CG14
Dryas octopetala-Silene acaulis ledge community

Synonymy
Glen Lochay *Dryas* heath Poore & McVean 1957; *Dryas-Salix reticulata* nodum McVean & Ratcliffe 1962; *Dryas-Carex rupestris* nodum McVean & Ratcliffe 1962 *p.p.*; *Salico-Dryadetum* Shimwell 1968*a*; Cairnwell Limestone vegetation Coker 1969 *p.p.*; *Dryas octopetala* localities Elkington 1971 *p.p.*; *Dryas octopetala* heath Ratcliffe 1977 *p.p.*; Cliff ledge communities Jermy *et al.* 1978 *p.p.*; *Dryas octopetala-Salix reticulata* nodum Huntley 1979; *Viola-Festuca-Agrostis* nodum Huntley 1979 *p.p.*; *Alchemilla glabra-Sedum rosea* nodum Huntley 1979 *p.p.*

Constant species
Alchemilla alpina, *Campanula rotundifolia*, *Carex capillaris*, *C. pulicaris*, *Dryas octopetala*, *Festuca ovina/vivipara*, *Hieracium* spp., *Polygonum viviparum*, *Saxifraga aizoides*, *S. oppositifolia*, *Selaginella selaginoides*, *Silene acaulis*, *Thalictrum alpinum*, *Thymus praecox*, *Viola riviniana*, *Ctenidium molluscum*, *Ditrichum flexicaule*, *Hylocomium splendens*, *Rhytidiadelphus triquetrus*, *Tortella tortuosa*.

Rare species
Alchemilla filicaulis ssp. *filicaulis*, *Astragalus alpinus*, *Bartsia alpina*, *Carex atrata*, *C. capillaris*, *C. rupestris*, *C. vaginata*, *Cerastium alpinum*, *C. arcticum*, *Draba incana*, *Dryas octopetala*, *Euphrasia frigida*, *Minuartia sedoides*, *Orthilia secunda*, *Oxytropis halleri*, *Polystichum lonchitis*, *Potentilla crantzii*, *Pyrola rotundifolia*, *Salix arbuscula*, *S. lapponum*, *S. myrsinites*, *S. reticulata*, *Sesleria albicans*, *Tofieldia pusilla*, *Veronica fruticans*.

Physiognomy
The *Dryas-Silene* community comprises rich, varied and luxuriant mixtures of dwarf shrubs, tall herbs, sedges and grasses among a carpet of cushion herbs and bryophytes. Stands are frequently small and fragmentary, the vegetation being usually disposed over the ledges of rock outcrops. *Dryas octopetala* is the most frequent and often the most abundant component of the open and uneven cover of dwarf shrubs and it occurs here as taller and larger-leaved plants than those found in the *Dryas-Carex* heath and the *Sesleria-Galium* grassland, variation which reflects the lack of grazing in this community but which also seems to have some genetic basis (Elkington 1971). Then, there is commonly one (very occasionally more than one) of a number of rare Arctic-Alpine willows. *Salix reticulata* is the most frequently encountered and the cover of its low creeping branches can rival or exceed that of *D. octopetala*. In some stands, it is joined or replaced by *S. arbuscula* with its more robust bushy growth and there are rare records, too, for *S. myrsinities* and *S. lapponum*. Hybrids between these species are sometimes encountered though their parentage is often difficult to determine (Meikle 1975): there are records in the data for *S.* × *boydii* (which is probably *S. lapponum* × *reticulata*) and for *S.* × *phaeophylla* (originally thought to be *S. lapponum* × *myrsinites*, but now re-determined as *S. lapponum* × *herbacea*). Other more widely distributed willows which make a rare contribution to the dwarf-shrub component are *S. aurita* and *S. repens*.

Intermixed with the *D. octopetala* and willows are usually small clumps of ericoids. *Vaccinium vitis-idaea* is the most common of these with, less frequently, *V. uliginosum*, *V. myrtillus* and *Calluna vulgaris*. *Empetrum nigrum* ssp. *hermaphroditum* is occasional, too, and it can attain local prominence. There is very frequently a little *Alchemilla alpina* putting up its leaves among the shrubs and, more occasionally, some *A. glabra*, *A. filicaulis* ssp. *filicaulis* and *A. filicaulis* ssp. *vestita*. *Thymus praecox* is constant with its sprawling mats typically anchored by single thick primary roots penetrating crevices (Pigott 1955). *Rubus saxatilis* occurs very occasionally.

