

# Caledonian Forest – Species Profile

## Cowberry

(*Vaccinium vitis-idaea*)

With its bright red berries and evergreen leaves, cowberry is one of the most distinctive plants of the Caledonian Forest ground flora.



### Worldwide distribution

Cowberry is circumboreal in its distribution, meaning that it occurs in the boreal zone all around the northern part of the planet. In North America, it grows in Alaska, throughout Canada and in the northeastern USA, and it also occurs in Greenland and Iceland. In Europe, its range is mainly in the north, from Britain and Scandinavia eastwards, but it also grows in the mountains further south, in the Pyrenees, the Alps and the mountains of Macedonia. Further east, it occurs in the Caucasus and across northern Asia to Siberia, Japan, the Korean peninsula and northern China.

Two sub-species are recognised – the North American population consists of *Vaccinium vitis-idaea* ssp. *minus*, while *Vaccinium vitis-idaea* ssp. *vitis-idaea* occurs in Europe and Asia. Throughout its range, cowberry is known by a variety of names, including lingonberry in Sweden and mountain cranberry in North America.

### Physical characteristics

Cowberry is a small evergreen perennial shrub in the Ericaceae, or heather, family. It typically grows up to 30 cm. in height, and can be a metre across, as it spreads by rhizomes, forming a dense mat on the forest floor. Cowberry also occurs on hummocks, the raised mats of vegetation growing over old tree stumps or rocks that are a characteristic feature of the old pinewoods of the Caledonian Forest.

The leaves are oval in shape, about 2 cm. in length, and grow at alternating positions along the stems. They are a glossy, deep green colour with a tough, leathery consistency, and have their edges slightly turned down. Cowberry flowers are up to 8 mm. long, white to pale pink in colour and are cup-shaped, with their open end pointing downwards. They are borne on special flower stems called racemes, which can have 5 or more flowers on each one, although some have just a single flower on them.



Cowberry plant, showing flowers, berries and leaves.

### Distribution in Scotland

Cowberry is widely distributed in Scotland, occurring throughout the mainland, on many of the Hebridean Islands, and in Orkney and Shetland. It grows from near sea level in some sites to an elevation of over 1,000 metres on Ben Lawers in Perthshire. Cowberry is a characteristic species in the native pinewoods of the Caledonian Forest, but also grows in a range of dry and wet heath communities, which accounts for its near ubiquitous range in Scotland.

### Conservation status

Because of its wide distribution and abundance throughout its range, cowberry is not considered to be at any risk, and is classified as Secure in terms of conservation.



Flowers of cowberry.



Pollination is by bumble bees (*Bombus spp.*) and some other insects, including bee flies (Bombyliidae) and hoverflies. Pollinated flowers develop into spherical, bright red berries that are up to 10 mm. across. These are acidic and sour in flavour, and contain yellow seeds that are 1 mm. in length. Berry production varies from year to year, with years of great abundance being followed by ones with relatively few berries produced.

Unusually, cowberry can have two flowering periods in the year, with one being from April to June, and the other from the end of July through to November. This makes it one of the latest-flowering plants in the Caledonian Forest, and as a result it provides food for pollinating insects when there are few other sources available at the end of the growing season. It also means that both flowers and ripe fruit can sometimes be seen simultaneously on the same plant.

Cowberry reproduces vegetatively as well, spreading by means of rhizomes, which are modified roots that can send up new shoots from their nodes. This enables cowberry to survive the fires that burn in some parts of its geographic range, with the rhizomes producing shoots after the above ground parts of the plant have been burned. It grows at the rate of about 10 cm. per year, with the shoots only living for a few years. However, the rhizomes can live for 20 years or so, and an individual cowberry plant itself may be a century or more in age, as new spreading growth replaces the old parts as they die off.



Cowberry plants on a hummock in a birchwood area in Glen Affric.

Cowberry redleaf (*Exobasidium vaccinii*) is a fungus that induces galls on cowberry. The galls take the form of a red swollen cup-like shape on the leaves, or pinkish swellings on the stems of the plant. A related, rarer fungus (*Exobasidium juelianum*) also affects cowberry, causing it to become dwarfed and heavily-branched.

Two midges (*Dasineura anglica* and *Dasineura vitisidaea*) induce galls on cowberry, but it is difficult to distinguish between the two of them. Three species of aphids feed on cowberry, and five different species of micro-moths make mines in cowberry, where their larvae feed between the epidermal layers of the leaves. Caterpillars of the green hairstreak butterfly (*Callophrys rubi*) feed on cowberry, amongst other plants, as do the larvae of a number of moths, including the northern spinach (*Eulithis populata*), the grey mountain carpet (*Entephria caesiata*) and the Manchester treble-bar moth (*Carsia sororiata anglica*). The larvae of the oak slug sawfly (*Caliroa annulipes*) have also been recorded feeding on cowberry.



Gall induced by the cowberry redleaf fungus (*Exobasidium vaccinii*) on a cowberry leaf in Glen Affric.

Birds such as the song thrush (*Turdus philomelos*) and blackbird (*Turdus merula*) feed on the berries of cowberry, and act as distribution agents for the seeds they contain. Mammals, including the red squirrel (*Sciurus vulgaris*), pine marten (*Martes martes*) and the badger (*Meles meles*), also eat the berries, as would have the European brown bear (*Ursus arctos*) before it was extirpated from Scotland. The fruit and leaves have long been used by indigenous people in Europe, Asia and North America for food and medicinal purposes. The berries are harvested and marketed commercially in Scandinavia and Japan, while the feasibility of commercial utilisation is currently being tested in parts of North America.

A list of sources for this profile can be found on our website.

## Ecological relationships of cowberry

In Europe, cowberry sometimes hybridises with its close relative, the deciduous blaeberry (*Vaccinium myrtillus*) and the resulting cross is known as *Vaccinium x intermedium*.

Cowberry forms mycorrhizal relationships with a number of fungi, including *Rhizoscyphus ericae*. In this mutually beneficial symbiotic partnership, both the plant and the fungus benefit through an exchange of nutrients. Cowberry provides sugars and carbohydrates, which it manufactures through the process of photosynthesis, to its fungal partner, while the fungus accesses nutrients in the soil that it passes on to the plant. Nutrient exchange between plant and fungus takes place where the hyphae (white filaments of the fungus body) wrap around the root tips of the plant. This partnership is considered to be crucial to the ability of ericaceous plants such as cowberry to grow in the nutrient-poor soils that occur in much of the Highlands, and elsewhere in its geographic range.



Caterpillar of the July highflyer moth (*Hydriomena furcata*) feeding inside two leaves of cowberry that it has sewn together.