



# **A key to common lichens on trees in England**

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**Illustrations of characters by Andrea Moro**

**Images by Harry Taylor et al.**



**KeyToNature 2009**



If you have already completed the OPAL lichen survey for assessing air quality using lichens and identified some of the nine indicator species, this key will help you to identify some of the other species that you may have found on the trees in your area. It is an illustrated key to the commoner lichens that are found on trees in urban and rural areas in England and includes 71 species. However this is still only a small part of the total number of lichens found in the British Isles, so you may find other species in your area that are not in this key and thus do not fit the descriptions here. Then you need to consult other literature or websites as listed, or to get in touch with the British Lichen Society <http://www.thebls.org.uk/>. to find someone in your area that can help you. We are interested in recording the distribution of these species and hope that you can help us to build up information on their distribution in your area.

**The characters** used in the key can all be seen with the naked eye or with a x10 hand lens, and are illustrated in the glossary. However in some places we have included additional characters in the key (and in the descriptions) that are useful to identify a species. Many lichens contain chemical compounds, some of which have been used to make dyes, and others as sunscreen products. These compounds are also useful in identification, and we have included colour reactions for simple spot tests which can help you to identify some of these species. These spot tests are easy to do in the field and are described below.

We have also included spore characters in cases where the lichens produce fruiting bodies containing spores, for which you need a microscope and a slide and coverslip. Make a squash of the tissue from the centre of the disc on a slide with a drop of water and a cover slip and place under the microscope with a x10 objective (click here to see how to make a slide of a lichen). If the tissue is too thick to see any spores, press the slide firmly with the wooden end of a pencil to spread the tissue and release the spores. More details on spore shape and measurements are available in the literature.

**Spot tests:** simple spot tests have been used for many years to identify lichen substances that have a colour reaction. Note that a + denotes a positive colour reaction and a – indicates that there is no colour change. If you want to use the substances in the field you only need very small amounts (c. 20cc) which can be put in eye dropper bottles and kept in the fridge when not in use.

**Sodium hypochlorite (C)** is common bleach, the thin cheap variety without any additives is the best. Keep the bottle in the fridge if you want to use it repeatedly over several weeks. Avoid getting it on your clothes.

**Potassium hydroxide KOH (K)** or alternatively sodium hydroxide (NaOH - caustic soda) is used as a 10% solution in water. Care should be taken preparing this as it is highly caustic in the concentrated form.

Both these substances are applied as a small drop to the cortex, or to the medulla after scraping away the cortex. Record the colour reaction carefully and any change in colour that occurs.

**Paraphenylenediamine P** is not readily available except from a lab and is not recommended for use outside laboratory conditions. It is available as crystals and can be dissolved in alcohol in order to test the specimen. Alternatively it can be made into a stable solution for regular use called Steiner's solution. Instructions are available in most lichen identification books.

#### **Additional information:**


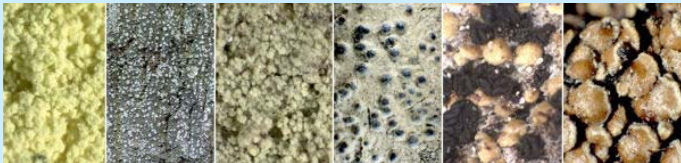



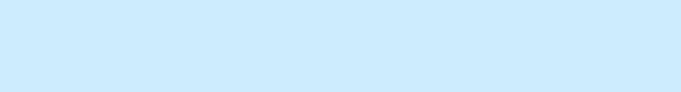




You can check the distribution of lichens in the UK on the National Biodiversity Network (NBN) <http://data.nbn.org.uk/> but at present these data are complete for Scotland but not for England, so will not represent the distribution of species in the UK. For additional illustrations of British Lichens go to an excellent website <http://www.britishlichens.co.uk/> and for information about the British Lichen Society go to: <http://www.thebls.org.uk/>. There are numerous fold-out keys to lichens of particular habitats available from the Field Studies Council which can be found in their publications list at: <http://www.field-studies-council.org/publications/bycategory/lichens.aspx> Literature includes An illustrated guide to Lichens







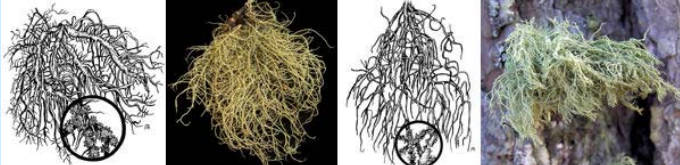
by Frank Dobson (2005) 480 pages, available from Richmond Press, and new edition of The Lichens of Great Britain and Ireland (2009) edited by Smith et al. and published by The British Lichen Society, also available from Richmond Press.


