

LICHENS

What is a lichen ?

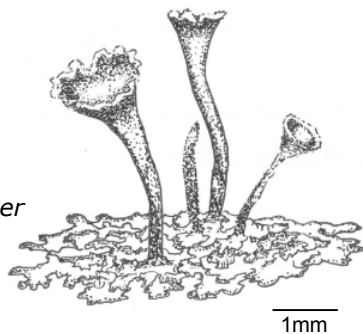
A lichen is actually two organisms, an alga and a fungus, growing together (in symbiosis). The alga produces sugars that the fungus can feed on. The fungus provides shelter for the alga, allowing it to survive in extreme conditions where it might otherwise be destroyed by excessive heat or drought.

Lichens display a wide spectrum of beautiful colours, including subtle greens and blues, as well as vibrant oranges, red and white. In shape too, they range from delicate frilly 'leaves' to flat crusts and dust-like granules.

Lichens are among the slowest growing organisms on earth, with some growing less than 1mm a year. There are around 1,700 different lichens in Britain, and 40,000 worldwide!

Air pollution

Many lichens are very sensitive to air pollution, particularly sulphur dioxide (SO₂) from industry and traffic fumes. Conversely, others *love* polluted air and are found only where contamination is present!



The lichen
Cladonia fimbriata
is scarce on Shotover

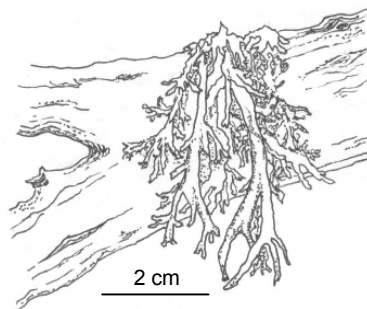
Where do you find lichens ?

Lichens can withstand extreme conditions and specialize in taking advantage of the kinds of places where other plants can't grow. For instance, baking deserts and freezing Polar Regions are no problem for lichens, and they can grow just as happily in shallow seas as on high mountains. They are mostly found on stone, bare soil and trees, and can add colour and beauty to the bleakest of landscapes.

Where can lichens be found at Shotover?

At Shotover, lichens grow on trees, on the 'dogger' stones at the sandpit, the boulders at the Plain and even bare soil on the heathland. Common lichens on Shotover's trees are the bright yellow patches of *Xanthoria parietina*, the light blue moon-cratered fronds of *Parmelia sulcata* and the grey beard-like tufts of *Evernia prunastri*, commonly known as Oak Moss.

Shotover Wildlife commissioned a lichen survey of Brasenose Wood and Shotover SSSI, and found that most species are those that can tolerate air pollution and Oxford's rather dry climate.



A common
Shotover lichen
Evernia prunastri
or 'Oak Moss'

Uses of lichens

Lichens have been utilized by man for centuries. The most important use in Britain has been in the production of dyes. In times past, dyes were made by mixing lichens with lime and urine!

Some lichens are edible too, including 'rock tripe' (*Umbilicaria* sp.) which can be used as emergency food in the wild. In 1820, on Franklin's ill-fated 'Northwest Passage' expedition, a team of men kept going for 11 days on boiled lichen alone.

Some lichens have a musky fragrance and are still used in quality perfumes and soaps.

Certain species have medicinal uses, with some being added to deodorants and shampoos. They are also an important source of antibiotic. Conversely, some lichens can cause allergic skin reactions.

MOSSES

What is a moss?

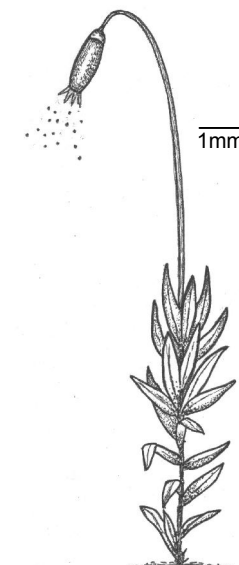
Mosses are the tiny green plants that grow in silky mats and soft velvety cushions on soil, trees, old walls, roofs and rocks. As with lichens, they are found in places where other plants can't survive. Mosses are often the first plants to grow on newly exposed surfaces, but cannot tolerate too much competition from other vegetation.

