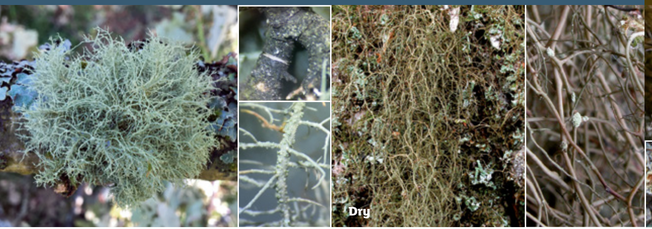
5 IS THE LICHEN BEARD-LIKE, HAIR-LIKE OR STRAP-LIKE?

Usnea subfloridana Beard lichen



Form Shrubby tufts on trees, mainly found on twigs.
Colour Yellow-green to grey-green thallus that is blackened at the base.
Soredia/Isidia Round to irregularly-shaped soralia with granular soredia and isida-like structures present.
Fruit Rare.
Notes Similar to other *Usnea* species, but has distinctly blackened base with transverse cracking only.

Bryoria fuscescens Horsehair lichen

Form Elongated tufts of very narrow, hair-like branches.
Colour Greenish brown, brown or dark brown.
Soredia/Isidia Soredia in discrete oval soralia along branches.
Fruit Very rare.
Underside Paler below.
Notes Similar to other *Bryoria* species but *B. fuscescens* is by far the commonest species in temperate rainforest.

Ramalina farinacea Shaggy strap lichen

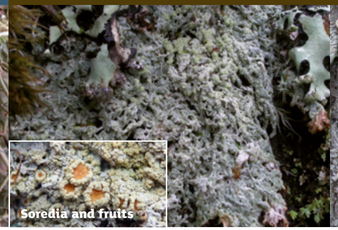
Form Short tufts of narrow, flattened branches.
Colour Pale grey-green to yellow-green.
Soredia/Isidia Soredia in discrete oval soralia along branch margins.
Fruit Rare.
Underside Same colour as upper surface.
Notes Similar to *Evernia prunastri* (see right), short-tufted *Usnea* species (but these have cylindrical branches) and other *Ramalina* species; *R. farinacea* is the most common *Ramalina* species on trees with acid bark.

Evernia prunastri Oak moss

Form Short tufts of flattened branches with forked tips, often with a network of ridges.
Colour Pale grey-green to pale yellow-green.
Soredia/Isidia At first, round and on ridges and lobe margins; later, irregular, spreading and coalescing.
Fruit Very rare.
Underside Whitish, occasionally with green patches.
Notes Similar to *Ramalina farinacea* which has narrower lobes, and the upper and lower surfaces are the same colour. A common species on a range of deciduous trees and used in the perfume industry.

6 IS THE LICHEN CRUSTY, LUMPY OR PORRIDGE-LIKE?

Ochrolechia androgyna A cudbear lichen



Form A thick, warty crust, usually without fruits.
Colour Whitish, pale grey to grey or greenish white.
Soredia/Isidia Round to irregular pale-green soralia that can join to form a continuous crust.
Fruit Occasional; pale pinkish to orange-brown disc, a thick rim with soredia.
Notes When fertile, it is often mistaken for *O. tartarea* (which has no soredia). This is a common species in north and west Britain in a range of lichen communities on acidic trees and rocks. It is used in the production of traditional cudbear dye.

Ochrolechia tartarea A cudbear lichen

Form A thick, warty crust with numerous 'jam-tart' fruits.
Colour White, pale grey to grey.
Soredia/Isidia None.
Fruit Frequent; dull orange-pink to pale-brown disc, thick rim.
Notes Similar to *O. androgyna*. Also used in the production of traditional cudbear dyes.

Pertusaria amara Bitter wart lichen

Form A thin or thickish warty crust.
Colour Pale grey, grey to greenish grey.
Soredia/Isidia Soredia are white and rounded, and taste very bitter (rub with a wet finger and taste).
Fruit Very rare.
Notes Similar to another common wart lichen, *P. albescens* (but this does not taste bitter). Both of these wart lichens are common in a range of lichen communities on trees.

Mycoblastus sanguinarius Bloody-heart lichen

Form A thin or thickish crust.
Colour White, pale grey or grey.
Soredia/Isidia Usually none.
Fruit Frequent; black convex fruits; scratch one with a fingernail to reveal a 'blood spot.