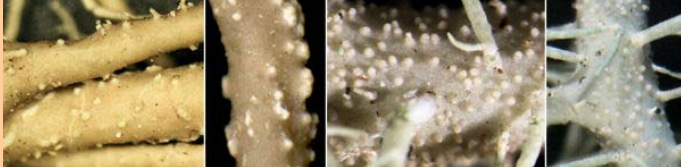




### **Acknowledgements**







Barbara Hilton and Peter James of The British Lichen Society (BLS) <http://www.thebls.org.uk/> have contributed their expertise in making this key, and the Field Studies Council has produced the fold out and workbook that accompany the OPAL survey.









Photographs of species are mainly by Harry Taylor and Pier Luigi Nimis, with additional ones by Ann Allen (*Usnea subfloridana*), Mike Sutcliffe (*Punctelia reddenda*), and other authors which are specified in the picture gallery of each species. Some of the illustrations to characters are based on drawings by Andres Saag (University of Tartu, Estonia).







1	Thallus leafy (leaf-like, flat) or bushy (attached to the bark only at the base)		2
1	Thallus crusty, powdery or of small overlapping scales		48
2	Thallus bushy and attached to the bark only at the base		3
2	Thallus leafy and more or less loosely attached to the bark from the lower surface		16
3	Thallus of erect fruiting structures surrounded at the base by crowded scales		<b>Cladonia spp. (several species)</b>
3	Thallus tufted and branched, without crowded scales at base		4
4	Branches with a different coloured upper and lower surface		5
4	Branches the same colour all round		7
5	Lobes swollen and hollow, with soredia at the lobe ends		<b>Hypogymnia tubulosa (Schaer.) Hav.</b>
5	Lobes flat and solid in section		6




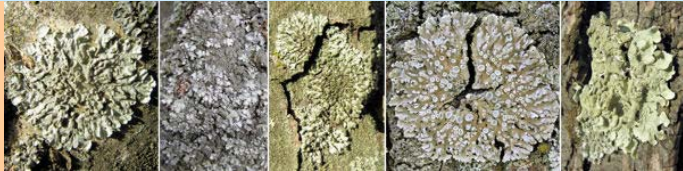


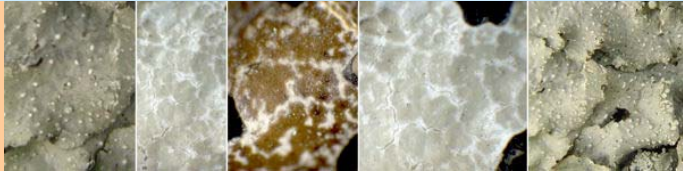
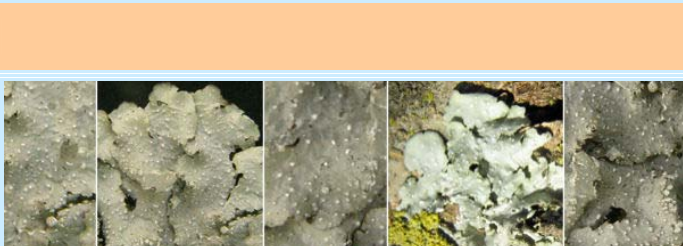
6	Lobes greenish above, white beneath, with soredia along the margins		<p><b>Evernia prunastri (L.) Ach.</b></p>
6	Lobes grey above, white to black beneath, with isidia on the surface		<p><b>Pseudevernia furfuracea (L.) Zopf</b></p>
7	Branches thread-like, breaking when pulled to reveal a central white strand		8
7	Branches not thread-like, without a central white strand		12
8	Fruits abundant, with rays on the margin		<p><b>Usnea florida (L.) F.H.Wigg.</b></p>
8	Fruits absent or very scarce		9
9	Branches very long and little branched with sausage-like swellings along the length		<p><b>Usnea articulata (L.) Hoffm.</b></p>
9	Lichens much branched and shrubby with short branches and no sausage-like swellings		10