From among these plants, there protrude the shoots of a diversity of tall herbs, the variously-coloured flowers of which contribute greatly to the attractiveness of this vegetation. Among the commonest of these are *Succisa pratensis*, *Angelica sylvestris*, *Geranium sylvaticum* and numerous montane Hieracia, particularly the

very handsome taxa of the sections Alpine, Subalpina and Cerinthoidea which frequently occur in distinctive assortments on the ledges of different mountain ranges (e.g. Sell & West 1955, 1965, 1968, Raven & Walters 1956, Kenneth & Stirling 1970). More occasionally, *Geum rivale*, *Filipendula ulmaria*, *Solidago virgaurea* and the Arctic-Alpine *Rhodiola rosea* and *Saussurea alpina* can be found and clumps of *Luzula sylvatica* are sometimes conspicuous.

Then, there is an equally rich and diverse lower tier of grasses, sedges and smaller herbaceous species. Among the grasses, *Festuca ovina* and *F. vivipara* are both frequent and the former especially can be patchily abundant. There is also commonly some *Deschampsia cespitosa*, *Anthoxanthum odoratum* and *Avenula pratensis* and *Nardus stricta*, *Festuca rubra* and *Agrostis capillaris* also occur occasionally. Most of the high-altitude Scottish localities of *Sesleria albicans* are in this vegetation and it can be locally abundant. The commonest sedges are *Carex pulicaris* and the Arctic-Alpine *C. capillaris* and both, especially the former, can have high cover. The community also provides one of the major loci for the much rarer Arctic-Alpine sedges, *C. rupestris* (easily confused with *C. pulicaris*, especially when vegetative) and the more robust *C. atrata* and *C. vaginata*. *C. flacca* is occasional too.

Among the herbaceous associates with the grasses and sedges the most frequent species are *Polygonum viviparum*, *Thalictrum alpinum*, *Campanula rotundifolia*, *Viola riviniana*, *Coeloglossum viride*, *Galium boreale*, *Pinguicula vulgaris*, *Linum catharticum* and *Asplenium viride* with, less commonly, *Luzula multiflora*, *Antennaria dioica*, *Parnassia palustris*, *Tofieldia pusilla*, *Huperzia selago* and the two rare wintergreens, *Pyrola rotundifolia* ssp. *rotundifolia* and *Orthilia secunda*, these sometimes in local colonies of numerous individuals. Other montane rarities occurring at very low frequencies here are *Minuartia sedoides* and *Oxytropis halleri* (Alpine), *Cerastium arcticum* (Arctic-Subarctic) and (all Arctic-Alpine) *Cerastium alpinum*, *Potentilla crantzii*, *Draba incana*, *Euphrasia frigida*, *Polystichum lonchitis*, *Veronica fruticans*, *Bartsia alpina* and the very rare *Astragalus alpinus*.

The lowest component of the vegetation comprises lush cushions of herbs and bryophytes. *Silene acualis* is a constant of the community and usually the most abundant species of this layer but there are very frequently scattered sprawls of *Selaginella selaginoides*, *Saxifraga oppositifolia* and *S. aizoides*. Among the bryophytes, bulky mosses usually make up most of the cover with *Ctenidium molluscum*, *Tortella tortuosa*, *Rhytidiadelphus triquetrus*, *Ditrichum flexicaule* and *Hylocomium splendens* especially frequent and abundant and, occurring more occasionally, *Racomitrium lanuginosum*, *Distichium capillaceum*, *Campylium stellatum* var. *protensum*, *Rhytidiadelphus loreus*, *Thuidium delicatulum*, *Dicranum scoparium*, *Breutelia chrysocoma*, *Hypnum cupressiforme* and *Pseudoscleropodium purum*. Species of more restricted distribution which can be found in this vegetation are *Rhytidium rugosum* (particularly distinctive of *Dryas* vegetation in Scotland), *Entodon concinnus*, *Plagiopus oederi*, *Orthothecium rufescens* and *Anoectangium aestivum*. Hepatics are, generally speaking, much less frequent and conspicuous than mosses but *Frullania tamarisci*, *Aneura pinguis* and *Plagiochila asplenoides* are occasionally found and there are sparse records for *Tritomaria quinquedentata*, *Metzgeria leptoneura* and *Herbertus stramineus*. Lichens are not abundant but, among the cushions, there are sometimes scattered plants of *Cetraria islandica*, *Cladonia pyxidata*, *C. gracilis*, *C. arbuscula*, *Peltigera canina* and *P. aphthosa* and James (1965; see also James *et al.* 1977) has described a distinctive suite of saxicolous and terricolous species from rock faces, talus and mica-schist soils occurring in association with this community.

