KEY I
THALLUS STERILE, WITH ISIDIA, THLASIDIA OR SCHIZIDIA ON BARK OR WOOD

(After Tonsberg, 1992)

April, 1993

1. Schizidia present. ..... Baeomyces rufus
1. Thlasidia or isidia present. 2

2. Thlasidia present. Lichen substances absent. ..... Gyalideopsis anastomosans
2. Isidia present. Lichen substances present. 3

3. Thallus areolate. 4
3. Thallus continuous. 5

4. Isidia orange, K+ purple, C. Herbidella 1 & 2 (anthraquinones) present. ..... Caloplaca herbidella
4. Isidia dark green to brown, K, C+ red. Gyrophoric acid (major) and 5Omethylhiascic acid present. ..... Placynthiella icmalea

5. Tuberculae resembling coarse, irregular isidia. Picrolichenic acid or fatty acids diagnostic substances. 6
5. Tuberculae, if present, not resembling isidia. Picrolichenic acid and fatty acids absent. 7

6. Picrolichenic acid (KC+ violet) present. ..... Pertusaria amara
6. Fatty acids (allopertusaric and dihydropertusaric) (KC) present. ..... Pertusaria albescens

7. Isidia with a distinct medulla, sometimes darkened towards the apices. 8
7. Isidia without a medulla, not darkened towards the apices; gyrophoric acid (C+ red, UV+ bluish white) present. ..... Ochrolechia subviridis

8. Isidia whitish, up to 1 mm wide, always with apothecia immersed in the apices. ..... Pertusaria dactylina
8. Isidia grayish, up to 0.5 mm wide, sterile, apically

darkened, pigment K+ violet. ..... Pertusaria oculata

ADD:

Thallus coralloidisidiate. Phycobiont Trentepohlia. ..... Porina nucula

Isidia in black, soralialike clusters; medulla I+ blue. ..... Thelomma ocellatum

Squamules to 0.5 mm wide, ± contiguous, often ascending, nodulose and subgranular, rarely dispersed and elongate, digitiform. On basic or nutrientenriched bark. ..... Agonimia tristiuscula

Thallus dark grayish to reddish brown, isidiate or consisting of granules < 0.1 mm diameter. Generally in fairly dry habitats. ..... Placynthiella uliginosa

Thallus pale fawn brown, of small granules (blastidia) forming a thick, granulareareolate crust, C+ persistent orange (xanthones). On exposed, decorticated maritime wood. ..... Lecidella prasinula

Thallus of yellow, coralloid granules, never dark colored on upper surface. On trunks of mature, basicbarked trees in parklands, wayside situations and woodlands. ..... Bacidia rubella

ADD (non N. American)

Caloplaca isidiigera

Gyalideopsis spp.

Bacidia biatorina

Rinodina isidioides

Macentina stigonemoides

Agonimia octospora

Pertusaria coccodes

Pertusaria coronata

Pertusaria flavida

Zamenhofia spp.

KEY II
THALLUS STERILE, SOREDIATE, WITHOUT ISIDIA, ETC.
ON BARK OR WOOD

(After Tonsberg, 1992)

1. Phycobiont green, mostly coccoid, not Trentepohlia or Stichococcus. In various habitats, sunexposed to shaded. 2
1. Phycobiont Trentepohlia or Stichococcus. In shaded habitats, mostly on bark under overhanging rock. ..... KEY 2g

2. Thallus of uniformly squamiform, imbricate areolae, C+ red. ..... Hypocenomyce scalaris.
2. Thallus continuous, or areolate with crustose, subsquamiform, or rarely squamuiform areoles, but never imbricate. 3

3. Thallus with a yelloworange to orangered or red pigment (K+ purplish). 4
3. Thallus not orange to red pigmented, sometimes yellow but then K. K+ reaction variable, but never purple. Pycnidia present or absent; black pycnidia under 0.2 mm, never with a violet K+ aeruginous, N+ reddish pigment. Caperatic acid absent. 6

4. Thallus only partly or weakly orange to red. 5
4. Thallus or soredia strongly yelloworange to orangered. Thallus C (gyrophoric acid absent). ..... KEY 2a