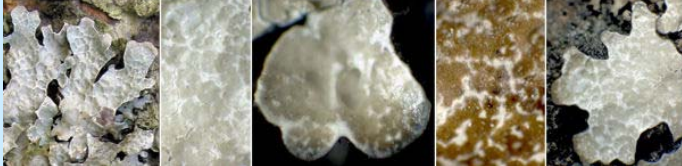
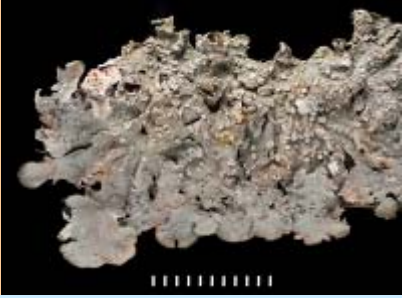




10	Main branches angular in section. Papillae (small warts) absent on all branches		Usnea hirta (L.) F.H.Wigg.
10	Main branches rounded in section. Papillae present at least on the main or on the terminal branches		11
11	Holdfast black at base, branches tough and not stretchy		Usnea subfloridana Stirt.
11	Holdfast not black at base, branches inflated and stretchy		Usnea cornuta Körb.
12	Branches white to grey, in coral-like clusters up the main stem		Sphaerophorus globosus (Huds.) Vain.
12	Branches greenish, flattened or irregular in section		13






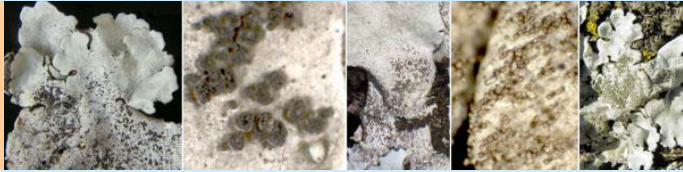
13	Branches distinctly channelled especially in the lower half		<b>Ramalina calicaris (L.) Fr.</b>
13	Branches not channelled		14
14	Lobes without soredia, usually with fruits		<b>Ramalina fastigiata (Pers.) Ach.</b>
14	Lobes with soredia, usually without fruits		15
15	Lobes hollow in the older parts with soredia developing inside splits in the lobe		<b>Ramalina canariensis J.Steiner</b>
15	Lobes solid with soredia in small oval spots along the margins		<b>Ramalina farinacea (L.) Ach.</b>
16	Thallus bright yellow to orange		17
16	Thallus not yellow nor orange		20




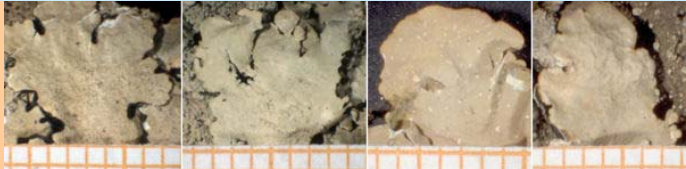
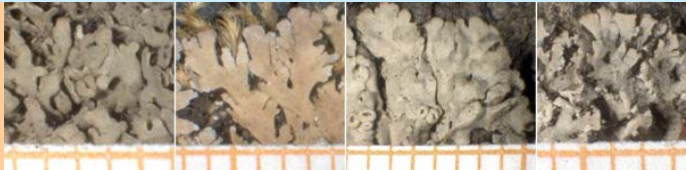