Habitat

The *Dryas-Silene* community is strictly confined to ungrazed crags and ledges of calcareous bedrocks, mostly in the montane regions of Scotland, with often lithomorphic, base-rich soils.

The altitudinal range of this vegetation and the regional climate it experiences are not quite so narrow and extreme as those typical of the *Festuca-Alchemilla-Silene* dwarf-herb community. Although stands tend to attain their greatest richness and luxuriance at higher levels, being found at up to about 900 m, and their mean altitude (just over 700 m) is well above that of the submontane calcicolous grasslands, the community can occur down to about 300 m, provided suitable topographies occur. Like many of the vegetation types of the Scottish Highlands, it descends lower in moving northwest as the climate becomes increasingly severe at equivalent altitudes, but it extends somewhat further into the more equable oceanic fringes than does the *Festuca-Alchemilla-Silene* community, though its stands become more fragmentary and isolated towards this margin of its range. Thus, outlying occurrences of *D. octopetala* with various sparse assortments of other Arctic-Alpines, such as are found on high-altitude ledges in Mull (Jermy & Crabbe 1978), Rhum (Ratcliffe 1977), Skye (Birks 1973) and Hoy (Prentice & Prentice1975) and, further afield and yet more fragmentarily, on the Glyders (Ratcliffe 1977) and Helvellyn (Ratcliffe 1960, 1977), are a somewhat pale reflection of the full richness of the Highland stands (see also Elkington 1971). Furthermore, along the north-west coastal fringes of Scotland, the vegetation tends to show some floristic transitions to the sub-montane *Dryas-Carex* heath which is common there.

This slightly wider range than that typical of the *Festuca-Alchemilla-Silene* dwarf-herb community takes in areas with a climate that is a little warmer. The mean annual maximum temperature is 22 °C (Conolly & Dahl 1970), 23 °C if the Lakeland occurrences are included, 24 °C with those in north Wales, and the winters especially tend to be milder, with February minima sometimes above freezing (*Climatological Atlas* 1952). Although, in the north-west Highlands, annual precipitation is extremely heavy, with over 2400 mm and more than 220 wet days yr^{-1} (*Climatological Atlas* 1952, Ratcliffe 1968), the community extends somewhat further into the drier east than does the *Festuca-Alchemilla-Silene* community, both to the north in Sutherland and to the south around Caenlochan and Clova where the annual precipitation is about 1000 mm. Despite these features, however, the general character of the climate is still cold, wet and windy and the topographic conditions characteristic of the community considerably exacerbate certain elements of it.

The *Dryas-Silene* vegetation is always found on more calcareous bedrocks and, though these are quite varied because of the accidents of geological deposition, the climatic range of the community largely coincides with the distribution of the Dalradian metasediments of the central and southern Highlands. Here, the glories of the rich schist and limestone ledges of Ben Lawers, Beinn Laoigh, Creag Mhor, Meall Ghaordie, Meall na Samhna, Carn Gorm and Caenlochan-Clova have been long extolled. Further north, good stands also occur on the more sparsely distributed calcareous rocks of the Moine Assemblage around the Glen Feshie area of the Cairngorms, Beinn Dearg and Ben Hope. Outside this area, suitable rocks are not so widespread and often occur towards the limit of the climatic range of the community so that stands are often fragmentary, but rich examples can be seen on the Devonian Old Red Sandstone of Ben Griam More (providing a far-flung eastern locality), on the Durness Limestone above Inchnadamph and on Glas Cnoc, and on Tertiary basalt on Beinn Iadain. More fragmentary stands occur on Tertiary basalt in Mull, Skye and Rhum and on Lewisian gneiss around Letterewe. On Helvellyn, the very small amounts of Arctic-Alpine *Dryas* vegetation are found on more calcareous parts of the Borrowdale Volcanics and in Snowdonia on pumice.