5. Thallus continuous. Rhodocladonic acid present, scattered in the medulla. Atranorin, chloroatranorin and caperatic acid or rangiformic acid present. ..... Mycoblastus sanguinarius "f. leprosus"
5. Thallus areolate. Anthraquinones present, apparent on the surface or in the soredia. Atranorin, chloratranorin and fatty acids absent. Areolae crustose; soralia bursting from the apices. Thallus C+ red (gyrophoric acid present). ..... Trapeliopsis pseudogranulosa

6. Thallus yellowish, KC+ yellow (usnic acid present). ..... KEY 2d
6. Thallus variously colored, KC (?) (usnic acid

absent). 7

7. Acetonesoluble pigments (xanthones, pulvinic acid derivatives and unidentified substances) present as major constituents; spots yellowish, more or less orange, red or brown in longwave UVlight on untreated plates. Thallus UV+ yellow, orange or rustred. 8
7. Acetonesoluble pigments absent (or present only in trace amounts). Thallus UV or UV+ bluish white. .....
8. Griseovirens unknowns and norstictic acid (K+ yellow then rusty crystals) present. ..... Buellia griseovirens
8. Griseovirens unknowns and norstictic acid absent; K or at least without rusty crystals. 14

14. Subaurifera unknowns 13 (pigments) present. Soralia of brown external soredia and distinctly yellow internal soredia. ..... Japewia subaurifera
14. Subaurifera unknowns absent. Soralia variously colored, but never partly brown, partly yellow. 15

15. Efflorescens unknown and pannarin present; soralia Pd+ immediately rustred. ..... Rinodina efflorescens
15. Efflorescens unknown and pannarin absent; soralia Pd. 16

16. Pulvinic acid or its derivatives present. Soredia usually bright yellow or vivid yellowish green, C. ..... KEY 2b
16. Xanthones present. Soredia variably colored, but not bright yellow or vivid yellowish green, C or C+ orange to red. ..... KEY 2c

16. Thallus with a leprose surface. Soredia usually superficial from the beginning. ..... KEY 2e
16. Thallus with a surface which is not completely dissolved in soredia or consoredia, or with soralia originating from endosubstratal thllus parts (bursting through the uppermost celllayers of the substratum). ..... KEY 2f

1. Soralia KC+ violet (picrolichenic acid present). ..... Pertusaria amara
1. Soralia KC reaction various, but not violet; picrolichenic acid absent. 2

2. Medulla and/or soralia Pd+ yellow, orange or red. 3
2. Medulla and soralia Pd (rarely brownish). 14

Gyrophoric acid present; lecanoric acid present in trace to moderate amounts. Medulla and soralia C+ red. External soredia grayish, greenish or yellowish. ..... KEY 2f1
Gyrophoric acid and related substances absent. Medulla and soralia C or C+ orange (variolaric acid). 15

KEY IIA
Sorediate; Thallus orangeyellow to orangered, K+ purple,
With Anthraquinones
Corticolous/lignicolous

1. Thallus uniformly brilliant orangeyellow, composed of discontinuous or contiguous verrucules or subsquamiform areolae that either bear marginal/labriform soredia, or are dissolved into soredia. ..... Caloplaca citrina
1. Thallus light greenish gray, continuous, mottled with pale yellow and orange; soredia reddish orange, coarse, subisidioid, erumpent. ..... Caloplaca discolor

Thallus areolate to almost squamulose; some areoles becoming sorediate. On elm bark or on wood. ..... Caloplaca microphyllina.

Thallus immersed, thin and continuous, whitish gray with scattered to crowded, delimited, erose soralia. Soralia bright orangeyellow. On nutrientenriched bark. ..... Caloplaca chrysophthalma

KEY IIB Corticolous/lignicolous
Thallus and/or Soralia Bright Greenish to Golden Yellow, K, With Pulvinic Acid or Related Compounds, or Rhizocarpic Acid; Photobiont Chlorococcoid

1. Thallus ± immersed or weakly areolate, greenish brown to brown; soralia ± discrete, under 0.4 mm diam., at first brown, later abrading ochraceous yellow. On bark. ..... Japewia subaurifera
1. Thallus superficial, orangeyellow, granular, leporse, or areolatesquamulose. 2

