecta***
15) Upper cortex without white dots (pseudocyphellae)… 16

16) Lower cortex with yellow spots (pseudocyphellae)… ***Pseudocyphellaria aurata***
16) Lower cortex without yellow spots… 17

17) With apothecia... 18
17) Without apothecia, soredia, isidia or no reproductive structures... 19
18) With brown apothecia, or brown at margins of apothecia... **Parmeliaceae key**
18) With black apothecia, or gray or white coated (pruina) on apothecia... **Physciaceae key**

19) Thallus surface texture cottony... ***Crocynia***
19) Thallus surface texture continuous and smooth or cracked... 20

20) Thallus circular, small, <5mm and aqua blue colored... ***Normandina pulchella***
20) Thallus various but not circular, small and bluish... 21

21) With isidia... 22
21) Without isidia... 24

22) Lower cortex orange... **Physciaceae Key** (***Heterodermia*)**
22) Lower cortex color various, not orange... 23

23) Almost crustose to adnate foliose... (**Physciaceae key**)
23) Foliose... **Parmeliaceae key**

24) Almost crustose to very adnate foliose; thallus color white to gray, to gray green… **Physciaceae key**
24) Leafier foliose; thallus color yellow green to green… **Parmeliaceae key**

Parmeliaceae key:

1) Cilia present, large and easily seen... 2
1) Cilia not present, or small and inconspicuous (appearing rhizine-like)... 4

2) Cilia without a bulbate (swollen) base, lobes large 4-20 mm wide, thallus often with large cracks, common throughout Florida... ***Parmotrema***
2) Cilia with a bulbate (swollen) base... 3

3) Cortex gray, common from Lake Okeechobee north... ***Bulbothrix***
3) Cortex yellow, two species in Florida, rare, known from the Florida Keys and the Florida Panhandle in old growth forests... ***Relicina***

4) With apothecia, soredia and isidia absent 5
4) Without apothecia, soredia and isidia present... 9

5) Lobes large 4-20 mm wide... ***Parmotrema***
5) Lobes small 0.5-6.0 mm wide... 6

6) Rhizines dichotomously branched... ***Hypotrachyna***
6) Rhizines simple or not dichotomously branched... 7

7) Medulla bright yellow... ***Vulpicida viridis***
7) Medulla pale yellow near algal layer or white... 8

8) Thallus green gray to green brown, apothecia with toothed margins, with white pseudocyphellae along thallus margin, all spot tests negative...***Tuckermanella fendleri***
8) Thallus yellowish green, apothecia without toothed margins, without white pseudocyphellae along margins, Cortex KC+ orange... ***Pseudoparmelia***

9) Lobes large 4-20mm wide... ***Parmotrema***
9) Lobes small 0.5-6.0 mm wide... 10

10) Underside black, thick and spongy like due to thick rhizines, known from Escambia county only, rare and probably restricted to Florida Panhandle, marginally isidiate... ***Anzia ornata***
10) Underside pale to black, not thick and spongy like, rhizines present but not very thick... 11

11) Cortex yellow green, pustulate, pustules break down to form coarse soredia; lowerside white... ***Parmeliopsis subambigua***
11) Cortex gray green, soredia and isidia various; lowerside various... 12

12) Rhizines dichotomously branched... ***Hypotrachyna***

12) Rhizines not dichotomously branched... 13

13) Soredia coming from pustules, medulla faintly yellow usually below soredia... ***Myelochroa aurulenta***
13) Soredia and isidia various, not coming from pustules... 14 (*Parmelinopsis, Canoparmelia, Imshaugia*)

14) Medulla C+ red or pink, or at least (KC+ red); underside black, sorediate.. ***Parmelinopsis***
14) Medulla C-; underside various, rarely entirely black, sorediate or not... 15

15) Lobes 1-2 mm wide, thallus K+ dark yellow, isidiate, often resembling *Physcia* sp., rare in FL... ***Imshaugiana aleurites***
15) Lobes 3-5 mm wide, thallus K+ light yellow, isidiate or sorediate, not resembling *Physcia* sp., common... ***Canoparmelia***

Physciaceae Key
1)lobes cottony, appearing sorediate ……..……..**Crocynia**
1) lobes small foliose not appearing sorediate over all the upper cortex ……..…..2

2) Isidia present... 2
2) Isidia not present... 3

3) Lower surface black, lacking rhizines… ***Dirinaria papillulifera***
3) Lower surface tan, with unbranched rhizines… ***Imshaugiana aleurites*** (in Parmeliaceae but resembles Physciaceae)

4) Cilia or rhizines resembling cilia present, lobes longer than wide, lobes appear to flow towards lobe tips, Lobes small (0.5-2 mm wide), lower cortex yellow or purple or lower cortex not present in some species... ***Heterodermia***
4) Cilia not present... 4

5) Rhizines lacking... 5
5) Rhizines present... 6

6) Underside black, lobes separable from the substrate, more adnate, rosette shaped thallus, lobes elongate and laterally confluent... ***Dirinaria***
6) Underside pale to black, lobes entirely adnate to the substrate, less adnate and not rosette forming, lobes not confluent... ***Hyperphyscia***

7) Cortex UV+ yellow or UV- and/or apothecia black, lacking a thalline margin and/or medulla white, yellow, orange to salmon colored... ***Pyxine***
7) Lichen not as above... 7

8) White lower surface, cortex K+ yellow… ***Physcia***
8) Black lower surface, cortex K-… ***Phaeophyscia/Physciella***

Bulbothrix (Loop lichen or Eyelash lichen)

Description: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Range: In Florida, south to Lake Okeechobee. In southeast United States mostly coastal plain on bark.

Notes: *B. isidiza* and *B. goebelii* are the most common species in Florida. *B. coronata*, which has apothecia and bulbate rhizines, is known only from eastern Texas.

B. confoederata
http://www.sharnoffphotos.com/lichens/bulbothrix_confoederata.html

Sources: Brodo et al. 2001; Hale 1976; Harris (1990 & 1995);
Benatti & Elix, 2012

Key:

1) Thallus not isidiate, apothecia present, medulla C+ red (lecanoric acid) ... ***B. confoederata*** (Smooth eyelash lichen)

1) Thallus isidiate, isidia often confined to a small portion or lobe of the thallus, apothecia absent, C+ red or pink, K- or K+ red ... 2

2) Lower side and rhizines black. Rhizines present and abundant. Medulla C+ red, K-, ... ***B. laevigatula*** (Matted eyelash lichen)

2) Lower side and rhizines beige to brown. Rhizines present, not abundant. Medulla C+ pink or K+ red ... 3

3) Medulla K+ red, C-, throughout Florida ... ***B. isidiza*** (Salted eyelash lichen)

3) Medulla K-, C+ rose to red, KC+rose, UV- northern Florida ... ***B. scortella*** (Rough eyelash lichen) Note: *B. scortella* was formerly called *B. goebelli*, due to a mis-typification of the species. *B. goebelli* is NIS, and is not known from North America.

B. laevigata


B. isidiza
http://www.sharnoffphotos.com/lichens/bulbothrix_isidiza.html


B. scortella- Close up of the bulbate cilia
Photo: Pamela Hess

Candelaria (Candleflame lichens)

Description: Foliose. Lobes small, closely attached to the barl, edges adnate but not entirely attached. Yellow colored upper surface. Medulla white. Lower surface white to pale brownish, corticate. Soredia present; apothecia rare. Spot tests: Thallus, all negative. Unique features: **One of the few yellow foliose lichens in Florida.**

Range: North of Lake Okeechobee.

Notes: Often found on orange trees in orchards, or in nitrogen rich environments. One species is known from Florida, *Candelaria concolor*.

Sources: Brodo et al. 2001

Candelaria concolor
http://www.sharnoffphotos.com/lichens/lic_img_1/candelaria_concolor_2.jpg

Canoparmelia (Cloud lichen)

Description: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Pale greenish-gray to yellowish upper surface. Apothecia rare. Soredia or isidia present. **Maculate or not maculate**. **Non ciliate**. **Rhizines unbranched**. Spot tests various. Unique features: **Lobes are cloud-like or ruffled** with a certain amount of 3-D texture in the lobes.

Range: Throughout Florida. *C. martinicana* is only known from the Florida Keys and Everglades, *C. amazonica* and *C. cryptochlorophaea* are found throughout FL, while the other species (*C. caroliniana*, *C. salacinifera*, and *C. texana* are restricted north of Lake Okeechobee.

Notes: On bark, often on conifers. Not included in the key is, *C. martinicana*, a tropical lichen, which is PD+, K-, and has inflated isidia, photo below.

Sources: Brodo et al. 2001; Harris 1990, 1995

Key:

1) Thallus isidiate... 2
1) Thallus sorediate… 4

2) Thallus not maculate, medulla UV-, K+ red or KC+ pink… 3
2) Thallus maculate, medulla UV+ blue white, K-, KC- ……..
…….. *C. caroliniana* (**Carolina cloud lichen)**

C. caroliniana Schumm

3) Lower surface jet black, medulla K-, KC+ pink... *C. amazonica* (**Florida cloud lichen**)
3) Lower surface brown, medulla K+ yellow to red, KC-, rare in Florida
... *C. salacinifera* (**Salted Cloud lichen**)

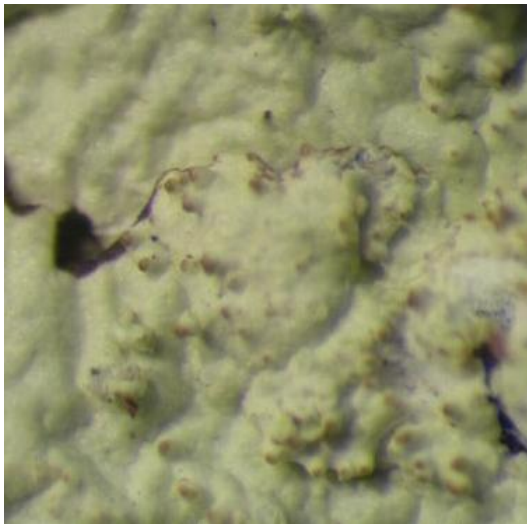
C. amazonica
Photo: Pamela Hess

C. salacinifera
Photo: Pamela Hess

4) Soredia on raised lobes… *C. cryptochlorophaea* (**Powdered cloud lichen**)
4) Soredia not on raised lobes… *C. texana* (**Texas cloud lichen**)

C. cryptochlorophaea Troy McMullin

C. texana http://www.tropicallichens.net/1851.html



C. martinicana (cropped to show isidia)
tropicallichens.net

Cladonia

Description: Consisting of **two parts, squamulose primary thallus, and an erect fruticose structure called podetia**. Squamules small to medium. Podetia small to large. Pale greenish-gray to white to yellowish upper surface. Apothecia or soredia present. Never isidiate. Apothecia brown or red or tan. Spot tests various. Unique features: **Sometimes intricately webbed** as in *C. evansii.*

Range: Throughout Florida. Some species have strong habitat preference

Notes: On bark, often on conifers. Tables of key characteristics are presented for each group of species for easy comparison.

