Plantlife Cymru

Plantlife Cymru is speaking up for Wales's wild flowers and plants. From the open spaces of our nature reserves to the corridors of the Welsh Assembly, we're here to raise their profile, celebrate their beauty and protect their future.

Wild flowers and plants play a fundamental role for wildlife and their colour and character light up our landscapes. But without our help this priceless natural heritage is in danger of being lost. Join us in enjoying the very best that nature has to offer.

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Some key features to look for when identifying lichens

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

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.

Lobe The rounded "leaf" of a leafy lichen

Lobules A small "secondary" lobe that develops on the margin or on the surface of the lobe.

Fruits Reproductive structures that produce spores. They can be round discs, pimple-like or globular, and can vary in colour from brownish to black.

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.

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.

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

Rhizines Root-like structures, as found on *Peltigera* species. These may be straight, forked or branched.

Tomentum An even or patchy carpet of short hairs (usually brownish or pale) on the underside as found in *Sticta* species.

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.

Fruits and isidia on *Lobaria pulmonaria*

Lobules on *Leptogium cyanescens*

Soredia on *Sticta limbata*

Hypothallus on *Degelia* sp.

Rhizines on *Peltigera* sp.

Tomentum with cyphellae on *Sticta* sp.

Lichens of Welsh temperate rainforest

Guide 1 The *Lobarion* lichens of ash, hazel, willow, rowan and old oak

This guide is for anyone interested in identifying some of the more conspicuous lichens of temperate rainforest, and aims to provide the tools to identify good and potentially important lichen habitat.

Different species of lichen often grow together, forming distinct communities. The *Lobarion* community grows on trees with mildly acidic or alkaline bark – for example ash, sycamore, willow, rowan and old oak – and is characterised by large leafy lichens, especially the four *Lobaria* species.

A companion guide (Guide 2) looks at the *Parmelion* community of lichens. These grow on trees with very acidic 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 semi-natural woodlands 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 are lichens of temperate rainforest important?

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 time.

Many species are not found in other parts of Britain and Europe, some are globally rare, and some species have their world headquarters here; it is therefore vital we look after them. A number of species are listed under Section 42 of the Natural Environment and Rural Communities Act, meaning they are of "principal importance for conservation of biological diversity" in Wales; most of the species in this guide are part of the Section 42 *Lobarion* community and some are listed in their own right; these are indicated in the guide by "S42".

Finding and identifying lichens

Now for the good bit – arm yourself with a hand lens and get out into the woods. The best areas will often be slopes and river valleys with mixed deciduous woods containing hazel and old trees of ash, rowan, willow and oak. Lobarion species occur on bark, or on mats of mosses and liverworts growing over bark. Many species also grow on mossy boulders and rocks, especially in humid situations.
The large, leafy lobes of *Peltigera horizontalis* and the black smears of *Parmeliella triptophylla* are good indicators of interesting habitat.

To identify a lichen first look at its growth form:

- Does it consist of leafy lobes? If so, see Section 1 of this guide
- Does it consist of small or tiny leafy lobes that look like roof-shingles? If so, see Section 2 of this guide
- Is it jelly-like when wet? If so, see Section 3 of this guide
- Is it crusty or powdery? If so, see Section 4 of this guide

There are other key features to look for when identifying lichens. These are described in more detail on the back page.

Finally, please submit any records you make to the British Lichen Society (see below). Please note that although common names have been used in this guide, few common names for lichens are universally accepted. Scientific names should always be used when recording lichens to avoid ambiguity.

Further information

Books

Lichens: An Illustrated Guide to the British and Irish Species, Frank Dobson, 5th Edition (2005), Richmond Publishing Co Ltd.
The best identification guide to most of the common lichens of a range of habitats.

Lichens, Oliver Gilbert (2000), Collins New Naturalist series, Harper Collins.
A highly readable account of lichen ecology and habitats in Britain, including a good chapter on woodland lichens.

Websites

www.wales-lichens.org.uk The Lichens of Wales is dedicated to the conservation of lichens in Wales and is a great resource
www.thebls.org.uk The British Lichen Society (BLS) has information on lichens, publications, courses and other web links.
www.uklichens.co.uk The UK lichens website has useful photos of many UK species.

Advice

Plantlife can help you in your quest for information and support.
www.plantlife.org.uk
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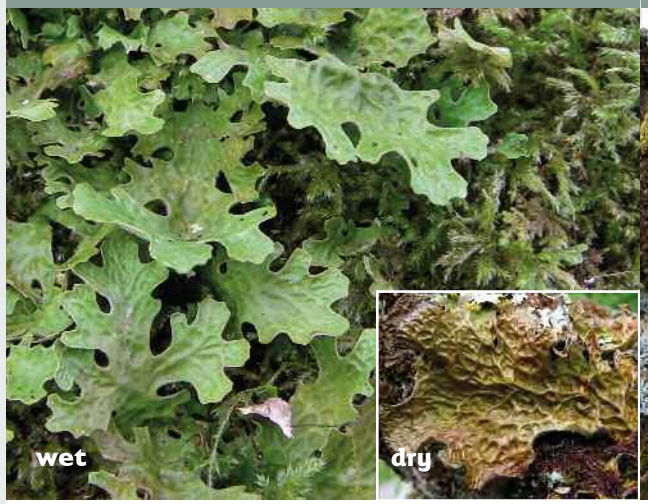
1 DOES THE LICHEN HAVE WELL DEVELOPED LEAFY LOBES?