Over these rocks, the community is confined to fractured cliff tops, ledges and inaccessible tumbles of talus. Softer deposits, like the Dalradian mica-schists, weather very readily and provide an abundance of suitable sites with broken rock faces and many small ledges. Harder rocks often crop out more dramatically and have fewer but larger ledges on which the vegetation is perched in spectacular 'hanging gardens'. But, whatever the particular physiognomy of the vegetation, there are two features of this crag environment of particular importance to the community.

The first is edaphic. Despite the generally high rainfall and the great potential for leaching, especially in the wetter north-west, the soils are maintained in a skeletal and base-rich condition by constant renewal of raw mineral material and the usually limited areas of bare rock over which they can develop. Freeze-thaw weathering may be of especial importance here: the climate is generally cold in winter and, though snow-falls can be frequent and appreciable, the exposure of the crags to wind means that they are generally kept free of its insulating cover. Even where more substantial amounts of rock fragments and organic detritus accumulate on larger ledges, horizon differentiation will be hindered by the churning of cryoturbation and solifluction over inclined surfaces. The soils are thus probably consistently rich in free calcium carbonate and their surface pH is always high, frequently more than 7 (McVean & Ratcliffe 1962, Coker 1969, Elkington 1971). Often, too, there is enrichment by the percolation or dripping of calcareous waters through and over the soils but the profiles are characteristically free-draining. Indeed, on fractured cliff tops with a southerly aspect which catch more of the small amounts of summer sun, the soils can become quite dry. In general, therefore, the profiles are much more like typical rendzinas than are those found under the *Festuca-Alchemilla-Silene* community (McVean & Ratcliffe 1962, Coker 1969, Elkington 1971, Huntley 1979), though more extensive and deeper soils may approach brown calcareous earths with a more integrated mull structure and slight differentiation of a B horizon.

The occurrence of such soils in areas of generally harsh montane climate exerts a major influence on the floristics of the community. It is in this vegetation that the richest mixtures of stricter Arctic-Alpine calcicoles occur and the combination of these features in less extreme situations has provided a relict habitat for the survival of various members of its flora in more outlying geographical localities (e.g. Raven & Walters 1956, Ratcliffe 1959*a*, *b*, 1960, McVean & Ratcliffe 1962, Coker 1969, Conolly & Dahl 1970, Elkington 1971). Here, too, there is a slight resurgence in some calcicoles which are, generally speaking, more widespread in lowland swards than they are throughout sub-montane calcicolous communities, e.g. *Carex flacca*, *Avenula pratensis*, *Linum catharticum*. Moreover, the contribution made by Nardo-Galion species is very slim and the somewhat chionophilous feel of the *Festuca-Alchemilla-Silene* community is not noticeable in this vegetation.

The second characteristic of the habitat of the community is that it is inaccessible to sheep and deer so that the vegetation is ungrazed. The effect of this is clearly seen in the prominence of dwarf shrubs and tall

herbs and the general luxuriance of the herbage (McVean & Ratcliffe 1962, Elkington 1971, Huntley 1979), features which are abruptly lost around the margins of stands which grazing animals can reach. No member of these components of the vegetation is confined to this particular community: the willows, for example, can form more shrubby stands of scrub proper, the ericoids are widespread in other kinds of ledge vegetation as well as in heaths, the tall herbs are characteristic of various ungrazed habitats (not all of them montane or even sub-montane) and *D. octopetala* also occurs in the *Dryas-Carex* heath. This particular combination of grazing-sensitive species is, however, unique to this vegetation and its particular attractiveness rendered all the more valuable by the likelihood that it represents but a fragment of what was previously a more widespread cover over ungrazed areas of base-rich soils throughout the Scottish Highlands.