Additional uncommon or rare *Cladonia* species in Florida:
C. cinerella- Only known from a few populations in Everglades National Park. This species is probably confined to tropical hammocks in southern Florida. It is common in the Caribbean islands. It has atranorin as a major chemical compound.
C. nana- Rare in North America, known from Everglades National Park, and a few state parks in Florida.
Sources: Brodo et al. 2001; Harris 1990, 1995; DeBolt et al. 2007,

Key:

1a. Podetia intricately branched, generally more than 5x ; the branch tips pointed; primary squamules usually lacking……..……..…...**Key 1**
1b. Podetia simple or sparingly branched, primary squamules usually present…… **2**
2a. Apothecia red……..…….**Key 2**
2b. Apothecia tan, brown or lacking…… **3**
3a. Podetia lacking, apothecia lacking……. *C. prostrata*
3b. Podetia present…….….. **4**
4a. Podetia forming definite cups……. **Key 3**
4b. Podetia not forming definite cups…..…… **Key 4**

Key 1

Podetia intricately branched. Primary squamules usually lacking.

1a. Cortex well developed, podetia often appearing glossy……..….**2**
2a. Podetia coarse, perforate, on white sugar sand, rare … ……*C. perforata*

Perforate Lichen

2b. Podetia coarse or fine but not perforate…….**3**

3a. Podetia PD+……...**4**

4a. Podetia squamulose, especially near the base, PD+ red (fumarprotocetraric acid), various habitats …… *C. furcata*

Many-forked Cladonia

4b. Podetia not squmulose, PD+ yellow……..**5**

5a. Podetia fine and hair-like, apothecia lacking; on white sugar sand, rare ……*C. subsetacea*

Spaghetti Lichen

5b. Podetia coarse, usually tipped with red apothecia; lacking in some populations, very common .....*C. leporina*

Jester Lichen

3b. Podetia PD-

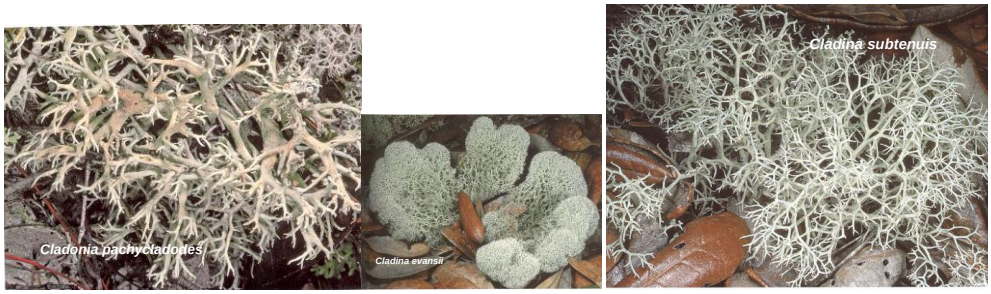
6a. Podetia gray-white -cream, cortex fuzzy, infrequent, in white sand
C. pachycladodes
Lazy Cladonia

1b. Cortex poorly developed, podetia usually appearing dull and fibrous

7a. Podetia usually white or gray-white but sometimes tinged with yellow-green toward the apex, PD-; forming compact subglobose colonies *C. evansii*
Syn.: *Cladina evansii*
Powder-puff Lichen or Deer Moss

7b. Podetia gray-white or yellow-green, PD+ red; forming loose subglobose or irregular colonies……**8**

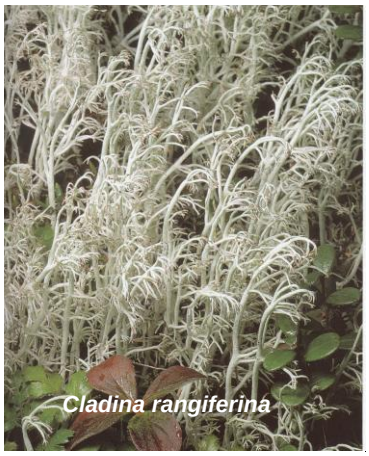
8a. Podetia generally yellow-green, occasionally gray, K-; common
C. subtenuis
Syn.: *Cladina subtenuis*
Dixie Deer Lichen



8b. Podetia gray, K+ yellow (atranorin); rare……..**9**

9a. Most branches terminate in whorls; on sand in north Florida
C. rangiferina
Syn.: *Cladina rangiferina*
Gray Reindeer Lichen

9b. Most branches terminate in dichotomies; on limestone in the Everglades and sandy habitats across the state, less densely branched than C. subtenuis … *C. sandstedei*
Syn.: *Cladina sandstedei*



Cladonia sandstedei
Photo: Pamela Hess

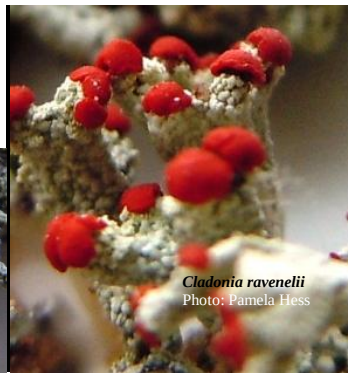
Table 1. Characteristics of species in Key 1. Podetia Intricately Branched
Y= yellow, R= red

Taxa	Common Name	Podetia	Apothecia	Chemistry		Habitat/ Substrate
				K	PD	
evansii	powder-puff deer	rounded, 3-6 cm	--	K+ Y	PD-	Sand
furcata	many-forked Cladonia	funnels present, pale green	brown	K-	PD+ R	Sand/soil wood
leporina	jester lichen	curved tips, yellow-green	red	K+ Y	PD+ Y	Sand/soil/ wood
pachycladodes	thick-walled Cladonia	bent tips, 25-50 mm	yell-brown (rare)	K-	PD+ Y	White sand
perforata	perforated Cladonia	pale green-yellow, 20-60 mm, shiny	--	K-	PD-	White sand
rangiferina	gray reindeer lichen	white-silver gray	--	K+ pale Y	PD+ R	Sand/soil
sandstedei	K+ Dixie deer lichen	pale yellow-green, dichotomous, slender	--	K+ Y	PD+ R	Sand/soil
subsetacea	lazy Cladonia	delicate in lax, tangled, recumbent colonies	--	K-	PD+ Y or R	White sand
subtenuis	Dixie deer lichen	pale yellow-green, dichotomous, slender	--	K-	PD+ R	Sand/soil

Key 2

Podetia simple or sparingly branched. Primary squamules usually present. Apothecia red.

1a. Basal squamules usually lacking, podetia much branched, very common *C. leporina*
Jester Lichen



1b. Basal squamules present, podetia simple or sparingly branched……...**2**

2a. Basal squamules granulose, often dissolving into sorediate masses; gray colored thallus; didymic acid present, usnic acid lacking, Podetia sorediate, common on wood
C. ravenelii
Ravenel's Cup Lichen

2b. Basal squamules not granulose……..**3**

3a. Basal squamules at least partially sorediate……...**4**

4a. Podetia corticated, non-sorediate, not darkening; usnic acid present, green colored, common ……*C. incrassata*
Powder-Foot British Soldiers

4b. Podetia partially non-corticate……....**5**

5a. Podetia nearly all sorediate (farinose); primary squamules with marginal soredia, green, contains usnic acid. .....*C. macilenta*
Lipstick Powderhorn or Pin Lichen

5b. Podetia sorediate on the lower half, primary squamules rounded, limited soredia or soredia lacking, grey colored,

lacking usnic acid

……

C. floerkeana
Gritty British Soldiers

3b. Basal squamules esorediate……...……**6**

6a. Surface of podetia K+, PD+……...**7**

7a. Basal squamules large, streaked with yellow below, often on the base of old trees or snags. ……*C. hypoxantha*

Cup Lichen

7b. Basal squamules smaller, not streaked with yellow below……..**8**

8a. Podetia densely squamulose, partially ecorticate, darkening

C. didyma var. *vulcanica*

Southern Soldiers

8b. Podetia rarely squamulose, completely corticated and not darkening; On *Taxodium* (cypress) and wood

C. abbreviatula

Cup Lichen

6b. Surface of podetia K-, PD-……...….**9**

9a. Podetia partially ecorticate, sorediate, ecorticate areas darkening; common in areas of dense vegetation

C. didyma

Southern Soldiers

9b. Podetia completely corticated, esorediate, not darkening; on wood, rare ……. *C. cristatella*

British Soldiers

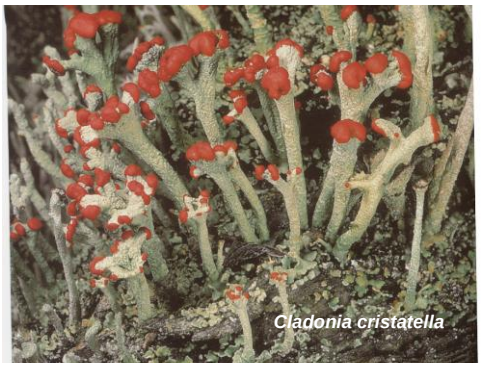


Table 2. Characteristics of species in Key 2. Podetia Sparingly Branched, Apothecia Red.
Y= yellow, R= red, O= orange

Taxa	Common Name	Podetia	Sorediate	Chemistry		Habitat/ Substrate
				K	PD	
abbreviatula	Short *Cladonia*	Yellow-green, short, turbinate, UV+	No	K+ Y	PD+ deep Y	Wood
cristatella	British soldiers	Unbranched (or at tips), green, cups absent, <25mm	No	K-	PD-	Wood
didyma	Southern soldiers	Unbranched, green gray, 10-30 mm	Yes	K-	PD-	Wood
didyma var. vulcanica	Southern soldiers	Unbranched, green gray, 10-30 mm	Yes	K+ Y	PD+ O	Wood
floerkeana	Gritty British soldiers	Unbranched, green-gray, 5-20 mm, cups absent	No	K-	PD-	Wood
hypoxantha	Yellow striped *Cladonia*	Poorly developed, yellow band on lower side of squamules	No	K+ Y	PD+ deep Y	Woody base of trees
incrassata	Powder-foot British soldiers	Unbranched, 8 mm, usnic acid, green	Yes	K-	PD-	Wood
leporina	Jester lichen	Branched (curved tips), yell-green	No	K+ Y	PD+ Y	Sand/soil/ wood
macilenta	Lipstick lichen	Unbranched, slender gray-green, 10-30 mm, cups absent	Yes	K-	PD-	Wood/soil
ravenelii	Ravenel's cup lichen	Well developed, gray colored	No, appear as large granules but they are not soredia	K+ Y	PD+ deep Y	wood

Cladonia prostrata

Podetia rarely developed; basal squamules large, to 4 mm long, loosely attached to the substrate and curling up at the edges, on sand, Common ……*C. prostrata*

Cigarette ash or Resurrection lichen
Or Fetta cheese on salad.