Lobaria pulmonaria Tree lungwort



Form Loosely attached lobes with a distinctive network of ridges giving a lung-like appearance.
Colour Green when wet, brownish-green when dry.
Soredia/Isidia Often has soredia or isidia along the margins and ridges.
Fruit Occasional; a red-brown disc.
Underside A patchy tomentum with convex naked areas corresponding to depressions between the ridges on the upper surface.

Lobaria amplissima Parchment lichen

Form Closely pressed to the substrate, smooth or wrinkled lobes with wavy margins; usually with dark brown rounded, shrubby growths (known as cephalodia) on the surface. Margins of young lobes have a fine frosting when dry.
Colour Pale grey (when dry) to pale green-grey (when wet), often with brown tips.
Soredia/Isidia None.
Fruit Scarce; a red-brown disc with a white margin.
Underside An even tomentum.
Notes Similar to *L. virens* when wet/green but that species never has cephalodia. *Flavoparmelia caperata* is brighter yellow-green, but has soralia and never has cephalodia.

Lobaria scrobiculata Lob scrob

Form Loosely attached irregular lobes with ridges.
Colour Yellowish-grey (dry) or blue-grey (wet).
Soredia/Isidia Grey to blue-grey soralia; spreading along the ridges and lobe margins.
Fruit Rare; a red-brown disc with a thick green margin.
Underside A patchy tomentum with convex naked areas corresponding to depressions between the ridges on the upper surface.

Lobaria virens Green satin lichen

Form Smooth or wrinkled wavy lobes closely pressed to the substrate.
Colour Green when wet, brownish-green when dry.
Soredia/Isidia None.
Fruit Frequent; an orange disc with a thick green margin.
Underside An even tomentum.
Notes Similar to *L. amplissima* and *Flavoparmelia caperata*.

Nephroma laevigatum A kidney lichen

Form Thin, papery lobes with distinctive fruits on the underside of upturned lobe tips. Often has tiny flattened lobules on lobe margins.
Colour Brown-grey to brown when wet, often red-brown when dry.
Soredia/Isidia None.
Fruit Frequent; an orange-brown disc on the underside of the upturned lobe tip.
Underside Smooth or wrinkled.

Nephroma parile Powdery kidney lichen

Form Leafy lobes.
Colour Chocolate brown to reddish-brown.
Soredia/Isidia Grey to brownish granular soredia along the margins and occasionally on the lobes.
Fruit Very rare.
Underside Pale and usually smooth, lacking other features, for example rhizines or cyphellae.
Notes Similar to *Peltigera collina* but that species has rhizines, and to *Sticta limbata* but that species has cyphellae.

Sticta fuliginosa A stinky *Sticta*

Form Rounded lobes with downturned margins; lobes undivided but may be notched or irregular.
Colour Blackish-brown when wet, dark grey-brown when dry.
Soredia/Isidia Tiny coral-like isidia visible as dark granular patches on the surface of the lobes.
Fruit Scarce; red brown, often with pale hairs on margins.
Underside Pale or brown tomentum with paler spots (cyphellae).
Notes Smells fishy when wet. Similar to *S. sylvatica*.

Sticta sylvatica A stinky *Sticta*

Form Irregularly branched lobes.
Colour Grey or brown to blackish-brown when wet, dark grey to grey-brown when dry.
Soredia/Isidia Tiny coral-like isidia visible as dark granular patches on the surface of the lobes.
Fruit Not recorded in the UK.
Underside Pale or brown tomentum with paler spots (cyphellae).
Notes Smells fishy when wet. When poorly developed it is difficult to distinguish from some irregularly notched forms of *S. fuliginosa*.

Peltigera horizontalis A dog lichen

Form Large smooth lobes forming large patches.
Colour Brown to grey-brown when wet, grey when dry.
Soredia/Isidia None.
Fruit Frequent; chestnut brown, rounded, held parallel to the lobe surface, ie horizontally.
Underside White with a network of dark veins and brown rhizines that look like twisted ends of frayed rope.
Notes Found on mossy tree trunks, stumps and rocks in old woodland. Similar to other *Peltigera* species.

Peltigera collina Floury dog-lichen

Form Lobes with raised wavy/frilly margins and soredia.
Colour Grey, blue-grey to grey-brown when dry, grey when wet.
Soredia/Isidia Coarse, pale-grey to blue-grey soredia on the wavy lobe margins.
Fruit Rare; dark brown to blackish.
Underside Soft rhizines.
Notes This is the only *Peltigera* species with marginal soralia. It is similar to *Nephroma parile* (which has a smooth or wrinkled underside with no rhizines).