We are Plantlife

For 30 years, Plantlife has had a single ideal – to save and celebrate wild flowers, plants and fungi. They are the life support for all our wildlife and their colour and character light up our landscapes. But without our help, this priceless natural heritage is in danger of being lost.

From the open spaces of our nature reserves to the corridors of government, we work nationally and internationally to raise their profile, celebrate their beauty and to protect their future.

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Some key features to look for when identifying lichens

Use a hand lens (preferably x10 magnification) to examine them.

Cilia Wiry black hairs on the upper surface or lobe margins.

Colour Of upper (and if visible, the lower) surface. The colour of a species can vary – eg, depending on whether it is wet or dry.

Cyphellae and **pseudocyphellae** Pores or cracks that expose the interior of the lichen, appearing as paler spots or lines on the surface.

Fruits Reproductive structures that produce spores. They can be round discs, pimple-like or globular, and their colour often contrasts with the lichen surface.

Hypothallus A dark mat on the lower surface, often only visible between lobes or at the margins. It may be thin and visible only as a dark stain, but when well developed may be thicker and velvet-like.

Isidia Tiny projections on the surface that may be nodular, granular, finger-like, or branched like tiny fragments of coral. They are a means of vegetative reproduction.

Lobe The rounded 'leaf' of a leafy lichen.

Lobules Small 'secondary' lobes that develop on the margins or on the surface of the lobes.

Rhizines Root-like structures. Stiff wiry black rhizines are typical of many *Parmelion* species. These may be straight, forked or branched.

Soredia Floury powder or coarse granules that often occur along ridges or cracks on the surface, or on the lobe margins. They may be diffuse or arise in discrete structures (termed **soralia**). Like isidia, they are a means of vegetative reproduction.

Cilia on *Parmotrema perlatum*

Fruits on *Ochrolechia tartarea*

Isidia on *Parmelia saxatilis*

Soredia on *Parmelia sulcata*

Pseudocyphellae on *Cetrelia olivetorum*

Rhizines on *Hypotrachyna laevigata*

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Lichens of temperate rainforest in the Lake District

Guide 2 The *Parmelion* lichens of birch, alder and oak

This guide is for anyone interested in identifying some of the more conspicuous lichens of temperate rainforest in the Lake District. Different species of lichen often grow together, forming distinct communities.

The *Parmelion* community grows on trees with very acidic bark, such as alder, birch and oak.

A companion guide (Guide 1) looks at the *Lobarion* community of lichens that grows on trees with mildly acidic or alkaline bark.

What is a lichen?

A lichen is a special association between a fungus and an alga. The fungus forms the main body of the lichen, providing an upper surface that protects the alga underneath, while the alga manufactures food using the energy of sunlight (photosynthesis). Each lichen has its own distinct species of fungus, but all lichens share just a small number of algae species; in most cases this is a green alga.

What is temperate rainforest?

Temperate rainforest is a type of usually ancient natural or semi-natural woodland found in western Britain and Ireland where the climate is mild and wet due to the influence of the Gulf Stream. These conditions are ideal for a range of important lichens. Temperate rainforests have been compared to tropical rainforests because of their luxuriant growth of lichens, ferns, mosses and liverworts.

Why is the Lake District's temperate rainforest important for lichens?

The temperate rainforests of western Britain are an important habitat for many lichens, mosses and liverworts. Many of these are largely confined to areas with low air pollution and ancient or long-established woodlands, for example those that have never been clear-felled or intensively coppiced. They play a fundamental role in woodland ecosystems, and are indicators of habitats that are of high quality and have been that way for a long period of time.

Many of these lichens are not found in other parts of Britain and Europe, and some are globally rare. A number of species are considered of "principal importance for the conservation of biodiversity in England" under Section 41 of the Natural Environment and Rural Communities Act (2006). Further details of species conservation status can be found in the GB Red List (see the books section under 'Further information').

Finding and identifying lichens

Parmelion species of lichen occur on bark, or on mats of mosses/liverworts growing over bark. Some can also be found on mossy boulders and rocky outcrops. In very humid situations they may grow directly on rock. The occurrence of pale-grey leafy lichens and extensive areas of whitish crusts on tree trunks is a good indication of the presence of this community. Good temperate rainforest will often have populations of a range of the species described in this guide, and may include scarce or rare species.

To identify a lichen first look at its growth form:

- Does it consist of leafy lobes? If so, see Sections 1 to 3 of this guide.
- Is it shrubby, beard-like, or coral-like? If so, see Sections 4 and 5 of this guide.
- Is it crusty, lumpy or porridge-like? If so, see Section 6 of this guide.

