M21

Narthecium ossifragum-Sphagnum papillosum valley mire

Narthecio-Sphagnetum euatlanticum Duvigneaud 1949

Synonymy

Sphagnetum Rankin 1911*b p.p.*; *Sphagnum* hummock complex, *Sphagnum papillosum* & *S. rubellum* phases Rose 1953; General bog communities Newbould 1960 *p.p.*; Valley bog Ward *et al.* 1972*a p.p.*; *Sphagnum* lawn bog hummocks NCC New Forest Bogs Report 1984.

Constant species

Calluna vulgaris, *Drosera rotundifolia*, *Erica tetralix*, *Eriophorum angustifolium*, *Molinia caerulea*, *Narthecium ossifragum*, *Sphagnum papillosum*.

Rare species

Agrostis curtisii, *Erica ciliaris*, *Hammarbya paludosa*.

Physiognomy

The *Narthecio-Sphagnetum* comprises mire vegetation dominated by carpets of Sphagna with scattered herbs and sub-shrubs, forming extensive lawns or the drier areas within low-amplitude hummock/hollow systems. The dominant *Sphagnum* is generally *S. papillosum*, the cover of which can be very extensive and luxuriant, but there is quite frequently some *S. auriculatum* or *S.recurvum* (very occasionally both) and sometimes *S. cuspidatum* occurs too, all these species tending to increase in prominence in wetter areas, where they may mark a transition to Rhynchosporion pool vegetation. Much more locally, the community provides important stations for *S. magellanicum* and *S. pulchrum*, both scarce species in south-eastern Britain, but sometimes growing in abundance here: the former is plentiful on some New Forest bogs (as on Cranesmoor: Newbould 1960, NCC New Forest Bogs Report 1984), the latter especially striking in some stands around Poole Harbour in Dorset (Ratcliffe 1977). Then, there are occasional records for *S. subnitens* and *S. tenellum*, with *S. capillifolium* occurring infrequently and usually on the tops of drier hummocks. In contrast to the *Ericetum tetralicis*, to which this vegetation often grades on drier ground, *S. compactum* is hardly ever found.

Other mosses are few in number and generally of low cover (*Hypnum jutlandicum* and *Aulacomnium palustre* are sometimes present) but the moist *Sphagnum* carpet provides a very congenial surface for a variety of hepatics, with patches of leafy liverworts often adding to the mosaic of colour over the ground. *Odontoschisma sphagni* and *Kurzia pauciflora* are the commonest species overall, but *Cladopodiella fluitans*, *Cephalozia macrostachya*, *C. connivens*, *C. bicuspidata* and *Calypogeia fissa* have also been recorded. In contrast to the stands described by Rose (1953), however, *Mylia anomala* has not been found very frequently. There can also be scattered thalli of *Aneura pinguis* and various *Riccardia* ssp. including *R. chamedryfolia*. Lichens are typically sparse, though the decaying tops of taller hummocks can provide a habitat for *Cladonia impexa*, *C. arbuscula* and *C. uncialis*.

The general appearance of the ground layer is thus very similar to that found in the *Erica-Sphagnum* and *Scirpus-Eriophorum* mires, though the surface relief here is often less pronounced than in those communities. The vascular component, too, provides some important floristic differences because, in contrast to other *Erico-Sphagnion* bogs, both *Eriophorum vaginatum* and *Scirpus cespitosus* are rare plants here: within the range of the *Narthecio-Sphagnetum*, both these species are becoming scarce and they are generally confined to the firmer substrates under the *Ericetum tetralicis* wet heath. But other monocotyledons of wet peaty soils remain very frequent and provide a measure of continuity between these different kinds of mires. *Eriophorum angustifolium* is a constant and it can be abundant, the masses of its cottony fruiting heads often enabling stands to be picked out from a distance in June. At closer quarters, it is often the profusion of *Narthecium ossifragum* that strikes the eye, both with its golden flowers in July and again when fruiting in early autumn. Then, there is typically some *Molinia caerulea*, looking rather weak and not tussock-forming in the more stagnant areas, but more vigorous and abundant in better-

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aerated situations. *Rhynchospora alba* is also very characteristic of one particular kind of *Narthecio-Sphagnetum*, being especially prominent in wetter hollows and around Rhynchosporion pools.

