The flora of Morvern and Ardnamurchan compared with that of Mull

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ABSTRACT

This paper compares and contrasts the flora of the island of Mull with that of Morvern and Ardnamurchan, the two nearest peninsulas of the Scottish mainland, and suggests some of the factors which may account for the differences. The basis of the paper is three different types of distribution patterns which are summarily discussed and exemplified in *The island of Mull: a survey of its flora and environment* (Jermy & Crabbe 1978). Although numerous hitherto unpublished records are included in the paper, particular species are selected more for illustrative purposes than as a contribution towards an exhaustive list of the vascular plants of the area concerned.

INTRODUCTION

The recent publication of *The island of Mull: a survey of its flora and environment* (Jermy & Crabbe 1978), the collaborative work of the Department of Botany of the British Museum (Natural History), has prompted me, by its occasional references to unpublished records from Morvern, to write a kind of appendix to the book on the similarities and differences between the flora of the island and that of the nearest parts of the mainland. Unfortunately, though I have fairly systematically covered the greater part of the peninsula of Morvern, there are still large areas between Ardgour to the east and the Point of Ardnamurchan to the west which, so far as I know, await a thorough botanical survey. But Ardnamurchan is floristically so rich and diverse that even a fragmentary knowledge of it is sufficient to reveal, particularly in relation to the flora of Mull, the presence of several plants which a botanist familiar with the vegetation of the Western Highlands would hardly expect to see there at all, let alone, as is often the case, in considerable quantity.

I have had some difficulty in deciding how best to determine the boundaries of the region to be included in this paper (Fig. 1). The peninsula as opposed to the parish of Morvern presents no difficulty: Loch Sunart, the Sound of Mull and Loch Linnhe between them make it almost an island, while the Carnoch and Tarbert Rivers complete in a most natural fashion the delimitation to the north-east. Similarly there is no problem about Ardnamurchan from the Point at the western end as far eastwards as the mouth of the River Shiel, and thence, following the county boundary between Argyll and Inverness-shire, eastwards again along the western bank of the river and the southern shore of the loch as far as Polloch. But from Polloch to Ardgour there is so much virtually untrodden hinterland that it seems best, particularly for mapping purposes, to be guided by the National Grid, to accept as the north-eastern corner of my area the 10 km squares 17/8.6 and 9.6, and to stress at the outset that only the more accessible southerly parts of these two squares have yet received any of the attention that they, and equally the two to the north of them, may well one day prove to deserve. There are thus 18 10km squares with which this paper is concerned (see Fig. 1); hereafter the prefix 17/ has been omitted for the sake of brevity. Where I record a plant from a square only a small part of which lies within my area (e.g. 5.4, 8.4, 4.7, 6.7), the record is for the part of the square which does actually fall in either Morvern or Ardnamurchan rather than in Mull, Lismore, Muck or Moidart.

Since my original objective was merely mapping on traditional lines, I have chosen to follow the example of the *Atlas of the British flora* (Perring & Walters 1962) in two respects. First, to facilitate cross-references, I have adopted its nomenclature even in the few instances when there is a strong case for altering it; and second, even when the result, as in square 4.7, is a strip of land only some 6 km long and of an average width of well under 1 km, I have adhered rigidly to the National Grid. The authors of *The island of Mull*, on the other hand, to avoid such absurdities as dividing both Ulva and the Treshnish