The key features to look for when identifying lichens are described on the back page. To see these features well, and to fully appreciate the beauty of lichens, you will need to use a magnifier or a hand lens of x10-15 magnification.

Although internationally important for their rich lichen and bryophyte communities, Temperate rainforests face a number of threats. Therefore, Plantlife is securing their future by working with landowners and managers, helping to develop their skills in identifying important sites and species; raising awareness of the key conservation issues; identifying priority areas for management; and planning effective habitat management that will build more secure and resilient populations.

Please submit any records you make to the British Lichen Society (see below). Records should comprise of date observed, site name, grid reference, names of surveyors, species and abundance. Please note that scientific names should always be used when recording.

Further information

Books

Lichens: An Illustrated Guide to the British and Irish Species, Frank Dobson, 7th Edition (2018), Richmond Publishing Co Ltd.

Lichens, Oliver Gilbert (2000), Collins New Naturalist series, HarperCollins.

A Conservation Evaluation of British Lichens and Lichenicolous Fungi, Woods & Coppins (2012), JNCC.

http://jncc.defra.gov.uk/page-6197
This is the current Red List for lichens in Great Britain.

Websites

www.britishlichensociety.org.uk The British Lichen Society (BLS) website provides a wide range of information about all aspects of lichens and lichenology.
www.nbnatlas.org The NBN atlas hosts an up-to-date database of British lichen distribution.
www.uklichens.co.uk The UK lichens website has useful photos of many UK species.
www.wales-lichens.org.uk This website is dedicated to the conservation of lichens in Wales, but is a great resource for some of the Lake District's temperate rainforest species.

1 IS THE LICHEN LEAFY WITH NUMEROUS BLACK, WIRY RHIZINES ON THE UNDERSIDE?

Hypotrachyna laevigata Smooth loop-lichen

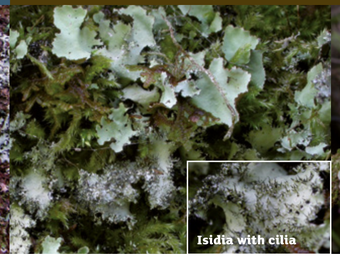
Form Smooth, narrow lobes with square-cut tips.
Colour Pale grey to pale blue-grey.
Soredia/Isidia Discrete globular soralia at lobe tips.
Fruit Scarce; dark brown disc with a rim.
Underside Black with numerous branched black rhizines.
Notes Similar to *H. taylorensis* but that species has no soralia, and to *H. revoluta,* but that species has less well-defined soralia and downturned, rounded lobe tips.

Hypotrachyna taylorensis Tailed loop-lichen

Form Densely overlapping lobes, looks scruffy; old lobes often hang down and roll up to form distinctive tubes.
Colour Pale grey to pale green-grey, often with brown tips.
Soredia/Isidia None.
Fruit Rare.
Underside Black, dark brown near margins, numerous black rhizines.
Notes Similar to *H. laevigata* but that species has soredia.

2 DO THE LOBES HAVE WAVY MARGINS AND/OR THE UNDERSIDE HAS A BARE AREA NEAR THE MARGIN?

Parmotrema crinitum Desperate Dan



Form Scruffy, wavy lobes with divided margins, isidia and stubble-like black hairs.
Colour Pale grey to pale green-grey.
Soredia/Isidia Simple or coral-like isidia, often with protruding black hairs (cilia).
Fruit Very rare.
Underside Black with simple rhizines and a brown naked zone at margin.
Notes Similar to *P. perlatum*, so search carefully for isidia/cilia to confirm *P. crinitum*. Also similar to *P. horrescens*.

Parmotrema perlatum Sea-storm lichen

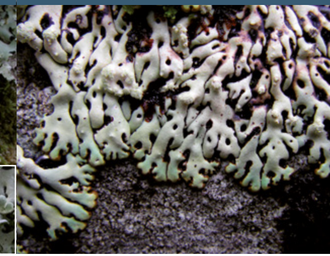
Form Lobes with raised wavy margins, often with scattered black cilia.
Colour Pale grey to pale green-grey.
Soredia/Isidia Soredia in discrete globular or lip-shaped soralia.
Fruit Rare.
Underside Black with a few simple rhizines and a brown-black naked zone at the margin.
Notes Common in a range of habitats in western Britain, similar to *P. crinitum* and *Cetrelia olivetorum*.