Table 3. Characteristics of *Cladonia prostrata.*
Y= yellow, R= red

Taxa	Common Name	Podetia	Sorediate	Apothecia	Chemistry		Habitat/
					K	PD	Substrate
prostrata	Resurrection lichen	Lacking or stubby	No	Lacking	K+ Y	PD+ R	Sand

Key 3

Podetia simple or sparingly branched. Primary squamules usually present. Apothecia tan, brown, forming recognizable cups

1a. Cups proliferating either marginally or from the center ……**2**

2a. Podetia PD+ yellow, on wood, rare ……*C. rappii*
Slender Ladder Lichen

2b. Podetia PD+ red or red-orange, on organic matter or wood, common …*C. subradiata*
Syn: *C. balfourii* **Powdery Subradiata**

1b. Cups not proliferating……**3**

3a. Podetia PD+ or PD-, grayanic acid present; rare in north Florida *C. grayi*
Cup Lichen

3b. Podetia PD+, grayanic acid lacking; sporadic throughout the state *C. chlorophaea*
Mealy Pixie-cup

Table 4. Characteristics of species in Key 3. Single and Sparingly Branched, Apothecia tan, or brown; with recognizable cups. Y= yellow, R= red, Br= brown

Taxa	Common name	Podetia	Cups	Sorediate	Apothecia	Medulla K	Medulla PD	Habitat/ substrate
chlorophaea	Mealy pixie-cup	Br-green, 35mm	Simple, terminal	Yes	--	K-	PD+ R	wood
grayi	Grayanic acid pixie cup	Gray-green Broad cups	Simple, terminal	Yes	--	K-	PD-	Wood
rappii	Slender ladder lichen	Gray-green, 15-40mm,	Multiple cups along podetia	No	Dark Br	K-	PD+ Y	Sand/soil
subradiata	Powdery subradiata	Cylindrical, 10-20mm	Simple, terminal	Yes	Dark Br, small	K-	PD+ Y	Wood/ organic matter

Key 4

Podetia simple or sparingly branched. Primary squamules usually present. Apothecia tan, brown; not forming recognizable cups

1a. Podetia sorediate……**2**

2a. Basal squamules granulose-sorediate, much divided; podetia PD+, K+, on wood ……*C. parasitica*
Fence-rail Cladonia

2b. Basal squamules esorediate, rounded; podetia PD+, K-……**3**

3a. Podetia ecorticate except at the very base; when sterile, terminating in a flat top, most common and wide spread sorediate species with podetia .....*C. subradiata*
Syn.: *C. balfourii;* **Powdery Subradiata**

3b. Podetia at least partially corticated; when sterile, blunt at the apex *C. ramulosa*
Syn.: *C. pitryea* **Cup Lichen**

1b. Podetia esorediate……..**4**

4a. Podetia K+……...……**5**

5a. Podetia branched, PD+ yellow or yellow-orange (thamnolic acid)……**6**

6a. Podetia irregularly branched, appearing flattened, coarsely areolate cortex …….*C. santensis* **Cup Lichen**

6b. Podetia branching to form corymbose clusters, finely areolate *C. floridana*
Bramble Cladonia

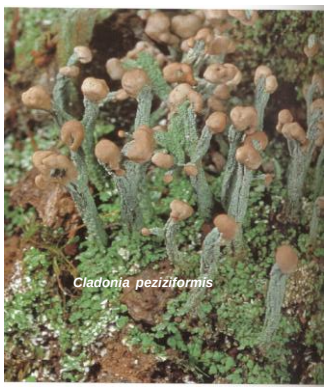
5b. Podetia usually unbranched, PD+ red or yellow; Atranorin present or absent, stictic and norstictic acid generally present; common in north Florida

C. subcariosa
Syn.: *C. polycarpia*; *C. polycarpoides*
Cup Lichen or Peg Lichen

4b. Podetia K-……**6**

6a. Podetia PD- or reaction not determinable……..**7**

7a. Podetia completely corticated, areolate, directly on soil or sand, common early successional species …….. *C. peziziformis*
Syn.: C. leptothallina **Turban Lichen**



7b. Podetia mostly ecorticate ……..*C. botryocarpa*
Cup Lichen

6b. Podetia PD+……..……...**8**

8a. Podetia PD+ yellow, fruit pale brown to dark brown often on Taxodium, In the Pan handle, check the chemistry for C. buckii, squamatic acid, UV+
C. beaumontii
Pale-fruited Funnel Lichen

8b. Podetia PD+ red…… **9**

9a. Podetia appearing twisted or torn, usually less than 1 cm tall, common early successional species ……. *C. peziziformis*
Syn.: *C. capitata* **Turban Lichen**

9b. Podetia not appearing twisted or torn, to 2.5 cm tall, squamules lobes
C. simulata
Cup Lichen

Table 5. Characteristics of species in Key 3. Single and Sparingly Branched, Apothecia Tan Brown; without cups. Y= yellow, R= red, O= orange; Br= brown

	Common Name	Podetia	Soredia present	Apothecia	Chemistry		Habitat/
					K	PD	Substrate
beaumontii	Pale-fruited funnel lichen	Gray-green, with squamules	No	Pale Br to Br	K-	PD+ Y	Wood
botryocarpa	Cup lichen	Simple, decorticate	No	Br	K- KC+	PD-	Soil/wood
floridana	Bramble *Cladonia*	Branched, slender, 25 mm, pale green-gray	No	Br	K+ deep Y	PD+ O	Soil
parasitica	Fence-rail lichen	Sparse or absent, 3-10 mm,	Yes	Pale R-Br	K+ Y	PD+ O	Wood
peziziformis	Turban lichen	Unbranched, slender, 10-20mm	No	Br, large	K-	PD+ R	Soil
subcariosa	Peg lichen	Unbranched, broad at top; 10-30mm	No	Br in cluster	K+ Y, R or K-	PD+ Y to Y	Wood
ramulosa	Cup lichen		Yes	Br	K-	PD+ R	Soil
santensis	Cup lichen	Short, rarely branched	No	--	K+	PD+ Y to O	Wood
simulata	Branched turban lichen	Branched, poorly developed cups	No	Br	K-	PD+	Wood/soil
subradiata	Powdery subradiata	Cylindrical, 10-20mm	Yes	Dark Br, small	K-	PD+ R	Wood/ organic matter

Coccocarpia (Shell lichen)

Description: Foliose. Lobes medium or small, closely attached to the bark, edges adnate but not attached. **Pale blue-gray upper surface**. White medulla. Isidia present, never sorediate. Apothecia often present, brown to black. Rhizines present, unbranched often thick. Spot tests negative, no chemicals. Unique feature(s): The larger species *C. erthroxyli* and *C. palmicola* can be distinguished by the thick bluish thallus. The small lobe species (under 2 mm) are the only small gray to **blue color** species of any genera in Florida. Other blue colored genera in Florida include *Pannaria* and some species of *Leptogium*. *Pannaria* species in Florida have apothecia and have a thick thalline margin around the apothecia, while *Coccocarpia* species have a thin thalline margin around the apothecia or lack a thalline margin.

Range: *C. domingensis*, *C. erthroxyli* and *C. palmicola* are found throughout Florida. The ranges of the other species are poorly known and are not well collected to determine their range.

Notes: On bark or on other lichens, mostly hardwood bark. The lobe size of *C. palmicola* and *C. erythroxyli* may be variable depending on location and habitat. North American collections are treated as wide lobed (2-7 mm wide). Smaller lobed species may be under reported in North America due to small size or restricted habitat requirements. Coccocarpia filiformis resembles Polychidium dendriscum but differ in their spores (*Coccocarpia* is 1 celled, *Polychidium* 2)

Sources: Brodo et al. 2001; Arviddson 1982, Lücking et al. 2007; Kaminsky et al. 2013

C. palmicola
http://www.sharnoffphotos.com/lichensB/lic_img2/coccocarpia_palmicola_3.jpg

Key:

1) Isidia present, apothecia absent... 2
1) Isidia absent, apothecia present, or not... 4

2) Lobes large (2-5 (-12) mm wide), lacking secondary branching lobes wider than longer, common throughout Florida ... ***C. palmicola*** (Salted shell lichen)
2) Lobes small (0.2 -2 mm wide), longer than wider, with secondary branching lobes... 3

3) All lobes flat, never curved, lobes never ascending or descending, isidia cylindrical to flattened, throughout Florida ... ***C. domingensis*** (Blue shell lichen)
3) Primary lobes flat, secondary branching lobes curved ascending or descending. Isidia flattened on margins (lobules). Known from Central Florida ... ***C. prostrata*** (Prostrate shell lichen)

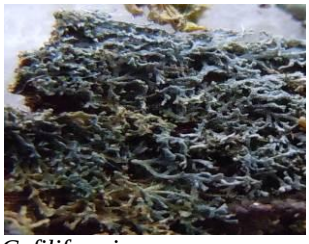
C. prostrata
Photo: Pamela Hess

C. domingensis
http://multimedia.inbio.ac.cr/m3sINBio/getImage?size=big&id=25231

4) Lobes large (2-7 (-12) mm wide), wider than long, common throughout Florida ... ***C. erythroxyli*** (Fruiting shell lichen)
4) Lobes small (0.2 -2 mm wide), longer than wide... 5

5) Thallus not minutely fruticose, flat, lobes 0.2 – 0.5 mm wide, uncommon in Florida ... ***C. stellata*** (Star-shaped shell lichen)
5) Thallus minutely fruticose, lobes under 0.1 mm wide, known from north-central Florida to the Panhandle; in the past it was miss identified as *Polychidium dendriscum*
... ***C. filiformis*** (Blue thread shell lichen)

C. erythroxyli
http://www.sharnoffphotos.com/lichensB/coccocarpia_erythroxyli.html



C. filiformis
Photo: Pamela Hess

C. stellata
http://content60.eol.org/content/2011/08/11/16/08730_580_360.jpg

Coenogonium (Pixie-hair lichens)

Description:

Template: Filamentous lichen usually forming light orange to pale green cottony tufts 10-30 mm across, coalescing into small shelf-like colonies in a few species. Each hair-like element of the thallus consists of a filament of the green algae *Trentepohlia*, enveloped ina network of fungal hyphae. Apothecia biatorine, yellow to pale orange, slightly stalked in some species disks usually flat, with thin, persistent margins, paraphyses unbrached, spores 1-2 celled, colorless, ellipsoid, 8 spores per ascus in eith a single row or two irregular rows. Chemistry: no known lichen substances.

Range: poorly known but probably throughout the state.

Notes: Probably more common than it is known.

Sources: Brodo et al. 2001

Only one species is known from Florida at this time. *Coenogonium implexum*, **Pixie-hair**.

Crocynia (Cotton lichen)

Description: Crustose lichen with a thick, cottony, bluish gray thallus. It often appears foliose, with distinct adnate lobes. Light green to bluish-gray color upper surface, **upper cortex ecorticate**. Lobe margins, 0.4-1.3 mm wide, Black hypothallus present. Often sorediate in older parts of thallus; Apothecia rare to lacking and isidia lacking. Photobiont green. Chemistry: Thalus PD+ orange, K+yellow, KC-, C-, atrnorin, strictic acid, triterpenes, and fatty acids. Unique feature(s): Looks like a *Lepraria* but has a black hypothallus.

Range: Throughout Florida

Notes: Two species are known from the state: *C. gossypina*, lack stictic acid while *C. pyxinoides* has stictic acid (K+ yellow, PD+ orange).

Sources: Brodo et al. 2001

Key:

1) With stictic acid (Medulla K+ yellow)… C. pyxinoides
1) Without stictic acid (Medulla K-)… *C. gossypina*

C. gossypina

Crocynia pyxinoides.
http://www.nhm2.uio.no/botanisk/lav/Photo_Gallery/Crocynia/pyxinoides_G=Peru+Loreto_C=ET_H=O-L144546_I=DSC_6652.jpg

Dirinaria (Medallion lichen)

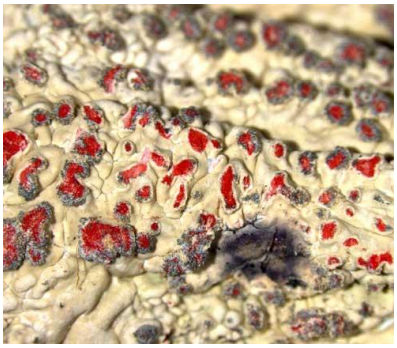
Description: Foliose. Lobes small (1-4 mm wide), closely attached to bark. Pale gray or greenish upper surface. Medulla white. Soredia, isidia or apothecia present. **Rhizines not present, or sparse**. Spot tests negative except for two species that are UV+ blue or white. Unique feature(s): **Lobes have a wavy texture to the surface**.