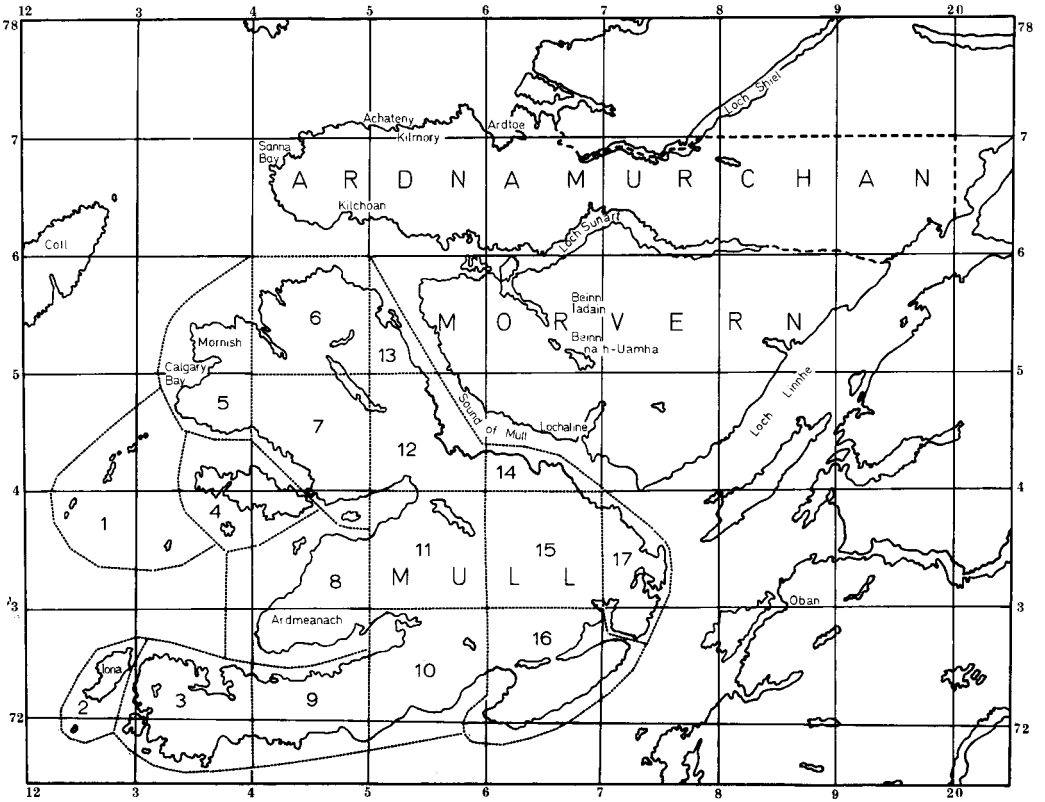

FIGURE 1. Map of the island of Mull and the Morvern and Ardnamurchan peninsulas, showing the boundaries of the areas discussed.

Islands between four squares each, the Laggan–Croggan peninsula into three and the Ardmeanach into two, sensibly made certain modifications, especially on the western side of the island, to comply with natural rather than conventional divisions (Fig. 1). It is inevitable that these modifications will, in some instances, as in the case of the calcicoles confined to the Ardmeanach, have reduced the number of squares in which certain plants mentioned in this paper are said to grow on Mull. This slight degree of distortion applies particularly of course to my comparative tables, especially that concerned with mountain species. I do not think, however, that it is sufficient to invalidate any of the tentative general conclusions to which my observations have sometimes led me.

Before going into detail it may be as well to state a few bald facts and figures. The number of non-critical species of vascular plants so far recorded from all 18 squares in Morvern and Ardnamurchan is 193, of which 128 are recorded also from all 17 divisions in Mull, as are an additional 13 which hitherto are unrecorded from at least one of the mainland squares. If square 1 on Mull, which consists only of the Treshnish Isles, is excluded from the calculation, the Mull total rises by 34 to 175. But similarly on the mainland there are no fewer than 42 plants recorded from every square except one, and in the great majority of cases the square where the last record is needed is one of the three which not only consist largely of sea but are also extremely remote (8.4, 4.7 and 5.7). The total number of new dots to be added to the first (1962) edition of the *Atlas of the British flora* for my 18 mainland squares is just over 2,000, an average comfortably in excess of 100 per square. I need hardly add that for a proportion of these, including some of the more important ones cited in this paper, I am indebted to a number of collaborators, both friends and strangers, to all of whom, though there are too many of them to name individually, I extend my warmest thanks.

TABLE 1. NUMBER OF SQUARES ON MULL AND ON THE MAINLAND IN WHICH FIVE COMMON SALTMARSH PLANTS ARE RECORDED

	Mull	Mainland
Spergularia media	10	14
S. marina	6	14
Suaeda maritima	7	11
Salicornia europaea	8	12
Carex extensa	9	13

TABLE 2. NUMBER OF SQUARES IN WHICH PLANTS OF SANDY PLACES ARE RECORDED

	Mull	Mainland
Honkenya peploides	7	5
Viola tricolor subsp. *curtisii*	5	1
Carex arenaria	6	4
Catapodium marinum	4	1
Ammophila arenaria	6	3

FLORISTIC COMPARISON

MARITIME DISTRIBUTIONS

Bangerter *et al.* (1978) state that, while the majority of distributional maps of Mull species would show no obvious general significance, there are three types of distribution, the western, the mountain and the maritime, each of which has a special and definable character. Since the most straightforward of the three, because it depends simply on the distribution of suitable habitats, is the maritime, I shall deal with this first.