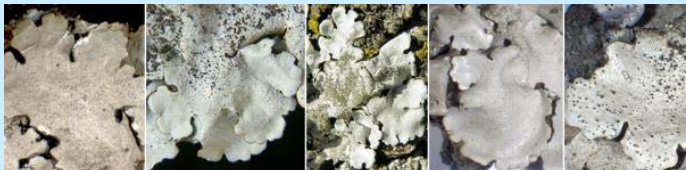
17	Lobes narrow and branching, fan-like, lemon-yellow, K-		<p><b>Candelaria concolor</b> (Dicks.) Stein</p>
17	Lobes small or leaf-like, orange-yellow to greenish-yellow, K+ red		18
18	Lobes with soredia on the margins. Fruits absent		<p><b>Xanthoria ucrainica</b> S.Y.Kondr.</p>
18	Lobes without soredia on the margins. Fruits usually present		19
19	Lobes broad, >2 mm wide, flattened and spreading		<p><b>Xanthoria parietina (L.)</b> Th.Fr.</p>
19	Lobes narrow, <2 mm wide, in small cushion-like clusters		<p><b>Xanthoria polycarpa</b> (Hoffm.) Rieber</p>
20	Lobes without soredia and isidia, usually with fruits		21
20	Lobes with soredia or isidia, usually without fruits		26


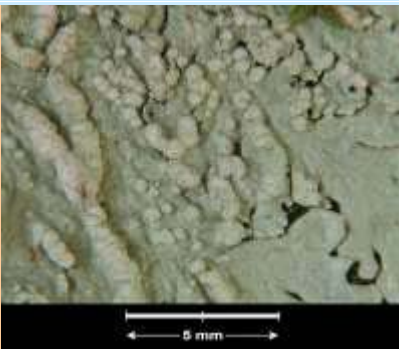
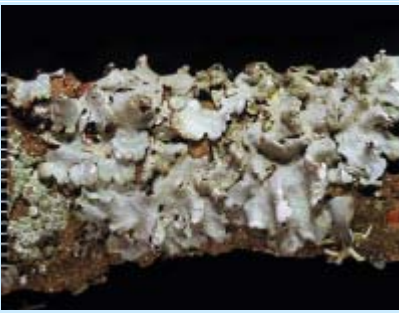

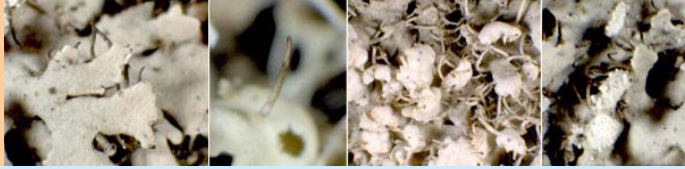

21	Lobes with long whiskers on the margins				<b>Physcia leptalea (Ach.) DC.</b>
21	Lobes without whiskers on the margins				22
22	Lobes greyish and white-flecked (x10 lens, best seen when wet), K+ yellow				<b>Physcia aipolia (Humb.) Fűrnrh.</b>
22	Lobes evenly grey- to dark-brown-coloured, without white flecks, K-				23
23	Lobes rounded, chestnut to olive-brown, without white-dusted margins				24
23	Lobes linear, grey to brown, white-frosted especially at the lobe tips				<b>Physcia distorta (With.) J.R.Laundon</b>
24	Lobes olive-brown to greenish grey, with upturned margins, not white-frosted				<b>Pleurosticta acetabulum (Neck.) Elix &amp; Lumbsch</b>
24	Lobes olive to chestnut-brown, closely appressed to bark surface				25


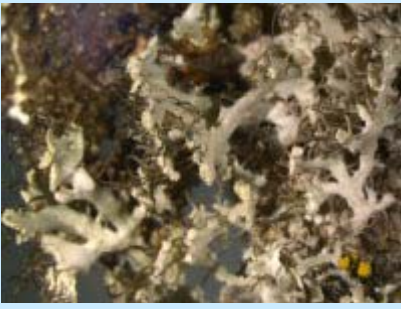



25	Lobes shiny with many narrow overlapping lobules		<b>Melanohalea laciniatula</b> (H.Olivier) O.Blanco, A.Crespo, Divakar, Essl., D.Hawksw. & Lumbsch
25	Lobes matt, rounded, with scattered pimple-like warts		<b>Melanohalea exasperata</b> (De Not.) O.Blanco, A.Crespo, Divakar, Essl., D.Hawksw. & Lumbsch
26	Lobes swollen and hollow; soredia on the tips on lobes		27
26	Lobes thin and solid; soredia on the surface or margin of lobes		28
27	Soredia in knob-like soralia on lobe ends		<b>Hypogymnia tubulosa</b> (Schaer.) Hav.
27	Soredia in lip-shaped soralia in splits in the lobe ends		<b>Hypogymnia physodes (L.)</b> Nyl.
28	Lobes with small white dots or lines (best visible at the tip of lobes)		29
28	Lobes without white spots or lines		33
29	Lobes with rounded white spots		30