Range: Common, throughout Florida. *D. leopoldii* is uncommon but may be more widespread

Notes: *D. leopoldii* is the only macrolichen with a red medulla in Florida

Sources: Brodo et al. 2001; Harris 1995

Key:



D. leopoldii
http://www.seaveyfieldguides.com/Lichens/photo_pgs_d/dirinaria_leopoldii2.html

1) Medulla red... *D. leopoldii* (**Leopold Medallion lichen**)
1) Medualla white... 2

2) With apothecia, not sorediate or isidiate... 3
2) Without apothecia, sorediate or isidiate... 5

3) Apothecia purple to slightly purple/black, usually abundant… *D. purpurascens* (**Purple eyed Medallion lichen)**
3) Apothecia not purplish, most black, difficult to determine in the field... 4

D. confusa
http://www.sharnoffphotos.com/lichensB/dirinaria_confusa.html

D. confluens
http://www.sharnoffphotos.com/lichensB/dirinaria_confluens.html

D. purpurascens
http://www.seaveyfieldguides.com/Lichens/photo_pgs_d/dirinaria_purpurescens.html

4) Medulla UV+ white... *D. confusa* (**UV+ white Medallion lichen**)
4) Medulla UV+ blue... *D. confluens* (**Wavy Medallion lichen**)

5) Isidia to isidiate pustulate, soredia absent,... 6
5) Isidia not present, soredia present, throughout Florida... 7

6) True isidia, known from Okeechobee and Citrus counties,
and south of Lake Okeechobee...
D. papillulifera (**Isidiate Medallion lichen**)
6) Isidiate pustulate... *D. aegialita* (**Grainy medallion lichen**)

D. papillulifera
Photo: Pamela Hess

D. aegialita
Photo: Pamela Hess

7) Lobes plane, not confluent, irregularly branched; apices truncate; throughout Florida, UV+ blue, common ……... *D. picta* (**Powdery medallion lichen**)
7) Lobes often convex, confluent; apices flabellate; throughout Florida, UV+ blue, common …
... *D. applanata* (**Confluence Medallion lichen**)

D. picta
http://www.sharnoffphotos.com/lichensB/dirinaria_picta.html

D. applanata
http://www.sharnoffphotos.com/lichensB/dirinaria_applanata.html

Heterodermia (Fringe Lichen)

Description: Foliose. Lobes small to large, center of lobes attached to bark. Edges of lobes free or adnate. **Pale gray upper surface to whitish**. White medulla. Soredia, isidia or apothecia present. **Lower side white, orange, or purplish gray in some species**. White cilia present in a few species. Cilia are pale rhizines. Spot tests various, K+ yellow, or orange, most species KC-, C-. Unique feature(s): Lobes appear to radiate out from center of thallus. **No lower cortex in some species**.
Range: Throughout Florida, although many species reported only from north of Lake Okeechobee while *H. albicans*, *H. pseudospeciosa* and *H. leucomela* reported throughout the state including south of Lake Okeechobee.

Notes:

Sources: Brodo et al 2001**;** Harris 1995, Lendemer et al. 2007; Lendemer, 2009

Key:

1) Thallus lobes ascending or descending, not adnate to bark, rare, Ocala National Forest and north, all rare… *H. leucomela*, *H. echinata*, *H. barbifera*
These three are rare species, or need further taxonomic study in Florida (Lendemer 2009) see the *Heterdermia* comparison chart for determinations.
1) Thallus adnate to bark… 2

2) Underside ecorticate… 3
2) Underside corticate… 8

3) Underside entirely pigmented orange; not pigmented yellow or purple, never unpigmented, underside K+ purple … 4
3) Underside sparsely pigmented yellow or entirely pigmented yellow or purple, or unpigmented, underside K-… 5

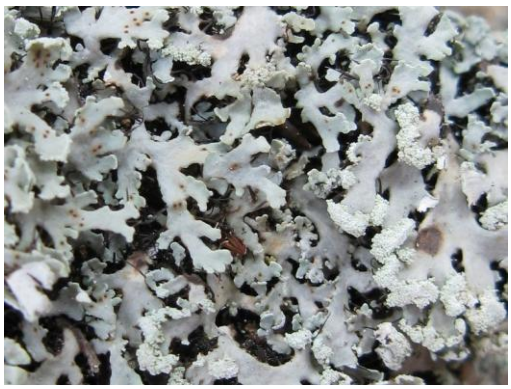
4) Laminally isidiate, when isidia erode looks like pustulate sorediate scars… *H. crocea* ……..(**Orange-bellied Fringe lichen**)
4) Granular sorediate at lobe tips… *H. obscurata* (**Orange-tinted fringe lichen**)


H. crocea- orange underside
Photo: Pamela Hess


H. obscurata- sorediate upper side
http://www.sharnoffphotos.com/lichensC/heterodermia_obscurata.html

5) Underside sparsely pigmented orange, lowerside K+ purple, disjunct population in Ocala National Forest… *H. neglecta (***neglected fringe lichen***)*
5) Underside pigmented yellow (sparsely to strongly), or unpigmented; lowerside K-… 6

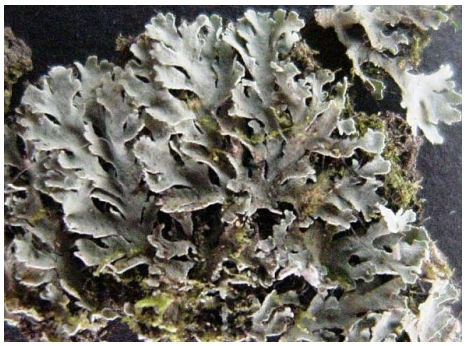
6) Rhizines thyrsiform (with many side branches, not squarrose) pale, soredia fine and terminal …… *H. galactophylla (***Pale rhizined fringe lichen***)*
6) Rhizines squarrose (with few side branches, not squarrose)… 7


H. neglecta Felix Schumm


H. galactophylla Felix Schumm

7) Underside not pigmented yellow; medulla K-… *H. japonica (***Japanese fringe lichen**)
7) Underside pigmented yellow; medulla K+ red (norstictic)… *H. casarettiana (***fringe lichen***)*


H. japonica Felix Schumm


H. casarettiana Felix Schumm

8) Soralia linear along lobe edges, K+ yellow to red, KC- ... *H. albicans* (**White fringe lichen**)
8) Soralia crescent shaped along lobe tips; medulla K+ yellow to orange, KC+- yellow or yellow to orange ……..… 9

9) Medulla K+ yel, corticolous, ……..… *H. speciosa* (**Powdered fringe lichen**)
9) Medulla K+ y- orange, mostly saxicolous… *H. pseudospeciosa* (**K+ orange powdered fringe**


H. albicans
http://www.sharnoffphotos.com/lichensC/heterodermia_albicans.html


H. speciosa/H. pseudospeciosa
http://www.sharnoffphotos.com/lichensC/heterodermia_speciosa.html

Comparison chart for the *Heterodermia* species in Florida

Species	Lobes	Lower surface	Lower surface color	Lower surface K test	Soredia/isidia	Additional distinct characteristics
albicans	Adnate	Corticate	White	NA	Soredia	Medulla K+ yellow to red
barbifera	Ascending	Ecorticate	White	NA	Soredia	Rhizines branched
casarettiana	Adnate	Ecorticate	Yellow	minus	Soredia	Rhizines squarrose; medulla K+ red
crocea	Adnate	Ecorticate	Entirely orange	purple	Isidia	NA
echinata	Ascending	Ecorticate	White	NA	Soredia	Rhizines simple
galactophylla	Adnate	Ecorticate	White	minus	Soredia	Rhizines thryse like, Pale
japonica	Adnate	Ecorticate	White	minus	Soredia	Rhizines squarrose, medulla K-
leucomela	Ascending	Ecorticate	White	NA	Soredia	Lobes long and pendant, strap-like
neglecta	Adnate	Ecorticate	Sparsely orange	purple	Soredia	NA
obscurata	Adnate	Ecorticate	Entirely orange	purple	Soredia	NA
pseudospeciosa	Adnate	Corticate	White	NA	Soredia	Medulla K+ yellow to orange
speciosa	Adnate	Corticate	White	NA	Soredia	Medulla K+ yellow

Heterodermia echinata, uncommon, lobes Ascending, sorediate, simple rhizines.

H. echinata

Hyperphyscia (Shadow-crust lichen)

Description: Foliose. **Lobes very small (0.5-2 mm wide), tightly attached to the bark**. Upper surface brown gray to gray. Medulla white or orange (in older sections of lobes). Lower surface pale to black. Apothecia or soredia present, never isidiate. Rhizines sparse to lacking. Cortex: no substances, medulla K-, or K+ purple (if medulla orange). Unique features: This is the **smallest lobed** genera in the state. *Phaeophyscia* spp, which are similar in size to *Hyperphyscia* spp are usually less closely attached to the substrate. Black hypothallus present in 1 species (*H. minor*).

Range: Throughout Florida. *H. pyrithrocardia* is the most common species, and *H. adglutinata* is a rare species, known from only two locations near Tampa, FL.

Notes: Four species are known from Florida. Due to their small size, they are often overlooked. The genus was recently revisioned (Esslinger et al. 2012), and *H. pyrithrocardia* was described as new to North America. These small lobed species may be under reported in North America due to small size or restricted habitat requirements.

Sources: Harris 1995; Esslinger et al. 2012.

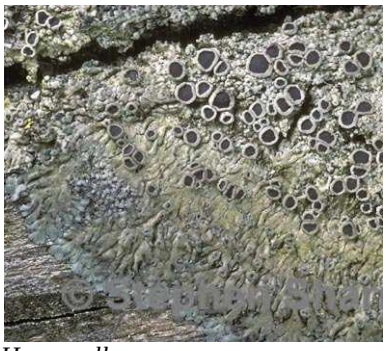
H. pyrithrocardia

Key: (Modified from Esslinger et al. 2012.)

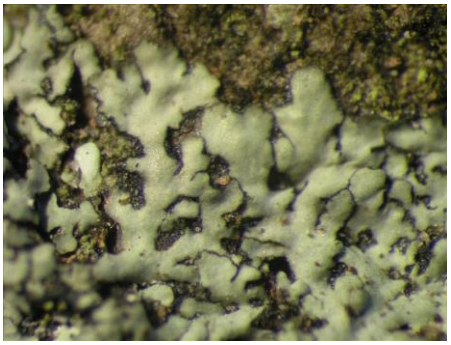
1) Medulla orange (skyrin- K+ purple) more or less throughout the thallus (sometimes) faint or missing in youngest lobes), at least the lower part of the medulla
... *H. pyrithrocardia* (Orange shadow-crust lichen)
1) Medulla white (very rarely with trace orange pigments)... 2

2) Thallus with apothecia, not sorediate
... *H. syncolla* (Fruiting shadow-crust lichen)
2) Soredia present, apothecia absent... 3

3) Thallus with a black lower surface, black hypothallus usually present
... *H. minor* (Shadow-crust lichen)
3) Thallus with a pale or only slightly darkened lower surface, hypothallus absent, rare in Florida
... *H. adglutinata* (Grainy shadow-crust lichen)



H. syncolla
http://www.sharnoffphotos.com/lichensC/hyperphyscia_syncolla.html



H. minor
http://www.tropicallichens.net/photopath/hyperphyscia-minor-netherlands-antilles--saba-harrie-sipman-6152.jpg

H. adglutinata
http://www.sharnoffphotos.com/lichensC/hyperphyscia_adglutinata.html

Hypotrachyna (Loop Lichen)

Description: Foliose. Lobes small to medium, closely attached to bark except for the edges. Upper surface gray to greenish yellow. White medulla. Apothecia or soredia present, never isidiate. Spot tests various. **Thallus UV+ yellow** or no color change. Unique features: **Rhizines dichotomously branched**

Range: South to Lake Okeechobee in Florida.