Although an island the size and shape of Mull might be expected to have a larger number of maritime species recorded from more of its divisions than even as indented a mainland coastline as that with which I am concerned, the reverse proves in this case to be the truth. Only four maritime plants are recorded from all the 17 divisions in Mull, namely *Glaux maritima, Armeria maritima, Plantago maritima* and *P. coronopus*. These four are also recorded from all 18 squares in Morvern and Ardnamurchan, as are four other coastal plants in addition to these, namely *Atriplex glabriuscula, Triglochin maritima, Juncus gerardii* and *Puccinellia maritima*. The simplest explanation of this fact, the number and extent of the saltmarshes in Morvern and along the north side of Loch Sunart, is supported by the data in Table 1. On the other hand Table 2, listing five plants characteristic of sandy bays, dunes and machair, approximately reverses the proportions. Morvern has no sandy sea beaches; Ardnamurchan has Sanna and Achateny Bays, both of which are botanically rich, and between the mouth of the Shiel River and Ardtoe there are scattered potential localities for plants that require a sandy soil. But Table 2 suggests that with Iona, Calgary and several sites on the southern shore of the island, Mull has more suitable localities for such plants than has the adjacent mainland.

A few brief comments are also called for here on six strictly coastal plants which do not, however, fit naturally into the categories so far discussed. *Asplenium marinum, Ligusticum scoticum* and *Crithmum maritimum* are here as elsewhere characteristic of sea cliffs and coastal rocks, and the first two, with only one exception apiece, behave exactly as they are said to do on Mull. A very small isolated colony of the *Asplenium* on a low cliff at Fiunary Bay on the Sound (6.4) is exceptional in that it can be exposed to an appreciable amount of salt spray only when a very high tide coincides with a very strong north-westerly wind. And again, a stronger colony of the *Ligusticum* in the crevices of a large flat outcrop of rock at Bonnavoulin, a few miles further up the Sound (5.5), can escape the ravages of the cows that are sometimes to be seen there only because it can hardly be reached without a determined and painful battle with the dense thicket of briars and brambles which almost encircles it. And, as for the *Crithmum*, the only thing that can yet be said on that subject is that the independent discovery of a considerable quantity of it by two separate botanists in what seem to be two different stations on the same stretch of

high sea cliff in square 4.6 constitutes one of the most unexpected and notable of recent additions to the exceptional diversity of that square's vegetation.

The other three coastal plants are *Blysmus rufus*, *Mertensia maritima* and *Scilla verna*. The *Blysmus* is equally widespread on both Mull and the mainland, in both cases recorded from all but three squares; *Mertensia*, though still surviving in six divisions in Mull, has lost its solitary foothold on Loch Linnhe; while *Scilla verna*, known in one station on the Ross of Mull and on several of the small islands off the western coast, has, as yet, despite the existence of several apparently suitable sites in Ardnamurchan, never been recorded in any of them.

PLANTS WITH A WESTERN DISTRIBUTION

Presumably because the western pattern of distribution is discussed and exemplified by Bangerter *et al.* (1978) before the maritime, a number of plants are included by them in the former category which I should prefer to group with the latter. Two plants of the type I have in mind are *Valerianella locusta* and *Sherardia arvensis*. Near the western tip of Ardnamurchan both grow on coastal sand, the former, for example, on the highest dune at Sanna (4.6), the latter on a small patch of machair behind Achateny Bay (5.7). Both in fact are hereabouts decidedly maritime, while they can only be regarded as western in the very limited context of North Argyll rather than in the wider context of the British Isles as a whole. And much the same is true of *Leontodon taraxacoides* at Kilmory (5.7), of *Carlina vulgaris* in many of its stations in square 4.6, of *Eupatorium cannabinum*, *Vicia orobus* and *Trifolium medium* at Kilchoan (4.6), of *Briza media* and *Koeleria cristata* at Sanna Bay, and finally of the very much more widespread *Anthyllis vulneraria*.

But besides these plants, which can only be properly regarded as western in a very limited and local context, there is a second group which may fairly be classed as predominantly western on the national as well as on the narrowly local scale. This second group comprises, among other and commoner plants, *Polystichum setiferum*, *Geranium sanguineum* and *Orobanche alba*, all three of which are excessively local in either peninsula, *Umbilicus rupestris*, which has only very lately been recorded from near Kilchoan as well as from western Mull and Iona, and three plants which occur either in Iona or in south-westernmost Mull or in both but which have yet to be recorded from the adjacent mainland, namely *Radiola linoides*, *Hypericum elodes* and *Scirpus cernuus*.