2. Thallus sorediate or leprose. 3
2. Thallus minutely subsquamulose, without soredia. ..... Candelariella vitellina

3. Thallus squamulose with marginal soredia, or thallus composed entirely of soredialike (usually?) corticate granules. Pulvinic acid a major substance. 4
3. Thallus more or less continuously sorediate throughout; soredia ecorticate. Pulvinic acid, if present, in trace amounts. [Chaenotheca furfuracea may also key out here; it is a paler shade of greenish yellow, and occurs on shaded wood under overhangs] 6

4. Thallus at least partly squamulose (actually minute foliose). ..... (Candelaria concolor f effusa)
4. Thallus composed entirely of granules. On deciduous trees and Thuja 5

5. Thallus consisting of scattered to crowded granules 0.050.15 mm across, appearing smooth and "corticate"; soredia absent. ..... Candelariella xanthostigma
5. Thallus composed of scattered small areolae and verrucules 0.090.15 mm across, breaking into soredia that usually dominate the thallus; soredia 0.20.5 mm across. Containing calycin. ..... Candelariella efflorescens

6. Rhizocarpic acid present. 7
6. Pinastric or vulpinic acid present. 8

7. Chrysophthalma unknown present. On moderately shaded bark more or less exposed to rain. ..... Chrysothrix chlorophthalma
7. Chrysophthalma unknown absent. On deeply shaded, dry bark under overhangs. ..... Psilolecia lucida

8. Pinastric acid or calycin present as major pigments. Zeorin absent. ..... Chrysothrix candelaris (pinastric acid strain = "Chrysothrix citrina")

8. Vulpinic acid and zeorin present. ..... Chrysothrix chlorina

KEY IIC. Corticolous/Lignicolous
Sorediate; Thallus Yellowish, K, UV+ orange,
With Xanthones; Without Usnic Acid
Corticolous/Lignicolous

1. Lichexanthone present. Soralia UV+ yellow. 2
1. Lichexanthone absent. Thallus UV+ orange to reddish brown, C+ bright orange (persistent). 4

2. Soralia yellow. Arthothelin and granulosin or 2,5,5trichloro3methylnorlichexanthone, isoarthothelin and thiophanic acid present. Soralia C or C+ orange. ..... Lecidella elaeochroma "f. soralifera"
2. Soralia grey. Gyrophoric or lecanoric acids present. Soralia C+ red. 3

3. Lecanoric acid (C+ bloodred) present. Arctic. ..... Varicellaria rhodocarpa
3. Gyrophoric acid (C+ red) major depside present. In the lowlands, temperateboreal. ..... Ochrolechia arborea

4. Thallus completely sorediate. 5
4. Thallus with delimited or irregularly delimited soralia; soredia not completely covering thallus. 6

5. Soredia pale yellowgreen, farinose; thallus thin, evanescent; thiophanic and usnic acids and zeorin. ..... Lecanora expallens
5. Soredia brownish green, finely granular; thallus rather thick, continuous; isoarthothelin and thiophanic acid. ..... Pyrrhospora quernea

6. Thallus evanescent; soralia becoming confluent; soredia farinose, pale yellow. ..... Lecanora expallens
6. Thallus distinct; soralia and soredia varied. 7

7. On smooth bark of trees and shrubs; thallus thin and even; soralia pale yellowsih gray, efflorescent; arthothelin, granulosin and lichexanthone. ..... Lecidella elaeochroma f. soralifera
7. On enriched rough bark, rotting bark or wood, in open habitats; thallus continuous (sometimes secondarily cracked) or minutely granularverrucose; soralia pale yellowgreen, irregular, often inconspicous and best revealed by rubbing thallus with

finger, coarsely granular; atranorin, arthothelin and + thuringione. ..... Lecidella scabra

ADD:

Atranorin absent. Thallus continuous, or areolate, but then forming a more or less continuous sorediate crust. On naked bark. Arthothelin and granulosin major xanthones. .....
Lecidella flavosorediata
Thallus pale yellowgreen, effusely sorediate, continuous near the thallus center, often noncontinuous near the margins. Containing thiophanic acid and arthothelin. ..... Sterile crust no. 1 (Gowan, Bay of Fundy)

Thallus continuous, minutely rimose, breaking irregularly into soredia; soralia at first punctiform, becoming confluent, remaining pale greenish. Containing thiophanic acid and arthothelin. On bark. ..... Sterile crust no. 2 (Gowan, Bay of Fundy).