Notes: Small lobed specimens can be confused with *Pyxine* or *Dirinaria*.

Sources: Harris 1995

Key:
1) Thallus sorediate. Apothecia not present...2
1) Thallus not sorediate. Apothecia common UV-... *H. livida* (Wrinkled loop lichen)

H. livida Sharnoffphoto.com

2) Thallus UV+ yellow, very common... *H. osseoalba* (UV+ Grainy loop lichen)
2) Thallus UV-, rare... *H. pustulifera* (UV- Grainy loop lichen)

H. osseoalba
http://www.sharnoffphotos.com

H. pustulifera
http://www.sharnoffphotos.com/lichensC/hypotrachyna_pustulifera.html

Leptogium*, *Collema*, *Physma (Gelatinous lichens)

Description: Foliose. Lobes small to large, loosely to closely attached to bark. Upper surface bluish gray to olive or brown. No medulla, algae dispersed among cortex layers. Isidia, soredia or apothecia present. Spot tests negative. Unique features: **Jelly like when wet, occasionally with white, felt-like rhizines**

Range: Throughout Florida.

Notes: More current taxonomic research is needed on species, and their ranges within Florida.

Sources: Moore 1968; Harris 1995

L. cyanescens
http://www.sharnoffphotos.com/lichensD/leptogium_cyanescens.html

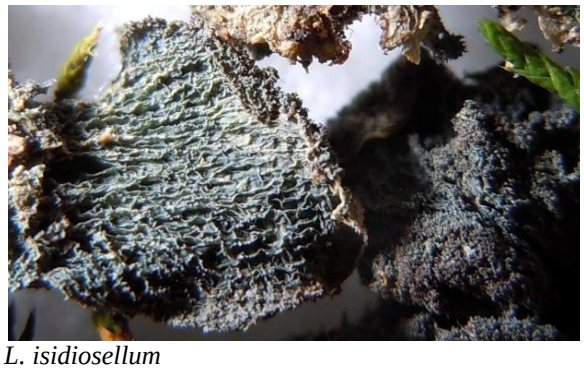
Key: *Leptogium*/*Collema*

1) Thallus isidiate, apothecia absent... 2
1) Thallus not isidiate, apothecia present... 7

2) Thallus wrinkled... 3
2) Thallus not wrinkled, may be minutely wrinkled with old age (visible only with a hand lens or microscope) ... *L. cyanescens*; syn:*L. denticulatum* (**Blue jellyskin**)

3) Thallus wrinkled mostly longitudinally... 4
3)Thallus wrinkled in every direction... 5

4) Wrinkled only longitudinally, forming a net-like pattern, wrinkles sharp and elevated, isidia most common along ridges, isidia not becoming granular with age... *L. isidiosellum* (**Isidiate Jelly-skin lichen**)
4) Wrinkled primarily longitudinally, but with wrinkles in other directions, not forming a net-like pattern, wrinkles look like stretched thallus, isidia common along ridges, becoming granular with age ... *L. millegranum* (**Stretched jellyskin**)


L. isidiosellum
Photo: Pamela Hess


L. millegranum
Photo: Pamela Hess

5) Small spherical apothecia, Isidia associated to apothecia
... *L. marginellum* (**Edge-fruting jellyskin**)
5) Apothecia not present... 6

L. marginellum *Sharnoff*


C. furfuraceum var. *luzonense*
Photo: Pamela Hess

6) Isidia mostly on ridges and pustules, lacking an upper and lower cortex (use microscope), thallus generally thinner than other similar looking species, with large lobes…..L. *furfuraceum* var *luzonense* (**Blistered jelly lichen)**
6) Isidia scattered throughout thallus, small to medium sized lobes, wrinkles on the lobes are slight ……... *L. austroamericanum* **(Dixie jellyskin**)
7) Thallus warty and appearing bluish, lobes frequently overlap, sharp wrinkles, common
... *L. floridanum* (**Florida jellyskin lichen**)
7) Thallus not warty, upper surface gray to gray-green...8


L. austroamericanum Photo: Pamela Hess


L. floridanum
Photo: Pamela Hess

8) Thallus thin (lacking upper and lower cortex), not thickened, pustules common, apothecia sometimes heavily pruinose, thallus longitudinally wrinkled, lobes not growing over each other (not anastomosing)... *C. pulcellum* (**Blistered jelly lichen)**


C. pulcellum
http://www.sharnoffphotos.com/lichensB/collem

9) Thallus thicker, with upper and lower cortex, not pustulate, apothecia never pruinose, thallus not wrinkled, lobes growing over each other (anastomosing)... 10

10) Thallus green or gray-green. Apothecia constricted at base, apothecia never immersed
... *L. chloromelum* (**Ruffled jellyskin**)
10) Thalllus gray. Apothecia not constricted at base, apothecia immersed in thallus
.... *L phyllocarpum* (**Frilly jellyskin**)

L. chloromelum Apothecia in bottom right are mature.Pamela Hess

L. phyllocarpum
http://www.sharnoffphotos.com/lichensD/leptogium_phyllocarpum.html

Uncommon or rare species in Florida

Collema *callibotrys*- lobes narrow, apothecia present, spores rod shaped or submuriform 10.5-17 x 8.5-10.5 µm, Florida Panhandle
Collema conglomeratum- lobes narrow, apothecia present often numerous, ascospores 2 celled 8.5-21 x 3-6.5, reported from Tampa north along Gulf coast.
Collema leptaleum- lobes narrow, apothecia present, cup shaped, Florida Panhandle
Collema pustulatum- lobes narrow, apothecia present, ascospores (2-6 celled), 20-40 x 11-15 µm, south of Lake Okeechobee
Collema subflaccidum- lobes large, not ridged or postulate, globose isidia, reported tentatively from Florida Panhandle and Everglades National Park.

Leptogium *adpressum*- with apothecia, thallus not wrinkled, spores acicular (needle-like) 50- 85 µm long
Leptogium azureum- with apothecia, thallus not wrinkled, thallus blue-gray
Leptogium corticola- with apothecia, thallus heavily wrinkled, lobes not interconnected,
Leptogium denticulatum- Similar to L. cyanescens, but has flattened isidia (phyllidia) on margins. Known for Everglades National Park
Leptogium fusisporum- with apothecia, thallus not wrinkled, spores acicular (needle-like), spores 25-40 µm
Leptogium juniperum- with apothecia, thallus not wrinkled, thallus gray-brown, lobes 2-3 mm wide
Leptogium microstictum- with apothecia, thallus pitted (only pitted species in FL), Known from Florida Panhandle
Leptogium sessile- with apothecia, thallus wrinkled but flattened, Ocala National Forest north
Leptogium stipitatum- with apothecia, lobes connecting (anastomosing), lobe ends hollow, apothecia on lobe ends
Leptogium tenuissimum- with apothecia, thallus tightly attached to bark or soil

Physma *byraseum*- with apothecia, only gelatinous species with simple spores, rare in Florida

Lobaria (Lung lichen)

Description: Foliose. Lobes medium to large, attached to bark loosely. Upper surface gray when dry, greenish when wet. White medulla. Florida species with apothecia only. Apothecial rim same color as thallus, disk reddish. Unique feature: **Lower side with fuzzy black tomentose cover and occasional holes that look like tomentose cover.**

Range: North of Lake Okeechobee in Florida.

Notes: This genus may be an old growth indicator in Florida forests. Lobe shape and size often resemble *Pseudoparmelia* species. However, *Lobaria* has a tomentose underside, and has a dull gray thallus color.

Sources: Brodo 2001

Key:

1) Lobules common, at the thallus margin, apothecia and pycnidia rare. Upper cortex usually K+ yellow … *L. tenuis* (**Slender lung lichen**)

1) Lobules rare, apothecia common and pycnidia often present. Upper cortex usually K- … *L. ravenelii* (**Dixie lung lichen**)

L. tenuis
http://www.sharnoffphotos.com/lichensD/lobaria_tenuis.html

L. ravenelii
http://www.sharnoffphotos.com/lichensD/lobaria_ravenelii.html

Myelochroa (Axil-bristle lichen)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Myelochora aurulenta: (**Powdery axil-bristle lichen**) Foliose. Medulla white to yellow (yellow mostly around soredia). **Coarse soredia**. Lower side black.

Range: Only known from North Florida so far.

Notes: Uncommon, May be an old growth indicator on the edge of its range

Sources: Brodo et al. 2001.

Myelochroa aurulenta
http://www.sharnoffphotos.com/lichensD/myelochroa_aurulenta.html

Nephroma (kidney lichens)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Nephroma helveticum: (**Fringed kidney lichen**) Foliose. Dark brown. Often isidiate, lobes **fringed with lobules and flat isidia**. Apothecia rare, flat, on lower surface.

Range: Only known from the Florida panhandle.

Notes: Only one known site in Florida, it should be searched for in more areas.

Sources: Brodo et al. 2001.

Nephroma helveticum
http://www.sharnoffphotos.com/lichensD/nephroma_helveticum.html


©Stephen Sharnoff

Pannaria (Shingle lichen)

Description: Foliose to squamulose. Lobes small, tightly attached to the substrate. Gray upper surface. White medulla. Apothecia present, red disk, rim same color as thallus. Florida species not sorediate or isidiate. Spot tests negative, no chemicals. Unique features: **Thallus color bluish-black**

Range: South to Lake Okeechobee in Florida

Notes: Specimens can be extremely fertile and the immature apothecia may resemble large, wide isidia.

Sources: Brodo et al. 2001

Key:
1) Thallus wrinkled, lobes larger, 2-6 mm wide, with branching veins or ridges along the upper surface, apothecia margins bumpy... *P. lurida* (**Veined shingle lichen**)
1) Thallus not wrinkled, lobes mostly smaller, 0.7 to 2 mm wide, more or less smooth, apothecial margins smooth or even or toothed... *P. rubiginosa* (**Brown eyed shingle lichen**)

P. lurida
http://www.sharnoffphotos.com/lichensE/pannaria_lurida.html


P. rubiginosa
http://www.sharnoffphotos.com/lichensE/pannaria_rubiginosa.html

Parmelinopsis (Shield lichen)

Description: Foliose. Lobes small, closely attached to bark. Gray upper surface. White medulla. Isidia or soredia present, never with apothecia. Lower surface black. Spot tests various: Medulla UV- or UV+ blue/white, K-, KC+ pink to red or purple and C- or C+ pink. **Cilia present, short, resembling rhizines**, often only in lobe axils. Lower side black. Unique features: **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Bulbothrix*, but the later has bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Range: North of Lake Okeechobee in Florida

Notes:

Sources: Brodo et al. 2001; Harris 1995

Key:
1) Thallus isidiate, medulla UV+ white or UV-... 2
1) Thallus sorediate, medulla UV+ ... 3

2) Isidia usually tipped with cilia, medulla UV-, KC+ purplish-pink, C-
……... *P. horrescens* (**Hairy-spined shield lichen**)
2) Isidia usually without cilia, medulla UV+ white, KC+ red, C+ pink
……... *P. minarum* (**Hairless-spined shield lichen**)

P. horrescens
http://www.sharnoffphotos.com/lichensE/parmelinopsis_horrescens.html

P. minarum
http://www.sharnoffphotos.com/lichensE/parmelinopsis_minarum.html

3) Soredia coarse, derived from pustules, throughout Florida

... *P. spumosa* (**Pustuled shield lichen)**

3) Soredia powdery (farinose), not derived from pustules, rare in Florida

... *P. cryptochlora* (**Powdery shield lichen**)

P. spumosa
http://www.sharnoffphotos.com

P. cryptochlora
http://www.tropicallichens.net/2350.html

Parmeliopsis (starburst lichen)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Parmeliopsis subambigua **(Green starburst lichen)**: Foliose. Cortex yellow. Soredia forming from pustules. Pale yellow-white lower surface.