That leaves from among the plants classified by Bangerter *et al.* (1978) as western only five plants with the clearest and at the same time the most puzzling distributional patterns of all. The five plants are *Cakile maritima*, *Apium inundatum*, *Anagallis tenella*, *Veronica anagallis-aquatica* and *Catabrosa aquatica*; and to these five, from my point of view, may be added at least three more which are not mentioned by Bangerter *et al.* (1978) in this context, namely *Ophioglossum vulgatum*, very recently found at Ardtoe (6.7), and *Thalictrum minus*, which has several stations on Ardnamurchan, in one of which, Achateny Bay in square 5.7, it is accompanied by my third example of this group, *Agropyron junceiforme*.

Of this group of eight plants, to which several others such as *Centaurium erythraea* and *Scutellaria minor* might justifiably be added, only two are essentially coastal, namely *Cakile* and the *Agropyron*. Reference to the *Atlas* will immediately reveal how remarkably similar are their distributional patterns all round the coasts of this whole island. But for the remainder the similarity of pattern is discernible primarily, if not always exclusively, from Mull and Ardnamurchan northwards. All eight plants in the group are to be found either on Iona or in south-western Mull; all occur on Ardnamurchan at either Sanna or Achateny Bays or else in the Ardtoe area; both Coll and Tiree have more than one station for each of the eight; all grow in numerous places in the Outer Hebrides from Barra right up to Lewis; and, though the *Thalictrum*, the *Cakile* and the *Agropyron* are widespread along the northern coast of the Scottish mainland, none of the eight has more than a few scattered sites on the mainland or the Inner Hebrides between Coll, Tiree and Ardnamurchan to the south and the coast between Cape Wrath and John O'Groat's to the north. Bangerter *et al.* (1978) write of *Apium inundatum* that 'It is present on Coll and Tiree, but appears to be absent from Skye and its adjacent islands and the north-west mainland of Scotland'; and lower down the same page comes the sentence 'Calgary Bay probably enjoys a climate which, like that of Iona, is warmer, sunnier and drier than most other parts of Mull'. Although that alone can hardly be the whole explanation of the type of distribution just discussed, the fact that all the main areas mentioned in this paragraph have an appreciably lower rainfall than almost the whole of the Western Highlands strongly suggests that this may well be an important factor. Certainly on this particular issue it looks as if climate must play a larger part than geology.

MAINLAND PLANTS UNKNOWN ON MULL

Before turning to mountain plants, it will be as well to say something of the heterogeneous group of lowland plants which are recorded from either Morvern or Ardnamurchan but not at present known in Mull. To effect the transition, two essentially western species should come first, both of which, like the last group discussed, have long been known to have more than one station on the island of Coll. First comes *Eriocaulon septangulare*, which was recorded from Iona by Druce, but is evidently now extinct there. Though first detected on Ardnamurchan too late to be included in the first edition of the *Atlas*, it is now known to occur in seven different sites in square 4.6 (by the thousand in at least two of these sites) and two in 4.7. And second is *Spiranthes romanzoffiana*, which also I now know in several separate stations both in Ardnamurchan and in Morvern. I am sure that the latter, and suspect the same of the former also, eluded detection for so long because until it comes into flower around the middle of August it is exceptionally difficult to pick out, even if you know what you are looking for, from the surrounding herbage. From my one visit to that district, which was too early in the season to justify a search for it, I should be not in the least surprised if the *Spiranthes* were yet to be found in one of the damper parts of Mornish, in the north-western corner of Mull.

These mainland sites for *Spiranthes romanzoffiana* have nothing very obvious or distinctive in common. Indeed two of the three sites in Morvern, steep grassy slopes dotted with small outcrops of rock and with occasional flushes giving rise to little trickles between tussocks of *Molinia*, could be duplicated times beyond number in lowland situations throughout the entire peninsula, while even the third, a relatively level if hummocky pasture with close parallel depressions suggesting that it was once cultivated as a 'lazy-bed', is the kind of terrain which nothing but a lucky chance was likely to reveal as the habitat of an unusually strong colony of a plant with an exceptionally restricted European range. And in all three of these Morvern stations, unlike those in Ardnamurchan, the *Spiranthes* is the only plant of the slightest note.