The other consistent structural element in the vegetation comprises woody plants. *Erica tetralix* and *Calluna vulgaris* are both very frequent, though the latter tends to be somewhat patchy in its occurrence, attaining vigour only on the tops of drier hummocks. Typically, these sub-shrubs form a very open canopy here, 1–3 dm tall, and a thickening of their cover often marks the transition to adjacent *Ericetum*. As in that kind of wet heath, though less frequently, *E. tetralix* can be accompanied or replaced by *E. ciliaris* in stands around Poole Harbour (e.g. Chapman 1975). More restricted in its occurrence than the two ericoids, but very noticeable when present in abundance, is *Myrica gale*, which can maintain its contribution to the cover into stands of neighbouring communities, most notably the Junco-Molinion grasslands, thus blurring the transitions.

Other frequent plants are few in number and generally present as scattered individuals. *Drosera rotundifolia* is very common and, at some sites, is accompanied by the more scarce *D. intermedia* or *D. anglica*. *Vaccinium oxycoccos*, by contrast, such a characteristic plant of wetter areas in the *Erica-Sphagnum* mire, is curiously uneven in its occurrence here, being confined to one of the sub-communities. And *Andromeda polifolia*, which often accompanies it on raised mires, is totally absent. There is sometimes a little *Potentilla erecta* and, very occasionally, some *Polygala serpyllifolia*, but the relative scarcity of these species provides a further distinction between the community and the *Scirpus-Eriophorum* mire. Small sedges and rushes are generally infrequent, though *Carex panicea* and *C. echinata* can sometimes be found and there are occasionally tussocks of *Juncus acutiflorus* or *J. effusus*. *C. rostrata* occurs with low frequency in wetter areas and there, too, particularly where there is some soligenous influence, *Potamogeton polygonifolius* and *Eleocharis multicaulis* are sometimes recorded. In some stands, *Phragmites australis* occurs as sparse shoots.

Among species of more restricted distribution in Britain, the community provides an occasional locus for *Pinguicula lusitanica* and, in Devon, introduced *P. grandiflora* survives in this kind of vegetation (Ivimey-Cook 1984). The rare and easily overlooked orchid, *Hammarbya paludosa*, occurs at some sites, typically in the transition zone to Rhynchosporion pool vegetation. *Agrostis curtisii* is found very infrequently on the drier tops of hummocks.

Sub-communities

***Rhynchospora alba-Sphagnum auriculatum* sub-community:** *Sphagnetum* Rankin 1911*b p.p.*; *Sphagnum* hummock complex, *Sphagnum papillosum* & *S. rubellum* phases Rose 1953 *p.p.*; General bog communities Newbould 1960 *p.p.*; *Sphagnum* lawn bog hummocks NCC New Forest Bogs Report 1984. In this, the most frequently described kind of *Narthecio-Sphagnetum*, the *Sphagnum* carpet is generally dominated by mixtures of *S. papillosum* (with, more locally, *S. magellanicum* or *S. pulchrum*) and *S. auriculatum*. *S. cuspidatum*, *S. subnitens* and *S. tenellum* occur occasionally, but *S. recurvum* is scarce. Hepatics are varied and often abundant with *Odontoschisma sphagni*, *Kurzia pauciflora*, *Cephalozia* spp. and *Aneura pinguis* preferentially frequent.

All the vascular constants of the community retain high frequency in open and mixed mosaics over the ground and, in addition, there is very frequently some *Rhynchospora alba*. *Myrica gale* is also slightly preferential to this sub-community and quite frequently shows local abundance.

***Vaccinium oxycoccos-Sphagnum recurvum* sub-community:** *Sphagnum* hummock complex, *Sphagnum papillosum* & *S. rubellum* phases Rose 1953 *p.p.* In this sub-community, *S. papillosum*, though often abundant, is a little patchier in its dominance of the ground carpet and is quite frequently rivalled in cover by *S. recurvum*, which is strongly preferential here. *S. auriculatum*, by contrast, is much reduced in frequency, though *S. subnitens* and *S. cuspidatum* still make an occasional contribution and there is sometimes a little *S. palustre*. Among the hepatics, *Odontoschisma sphagni* occurs in some stands, but the richness of this element is not so great as in the first sub-community, most of the species occurring very infrequently.

In the vascular element, the most obvious features are the scarcity of *Rhynchospora alba* and the frequency of *Vaccinium oxycoccos*, though even here the latter is of patchy occurrence, being much more common in East Anglian stands than elsewhere. *Potentilla erecta* is somewhat more common in this sub community, too, and there are occasional records for *Carex echinata*, *C. panicea* and *Succisa pratensis*, which give some stands a floristic character transitional to Caricion nigrae mires.