KEY IID. Corticolous/lignicolous
Sorediate; Thallus yellowish, KC+ yellow (usnic acid)

1. Thallus with discrete soralia surrounded by esorediate thallus parts. 2
1. Thallus with a more or less leprose surface. 3

2. Planaic acid and chloroatranorin present. Soralia up to 2.5 mm diameter. Thallus pale gray, verrucose. Atranorin and usnic acid. On bark and wood of old pine trees. ..... Mycoblastus alpinus
2. Planaic acid and chloroatranorin absent. Thallus consisting of scattered to contiguous verrucae, some breaking into soredia; soredia often bluish green. Thallus containing usnic and thiophanic acids, and zeorin. On wood. ..... Lecanora oraefrigidae (others will also key out here)

3. Atranorin present. Prothallus distinct, white. Zeorin present. 4
3. Atranorin absent. Porphyrilic acid absent. Prothallus indistinct. 5

4. Porphyrlic acid present. Thallus softe, leprose or farinose, often widespreading, composed of fine soredia, whitish to pinkish gray, K+ yellow, P+ pale yellowish. ..... Haematomma ochroleucum
4. Porphyrilic acid absent. On Thuja and deciduous trees. ..... Lecanora thysanophora

5. Xanthones absent. Thallus UV, C ?. Thallus powderygranular with a smooth, pale, continuous prothallus. Usnic acid, zeorin, and terpene(s) or sterol(s). On mosssy bark of deciduous trees in old woodlands. ..... Megalospora tuberculosa
5. Xanthones (thiophanic acid) (UV+ orange, C+ orange) present. ..... Lecanora expallens

ADD:

Thallus yellowish, containing usnic acid and zeorin. Thallus without a fimbriate margin of hypothallus. ..... Lepraria (Lecanora?) sp.

KEY IIF Corticolous/Lignicolous
Sorediate, with ± Definite Soredia;
Thallus or soredia P+ yellow, orange, or red,
K or K+ yellow (to reddish brown, but without crystals)

1. Thallus immersed to ± superficial, very thin. 2
1. Thallus superficial, minutely wartedgranular or areolate. 3

2. Thallus K+ yellow (atranorin present). On wood of fallen trunks and old fencing in sheltered, boggy areas. ..... Mycoblastus fucatus
2. Thallus K (atranorin absent). Mainly on bark. Soralia pale green, irregularly rounded, soon confluent. Containing argopsin. ..... Biatora epixanthoidiza

3. Alectorialic acid present. 4
3. Alectorialic acid absent. 7

4. Prothallus brown. Soralia bursting from the apices of the areolae, concave. Medulla indistinct. ..... Fuscidea praeruptorum
4. Prothallus usually indistinct. Soralia marginal or laminal, flat to strongly convex. Medulla distinct. 5

5. Soredia capitate. Thallus continuous or composed of distinctly convex, often papilliform areolae. ..... Pertusaria gemnipara
5. Soredia labriform to laminal and orbicular, rarely more or less capitate. Thallus areolate, never continuous. 6

6. Areolae mostly distinctly crustose, yellowish green, up to 0.6 mm diameter, often becoming completely dissolved into soredia. Soralia usually not labriform. On Betula, Picea and Pinus. ..... Hypocenomyce sorophora
6. Areolae often subsquamiform, grayish white to yellowish brown, rarely with a green tinge, up to 1 mm diameter, usually not becoming completely dissolved into soredia. Soralia often more or less labriform. On various phorophytes, but mostly Alnus, Betula, and Sorbus. ..... Hypocenomyce leucococca

7. Thamnolic acid present. Thallus K+ yellow. Prothallus distinct, white. Thallus light greenish gray to whitish, smooth to pustulate. Soralia at first punctiform, or forming by the

distintegration of small pustules, often becoming confluent at the thallus center. Usually on conifers. ..... Loxospora elatina

7. Thamnolic acid absent. Stictic acid absent. Prothallus indistinct. ,..... 8

8. Pannarin present. Soralia often brownpigmented. Areolae grayish, greenish or brownish, scattered. Photobiont not micareoid. Gyrophoric acid absent. ..... Rinodina efflorescens

8. Fumarprotocetraric acid major