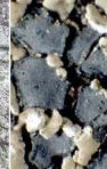
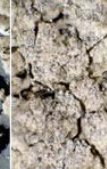
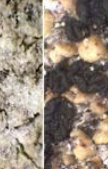
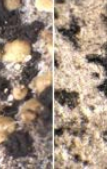


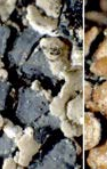


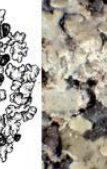


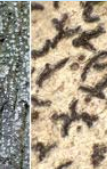
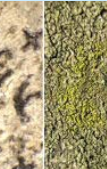
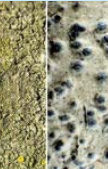
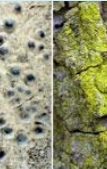







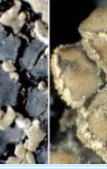


29	Lobes with net-like white lines		32
30	Lower surface pale brown. (medulla and soredia C+pink)		<b>Punctelia subrudecta (Nyl.) Krog</b>
30	Lower surface black. Medulla C- or C+red		31
31	Medulla and soredia C+red		<b>Punctelia borreri (Sm.) Krog</b>
31	Medulla and soredia C-		<b>Punctelia reddenda (Stirt.) Krog</b>
32	Lobes with soredia along the white lines		<b>Parmelia sulcata Taylor</b>
32	Lobes with dark-tipped pin-like isidia on the surface		<b>Parmelia saxatilis (L.) Ach.</b>


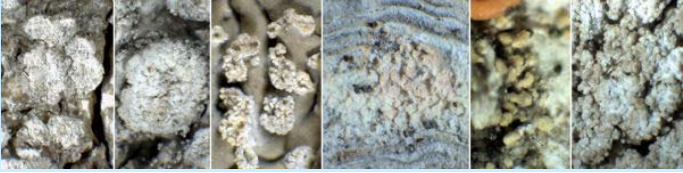
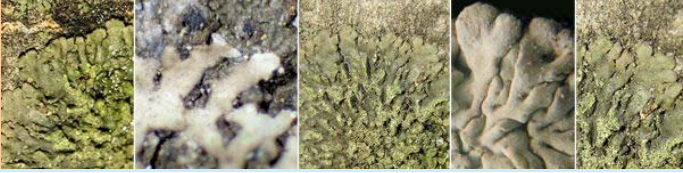



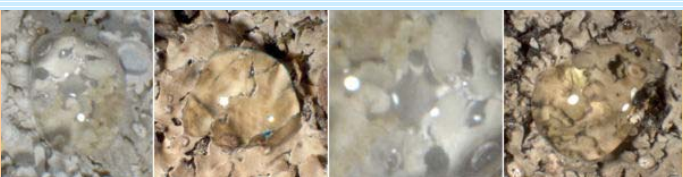
33	Lobe tips and fruits appearing white-frosted, medulla yellowish		<b>Physconia enteroxantha</b> (Nyl.) Poelt
33	Lobe tips and fruits without frosted appearance, medulla white		34
34	Lobes olive- to chestnut-brown, >3 mm wide		35
34	Lobes white to grey, if brown then lobes <3 mm wide		37
35	Lobes with scattered pimple-like conical warts		<b>Melanohalea exasperata</b> (De Not.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch
35	Lobes not covered with conical warts, with isidia and/or soredia		36
36	Lobes shiny, with coral-like isidia and without soredia		<b>Melanelixia fuliginosa</b> (Duby) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch
36	Lobes matt, with pale yellowish scars where soredia and isidia abraded		<b>Melanelixia subaurifera</b> (Nyl.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch
37	Thallus with isidia on the upper surface of lobes		38
37	Thallus with soredia on		40