Habitat

The *Narthecio-Sphagnetum* is a community of permanently-waterlogged, acid and oligotrophic peats in the relatively warm and dry, southern lowlands of Britain, where it is especially characteristic of valley mires maintained by a locally high ground water-table. The wetness of the substrate gives the vegetation some protection against the burning and grazing that are (or have been) important features in the heathland that usually surrounds the community, but draining is very deleterious and has severely affected some stands. Modest variation in the trophic state of the ground waters may have some

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control over floristic differences in the community and this can be accentuated by artificial eutrophication of the habitat.

The consistent saturation of the ground with more base- and nutrient-poor waters gives the vegetation its distinctive Sphagnetalian character, a feature best appreciated by comparing the community with the *Ericetum tetralicis*, the wet heath which replaces it on shallow peats and mineral soils that show seasonal waterlogging. The superficial acidity here is generally similar to that under the wet heath, mostly from 3.5 to 4.5, but the water-table is maintained at or very close to the ground surface throughout the year, favouring the luxuriant growth of peat-building Sphagna. The peat under the community is, in fact, not usually very deep, mostly from 20 to 150 cm, the more extensive accumulations towards the centre of valley mires carrying vegetation influenced by directional through-put. But it is species such as *S. papillosum* with, more locally, *S. magellanicum* and *S. pulchrum*, that comprise the bulk of the cover on the active plane, with semi-aquatic Sphagna becoming abundant in wetter hollows. By and large, these species are all scarce in the *Ericetum*, where extensive cover of more hydrophilous Sphagna is confined to areas of local soligenous influence. Conversely, it is the shift to wetter conditions that accounts for the rarity in the *Narthecio-Sphagnetum* of *S. compactum* and the general restriction of *S. capillifolium* to the drier hummocks. This change in the luxuriance and composition of the *Sphagnum* carpet is matched by the increase in cover and diversity of delicate hepatics, plants intolerant of the periodic surface-drying typical of much *Ericetum*.

Concomitant differences can be seen in the vascular component of the vegetation. Among the herbs, species like *Eriophorum angustifolium*, *Narthecium ossifragum* and *Drosera rotundifolia*, often confined to the areas of wet, bare peat in the *Ericetum*, now become constant; *Rhynchospora alba*, though not frequent throughout here, behaves in the same way. And then there is the shift in the balance of the two common ericoids, *Calluna* and *E. tetralix*, and *Molinia*. All of these are frequent, too, in the wet heath but, in the *Narthecio-Sphagnetum*, *Calluna*, already at something of a disadvantage against *E. tetralix* on the more severely waterlogged soils under the *Ericetum* (Rutter 1955, Bannister 1964*b*, Smart in Gimingham 1972), is usually very obviously subordinate and sometimes distinctly sickly in appearance (Bannister 1964*c*, *d*). And conditions quite often seem to be such that *E. tetralix*, despite its shallow root system (Sheikh 1970), is not able to take full advantage of the consequent lack of competition (Bannister 1966, Gimingham 1972). Poor aeration probably also hinders the growth of *Molinia*, though the general nutrient-poverty of the peats is likely to be of more importance in restricting its abundance and vigour here compared with often closely-juxtaposed Junco-Molinion vegetation nearer to the lines of soligenous influence in valley mires (e.g. Loach 1966, 1968*a*, *b*, Sheikh & Rutter 1969, Sheikh 1969*a*, *b*, 1970).

Although the quantitative contribution of *Molinia* is under some edaphic constraints, its high frequency through the *Narthecio-Sphagnetum* is one feature which reflects the mild, often distinctly oceanic character of the climate that prevails over the range of the community. This is a vegetation type of southern Britain, found predominantly below 200 m, though reaching higher altitudes towards the south and west, on the fringes of Dartmoor, Exmoor and in Wales, and towards its north-eastern limit, in the North York Moors. Over such a zone, the mean annual maximum temperature is generally in excess of 26 °C (Conolly & Dahl 1970) and, more particularly, the annual accumulated temperature is mostly more than 1400 day-degrees C (Page 1982), with February minima often a degree or more above freezing (*Climatological Atlas* 1952). The montane floristic element typical of northern upland Sphagnetalia bogs, best seen in the *Calluna-Eriophorum* mire, is thus absent here, whereas similarities with north-western oceanic ombrogenous bogs, especially the *Scirpus-Eriophorum* mire, are quite pronounced. Apart from the constancy of *Molinia*, there is the fairly common occurrence of *Myrica* and the occasional representation of plants such as *Drosera anglica*, *D. intermedia*, *Pinguicula lusitanica* and *Hammarbya paludosa*; and, among the Sphagna, the frequent presence of *S. auriculatum* and local occurrence of *S. pulchrum*. With the somewhat less oceanic *Erica-Sphagnum* mire, the *Narthecio-Sphagnetum* shares records for *Vaccinium oxycoccos* and *Sphagnum magellanicum*.