Range: Northern Florida south to Orlando, FL area.

Notes: infrequent

Sources: Brodo et al. 2001.

Parmeliopsis subambigua
http://www.sharnoffphotos.com

Parmotrema (Shield lichen)

Description: Foliose. **Lobes large**, attached to bark at base, lobes free. Gray, gray-green to yellow-green upper surface. White medulla white or yellow (2 species). Isidia, soredia or apothecia present. Ciliate or non-ciliate. Spot tests various. Unique features: **Large lobes**, largest in Florida.

Range: Throughout Florida.

Notes: These are distinctive taxa because of their large lobes. This genus is often found on young twigs with no sexual characteristics. It can also be found in miniature with small lobes on small twigs and look like another genus.

Sources: Brodo et al. 2001; Harris 1995; Jon Dey unpublished keys to Southeast United States

Key:

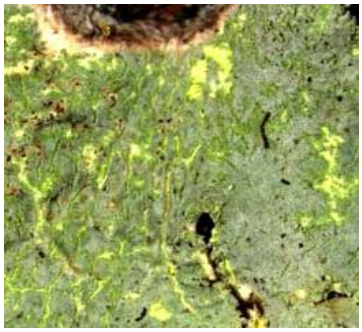
1a. Cilia present … 2
1b. Cilia absent ... 13

2a. Isidiate ... 3
2b. Sorediate or lacking both isidia and soredia (**NIS**) ... 7

3a. Cortex or medulla yellow ... 4
3b. Cortex white or grey ... 5

4a. Medulla white, cortex yellowish green (usnic acid)... *P. xanthinum* (**Green ruffle lichen**)
4b. Medulla bright yellow ... *P. sulphuratum*, (**Sulfur ruffle lichen**)

P. xanthinum http://www.sharnoffphotos.com

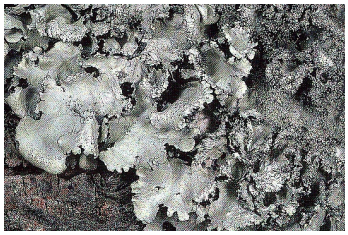


P. sulphuratum
http://www.seaveyfieldguides.com/Lichens/images_p/parmotrema_sulphuratum3_lg.jpg

P. subisidiosum
http://www.sharnoffphotos.com/lichensE/parmotrema_subisidiosum.html

5a Maculate, thallus cracked... *P. subisidiosum* (**Salted ruffle lichen**)
5b Not maculate, thallus not cracked... 6

6a. Isidia dense, becoming branched, coralloid with apical cilia, UV-, medulla K+ yel
…… *P. crinitum* (**Salted ruffle lichen**)
6b. Isidia common, rarely dense, UV+ yel, Med K+ red... *P. ultralucens* (**Spotted gray ruffle lichen**)



P. crinitum
http://www.sharnoffphotos.com/lichensE/parmotrema_crinitum.html

P. ultralucens
http://www.sharnoffphotos.com/lichensE/parmotrema_ultralucens.html

P. reticulatum

7a. Sorediate, apothecia absent ... 8
7b. Not sorediate, apothecia present … 11

8a Thallus with small fine cracks, visible maculae…….. *P. reticulatum* syn=Rimelia(**Cracked ruffle lichen)**
8b Thallus without cracks, maculae often present... 9

9a. Soredia marginal on lobe tips, not maculate, Med K-, UV++ bright blue (brighter than other UV+ so it's a good indicator amongst other Parmotremas)... *P. rampoddense* (**Powdered long-whisker ruffle lichen)**
9b. Soredia marginal not elevated on lobe tips, often weakly to strongly maculate, Med K+ yel to red or orange, UV-... 10

P. rampoddense
Photo Troy McMullin

P. hypoleucinum Pamela Hess

P. hypotropum Pamela Hess

10a. Med K+ yellow to **orange,** Pd+ **orange**, UV- .... *P. hypoleucinum*
(Pd+ orange powdered ruffle lichen)

10b. Medulla K+ yellow to **red**, Pd+ **yellow**, UV-... *P. hypotropum*
(Pd+ yellow powdered ruffle lichen)

11a. Cortex maculate, lower surface white to mottled brown margins..12

11b. Cortex not maculate, Pd+ red, lobe margins dissected, lower surface brown margins .. *P. submarginale* (**Unperforated ruffle lichen**)
syn: *P. michauxianum*

P. submarginale

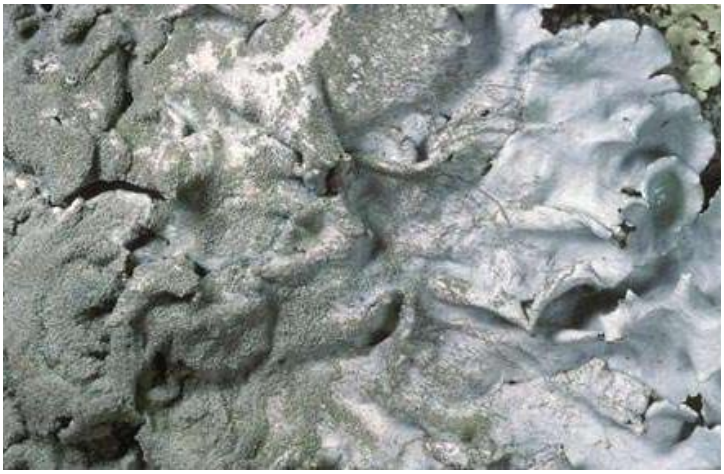
12a. UV-, white lower side margin, perforated apothecia. Med K+ yel … *perforatum (***Perforated ruffle lichen**)

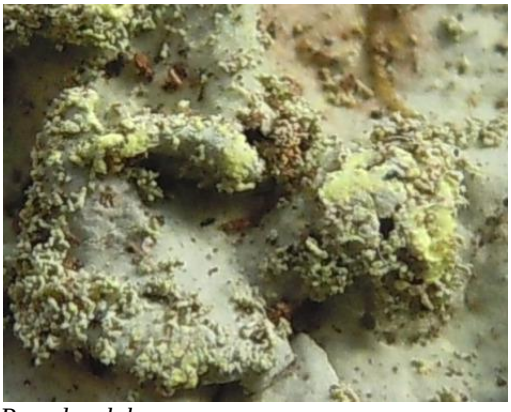
12b. UV+, white lower side margin, perforated apothecia. Med K-, KC+ pink ... *P. subrigidum* (looks like *P. perforatum*, no photo**),**
(**KC+ perforated ruffle lichen**)


P. perforatum Sharnoff

13a. Isidiate ... 14
13b. Sorediate or lacking both soredia and isidia... 15

14a. Med white, med C+ red, very common in Florida ... *P. tinctorum* (**Palm ruffle lichen**)
14b. Med yellow, med C+ pink … *P. endosulphureum (***Yellow-cored ruffle lichen**)

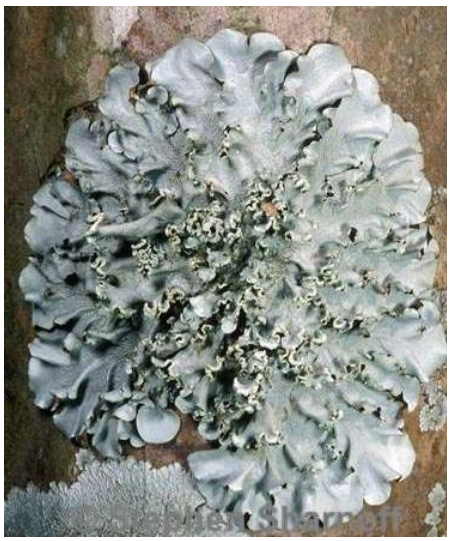

P. tinctorum Sharnoff


P. endosulphureum
Photo: Pamela Hess

15a. Thallus non-sorediate, Med Pd+red, south Florida ……. *P. zollingeri* (**shield lichen)**
15b. Thallus sorediate ……16

16a. Soredia crescent shaped, lower surface white margin, **narrower** lobes, Med K-, P- ... *P. praesorediosum* (**Powder-crown ruffle lichen**)
(part of the *P. cristiferum* **complex**)

16b. Soredia marginal, **wider** lobes, lower surface with a brown margin .. *P. cristiferum* ***complex*** (**unwhiskered ruffle lichen**)



P. praesorediosum
http://www.sharnoffphotos.com/lichensE/parmotre

Chemomorphs in the *P. cristiferum* **complex**		Medulla reactions
P. cristiferum	soredia marginal or lacking, **brown** margin	K+yel->red P+orange
P. dilatum	soredia marginal on small lobes, broad **brown** zone on lower surface margin,	K+pale yel, P+red->orange
P. gardneri	soredia marginal to **terminal** broad **brown** zone on lower surface margin, occasional sparse **cilia**	K- P+red-orange
P. praesorediosum	Soredia **crescent shaped**, Lower surface white margin	K-, P-

P. gardneri K-
Photo: Pamela Hess

Parmotrema cristiferum* **complex are chemo-morphs that may be difficult to detect in the field

P. cristiferum K+yel->red, P+orange *Sharnoff*

P. dilatum K+pale yel Sharnoff

Uncommon or rare *Parmotrema* species in Florida:

P. austrosinese- Lacking cilia, soralia marginal, medulla K-, KC+ red, C+ red
P. dominicanum- Lacking marginal cilia, only species in US with yellowish soralia
P. mellissii- With cilia, soredia becoming isidiate, medulla UV+ blue
P. neotropicum- Isidiate, ciliate, maculate, med PD+ orange, K+ red, KC-, C-, Similar to *P. subtinctorium- syn=Canomaculina subinctorium.*
P. rubefaciens- Lacking marginal cilia, sorediate, medulla K+ yellow to red
P. subtinctorium- Isidiate, ciliate, maculate, medulla PD+ yellow, K+ red, KC+ red, C-, syn: *Canomaculina subtinctoria*
P. wrightii- Without cilia, apothecia present, med C-, K+ yellow to red, PD+ red or orange. Known from a few collections in Everglades National Park.

Peltigera (Pelt lichens)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. Peltigera tends to grow upon the soil or over mosses while the other genera discussed below tend to grow as epiphytes in trees. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Lower surface with black veins. Rhizines in localized structures. One species known from three locations in Florida, *P. polydactylon*. (**Many-fruited pelt lichen**)Foliose. Brown to gray.

Range:

Notes:

Sources:

P. polydactylon

P. polydactylon

Phaeophyscia and ***Physciella*** (Shadow lichen)

Description: Foliose. **Lobes small (0.5-1.5 mm wide), loosely attached to bark**. Olive to brown upper surface. White medulla. Soredia or apothecia present, never isidiate. Apothecia disk brown to black, the rim is the same color as the thallus. Spot tests negative, unless medulla is orange (K+ red/purple). Unique features:

Range: Most species found only in the Florida Panhandle.