In Ardnamurchan *Spiranthes romanzoffiana* occurs around the western end of Loch Shiel and the short but sinuous stretch of river between it and the sea. There are probably more sites for the plant in this area than I know, but the five I do know share a characteristic which I have seen mentioned in the literature but which applies to none of the Morvern sites, that they are liable to winter inundation. And that in itself is certainly part of the reason for another difference between these and the Morvern localities, that here the *Spiranthes* tends to grow in interesting company. In one station, for instance, it is associated with a small patch of *Rhynchospora fusca*, an abundant feature of Kentra Moss not far away but unknown on Mull, and with an exceptional quantity of *Lycopodium inundatum*, which too is unknown on Mull but here, intermingled with *Drosera anglica*, grows in an almost continuous zone some 100m long and of an average width of about 1m; a zone which, though I have more than once seen it well under water, presumably represents the high water mark of a normal Western Highlands spate. In another rather more remote station the association of which the *Spiranthes* is a relatively frequent member includes, as well as all three species of *Drosera*, the colony of *Apium inundatum* to which I have already referred and another species that is almost as infrequent in the two peninsulas as well as in Mull, *Alisma plantago-aquatica*. And between these first two stations there are at least two others within a stone's throw of which grow dense if excessively local patches of the little annual *Crassula aquatica*, accompanied at one point by a few plants of the even more diminutive *Elatine hexandra*.

The *Crassula*, apart from its unexplained occupation of the muddy margins of a pool near Leeds from 1921 to (at latest) 1945, is an addition to the British flora. Being a native of central and especially northern Europe, including Germany, Denmark, Finland, Sweden and Norway as well as Iceland, it is perhaps no less likely than that other tiny annual, *Koenigia islandica*, to be a genuine British native which, until a keen-eyed botanist eventually spotted and identified it, successfully survived undetected. Alternatively, since no normal human activity seems likely to have introduced it either deliberately or accidentally, it may well owe this extension to its known range to the Whooper Swans which regularly alight on exactly this area on their autumnal migration southwards. But, whichever of these or any other conceivable explanation may account for the facts, there is no obvious reason why this species should occur here alone in Britain. It seems much more likely that, as again in the case of the *Koenigia*, other comparable localities in the north of the British Isles still house the *Crassula* incognito.

Among the other plants just mentioned as occurring in this exceptional area two, *Lycopodium inundatum* and *Rhynchospora fusca*, besides being absent from Mull, have on Ardnamurchan their most westerly station in Britain, while the *Alisma*, despite its one station on Mull, and the *Elatine* despite its two, are here at the north-westerly limit of their British range. Several other lowland plants

which have not been recorded from Mull are also, in either Ardnamurchan or Morvern, at or near the limit of their distribution. *Potentilla anglica* on the eastern side of Loch Aline (6.4), *Sedum telephium* subsp. *fabaria* at Drimnin (5.5), *Cruciata chersonensis* near Larachbeg (6.4)—both these last looking as native as they could—and even *Carex aquatilis* on the banks of both the Aline and the Rannoch Rivers (6.4, 7.4 and 6.5) all mark considerable extensions to the north or the west or to both. Though the same is not quite true also of the four grasses, *Festuca altissima, Catapodium marinum, Trisetum flavescens* and *Agrostis gigantea*, the discovery of the first in a steep narrow ravine in square 6.4, of the second on rocks at Sanna Bay in 4.6, of the third in sparse native woodland in 5.5 and 5.6, and of the last on a bare stony slope in 7.4 and at the top of shingle beaches in 7.6 and 8.6, in each case puts a dot on the map in an area where dots for the species concerned are few and far between. Other plants absent from Mull but known to occur either in Morvern or Ardnamurchan include *Jasione montana* (6.6 and 9.6), *Adoxa moschatellina* (9.5 and 9.6) and, as a widespread feature of roadsides and waste places, the freely hybridizing *Rumex longifolius*. In each of these three cases, however, the extension of the plant's range is of no great distance or significance. And if mere ruderals are postponed for consideration later, that leaves, in the present context of native plants occurring in lowland sites on the adjacent mainland but not on Mull, only four species, which have little in common except that all of them happen to grow in square 4.6.