In quite marked contrast to both these communities, however, is the great scarcity of *Scirpus cespitosus* and *Eriophorum vaginatum*: both of these, and especially the latter, are uncommon in southern lowland Britain and, where they do occur, it tends to be on the firmer substrates of the *Ericetum*. One other difference between the communities, which probably has some climatic basis, is that surface relief is less pronounced on the bog plane of the *Narthecio-Sphagnetum* than in the *Scirpus-Eriophorum* or *Erica-Sphagnum* mires. Distinct hummock/hollow systems can be seen, with some patterning among the Sphagna and vascular plants (e.g. Rose 1953, Newbould 1960), and transitions to Rhynchosporion vegetation in the pools (see below), but the relief is typically of rather low amplitude and patterning ill-defined, at least when compared with the mires of the wetter north-west of Britain (Lindsay *et al.* 1984).

The lighter rainfall over the lowland south of the country also has an important control on the kind of habitat favourable to the development of the *Narthecio-Sphagnetum*. In this part of Britain, precipitation falls below the 1200 mm yr^{-1} or 160 wet days yr^{-1} threshold

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necessary for the accumulation of a mantle of blanket peat (Ratcliffe 1977), so Sphagnetalia vegetation can develop only where topography maintains a locally high water-table. On raised mires, where waterlogged acid peat forms ombrogenously on a topogenous base, and in base-poor basin mires, there is a strong tendency for the bog vegetation to be of the *Erica-Sphagnum* type. The *Narthecio-Sphagnetum*, on the other hand, is very much a community of valley mires developed in catchments of prevailingly acidic substrates where, over sometimes quite gently-undulating topography, base-poor ground waters emerge at impervious bedrocks or superficials and maintain waterlogged conditions in elongated depressions. The hydrological regime in such mires is often quite complex, with percolating waters from the higher ground frequently being channelled along a central soligenous soakway or stream; and there is commonly an artesian element helping to maintain a general high water-table throughout and inducing back-gleying in the surrounds. Within the very distinctive zonation of vegetation types associated with this kind of site, the community characteristically occurs in a belt on shallower marginal peats which are kept consistently wet but where soligenous influence, and therefore any increase in enrichment and aeration, is small.

Valley mires in which the *Narthecio-Sphagnetum* is represented are concentrated on the more acidic elements within the sequences of younger rocks and superficials that underlie the low relief of central-southern and south-eastern England: for example, the Eocene clays, sands and gravels of southern Dorset, Hampshire and Surrey, the sands and clays of the Hastings Beds and Lower Greensand in The Weald and, locally, in west Norfolk, and Triassic sandstones and pebble-beds in Devon and Cornwall. In the New Forest, Pleistocene gravels underlie some valley mires and, further towards the north and west, where the community is found over a variety of bedrocks, glacial drift can play some part in inducing the local drainage-impedence necessary for the development of the community. Increasingly, however, with the move to the wetter climate of the upland fringes, there is a tendency for valley mires to lose their discrete character within the mantle of blanket peat and, in such situations, the *Narthecio-Sphagnetum* is replaced by the *Scirpus-Eriophorum* mire.

The distribution of the two sub-communities shows a clear pattern over this total geographical range, with the *Rhynchospora-S. auriculatum* type being rather strongly confined to the south, where it runs from Devon to Surrey, the *Vaccinium-S. recurvum* type including all the outlying stands sampled to the north and west of this area. This partitioning may have some climatic basis but it is possible that differences between the two kinds of *Narthecio-Sphagnetum* also reflect variations in the trophic state of the peats and waters: in rather similar vegetation in the *Erica-Sphagnum* mire, large amounts of *S. recurvum* have been related to nutrient enrichment, and the presence of other preferentials like *Carex echinata*, *C. panicea* and *Aulacomnium palustre* is perhaps indicative of some slight amelioration of the generally impoverished conditions. As in the *Erica-Sphagnum* mire (Sinker 1962, Green & Pearson 1968, Tallis 1973*a*), such eutrophication may be related to human activity, originating from fertiliser run-off or drift, for example, and perhaps such influences have been greater towards the limit of the range of the community.