Zonation and succession

Most often, zonations between the community and other vegetation types are a direct reflection of the extent of grazing, though edaphic transitions related to bedrock and soil type are also found.

Very commonly, the *Dryas-Silene* community passes, where ledges become more accessible, to grazed calcicolous vegetation over the more intact soils of the surrounding smoother topography. The communities involved in such transitions vary with altitude. Around higher crags, there is typically a zonation to the *Festuca-Alchemilla-Silene* community in which the representation of those Arctic-Alpines tolerant of grazing is maintained. Such mosaics are well seen towards the upper slopes of Ben Lawers, on Beinn Dearg and Ben Alder (Ratcliffe 1977) and, on Helvellyn, the very small fragments of the community survive among more extensive areas of dwarf-herb vegetation (Ratcliffe 1960, 1977). Towards lower altitudes, the community gives way to the more sub-montane vegetation of the *Festuca-Agrostis-Alchemilla* grass-heath and the *Festuca-Agrostis-Thymus* grassland as on the lower slopes of Ben Lawers, on Beinn Laoigh, in the Caenlochan–Clova area and on Meall Ghaordie and Beinn Iadain. It is very likely that each of these three communities has, in part, been derived by grazing from the *Dryas-Silene* vegetation which has been progressively restricted to the more inaccessible crags but it should be remembered that, around the margins of these exposures, there is frequently a coincidental edaphic shift to more intact and sometimes deeper soils, even though the underlying bedrock remains calcareous.

It may be presumed that the frequent instability of the crag environment with its exposure to erosion by frost and wind, and the often precarious hold of the vegetation on ledges, help maintain the characteristic patchwork of plants of differing stature. For the most part, stands are at altitudes which are too high for colonisation by trees and much of this vegetation represents a climax dependent on the extreme climatic and edaphic conditions. Sometimes, however, the willows form a more intact cover, shading out many of the species of the community, and transitions to such low scrub can be seen on Meall na Samhna, Carn Gorm and Beinn Dearg (Ratcliffe 1977).

Grazing-related zonations such as these can be complicated where there are edaphic variations attributable to differences in the underlying bedrock and/or the character of percolating waters. Then, other less calcicolous vegetation types may occur in close association with the *Dryas-Silene* community. For example, where isolated calcareous crags intrude into areas of acid bedrocks, a common feature among the Moine and Lewisian Assemblages, *Nardus-Galium*, *Juncus-Festuca* or *Deschampsia-Galium* grasslands may surround stands of the community. In other cases, complexes of ledges run across geological boundaries or receive irrigation with waters of varying calcium carbonate content. Where flushing with less calcareous waters occurs, the *Dryas-Silene* vegetation can pass into other kinds of ungrazed tall-herb communities in which calcicoles are much more poorly represented. Such transitions are a prominent feature of parts of Ben Lawers, Beinn Laoigh, the Caenlochan–Clova area, Meall Ghaordie and Beinn Dearg (Ratcliffe 1977).

Distribution

The centre of distribution of the *Dryas-Silene* community is in the central and southern Scottish Highlands with outlying localities in the north-west Highlands and fragmentary stands in North Wales, Cumbria, Mull, Rhum, Skye and Orkney.

Affinities

Although much British vegetation containing *D. octopetala* is varied and sometimes fragmentary, this community emerges as clearly distinct from the *Dryas-Carex* heath of low altitudes in north-west Scotland, although transitional stands do occur on ledges above Inchnadamph. It unites samples from two of the fragmentary noda recognised by McVean & Ratcliffe (1962) and is essentially similar to the *Salico-Dryadetum* of Shimwell (1968*a*). Among British calcicolous communities, it represents the nearest approach to the montane dwarf-shrub heaths of the Elyno-Seslerietea (recast by Oberdorfer (1978) as the Seslerietea variae). Within this class, the *Dryas-Silene* community is closest to the kinds of Scandinavian vegetation included by Nordhagen (1928, 1936, 1955) in the Kobresio-Dryadion and it shares a number of species with his rather compendious *Kobresieto-Dryadetum*: *D. octopetala*, *Salix reticulata*, *Carex capillaris*, *C. rupestris*, *C. atrata*, *Astragalus alpinus* and *Bartsia alpina*.

