
M31

Anthelia julacea-*Sphagnum auriculatum* spring *Sphagno auriculati*-*Anthelietum julaceae* Shimwell 1972

Synonymy

Anthelia julacea-*Deschampsia cespitosa* provisional nodum McVean & Ratcliffe 1962; *Anthelia julacea* banks Birks 1973.

Constant species

Deschampsia cespitosa, *Anthelia julacea*, *Marsupella emarginata*, *Scapania undulata*, *Sphagnum auriculatum*.

Rare species

Anthelia juratzkana, *Pohlia ludwigii*.

Physiognomy

In the *Sphagno auriculati*-*Anthelietum julaceae*, *Anthelia julacea* more than justifies the claim of McVicar (1912) that it is 'the most conspicuous hepatic of our highland mountains'. For though its individual shoots are thread-like, they are here massed into extraordinarily robust and dense tufts, cushions or huge swelling masses, up to a metre or more thick and sometimes covering as much as several square metres in total extent. Dull and glaucous when kept wet, as they typically are, or occasionally drying out to a pale grey colour, the larger mats and banks can scarcely be missed, even from a distance.

In terms of its associated flora, however, this is generally a rather species-poor assemblage, with vascular plants being especially sparse. Among other bryophytes, *Sphagnum auriculatum*, *Marsupella emarginata* (both var. *emarginata* and var. *aquatica*) and *Scapania undulata* are all constant and, though none rivals *A. julacea* itself in abundance, the first in particular can be found as patches of moderate size, often prominent by virtue of their coppery hue. *Racomitrium lanuginosum* and *Philonotis fontana* are also quite frequent, with *Calliergon sarmentosum*, *Campylopus atrovirens*, *Polypodium commune* and *Racomitrium fasciculare* occurring occasionally. Rare bryophytes recorded here include *Anthelia juratzkana*, which seems totally to replace *A. julacea* in some stands (McVean & Ratcliffe 1962), and *Pohlia ludwigii*.

The commonest vascular plant in the community is

Deschampsia cespitosa (presumably sometimes ssp. *alpina* at higher altitudes) and this is typically found as small tufts set in the bryophyte cushions. Scattered plants of *Nardus stricta* also occur quite often with occasional *Narthecium ossifragum*, *Pinguicula vulgaris*, *Carex demissa* and *Saxifraga stellaris*. Less frequent are *Eriophorum angustifolium*, *Carex bigelowii*, *C. nigra*, *Festuca vivipara*, *Agrostis canina*, *A. stolonifera*, *Juncus bulbosus*, *Thalictrum alpinum* and *Viola palustris*.

The available data do not indicate any well-marked sub-divisions within the community, though there is a suggestion that *Racomitrium lanuginosum*, *Nardus* and *Narthecium* might define one sub-group, with *Philonotis fontana*, *Calliergon sarmentosum*, *Carex demissa* and *Pinguicula vulgaris* preferential to another.

Habitat

The *Sphagno*-*Anthelietum* is a montane community of north-west Britain, typical of often skeletal mineral and organic soils kept more or less permanently wet by the trickling of acid and oligotrophic waters, frequently derived, at higher altitudes, from snow-melt.

A. julacea occurs at moderate to high altitudes, from about 400 m to over 1000 m in the available samples, in Wales, north-western England, south-west Scotland and up through most of the Highlands, a region characterised by mean annual maximum temperatures generally less than 25 °C and considerably lower through most of north-west Scotland (Conolly & Dahl 1970). Although it can be found in this zone as an occasional in other kinds of vegetation, it typically dominates here around spring-heads and over constantly-irrigated soils, often of a fragmentary character. Thus, though some of the profiles could be classed as stagnogleys or alluvial gleys (Avery 1980, Birse 1984), many are little more than raw accumulations of mineral and organic detritus held beneath the mass of vegetation. Stands can be found on virtually level ground or gently shelving slopes in hollows and corries cut into granite, gneiss and acid schists, or over somewhat steeper banks and stabilised masses of debris.

The irrigating waters are characteristically acid, of pH 4.5–5.0 in the available samples, and low in carbonates and exchangeable bases. At higher altitudes, melt-water contributes substantially to seepage in the late spring and summer months and snow-lie over this vegetation can be quite substantial, though typically not so long as with the *Pohlietum glacialis* or snow-bed vegetation proper. Even though the ground is kept more or less continually wet, however, and though the community often marks out distinct spring-heads, irrigation is probably not so vigorous as in the *Philonoto-Saxifragetum stellaris*.