Towards its heartland, the characteristic occurrence of the community within stretches of unimproved heath has afforded this vegetation some measure of protection against gross disturbance. And the general wetness of the ground provides some insurance against the effects of the burning and grazing that have traditionally been practised in the surrounding landscape. Neither of these is of importance in maintaining the community: indeed, where they do occur, they can induce severe damage, particularly where they have been combined with draining (see below). Valley bogs sometimes show signs of peat-digging, though the deposits are often rather sloppy and little-humified: cut-over areas can diversify the surface patterning within the community and produce new areas for regeneration in mires that are becoming dry.

Zonation and succession

The *Narthecio-Sphagnetum* occurs in mosaics and zonations with other vegetation types in relation to the height of the water-table and the degree of soligenous influence within valley mires, the overall configuration of which is strongly dependent on local topography. With continued autogenic accumulation of peats, the community probably progresses naturally to some kind of woodland and draining may speed this succession. Often, however, together with burning and grazing, it has led to degradation of the vegetation.

The fully-developed sequence of communities in which the *Narthecio-Sphagnetum* occurs is very distinctive (e.g. Rose 1953, Newbould 1960, Ivimey-Cook *et al.* 1975, Wheeler 1983). First, within tracts of the community itself, there can be some measure of surface-relief, with a patterned distribution of the Sphagna and vascular plants over drier and wetter ground and transitions to Rhynchosporion vegetation in pools proper. Characteristically, this latter is of the *Sphagnum auriculatum* type, the pools often surrounded by a zone of *Rhynchospora alba* (sometimes with *R. fusca*) and showing a switch to dominance of *S. auriculatum* and *S. cuspidatum* in the ground carpet, with an appearance of plants like *Menyanthes trifoliata*, *Potamogeton polygonifolius* and *Utricularia* spp. It is in the transition zone to such pools that *Hammarbya* typically occurs.

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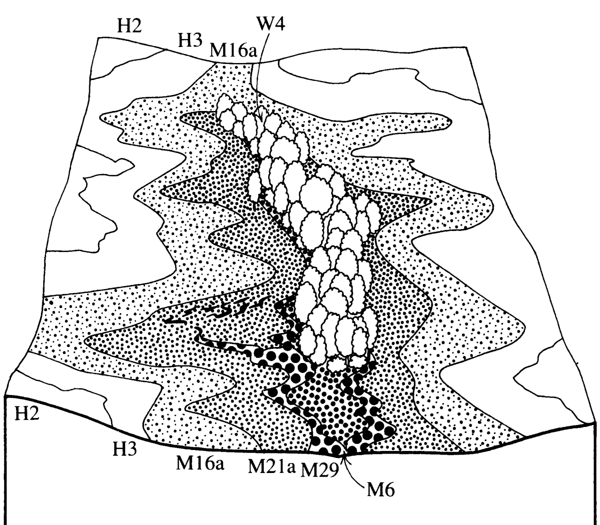
Where such wetter areas show some measure of soligenous influence, Littorelletea vegetation is often found, with *P. polygonifolius*, *Eleocharis multicaulis*, *Juncus bulbosus/fluitans* and *Hypericum elodes*. These can mark out small seepage areas around the edge of the *Narthecio-Sphagnetum* or water-tracks within stretches of the mire, but quite often the Littorelletea vegetation forms a distinct zone inward of the *Narthecio-Sphagnetum* towards the central mire axis. Continuing this zonation towards the zone of maximal soligenous influence, there can be a strip of Caricion nigrae poor fen and then a central line of *Betula-Molinia* woodland; in valley mires with somewhat more base- and nutrient-enrichment, the last two may be replaced by *Caricetum paniculatae* swamp and *Alnus-Carex* woodland (Figure 17).

In the opposite direction, towards the fringes of the mire, the *Narthecio-Sphagnetum* typically gives way to the *Ericetum tetralicis*. With the move to the periodically-waterlogged shallow peats and peaty gleys that cover the surrounding slopes, the carpet of luxuriant *Sphagnum papillosum* is replaced by patchy *S. compactum* and *S. tenellum*, species such as *Eriophorum angustifolium*, *Narthecium* and *Drosera rotundifolia* thin out and the canopy of ericoids becomes denser. Small patches of wet sandy peat in the transition zone are sometimes picked out by the striking *Rhynchospora-Drosera* sub-community of the *Ericetum*, with its occasional *Lepidotis inundata* and crusts of the purple alga *Zygogonium ericetorum s.l.* Beyond the wet heath, the basic sequence continues into dry Calluno-Ulicetalia heath of some kind.