Sticta limbata Floury *Sticta*

Form Rounded, sometimes notched or irregular lobes with downturned floury margins.
Colour Pale grey to pale grey-brown, darker when wet.
Soredia/Isidia Diffuse, floury, pale-grey soredia along margins and spreading on to surface.
Fruit Very rare.
Underside Pale or brown tomentum with paler spots (cyphellae).
Notes When poorly developed could be confused with *Nephroma parile* which has a smooth underside with no pale spots.

Normandina pulchella Elf ears

Form Tiny rounded ear-like lobes with a distinctive pale rim.
Colour Pale blue-grey to pale green-grey; greener when wet.
Soredia/Isidia Greyish to greenish soredia, mainly on the margins and sometimes spreading to cover lobes.
Fruit Not recorded in UK.
Notes May be scattered or clustered; usually grows on mosses, liverworts or other lichens.

2 DOES THE LICHEN HAVE TINY LEAFY LOBES?

Degelia atlantica Felt lichen

Form Scallop-like plates closely attached to the substrate with longitudinal ridges, concentric "growth" rings and blackish felted margins (the hypothallus).
Colour Pale grey, sometimes tinged brown; darker when wet.
Soredia/Isidia Numerous knobbly isidia on the surface and margins, especially on the raised ridges where the lobe margins meet.
Fruit Very rare; reddish.
Underside Thick blackish or greyish velvety mat (hypothallus) visible at the edges of upturned lobe margins.
Notes Similar to *D. plumbea*, but this is usually abundantly fertile, has no isidia, and is very rare in Wales.

Pannaria conoplea Mealy-rimmed shingle lichen

Form Small lobes with finely scalloped margins.
Colour Pale grey to blue-grey with paler margins, sometimes tinged brown and darker when wet.
Soredia/Isidia Coarse grey soredia.
Fruit Very rare.
Underside Blackish or greyish velvety mat (hypothallus) not usually visible.
Notes Similar to *P. rubiginosa*, but this is usually abundantly fertile, has no soredia and is very rare in Wales.

3 DOES THE LICHEN LOOK JELLY LIKE WHEN WET?

Leptogium lichenoides Tattered jelly-skin lichen

Form Dense mass of very thin lobes that appear minutely frilly at the margins due to abundant isidia.
Colour Dark brown when wet, grey to grey-brown when dry.
Soredia/Isidia Abundant elongated cylindrical isidia on lobe margins.
Fruit Rare; small red-brown disc.
Underside Ridged.
Notes Found among mosses on trees (especially ash) and sometimes on mossy rocks in old woodlands. Very similar to some other *Leptogium* species, eg *L. pulvinatum* (but that species has flattened isidia).

Leptogium cyanescens Blue jelly-skin lichen

Form Intricate rosettes of thin overlapping lobes with isidia or lobules, or both.
Colour Pale blue-grey when dry, dark grey to blackish when wet.
Soredia/Isidia Cylindrical or flattened isidia or lobules abundant on lobe margins or surface.
Fruit Very rare.
Underside Smooth or slightly wrinkled.
Notes When wet is similar to some other *Leptogium* species. If in doubt dry a specimen to see the distinctive colour of dry *L. cyanescens*.

4 IS THE LICHEN CRUSTY AND GRANULAR?

Parmeliella triptophylla Black-bordered shingle lichen

Form Tiny lobes (squamules) on the black margins of a dense crust of isidia.
Colour Blackish when wet to brown or grey-brown when dry.
Soredia/Isidia Minute, thin and finger-like, often branched (best visible when dry).
Fruit Rare; small (to 1mm), red-brown.
Underside Black hypothallus extending beyond the margins of the lobes.
Notes Appears as a dark stain on the bark of trees (especially old ash).

S42 *Fuscopannaria sampaiana* Brown shingle lichen

Form Appears like a brown crust, but has tiny lobes (squamules) usually visible on the margins of a crust of soredia.
Colour Creamy red-brown to red-brown with paler margins. More greyish when wet.
Soredia/Isidia Pale greyish to creamy granular soredia.
Fruit Not recorded in UK.
Underside Blue-black hypothallus often visible at squamule margins.
Notes Some people detect a distinctive sweet, fruity smell (like a juicy fruit chewing gum) when the wet surface is gently rubbed with a finger.

Thelotrema lepadinum Barnacle lichen

Form A thin crust with numerous small, distinctive barnacle-like fruits.
Colour Whitish to pale grey.
Soredia/Isidia None.
Fruit Abundant; like small barnacles.
Notes Found on mature trees and shrubs in old woods including hazel and rowan, and on smooth bark on mature ash and oak.

Mycobilimbia pilularis

Form A fine granular dusting with distinctive fruits.
Colour Green to grey-green, greener when wet.
Soredia/Isidia None.
Fruit Abundant; buff to pinkish-orange and globular, or pill-like.
Notes Frequently found on or near the base of mature trees, often in more shaded conditions.