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Floristic table CG14

Dryas octopetala	V (2–9)
Polygonum viviparum	V (1–4)
Selaginella selagionides	V (1–3)
Hylocomium splendens	V (1–4)
Ctenidium molluscum	V (1–4)
Thymus praecox	IV (1–5)
Silene acaulis	IV (1–6)
Carex capillaris	IV (1–4)
Saxifraga aizoides	IV (1–4)
Alchemilla alpina	IV (1–5)
Hieracium spp.	IV (1–3)
Saxifraga oppositifolia	IV (2–5)
Thalictrum alpinum	IV (1–3)
Campanula rotundifolia	IV (1–3)
Rhytidiadelphus triquetrus	IV (1–5)
Carex pulicaris	IV (1–4)
Tortella tortuosa	IV (1–4)
Festuca ovina	IV (3–9)
Ditrichum flexicaule	IV (1–6)
Viola riviniana	IV (1–4)
Racomitrium lanuginosum	III (1–4)
Succisa pratensis	III (1–4)
Salix reticulata	III (1–8)
Angelica sylvestris	III (1–3)
Coeloglossum viride	III (1–3)
Geranium sylvaticum	III (1–3)
Asplenium viride	III (1–3)
Vaccinium vitis-idaea	III (1–5)
Galium boreale	III (1–4)
Deschampsia cespitosa	III (2–5)
Avenula pratensis	III (1–4)
Pinguicula vulgaris	III (1–3)
Anthoxanthum odoratum	III (2–4)
Festuca vivipara	III (1–4)
Linum catharticum	III (1–3)
Antennaria dioica	II (1–4)
Pyrola rotundifolia	II (1–4)
Alchemilla glabra	II (1–4)
Vaccinium uliginosum	II (2–5)
Luzula sylvatica	II (1–4)
Vaccinium myrtillus	II (1–3)
Empetrum nigrum hermaphroditum	II (1–5)
Euphrasia officinalis agg.	II (1–3)
Frullania tamarisci	II (1–3)
Carex flacca	II (1–3)
Campylium stellatum var. *protensum*	II (1–3)
Huperzia selago	II (1–4)
Alchemilla filicaulis filicaulis	II (1–2)
Aneura pinguis	II (1–3)
Distichium capillaceum	II (1–4)
Tofieldia pusilla	II (1–3)
Parnassia palustris	II (1–3)
Nardus stricta	II (2–4)
Rhodiola rosea	II (1–3)
Saussurea alpina	II (1–4)
Rhinanthus minor	II (1–2)
Mnium hornum	II (1–4)
Geum rivale	II (1–4)
Rhytidiadelphus loreus	II (1–3)
Luzula multiflora	II (2–3)
Plagiochila asplenoides	II (1–3)
Filipendula ulmaria	II (1–2)
Ranunculus acris	II (1–3)
Thuidium delicatulum	II (1–4)
Solidago virgaurea	II (1–3)
Festuca rubra	II (2–6)
Agrostis capillaris	II (1–3)
Dicranum scoparium	II (1–3)
Carex rupestris	II (2–4)
Breutelia chrysocoma	II (1–5)
Hypnum cupressiforme	II (1–3)
Pseudoscleropodium purum	II (1–3)
Lotus corniculatus	II (1–4)
Calluna vulgaris	II (1–5)
Potentilla erecta	II (1–3)
Carex atrata	II (1–4)
Thuidium abietinum	I (1–3)
Salix arbuscula	I (1–5)
Alchemilla filicaulis vestita	I (1–3)
Cetraria islandica	I (1–3)
Rhytidium rugosum	I (1–3)
Minuartia sedoides	I (1–3)
Drepanocladus uncinatus	I (1–4)
Cerastium alpinum	I (1–3)
Ptilium crista-castrensis	I (1–3)
Tritomaria quinquedentata	I (1–3)
Racomitrium canescens	I (1–3)
Rhytidiadelphus squarrosus	I (1–3)
Galium saxatile	I (1–3)
Thuidium tamariscinum	I (1–3)
Hieracium pilosella	I (1–3)
Hypericum pulchrum	I (1–3)
Prunella vulgaris	I (1)
Bellis perennis	I (1)
Luzula campestris	I (1)
Cerastium fontanum	I (1–3)
Scapania aspera	I (1–3)