Complete zonations of this type are best seen in some of the New Forest valley mires, as at Wilverley, Holmsley and Matley bogs and in the Denny/Shatterford system (Rose 1953, Tubbs 1968, Ratcliffe 1977, NCC New Forest Bogs Report 1984), and on certain south Dorset heaths (Ratcliffe 1977). In other sites, the sequence of communities is incomplete because of differences in topography and hydrology: at Thursley Common, in Surrey, for example, the *Narthecio-Sphagnetum* terminates the zonation below, forming a rather extensive stretch of bog like a raised mire (Rose 1953, Ratcliffe 1977) and on Aylesbeare Common, in Devon, stretches of the community mark out more strongly waterlogged ground over gently-undulating topography with a complex mosaic of wet and dry heaths (Ivimey-Cook *et al.* 1975).

Quite frequently, too, the general zonation is complicated by the occurrence of other vegetation types which reflect differences in base- or nutrient-richness of the substrates and waters. Tracts of Junco-Molinion grasslands, sometimes dominated by *Myrica*, can be found at some sites below the *Narthecio-Sphagnetum*, where soligenous influence increases, or cutting through it, where there is some channelling of flow down the slopes (Ivimey-Cook *et al.* 1975). Then, in certain New Forest mires, notably at Cranesmoor (Newbould 1960), on

Figure 17. Zonation around a typical lowland valley bog in southern England.
M6 *Carex echinata-Sphagnum* mire
M16a *Ericetum tetralicis* wet heath, Typical sub-community
M21a *Narthecio-Sphagnetum* valley bog, *Sphagnum-Rhynchospora* sub-community
M29 *Hyperico-Potametum* soakway
W4 *Betula-Molinia* woodland
H2 *Calluna-Ulex minor* heath
H3 *Ulex minor-Agrostis* heath



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Hartland Moor in Dorset (Ratcliffe 1977) and at Aylesbeare (Ivimey-Cook *et al.* 1975), the *Narthecio-Sphagnetum* gives way to the *Schoenus-Narthecium* community along the central mire axis. In the 'mixed mires' found on some north Norfolk commons, like Roydon, where valleys have cut down through sands and gravels to Chalky Boulder Clay, there is a more marked shift from the community to calcicolous fen-meadow and fen, with vegetation types like the *Cirsio-Molinietum* and *Schoenetum* bordering the mire axis (Rose 1953, Daniels & Pearson 1974, Wheeler 1975).

Towards the north and west, there is an increasing tendency for the *Narthecio-Sphagnetum* to be less well characterised floristically and for stands to survive in fragmentary form within much-altered landscapes. Even in the south-east, treatments have had some drastic effects and losses of the community, with heathland reclamation, have probably been extensive. Severe fires sometimes cause local damage to the *Sphagnum* carpet with a run-down of the vegetation to the *Ericetum tetralicis* and, where stock are turned on to the community in large numbers, trampling and manuring may precipitate a succession to poor fen (Rose 1953). But draining has been particularly destructive and, even where this has not been followed by improvement for agriculture or forestry, it has induced substantial changes. Essentially, it speeds up what is probably naturally a rather slow process of surface-drying with autogenic peat accumulation: lowering the water-table encourages the invasion of woody plants, among which *Betula* spp. and *Pinus sylvestris* are generally prominent, and makes the vegetation more susceptible to the effects of burning. Under such conditions, what was once *Narthecio-Sphagnetum* often presents a sorry spectacle of scrubby woodland and impoverished *Ericetum* and dry heaths.

Distribution

This is a local community of the southern lowlands of Britain, being best represented by the *Rhynchospora-S. auriculatum* sub-community in central southern England with the *Vaccinium-S. recurvum* sub-community widely scattered to the north and west of this area.