The first of the four, which, when I first found it, caused me the greatest surprise, is *Asplenium septentrionale*, a plant whose requirements I have never understood. In 1948 there were four tufts of it in a narrow crack on the side of a single boulder, one of many that looked very much alike, which outcropped from the steep south-facing side of one of the narrow valleys on the west side of Meall Sanna. The same four tufts are still there 30 years later, and what is more, R. W. David, searching for my colony in 1976 but in the valley next to mine to the north, discovered a different colony which also comprised four tufts. It is a plant which, in Scotland at least, has two peculiarities. First, as the *Atlas* shows, its stations are widely separated, and secondly, in the few places where it occurs, it is often in very small quantity. This second peculiarity it shares too with the second of my four plants, *Ajuga pyramidalis*, which so far I know in only two stations in the vicinity, one to the north of Sanna, the other west of Loch Caorach, but which, unlike the *Asplenium*, I fully expect to be found in other places near the Point of Ardnamurchan than those I happen to know. My third plant is *Gentianella amarella*, which grows in sandy turf in square 4.7 as well as at Sanna Bay in 4.6, but only in the latter site, so far as I know, poses a problem for the taxonomist by confronting him not only with subsp. *septentrionalis* as well as subsp. *amarella* but also with forms, presumably of hybrid origin, which have been accepted by N. M. Pritchard as intermediate between the two. And finally there is *Eriophorum latifolium*, whose total absence from Mull I find the most surprising of all. It is recorded from no less than seven of the 18 squares which are my concern, three in Ardnamurchan and four in Morvern, and it is locally so frequent, especially in square 6.5, that in as many as seven quite separate stations I have actually spotted it while driving my car. Nor, I suspect, does it require quite such basic conditions as is often supposed. Not only does it grow very healthily, mixed with about the same quantity of *E. angustifolium*, on the slope above the eastern shore of Loch Doire nam Mart, where the steep side of Beinn na h-Uamha above it is acid enough to support a colony of *Cryptogramma crispa*, but there is even a small boggy flush beside the track up the notoriously acid Gleann Dubh (7.5) where *E. vaginatum, E. angustifolium* and *E. latifolium* all grow together in an area of, at most, 20 m^2. A. C. Jermy tells me that Ardmeanach, the home of the calcicoles on Mull, lacks the right kind of flush for *E. latifolium*; but even so, it is hard to understand why a plant that flourishes in the westernmost parts of both Ardnamurchan and Morvern (6.5, 4.6 and 5.6) should not occur at all on the other side of the Sound.

MOUNTAIN SPECIES

The section on the distribution of mountain species by Bangerter *et al.* (1978), though it occupies less than a page, still mentions 17 species, of which no fewer than 14 are mapped on the pages which immediately follow. Table 3 lists those mountain species which occur both on Mull and on the adjacent peninsulas. *Sedum rosea*, which is recorded from 14 of Mull's 17 squares and 16 of the 18 that cover Ardnamurchan and Morvern, is omitted from Table 3 since in both cases under discussion, and particularly on the western coast of Mull and the northern one of Ardnamurchan, it is a plant of maritime as well as of mountain cliffs.

Nothing of much significance emerges from Table 3 except perhaps that in the mountainous areas of

TABLE 3. THE RELATIVE FREQUENCY ON MULL AND ON THE ADJACENT MAINLAND OF THOSE MOUNTAIN SPECIES WHICH OCCUR ON BOTH

	Mull	Mainland
Lycopodium alpinum	6	10
Cryptogramma crispa	2	4
Polystichum lonchitis	2	1
Thalictrum alpinum	7	9
Cardaminopsis petraea	2	2
Silene acaulis	3	2
Dryas octopetala	1	1
Alchemilla alpina	6	11
Sedum villosum	1	1
Saxifraga stellaris	5	9
S. hypnoides	3	6
S. aizoides	3	13
S. oppositifolia	1	7
Epilobium anagallidifolium	1	2
E. alsinifolium	3	3
Polygonum viviparum	4	4
Oxyria digyna	5	8
Salix herbacea	6	10
Arctostaphylos uva-ursi	9	10
Empetrum hermaphroditum	2	4
Saussurea alpina	5	8
Juncus triglumis	1	2
Luzula spicata	3	2
Carex bigelowii	4	7
Deschampsia alpina	1	2

Mull there is relatively little basic rock. The two most striking contrasts between Mull and the adjacent peninsulas are the figures for *Saxifraga aizoides* and *S. oppositifolia*, which clearly point towards that deduction, as does the fact that calcicoles such as *Dryas octopetala* and *Sedum villosum* are confined to the Ardmeanach. The list of the six mountain plants which occur on Mull but have not yet been recorded from the adjacent mainland is not very illuminating either. Much the most interesting of them, *Koenigia islandica*, like the last two plants mentioned, is confined to the Ardmeanach, where it occupies a very unusual type of habitat. Another of the six, *Draba incana*, is evidently on Mull, as also on Tiree and elsewhere, a coastal rather than a montane species. And as for the remaining four, *Lycopodium annotinum* (which I am perhaps wrong in regarding as a mountain species), *Cerastium arcticum, Cherleria sedoides* and *Minuartia verna*, never having seen any of them in their Mull stations, I can think of no compelling reason why they should grow just where they do and not on the other side of the Sound. But then, since that does seem to be the case, I can equally think of no compelling reason why, with the emphatic exception of the *Minuartia*, which seems quite unaccountable, they should not do just that.