3 ARE THE LOBES INFLATED AND HOLLOW, WITH A SMOOTH UNDERSIDE WITHOUT BLACK RHIZINES?

Hypogymnia physodes Heather rags

Form Inflated hollow lobes, with lobe tips often raised to show brown underside, or split to reveal distinctive soralia.
Colour Pale grey to green-grey.
Soredia/Isidia Lobe tips split, turn up and develop soredia on underside.
Fruit Scarce; red-brown disc with a rim.
Underside Black, brown near margin without rhizines.
Notes Similar to *H. tubulosa* which has globular soralia on unsplit lobe tips. Also similar to *Menegazzia terebrata*.

S42 *Menegazzia terebrata* Tree flute



Form Inflated hollow lobes, with distinctive holes. Often forms neat rosettes closely pressed to the substrate.
Colour Pale grey to pale green-grey.
Soredia/Isidia Soredia in discrete rounded soralia.
Fruit Very rare.
Underside Black without rhizines.
Notes Similar to *Hypogymnia physodes*, which has distinctive soralia and lacks holes in lobes.

4 DOES THE LICHEN RESEMBLE CORAL?

Parmelia saxatilis Grey crottle

Form *Parmelia saxatilis* is a common leafy species and similar in appearance to *Parmelia sulcata*. Look for white ridges, giving an appearance like that of hammered metal.
Colour Pale grey with white flecks and ridges.
Soredia/Isidia *P. saxatilis* has simple or coral-like isidia which are often brown-tipped.
Fruit Occasional; red or brown disc.
Underside Black, brown at margin with numerous simple or occasionally forked black rhizines.
Notes This species is common in a range of lichen communities and is used to make traditional dyes.

Parmelia sulcata Powdered crottle

Form *Parmelia sulcata* is a common leafy species that looks like *Parmelia saxatilis*. Look for white ridges, which give the appearance of hammered metal.
Colour Pale grey with white flecks and ridges.
Soredia/Isidia *P. sulcata* has soredia.
Fruit Occasional; red or brown disc.
Underside Black, brown at margin with numerous simple or occasionally forked black rhizines.
Notes This species is common in a range of lichen communities and is used to make traditional dyes.

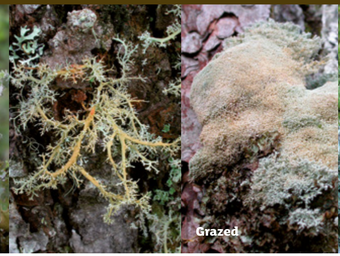
Cetrelia olivetorum Speckled sea-storm lichen

Form Lobes with raised wavy margins and distinctive white spots.
Colour Pale grey to pale green-grey, sometimes tinged with brown.
Soredia/Isidia Soredia on margins of older lobes.
Fruit Rare.
Underside Black with scattered simple rhizines and a brown-black naked zone at the margin.
Notes Similar to *P. perlatum* but that species has no white spots on the lobe surface.

Platismatia glauca Frilly lettuce

Form Frilly lobes with wavy divided margins.
Colour Pale grey-green to whitish green, sometimes tinged with brown, and often with reddish or pinkish patches on older lobes.
Soredia/Isidia Often with simple to coral-like isidia or granular soredia on margins.
Fruit Very rare.
Underside Brown, white or black; if present, the few rhizines are simple or branched.
Notes A common species on trees in a range of habitats.

Sphaerophorus globosus Coral lichen



Form Irregularly branched cylindrical stems, although if grazed – for example, by slugs – it can form neat, dense cushions.
Colour Pale grey to pale green-grey, main branches often orange-brown.
Soredia/Isidia None.
Fruit Occasional; globular swellings at branch tips burst to reveal a dark powder of spores.
Notes Similar to *Bunodophoron melanocarpum*.

Bunodophoron melanocarpum Black-eyed Susan

Form Branched, flattened stems, sometimes forming distinct tiers; branch tips divide to look like hands; fruits distinctive when present.
Colour Whitish, pale grey to pale green-grey.
Soredia/Isidia None.
Fruit Occasional; branch tips swell to form a hood that has distinctive 'black eyes' (a mass of spores) on the lower surface.
Underside Paler below.
Notes Similar to the much more common *Sphaerophorus globosus* which has cylindrical branches; the main branches are often orange-brown.