Plantlife Cymru

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ISBN: 978-1-907141-88-1

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All photos © Acton/Griffith 2013 Except *Usnea florida* © Alan Hale 2013 and *Parmelinopsis horrescens* ©Tim Wilkins 2013

The production of this guide was funded by

Cyfoeth Naturiol Cymru Natural Resources Wales

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.

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

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. Stiff wiry black rhizines are typical of many Parmelion species, and these may be forked, branched, or just simple.

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.

Cilia on *Parmotrema perlatum*

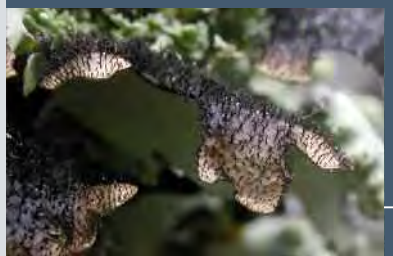
Fruits on *Ochrolechia tartarea*

Isidia on *Parmelia saxatilis*

Soredia on *Parmelia sulcata*

Psuedocyphellae on *Cetrelia olivetorum*

Rhizines on *Hypotrachyna laevigata*



Lichens of Welsh temperate rainforest

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, 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 *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 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 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 period of 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; 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. 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 Section 4 and 5 of this guide
- Is it crusty, lumpy or porridge-like? If so, see Section 6 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 support you in your quest for information and support.
www.plantlife.org.uk
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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 down-turned, 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.

Parmelia saxatilis Grey crottle and *P. sulcata* Powdered crottle

Form Two very similar and common leafy species with 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, whilst *P. sulcata* has soredia.
Fruit Occasional; red or brown disc (*P. saxatilis*) or soredia (*P. sulcata*).
Underside Black, brown at margin with numerous simple or occasionally forked black rhizines.
Notes These species are common in a range of lichen communities and are used to make traditional dyes.

S42 *Parmelinopsis horrescens* Hairy-spined shield lichen

Form Small, scruffy-looking, crowded lobes tightly attached to the substrate; upper surface with a crust of isidia and black hairs (cilia).
Colour Pale grey-white.
Soredia/Isidia Abundant brown-tipped isidia. Black cilia grow at tips of, and among, isidia, as well as on lobe margins.
Fruit Very rare.
Underside Black-brown with simple or branched black rhizines to the margin.
Notes Similar to *Parmotrema crinitum* but smaller and more closely pressed to the substrate.

2 DO THE LOBES HAVE WAVY MARGINS AND/OR THE UNDERSIDE HAVE 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*, search carefully for isidia/cilia to confirm *P. crinitum*. Also similar to *Parmelinopsis 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 the 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 un-split 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?

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 A coral lichen

Form Irregularly branched cylindrical stems, although if grazed, eg 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.

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

S42 *Usnea florida* Witches whiskers

Form Shrubby tufts on twigs and branches in the canopy with very distinctive fruits.
Colour Pale grey-green.
Soredia/Isidia None.
Fruit Usually abundant and very distinctive; a grey-green disc (up to 1cm diameter) with abundant grey-green projections from the margin, looking like sun's rays or eyelashes.
Notes Other *Usnea* species are not usually so fertile. The most similar, *Usnea subfloridana*, rarely fruits and develops clusters of minute isidia.

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.

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 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.

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.

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”.