Under the heading of 'mountain species' the most interesting and important list in the present context is clearly that of the plants which grow in Morvern or Ardnamurchan but not on Mull. This list, for purposes of convenience, I shall divide into two. As has been clearly recognized by their relatively recent acquisition as a Nature Reserve, there are two hills in Morvern, Beinn Iadain and Beinn na h-Uamha (6.5), the respective heights of which are only 571 and 464 m, which between them support a richer arctic-alpine flora than all the rest of the hills of Morvern and Ardnamurchan put together. The richest areas, the long north-facing cliff of Beinn na h-Uamha and the west-facing cliffs and the stony patches on the summit plateau of Beinn Iadain, consist of a base-rich basalt which produces ledges reminiscent of the mica-schist of Ben Lawers and Ben Lui but tends to crumble into steep and unstable screes of strikingly red soil. The flora accords with the pH; a sample from above the western end of the northern cliff of Beinn na h-Uamha had a pH of 7.2 and there are several places on or just below the foot of the cliffs where it might well prove to be higher than that. Both hills can boast, among other things, *Dryas, Silene acaulis* and all four species of *Saxifraga* that occur on both Mull and the

mainland, and both also carry *Poa alpina* and *P. glauca*, neither of which is found either on Mull or on Ardnamurchan. Besides *Asplenium viride* and *Polystichum lonchitis*, the latter of which is not known elsewhere in either peninsula, Beinn na h-Uamha supports a very few plants of *Saxifraga nivalis*, for which again no other station is at present known in either area, and the same claim can be made for *Sagina normaniana, Arenaria norvegica, Potentilla crantzii* and *Galium sterneri* on Beinn Iadain. When *Sedum villosum, Juncus triglumis* and *Luzula spicata* are added to the latter hill's list of local rarities, and the remarkable fact is also noted that in block scree on the southern side of Beinn na h-Uamha and again at the foot of the northern cliffs of Beinn Iadain there are flourishing colonies of that arch-calcifuge *Cryptogramma crispa*, the reasons for treating these two hills separately from the rest should be apparent.

The higher hills in the east of the peninsula, Beinn Mheadhoin (739 m), Fuar Bheinn (765 m) and Creach Bheinn (853 m), are at first sight as different as could be from the two just discussed. The rock of the last two of these is a hard, barren, quartz-rich gneiss belonging to the Moine series and the flora is typical, for the most part, of an acid hill of only moderate height. Even so, between them they yield seven species characteristic of such hills in Scotland, plants indeed whose presence on these hills is less surprising than their absence from Ben More, which is 966 m high, and all the other hills to the east of it on Mull. And moreover Beinn Mheadhoin at least, which consists instead of Strontian granite, is here and there considerably richer floristically than a first rapid ascent might suggest. A number of little burns rise from the extensive and desolate summit plateau to flow in every direction, and several of them, following faults and intrusive dykes, have formed ravines, of varying length and depth, on the sides and bottom of which grow a number of plants, notably *Saxifraga oppositifolia*, indicative of more basic conditions. In a north-facing ravine near the summit, among plentiful *Silene acaulis* in its only local station outside square 6.5, grow *Cerastium alpinum*, unknown elsewhere in either peninsula, and *Cochlearia alpina*, whose only other station in the area is in another ravine barely 1 km away. On the banks of a tiny burn on the northern slope of Meall na Greine, this time accompanied by an abundance of *Thalictrum alpinum* and *Saxifraga oppositifolia, Tofieldia pusilla*, again unknown elsewhere in either peninsula, is locally quite frequent. The deepest of the ravines facing east has, among other things, several fine clumps of *Saussurea alpina* and a single small patch of *Epilobium anagallidifolium*. On top of the vertical rocky bank of the burn flowing south is one of the only two colonies yet known in the area of *Chamaepericlymenum suecicum*, the other and stronger being some 2 km north of the north-western spur of Beinn Iadain. Even the desolate summit plateau itself can boast another plant, *Vaccinium uliginosum*, whose absence from Mull is the more remarkable in that on the adjacent mainland it occurs on Creach Bheinn and Maol Odhar in square 8.5 and Garbh-Bheinn in 9.6 as well as here on Beinn Mheadhoin in 7.5. And, finally, on lower cliffs in more than one miniature ravine near the foot of the mountain there are flourishing patches and even sizable colonies of *Orthilia secunda*.