Zonation and succession

The community is typically found marking out areas of less vigorous seepage among tracts of montane grasslands and grass-heaths or among snow-bed vegetation, and in such situations it can form intimate mosaics with the *Philonoto-Saxifragetum* where there is variation in the rate of flow. It is an essentially stable community in the harsh environment in which it characteristically occurs.

Distribution

The *Sphagno-Anthelietum* is a local but widespread community through much of Scotland, extending from the Central Highlands west to Skye and South Uist and northwards to the Loch Broom area. It can be found too, often at somewhat lower altitudes, through south-west Scotland and in the Lake District and Snowdonia.

Affinities

This distinctive vegetation type, defined here as an expanded though essentially similar version of the assemblage first characterised by McVean & Ratcliffe (1962), is rather isolated syntaxonomically. Species such as *Scapania undulata* and *Marsupella emarginata* provide a link with submerged bryophyte communities of fast-flowing mountain streams, but closer affinities are with the *Philonoto-Saxifragetum*. However, the absence of *Montia fontana* and many of the typical plants of the Cardamino-Montion is very noticeable and Shimwell (1972) proposed a new alliance, the Anthelion julaceae, within the Montio-Cardaminetalia, to contain the community.

Floristic table M31

<i>Anthelia julacea</i>	V (7–10)	<i>Polytrichum alpinum</i>	I (2)
<i>Sphagnum auriculatum</i>	V (1–5)	<i>Racomitrium heterostichum</i>	I (1–3)
<i>Marsupella emarginata</i>	V (1–7)	<i>Juncus bulbosus</i>	I (1–3)
<i>Scapania undulata</i>	IV (1–5)	<i>Diplophyllum albicans</i>	I (1)
<i>Deschampsia cespitosa</i>	IV (1–5)	<i>Juncus squarrosus</i>	I (2)
<i>Racomitrium lanuginosum</i>	III (1–7)	<i>Drepanocladus exannulatus</i>	I (1–3)
<i>Nardus stricta</i>	III (1–6)	<i>Saussurea alpina</i>	I (2)
<i>Philonotis fontana</i>	II (1–4)	<i>Cerastium fontanum</i>	I (1)
<i>Pinguicula vulgaris</i>	II (1–2)	<i>Carex echinata</i>	I (3)
<i>Narthecium ossifragum</i>	II (1–7)	<i>Plantago maritima</i>	I (3)
<i>Carex demissa</i>	II (1–4)	<i>Ranunculus acris</i>	I (2)
<i>Calliergon sarmentosum</i>	II (2–5)	<i>Ranunculus flammula</i>	I (1)
<i>Saxifraga stellaris</i>	II (1–3)	<i>Taraxacum officinale</i> agg.	I (2)
<i>Festuca vivipara</i>	I (1–3)	<i>Pohlia ludwigii</i>	I (3)
<i>Campylopus atrovirens</i>	I (1–6)	<i>Nardia scalaris</i>	I (4)
<i>Polytrichum commune</i>	I (1)	<i>Barbilophozia floerkii</i>	I (3)
<i>Eriophorum angustifolium</i>	I (3–4)	<i>Molinia caerulea</i>	I (2–3)
<i>Racomitrium fasciculare</i>	I (1–3)	<i>Blindia acuta</i>	I (1–2)
<i>Agrostis canina</i>	I (3–4)	<i>Huperzia selago</i>	I (1–2)
<i>Carex bigelowii</i>	I (1–4)	<i>Deschampsia flexuosa</i>	I (1)
<i>Carex nigra</i>	I (1–2)	Number of samples	28
<i>Thalictrum alpinum</i>	I (3)	Number of species/sample	13 (9–20)
<i>Viola palustris</i>	I (1–2)	Vegetation cover	96 (65–100)
<i>Agrostis stolonifera</i>	I (1–2)	Altitude (m)	712 (442–1052)
<i>Mylia taylori</i>	I (1–4)	Slope (°)	10 (0–30)
<i>Aneura pinguis</i>	I (1–2)		