Notes: This genus is rare or under collected in the state.

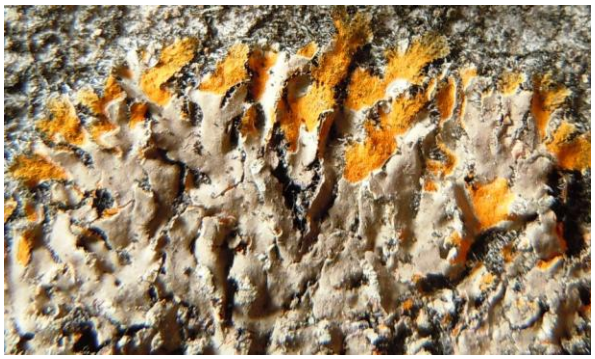
Sources: Brodo et al. 2001; Harris 1995

Key: Harris 1995

P. ciliate Andrea Aproot

1. Thallus sorediate; apothecia usually lacking... 2
1. Thallus not sorediate; apothecia present; Panhandle
... *Phaeophyscia ciliata* (**Smooth Shadow Lichen)**

2. Medulla white... 3
2. Med o->red; Panhandle *Phaeophyscia rubropulchra* (**Orange-cored shadow lichen**)



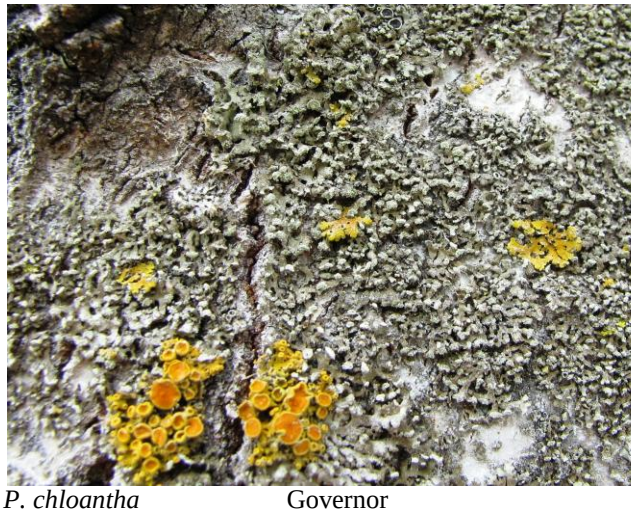
P. rubropulchra
Photo: Pamela Hess

P. hirsuta Photo: Pamela Hess

3. Tips of lobes naked ... 4
3. Tips of lobes with erect, colorless hairs;
St. Johns County... *Phaeophyscia hirsuta*
syn: *Phaeophyscia cernohorskyi* (**Hairy shadow lichen**)

4. Soralia capitate, borne on raised, lateral lobes; underside dark; Panhandle
…….. *Phaeophyscia pusilloides* (**Pompon shadow lichen**)
4. Soralia marginal; underside pale; Baker County ……..... *Physciella chloantha*
(**Green Shadow lichen**)

P. pusilloides
http://www.sharnoffphotos.com/lichensE/phaeophyscia_pusilloides.html



P. chloantha Governor

Physcia (Rosette lichen)

Description: Foliose. Lobes small, tightly attached to the bark. Pale greenish gray upper surface. Lower surface brown to black. White medulla. Soredia or apothecia present. Never isidiate. Apothecia disk brown to black. Rhizines sparse to abundant. Medulla K+ yellow, or K-, KC-, C-.Unique features: **Cortex K+ yellow, small lobed (1-3 mm wide)**.

Range: Common throughout Florida. *Physcia americana* is restricted to north of Lake Okeechobee, while all other species are found throughout the state.

P. neogaea Sharnoff

Notes:

Sources: Brodo et al. 2001, Harris 1995

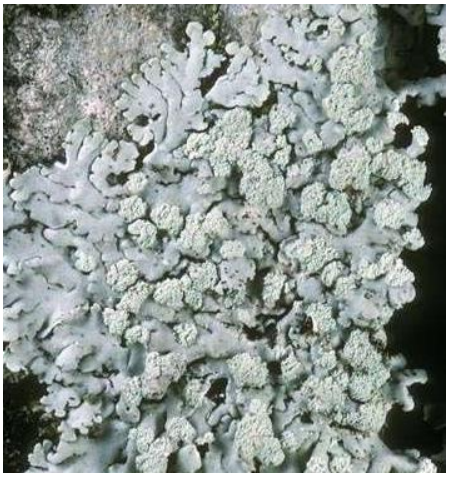
Key:

1) Apothecia present, soredia absent.....
P. aipolia complex, ***P. neogaea***, *P. pumilior*
(the use of spores and spore type is needed to key these lichens out)
1) Apothecia absent, soredia present... 2

2) Soralia laminal, underside pale... *P. americana* (**Powdery rosette lichen**)
2) Soralia marginal, underside dark or pale... 3

3) Underside pale at tips with dark longitudinal lines
... *P. atrostriata* (**Streaked rosette lichen**)
3) Underside dark, not striate... *P. sorediosa* (**Black-bottomed rosette lichen**)

P. americana
http://www.sharnoffphotos.com/lichensE/physcia_americana.html



P. sorediosa
http://www.sharnoffphotos.com/lichensE/physcia_sorediosa.html

P. atrostriata Photo: Pamela Hess

Uncommon or rare species in Florida:
P. undulata- sorediate, med K+ yellow, thallus not frosted looking, thin and fragile.
P. crispa- sorediate, med K-, thallus frosted looking, thick

Physma (Gelatinous lichen)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Range: Citrus, Near Floral City, Florida

Notes: only a single collection.

Sources:

Physma byraseum: Foliose, only gelatinous lichen with simple spores. Rare in Florida.

Physma byrasem Felix Schumm

Pseudocyphellaria (Specklebelly lichens)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Pseudocyphellaria aurata: (**Green Specklebelly lichen**)Foliose. With pseudocyphellae on the lower surface. Green gray or brown. Soredia and medulla yellow. One species known from Florida, *P. aurata*. No chemicals.

Range: The northern half of Florida

Notes:

Sources: Brodo et al. 2001,

Pseduocyphellaria aurata Sharnoff

Pseudoparmelia (Lemon-Lime Lichen)

Description: Foliose. Lobes small to medium, closely attached to the bark. Upper surface gray to green-yellow. Apothecia present. Never isidiate or sorediate. Non-ciliate. Spot tests various. Unique features: **Thallus lemon-lime color when moist.**

Range: Throughout Florida

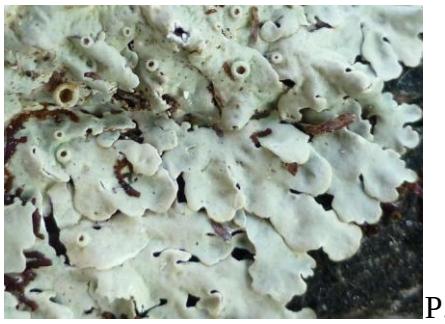
Notes: All three species have been collected in Everglades National Park, but the genus is uncommon to infrequent throughout Florida. Chemical testing (PD) is the most reliable way to differentiate species. Lobes resemble *Lobaria* species (see notes under *Lobaria*).

Sources: Brodo et al. 2001; Elix & Nash 1997

Key:

1) Medulla PD-, KC+ orange or yellow… *P. uleana* (**Common Lemon-Lime Lichen**)
1) Medulla PD+ yellow-orange to orange, K+ red or yellow…2

2) PD+ yellow-orange, K+ yellow, dark red… *P. floridensis* (**Florida Lemon-Lime lichen**)
2) PD+ orange, K+ yellow…*P. cubensis* (**Cuban Lemon Lime**



P. uleana Troy McMullin

P. uleana Photo: Pamela Hess, black dots are pycnidia

P. uleana Photo: Pamela Hess

Punctelia (Speckled shield lichen)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Punctelia rudecta: (**Rough speckled shield lichen**) Foliose. White cyphellae present on upper cortex often near lobe tips, isidiate, medulla C+ red (lecanoric acid).

Range: Thoughout Florida but infrequent.

Notes:

Sources: Brodo et al. 2001.

Punctelia rudecta Troy Mc Mullin

Punctelia rudecta
http://www.sharnoffphotos.com/lichensF/punctelia_rudecta.html

Pyxine (Buttoned rosette lichen)

Description: Foliose. Lobes small (0.5-1.5 mm wide), tightly attached to bark. Gray to greenish upper surface. Medulla white, yellow, or pale orange to salmon. Apothecia or soredia present, never isidiate. Apothecia black, with black rim. Spot tests various, **K+ yellow or purple** or K-. Upper cortex sometimes UV+ yellow. Unique features: **Apothecia distinctive, only small lobed genera without a green apothecia rim. Upper cortex sometimes UV+ yellow or**

Range: Throughout Florida

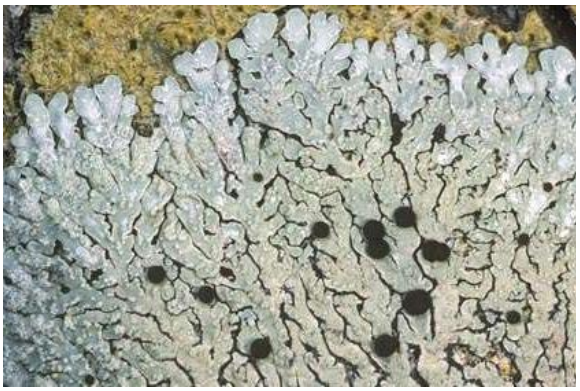
Notes:

Sources: Brodo et al. 2001**;** Harris 1995

Key:
1)Thallus UV-, dactyls isidiate/pustulate Marginal, breaking down into soredia ……..... *P. eschweileri* (**UV- Buttoned rosette lichen**)
1) Thallus UV+ yellow... 2


P. eschweileri sharnoff

2) Medulla white, K+ yellow or K-... *C. cocoes* (**UV+ Buttoned rosette lichen**)
2) Medulla orange to pale salmon, K+ purple... *C. caesiopruinosa* (**Orange buttoned rosette lichen**)


P. cocoes *Sharnoff*

P. caesiopruinosa
http://www.sharnoffphotos.com/lichensF/pyxine_caesiopruinosa.html

Uncommon or rare species in Florida:
P. albovirens- not reported by Harris (taxonomic status uncertain)
P. berteriana- Tropical/subtropical, south of Lake Okeechobee
P. coralligera- NIS, panhandle
P. sorediata- Panhandle lichen, Harris himself saw no specimens
P. subcinera-wide soredia marginal.

Ramalina (Ramalina)

Description: Fruticose. **Flattened to slightly rounded branches**. Pendant or shrubby. Yellowish green upper surface. White medulla. Soredia or apothecia present, never isidiate. Spot test various (hard to determine, because medulla is very thin): Unique features: Often with white lines (pseudocyphellae).

Range: Throughout Florida.

Notes: Species listed in the key are common and found throughout Florida. *R. peruviana* and *R. usnea* are subtropical and their range is uncertain. There may be disjunct populations of more tropical lichens around the state (perhaps in areas of high humidity). A disjunct population of *R. dendricoides* from Paynes Prairie State Park (Scott LaGreca, personal communication).