Affinities

Although the occurrence of *Sphagnum*-rich bog vegetation in the distinctive zonations of southern British valley mires has long been recognised (e.g. Rankin 1911*b*) and some descriptive accounts provided (e.g. Rose 1953, Newbould 1960), the floristic relationships of the community have not been much explored. Ivimey-Cook *et al.* (1975) provided the first phytosociological diagnosis and pointed out the essential similarity of the vegetation to the *Narthecio-Sphagnetum acutifolii euatlanticum*, described from Brittany by Duvigneaud (1949). In Moore's (1968) scheme, this was placed among the wet heaths of the Ericion tetralicis, but, although the community is typically found in close association with the *Ericetum tetralicis*, it is better grouped among the Erico-Sphagnion mires with their characteristic abundance of peat-building Sphagna. Among these, it is most closely allied to the *Scirpus-Eriophorum* mire of the very oceanic far-west of Britain and can be seen as its soligenous equivalent. Abundance of *Narthecium* and *Molinia* is also characteristic of the Norwegian *Narthecio-Sphagnetum* of Dierssen (1982) which occurs, like the present community, in more or less minerotrophic situations. However, that vegetation is found largely in the montane and sub-alpine zones of western Norway, and it is of a much more northern character than our community.

Floristic table M21

	a	b	21
Erica tetralix	V (2–7)	V (3–7)	V (2–7)
Molinia caerulea	V (2–9)	V (2–7)	V (2–9)
Eriophorum angustifolium	V (2–6)	V (2–7)	V (2–7)
Narthecium ossifragum	V (1–8)	V (2–8)	V (1–8)
Drosera rotundifolia	V (1–4)	IV (1–4)	V (1–4)
Sphagnum papillosum	V (2–9)	IV (3–7)	V (2–9)
Calluna vulgaris	IV (1–5)	IV (1–7)	IV (1–7)
Sphagnum auriculatum	IV (1–8)	II (1–8)	III (1–8)
Rhynchospora alba	IV (1–5)	I (6)	II (1–6)
Myrica gale	III (1–7)	II (3–6)	II (1–7)
Odontoschisma sphagni	III (1–4)	II (1–3)	II (1–4)
Kurzia pauciflora	III (1–3)	I (1–2)	II (1–3)