A close relative of the mosses are the **liverworts**, and together are collectively known as **bryophytes**.

Mosses and liverworts are low growing, moisture-loving plants. Most species have leaves of just one cell in thickness, and because of this, they are able to absorb water and nutrients directly into their leaves. Instead of flowers, they produce capsules in which spores develop.

On closer inspection, moss capsules are the most beautiful and delicate of structures that have an intriguing array of hoods, lids and 'teeth' of different textures and colours. When ripe the spores are released, and are carried great distances by the wind to form new plants.

Swan's-neck Thyme-moss
(*Mnium hornum*)
is a common woodland
moss on Shotover



Mosses at Shotover

The interesting diversity of bryophytes at Shotover is due to the different kinds of habitat, such as damp woodland and scrub, old field boundaries, marsh, and bare soils of the heath.

Shotover heathland, with its acidic soil, is a rare habitat in Oxfordshire and the mosses

that grow there reflect this acidic environment, especially the tiny moss Bristly Haircap (*Polytrichum piliferum*) which is rare and declining in Oxfordshire.

Shotover Wildlife has carried out a full survey of mosses and liverworts at Shotover. Through this work, several species have been rediscovered, after having been reported as extinct on the hill, including the Squirrel-tail Moss (*Leucodon sciuroides*), Lateral Cryphaea (*Cryphaea heteromalla*), and the Frizzled Pincushion (*Ulota phyllantha*).

Bryophytes are often overlooked in wildlife conservation and their ecological significance is not always recognized. Vulnerable species at Shotover are being monitored by **Shotover Wildlife**, and new discoveries of unusual species are being made.

Lateral Cryphaea
(*Cryphaea heteromalla*)
One of several mosses
being monitored by
Shotover Wildlife



Ecology

Bryophytes can provide a great deal of information about a habitat. They are excellent indicators of rock type, soil acidity, geological substrate, age of woodland, and even presence of air pollution. They also play a role in the creation of soil and in the stabilization of soil against erosion.

Bryophytes also help to maintain soil moisture and provide micro-habitats amongst their moist leaves that support a remarkable number of microscopic animals such as tardigrades, rotifers and nematodes, providing food for the smallest of insects.

Some mosses and liverworts have special features that protect them from drying out, whilst others simply 'shut down' and stop growing until moister conditions return, perhaps months later.

There are about 1,000 different bryophyte species in Britain, and around 22,000 worldwide. One of the world's earliest collections of mosses and liverworts was begun in Oxford by Jacob Bobart in the 17th Century.

Mosses and liverworts are among the first land plants to have evolved 400 million years ago.

When compared with the age of the dinosaurs about 200 million years ago, it can be appreciated just how long mosses and liverworts have been present on Earth!

Shotover Wildlife is a voluntary organisation founded to research and communicate the importance of Shotover Hill for wildlife

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Cover picture: the lichen *Cladonia fimbriata*
and Common Bladder-moss (*Physcomitrium pyriforme*)

**For Mosses Identification Courses
contact Shotover Wildlife**

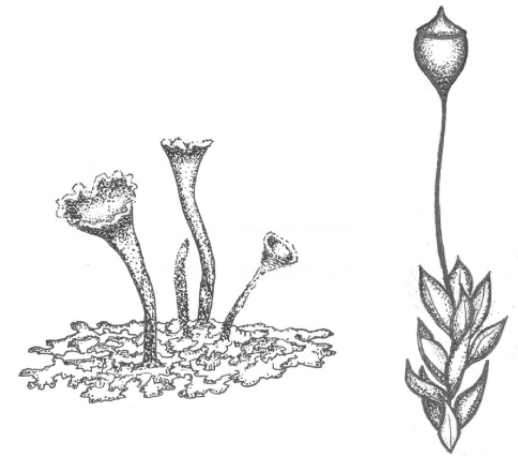
Jacqueline Wright is County Recorder of Bryophytes
for Oxfordshire and Berkshire

Related leaflet titles:

Heathland Geology
Habitats Remarkable Trees
Shotover Ancient Trees Project

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LICHENS AND MOSSES on SHOTOVER



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