Sources: Brodo et al. 2001

Key:

R. peruviana

1a) With soredia, apothecia not present... ***R. peruviana***
1b) Without soredia, apothecia present... 2

2a) Branches long and pendant, large white striations on the branches, resembling an *Usnea* species..... ***R. usnea***
2b) Branches shrubby or pendant, with or without white striations... 3

R. stenospora

3a) Branches smooth..... 4
3b) Branches bumpy with raised white marks or ridges or depressions… 5

4a) Lobe tips flattened, branches fairly even in width .. ***R. stenospora*** **(southern strap)**

4b) Lobe tips round, white striations common .... ***R. montagnei***
(Striped ramalina) **These above two species intergrade.**

5a) Apothecia on the branch surface or margins, bumps are abundant ..... ***R. complanata***

5b) Apothecia on or close to the tips of the branches 6


R. montagnei


R. complanata
http://www.sharnoffphotos.com/lichensF/ramalina_complanata.html

6a) Branches with depressions and ridges or long groves, but without tubercles, Med K-..... ..... ***R. americana****
specimens with a certain chemistry can be referred to as ***R. cublersoniorum***
6b) Branches with small white (bumps) tubercles or papillae, Med K+ red 7


R. americana

7a) Spiny perpendicular branches usually present although they may be sparse, spores ellipsoid, Med Pd+ red or yellow, C- ..... ***R. willeyi***
7b) Spiny perpendicular branches absent, spores fusiform, Med Pd-, C+ pink to red (rapidly disappearing) ..... ***R. paludosa***


R. paludosa Sharnoff


R. willeyi Sharnoff

Uncommon or rare species in Florida:
Everglades National Park and Fakahatchee Strand State Preserve.
R. dasypoga
R. dendricoides
R. denticulata

Uncommon or rare species known from only Everglades National Park:
R. leptosperma
R. sorediantha
R. subpellucida

Relicina (Eyelash lichen)

Description:

Template: This genus looks similar to a *Bulbothrix* but it has a yellow-green color caused by usnic acid in the corted instead of atranorin, and in having dumbbell shaped conidia 6-8 um long. Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Spot tests various. Rhizines present unbranched or forked. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Relicina: Foliose. Upper cortex yellow green. Cilia swollen at base. Rarely collected in Florida. Two species known are *R. abtrusa* (from northern Florida and Georgia) and *R. excrimbulata* (Florida Keys).

Range:

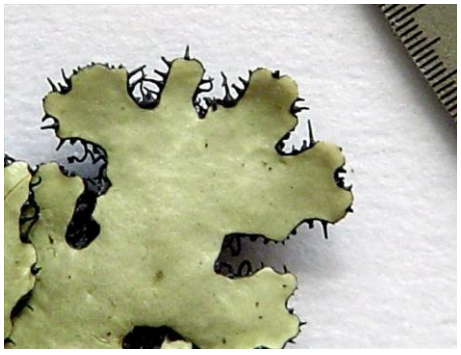
Notes:

Sources: Brodo et al. 2001.

Key:

1.a Thallus isidiate, Medulla K+red, containing norsticitic acid, Northern Florida ……..….**R. abtrusa**

1.b Thallus not isidiate or sorediate, Medulla K- or brownish, Pd+ red, containing fumarprotocetraric acid, Florida Keys ……..…..**R. eximbricata**



Relicina abtrusa Spielmann

Relicina excrimbulata
http://mushroomobserver.org/image/show_image/130869

Sticta (Moon lichen)

Description: Foliose. Lobes small to large, loosely attached to bark or moss. Dark brown to gray-brown upper surface. White medulla. **Isidia present (coralloid and often in crack, or phyllidiate on lobe edges),** never apothecia or soredia. Spot tests negative, no chemcals. Unique features: **Fuzzy tomentose** and **white cyphellae** present on lower surface. This is the only genera with white cyphellae in Florida.

Range: South to Lake Okeechobee in Florida.

Notes: The range of these taxa is unknown. S. beauvoisii was collected in Fakahatchee Strand Preserve, but seems to be rare south of Lake Okeechobee and uncommon further north. *Sticta weigelli*, closely resembles *S. beauvoisii*, but is not currently listed on the North American Lichen Checklist (Version 17). *S. weigelii* has a K+ purple medulla, while the medulla of *S. beauvoisii* is K-.

Sources: McDonald et al. 2003

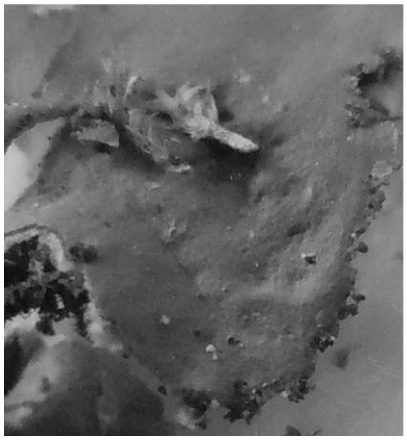
Key:

1) Isidia coralloid, branched, laminal, often emerging from cracks
... *S. beauvoisii* (Fringed moon lichen)
1) Isidia phyllidiate (flattened and sticking out off of lobes)... 2

2) Medulla K+ red, yellow, or purple, PD+ orange... *S. fragilinata* (Fragile moon lichens)
2) Medulla K-, PD-... *S. carolinensis* (Carolina moon lichen)

S. beauvoisii Sharnoff


S. fragilinata
http://lichens.digitalmycology.com/macrolichens/Sticta.html


S. caroliniana
Photo: Pamela Hess

Teloschistes (Orange bush lichens)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Teloschistes exilis: Fruticose. Cortex orange. Apothecia common, NIS. Apothecia margins without cilia.

Range:

Notes:

Sources:

Teloschistes exilis http://www.sharnoffphotos.com/lichensG/teloschistes_exilis.html

Tuckermanella (Wrinkle lichen)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

*Tuckermanella fendleri (***Dwarf wrinkle lichen***)*: Foliose to fruticose, more erect than prostrate. Greenish-brown. Brown, usually flat, large apothecia.

Range:

Notes: syn= Cetraria, Tuckermanopsis fendleri.

Sources:

Tuckermanella fendleri
http://www.sharnoffphotos.com/lichensG/tuckermanella_fendleri.html

Usnea (Beard lichens*)*

Description: Fruticose. Pendant or shrubby. Lobes large. Attached to bark at one central location. Yellowish green upper surface or reddish (in 1 species). Apothecia, soredia or isidia present. Often sorediate becoming isidiate, or spiky soredia. Spot tests various. Unique features: **Often with perpendicular branches. Apothecia larger than apothecia of *Ramalina* ssp. With a white, pink or red central cord** (scrape cortex off).

U. trichodea sharnoff

Range: Throughout Florida

Notes: *Usnea strigosa* is very common and found throughout Florida.

Sources: Brodo et al. 2001; Harris 1995;

Key:

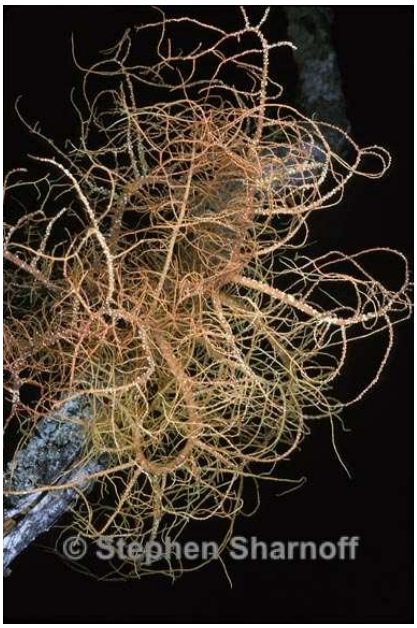
1) Cortex, medulla or axis not red or pink....2
1) Cortex, medulla or axis red or pink…4

2) Soredia and isidia absent, thallus long, pendant, axis brownish
…… ***U. trichodea***
2) Soredia and or isidia present…3

3) Thallus pendant, often with numerous perpendicular branchlets.
…… . ***U. dimorpha***
3) Thallus shrubby, medulla compact, isidiate-sorediate… ***U. subscabrosa***

U. dimorpha
http://www.sharnoffphotos.com/lichensH/usnea_dimorpha.html

U. subscabrosa
http://www.sharnoffphotos.com/lichensH/usnea_subscabrosa.html



U. rubicunda Sharnoff

4) Cortex not red, but the medulla or axis is red to pink…5
4) Cortex mottled red, medulla and cortex not pigmented, shrubby to subpendant, isidiate or isidiate-sorediate**…(** syn:*U. pensylvanica)* ***U. rubicunda***

5) Main axis hollow…6
5) Main axes solid…7

6) Medulla red, K+ red, UV- (norstictic), sorediate-isidiate… ***U. baileyi***
6) Medulla pink, K-, UV+ (diffractaic), isidiate-sorediate… ***U. perplectata***

U. perplectata
Photo: Pamela Hess

U. baileyi Note: the red medulla
Photo: Pamela Hess

7) Thallus shrubby to pendant w/o numerous perpendicular branchlets, apothecia rare…8
7) Thallus shrubby with numerous perpendicular branchlets, main branches often ending in apothecia, NIS. …***U. strigosa***

U. strigosa Sharnoff

8. Axis reddish… ***U. mutabilis***
8. Axis unpigmented, medulla pale pink branches often coarse… ***U. ceratina***

U. mutabilis
Photo: Pamela Hess

U. ceratina
Photo: Pamela Hess

Additional uncommon or rare species in Florida
U. endochrysea: Similar to U. strigosa. Usnea endochrysea has larger ascospores (9-12 long) than U. strigosa (7-9 long)
Usnea evansii: Probably common along the coast except in the extreme south
U. michauxii, Rare and coastal, mainly in the northern counties
U. pensylvanica, Similar to *U. rubicunda*. They differ in chemistry. Inner medulla is K+ yellow to red, and outer medulla is K-. *Usnea rubicunda* is medulla K+ red, and P+ yellow. At the basal portion. They also differ in basal color (green in *U. rubicunda* and red in *U. pensylvanica*), and cracks (*U. rubicunda* cracked while *U. pensylvanica* isn't cracked). It may be in Florida?

Vulpicida (Sunshine lichens)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

*Vulpicida viridis (***hidden sunshine lichen***)*: Foliose. Yellowish, orange or gray green. Apothecia present, brown. NIS.

Range:

Notes:

Sources:

Vulpicida viridis http://www.sharnoffphotos.com/lichensH/vulpicida_viridis.html

Xanthoparmelia (Rock Shield lichens)

Description:

Template: Foliose. Lobes medium, closely attached to the bark, edges adnate but not attached. Gray-green colored upper surface color. Medulla white. Lower surface brown or black. Apothecia or isidia present, occasionally branched; never sorediate. Ciliate, **with the base of the cilia bulbate or swollen**. Rhizines present unbranched or forked. Spot tests various. Unique feature(s): **Its lobes are often rounded and make little circular shapes between lobes in the lobe sinus**. The lobes are similar to *Parmelinopsis*, but the later does not have bulbate cilia. *Relicina* spp also has bulbate cilia but is very rare in Florida, and has a yellowish cortex.

Xanthoparmelia conspersa: Foliose, on rock. Known from one location in Panhandle. Medulla K+ yellow to red, isidiate, lower side black.

Range:

Notes:

Sources:

Xanthoparmelia conspersa

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Other uncommon or rare taxa in parts of Florida.

Anzia ornata
Underside black, thick and spongy like due to thick rhizines, known from Escambia county only, rare and probably restricted to Florida Panhandle, marginally isidiate.

Anzia ornate Troy Mc Millian