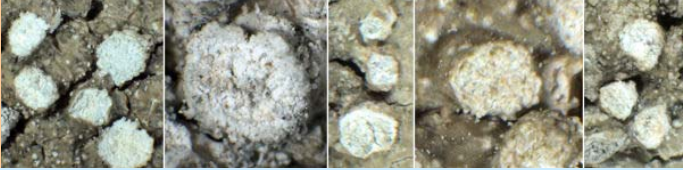



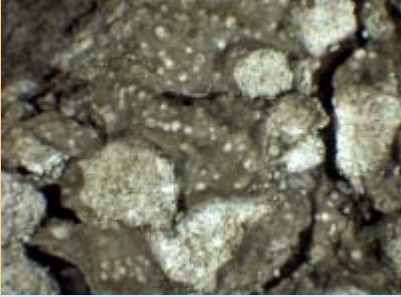
	the margins or upper surface of lobes		
38	Lobes attached closely to bark, with black, button-like isidia		<b>Parmelina pastillifera (Harm.) Hale</b>
38	Lobes pale grey to greenish, loosely attached to the bark, turning up at the margins, isidia preent		39
39	Lobes broadly crisped, lettuce-like with wrinkled or ridged surface, isidia mostly marginal or on ridges		<b>Platismatia glauca (L.) W. L. Culb. &amp; C. F. Culb.</b>
39	Lobes narrow, strap-shaped, with numerous isidia covering the lobe surface		<b>Pseudevernia furfuracea (L.) Zopf v. furfuracea</b>
40	Lobes >3 mm wide		41
40	Lobes <3 mm wide		44
41	Thallus yellowish-green when dry, soredia developing on the surface of the lobes		42
41	Thallus grey when dry, soredia on the margins or lobe-tips		43





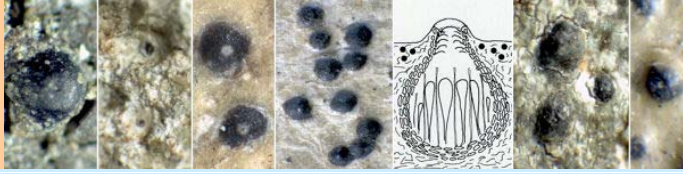
42	Soredia diffuse in centre of thallus (Medulla K- or K+ yellow)				<b>Flavoparmelia caperata (L.) Hale</b>
42	Soredia in neat rounded spots, at least at the beginning. (Medulla K+ yellow turning to red)				<b>Flavoparmelia soredians (Nyl.) Hale</b>
43	Lobes with dense rootlets to edge of lower surface, soredia in flaky patches on the upper surface				<b>Hypotrachyna revoluta (Flörke) Hale</b>
43	Lobes with naked lower surface along the upturned margins. Soredia along the margins of the lobes				<b>Parmotrema perlatum (Huds.) M.Choisy</b>
44	Lobes loosely attached and upturned with long marginal whiskers. Soredia at the tips of lobes		45		
44	Lobes attached closely to bark, without marginal whiskers, soredia on the surface of lobes		46		

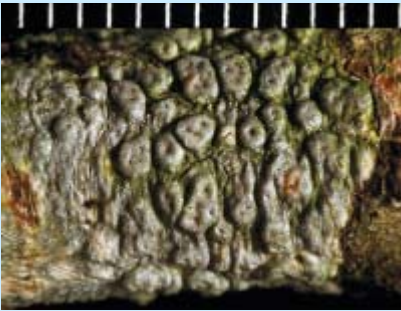
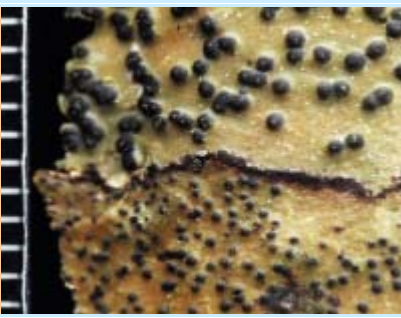