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Floristic table CG14 (*cont.*)

Entodon concinnus	I (1)
Peltigera canina	I (1–3)
Saxifraga hypnoides	I (1–3)
Anemone nemorosa	I (1)
Armeria maritima	I (1–4)
Crepis paludosa	I (1–2)
Cladonia pyxidata	I (1)
Cladonia gracilis	I (1–2)
Arabis hirsuta	I (1)
Gentianella campestris	I (1–2)
Veronica fruticans	I (1)
Botrychium lunaria	I (1–3)
Fissidens adianthoides	I (1–2)
Potentilla crantzii	I (1–3)
Orthothecium rufescens	I (1)
Fissidens osmundoides	I (1–2)
Preissia quadrata	I (1)
Plagiobryum zierii	I (1)
Metzgeria leptoneura	I (1)
Plagiopus oederi	I (1–4)
Blindia acuta	I (1–4)
Carex vaginata	I (1–2)
Trollius europaeus	I (1–4)
Salix myrsinites	I (2–3)
Sesleria albicans	I (1–7)
Cladonia arbuscula	I (1–3)
Salix herbacea	I (1–3)
Luzula spicata	I (1)
Salix lapponum	I (1–3)
Equisetum variegatum	I (1)
Draba incana	I (1)
Barbilophozia barbata	I (1)
Bryum pseudotriquetrum	I (1)
Orthilia secunda	I (1)
Sphagnum capillaceum	I (1)
Polystichum lonchitis	I (1)
Peltigera aphthosa	I (1)
Heracleum sphondylium	I (1)
Salix aurita	I (1)
Bartsia alpina	I (1)
Ptilidium ciliare	I (1–2)
Nardia scalaris	I (1)
Euphrasia frigida	I (1)
Deschampsia flexuosa	I (2)
Taraxacum officinale agg.	I (1–2)
Encalypta streptocarpa	I (1)
Solorina saccata	I (1)
Rubus saxatilis	I (2–4)
Leontodon autumnalis	I (1–2)
Plantago lanceolata	I (1–2)
Plantago maritima	I (1–2)
Lathyrus montanus	I (1)
Danthonia decumbens	I (1–2)
Cerastium arcticum	I (1)
Salix × *phaeophylla*	I (5)
Salix × *boydii*	I (3)
Number of samples	33
Number of species/sample	42 (23–62)

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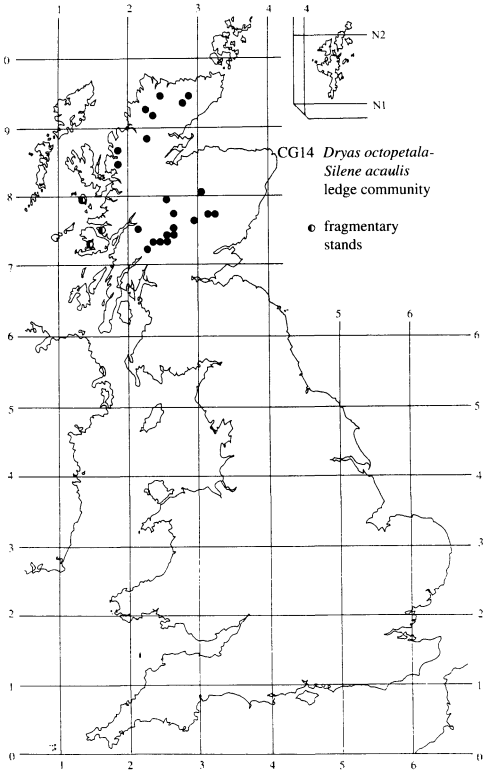

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