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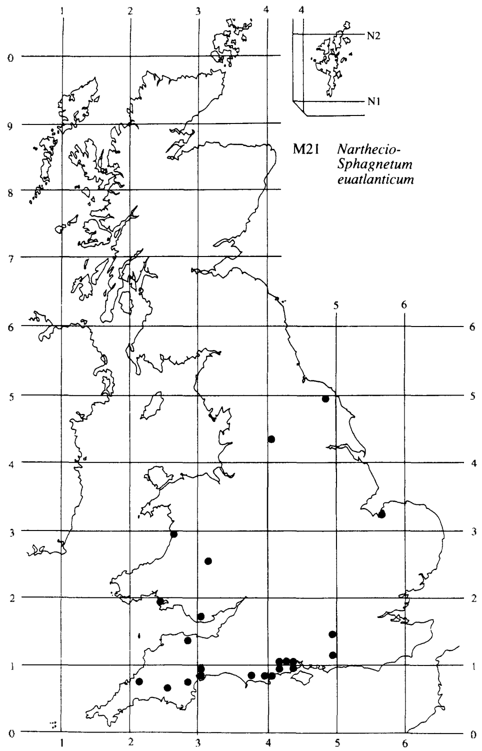
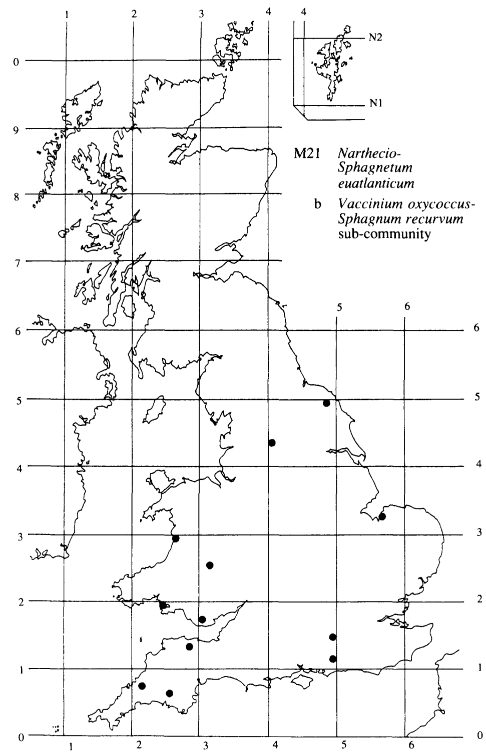
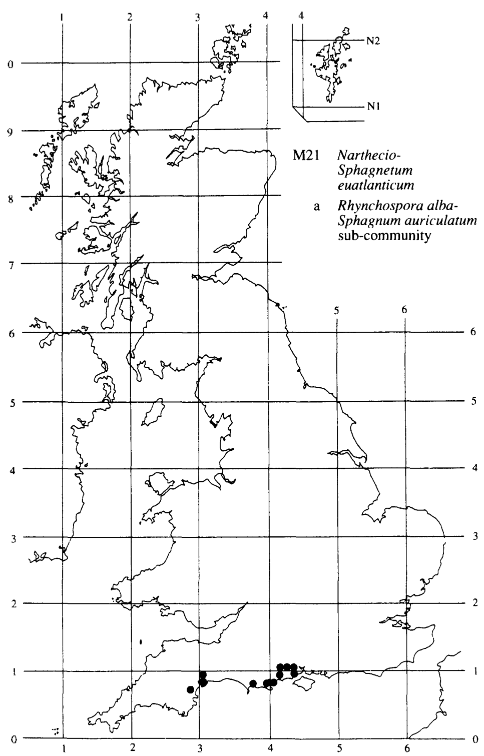
Sphagnum tenellum	II (2–6)	I (2–5)	II (2–6)
Sphagnum subnitens	II (1–4)	I (2–9)	II (1–9)
Phragmites australis	II (1–4)	I (4–6)	I (1–6)
Cephalozia macrostachya	II (1–2)	I (2–3)	I (1–3)
Cephalozia connivens	II (1–4)	I (2)	I (1–4)
Cladopodiella fluitans	II (1–3)		I (1–3)
Drosera intermedia	II (1–3)		I (1–3)
Sphagnum magellanicum	II (1–6)		I (1–6)
Cirsium dissectum	II (1–3)		I (1–3)
Cephalozia lunulifolia	I (1)		I (1)
Aneura pinguis	I (1–2)		I (1–2)
Eleocharis multicaulis	I (2–6)		I (2–6)
Pinguicula lusitanica	I (1–3)		I (1–3)
Sphagnum pulchrum	I (4–7)		I (4–7)
Erica ciliaris	I (5)		I (5)
Hammarbya paludosa	I (1)		I (1)
Sphagnum recurvum	I (5–9)	IV (2–8)	III (2–9)
Potentilla erecta	I (1–3)	III (1–4)	II (1–4)
Vaccinium oxycoccos		III (1–4)	II (1–4)
Carex echinata	I (1–3)	II (3–4)	I (1–4)
Carex panicea	I (1)	II (1–3)	I (1–3)
Aulacomnium palustre	I (2–4)	II (1–4)	I (1–4)
Sphagnum palustre		I (3–4)	I (3–4)
Succisa pratensis		I (2–3)	I (2–3)
Juncus effusus		I (3–5)	I (3–5)
Polytrichum commune		I (3)	I (3)
Nardus stricta		I (4–5)	I (4–5)
Sphagnum cuspidatum	II (1–7)	II (1–8)	II (1–8)
Juncus acutiflorus	II (2–5)	I (3)	I (2–5)
Sphagnum capillifolium	I (2–4)	I (4–6)	I (2–6)
Hypnum jutlandicum	I (2–3)	I (2–4)	I (2–4)
Scirpus cespitosus	I (1–4)	I (4–5)	I (1–5)
Carex rostrata	I (1–3)	I (2–4)	I (1–4)
Cladonia impexa	I (3–5)	I (1–4)	I (1–5)
Polygala serpyllifolia	I (1–2)	I (1)	I (1–2)
Pinus sylvestris sapling	I (1–2)	I (1–2)	I (1–2)
Cephaloziella sp.	I (1)	I (1)	I (1)
Calypogeia fissa	I (2–3)	I (3)	I (2–3)
Cephalozia bicuspidata	I (1–3)	I (1–3)	I (1–3)
Riccardia chamedryfolia	I (2)	I (3)	I (2–3)
Campylopus paradoxus	I (1)	I (3)	I (1–3)
Potamogeton polygonifolius	I (1)	I (4)	I (1–4)
Agrostis curtisii	I (2)	I (1)	I (1–2)
Juncus squarrosus	I (4)	I (1)	I (1–4)
Number of samples	31	24	55
Number of species/sample	15 (8–24)	13 (8–18)	14 (8–24)

a *Rhynchospora alba-Sphagnum auriculatum* sub-community
b *Vaccinium oxycoccos-Sphagnum recurvum* sub-community
21 *Narthecio-Sphagnetum euatlanticum* (total)







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