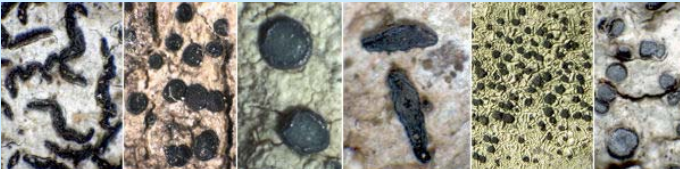
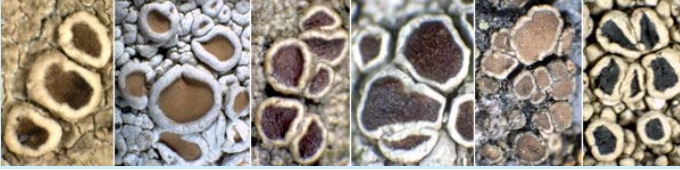


45	Soredia in recurved helmet-shaped lobe ends		<b>Physcia adscendens (Fr.) H.Olivier</b>
45	Soredia in lip-shaped upturned lobe ends		<b>Physcia tenella (Scop.) DC.</b>
46	Thallus whitish with darker bluish soredia (K+ yellow)		<b>Physcia caesia (Hoffm.) Fürrn. v. caesia</b>
46	Thallus grey to brown, with soredia paler than the thallus (K-)		47
47	Lobes almost crust-like, without rootlets, lower surface whitish		<b>Hyperphyscia adglutinata (Flörke) H.Mayrhofer &amp; Poelt</b>
47	Lobes leafy, attached by rootlets, lower surface blackish		<b>Phaeophyscia orbicularis (Neck.) Moberg</b>

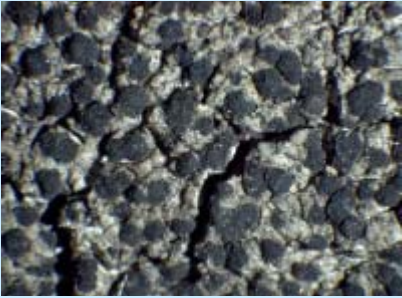

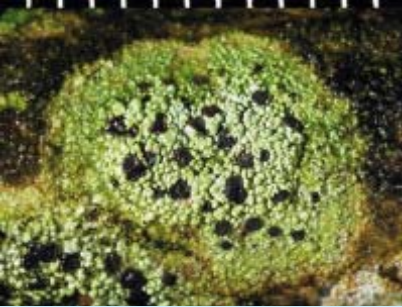
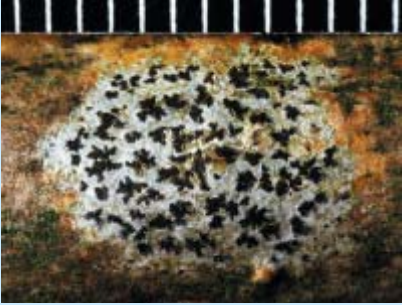
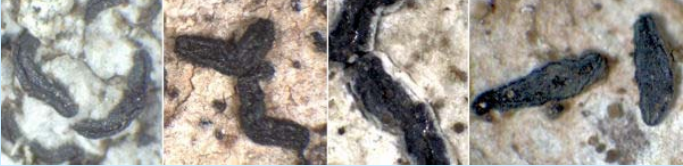

48	Thallus soft and powdery, consisting of soredia-like granules				<b>Lepraria spp.</b>				
48	Thallus crust-like or scale-like								49
49	Thallus scale-like, with overlapping or ascending scales								50
49	Thallus crust-like								52
50	Scales ascending, grey to green above, white below				<b>Cladonia spp.</b>				
50	Scales closely appressed to bark or wood, bluish-green to pale brown								51
51	Scales pale brown, C+ red				<b>Hypocenomyce scalaris (Ach.) M.Choisy</b>				
51	Scales shell-like, bluish-green, C-				<b>Normandina pulchella (Borrer) Nyl.</b>				








52	Crust bright yellow		<b>Candelariella reflexa (Nyl.) Lettau</b>
52	Crust white, grey, green or brown		53
53	Crust with soredia. Fruits often absent		54
53	Crust without soredia. Fruits usually present		64
54	Crust with radiating marginal lobes		55
54	Crust without radiating marginal lobes		56
55	Thallus white, K+ yellow		<b>Diploicia canescens (Dicks.) A.Massal.</b>
55	Thallus grey to brown, K-		<b>Hyperphyscia adglutinata (Flörke) H.Mayrhofer &amp; Poelt</b>
56	Crust C+ red		57
56	Crust C- (or C+orange)		58

57	Tallus grey-green, margins distinctly zonate, isidia present		<b>Ochrolechia subviridis (Høeg) Erichsen</b>
57	Thallus yellowish-white, margins not zonate, soredia in distinct white spots, at least when young		<b>Ochrolechia androgyna (Hoffm.) Arnold</b>
58	Soredia in distinct white spots on the crust, at least when young		59
58	Soredia diffuse in the central part of the crust		61
59	Thallus K+ yellow		<b>Pertusaria multipuncta (Turner) Nyl.</b>
59	Thallus K-		60
60	Soralia flat to convex, KC-. Lichen not tasting bitter		<b>Pertusaria albescens (Huds.) M.Choisy &amp; Werner</b>
60	Soralia convex, KC+ violet (warning! reaction fading). Lichen with a very bitter taste		<b>Pertusaria amara (Ach.) Nyl.</b>

61	Crust like white paint on the bark, (K+ yellow, then blood-red)		<b>Phlyctis argena (Spreng.) Flot.</b>
61	Crust greenish or greenish-grey, (K- or K+yellow)		62
62	Crust of many bright-green granules with soredia. Fruits wine-gum-like, grey to black		<b>Fuscidea lightfootii (Sm.) Coppins &amp; P.James</b>
62	Crust with continuous smooth surface. Fruits rarely present		63
63	Crust thin, yellowish green, (K+ yellow, C+ yellow to orange)		<b>Lecanora expallens Ach.</b>
63	Crust thick, grey-green (K-, C-)		<b>Lecanora conizaeoides Cromb.</b>
64	Fruits enclosed in pimple- or volcano-like structures with hole at the top to release spores		65
64	Fruits disc-like or elongated		67

65	Thallus grey, fruits raised grey warts with several pores (cf. a pepper-pot)		<p><b><i>Pertusaria pertusa</i></b> <b>(Weigel) Tuck.</b></p>
65	Thallus pale cream to brown, with pimple- or volcano-like fruits and one pore		66
66	Thallus brown, with black pimple-like fruits with small hole at the top		<p><b><i>Pyrenula</i> spp.</b></p>
66	Thallus cream, with cream-coloured volcano-like fruits with distinct papery inner margin		<p><b><i>Thelotrema lepadinum</i></b> <b>(Ach.) Ach.</b></p>
67	Disc and margin of fruits grey to black		68
67	Disc and/or margin of the fruits white, green or brown		73
68	Fruits disk-like. Crust green when wet		69
68	Fruits comma- or star-shaped. Crust orange-green when scratched, unchanged when wetted		71

69	Fruits soon convex and without distinct margin		<b>Buellia punctata Hoffm.</b>
69	Fruits remaining flattened and with a distinct raised margin		70
70	Crust more or less smooth (C+ yellow)		<b>Lecidella elaeochroma (Ach.) M.Choisy</b>
70	Crust of many small rounded granules (C-)		<b>Fuscidea lightfootii (Sm.) Coppins &amp; P.James</b>
71	Fruits star-shaped or lobed, not raised above thallus		<b>Arthonia radiata (Pers.) Ach.</b>
71	Fruits lip-like and raised above thallus		72
72	Fruits usually >4 mm long, evenly scattered		<b>Graphis scripta (L.) Ach.</b>

72	Fruits usually <4 mm long, densely clustered				<b>Opegrapha atra Pers.</b>
73	Disc of fruit green, becoming swollen and soon obscuring margin				<b>Lecanora symmicta (Ach.) Ach.</b>
73	Disc of fruit not green, with a distinct margin			74	
74	Disc of fruit immersed in wart-like swellings of the crust				<b>Pertusaria hymenea (Ach.) Schaer.</b>
74	Fruits button-like and constricted where they arise from the crust				75
75	Disc of fruit grey-frosted (C+ yellow), margin thin, smooth and neat				<b>Lecanora carpinea (L.) Vain.</b>
75	Disc pale brown, not grey-frosted, (C-), margin thick, rough				<b>Lecanora chlarotera Nyl.</b>