The two mountain masses mentioned in the last paragraph, Garbh Bheinn and Beinn Bheag to the north of Glen Tarbert and Creach Bheinn and Maol Odhar to the south, provide the only records in the two peninsulas for two of the only three mountain species still to be mentioned, *Loiseleuria procumbens* and *Juncus trifidus*. The similarity of the distributional patterns of these two in the *Atlas* is no accident; demanding exactly the same conditions, the barest rocky tops of the most exposed mountain ridges, they repeatedly grow in one another's company. That is the case on these mountains, where, however, both are decidedly sporadic rather than frequent, and where the *Juncus*, on the Creach Bheinn range at any rate, shows an apparent preference for even more inhospitable sites at slightly higher altitudes than the *Loiseleuria*.

The last plant of all to be considered in this category, *Gnaphalium supinum*, may possibly point to the answer to the question under discussion—why should none of these regular inhabitants of Scotland's acid and floristically monotonous mountains grow on Ben More or any other of the higher hills of Mull? The party who, at my earnest request, first explored the hills around Glen Galmadale and in the process first found there all these three last plants was under the leadership of S. M. Walters and P. D. Sell. The former's field note on *Gnaphalium supinum* ran: 'V. local on snow-cornice edge of steep N-facing corries under ridge of Meall Odhar'. Jermy (1978) writes 'Whatever amount of snow falls on Mull, it is only on the higher hills in the Ben More Massif and the Torosay hills that snow persists for more than the single day or two . . . There are no areas of characteristic snow-bed vegetation as may be found on the Scottish mainland . . . For the most part the relatively clement climate is against prolonged snow-lie and the few species requiring it which would otherwise find the right conditions are therefore absent.'

Although that quotation should perhaps be the last word on this topic, I would add one final argument to reinforce it. It concerns the genus *Hieracium* and its various sections. Of the very distinctive section *Alpina* only two species have so far been recorded from the area with which I am concerned, the relatively common and widespread *H. holosericeum* and the very much scarcer *H. alpinum* itself; both these were reported from Garbh Bheinn by Kenneth and Stirling (1970). On the other hand, thanks not least to P. D. Sell's presence on the excursion around Glen Galmadale, no fewer than seven species of section *Subalpina* have been authoritatively recorded from Morvern alone, namely *H. senescens, H. marshallii, H. centripetale, H. callistophyllum, H. dasythrix, H. petrocharis* and *H. pseudanglicum*. The significant fact here is succinctly stated by Kenneth & Stirling (1970) in the following summary sentences—'The hawkweed flora of Mull, so far as we have been able to judge, is remarkably poor. No species of the Section Alpina has been found and only one named species of the Section Subalpina.' Bangerter & Cannon (1978) do nothing to gainsay the latter half of this summary, the explanation of which would again seem, with virtual certainty, to be climatic rather than geological.

RUDERALS

Thanks largely to Iona's poppies and fumitories, Mull and its satellite islands can produce a longer and more interesting list of ruderals (Jermy, James & Eddy 1978) than any area of the adjacent mainland except possibly the arable strips between road and sea on the western side of Kilchoan Bay (4.6). In the present context precedence should be given to those species whose existence on Mull either rests on doubtful evidence or else is not recorded at all. The first of these is *Coronopus squamatus*, for which my original note, dated 1973, runs: 'Several plants on bare trodden earth ... at Bonnavoulin' (5.5), where it has persisted every year since then. Next comes *Thlaspi arvense*, of which I wrote in 1977, 'A colony of several plants in the S.W. corner of a field of potatoes on the N. side of the private road to Kingainloch' (8.5), and I later added, as I could not of the single plant of *Silene noctiflora* which had accompanied it in 1977, 'Still there in '78'. *Rorippa islandica*, unknown on Mull, is abundantly and ineradicably established in and around the farmyard at Achranich (7.4), while in the walled kitchen garden nearby, though quite a large colony of *Barbarea vulgaris* was successfuly exterminated by chemical warfare, *Veronica peregrina*, along with *Stachys arvensis*, keeps germinating so persistently and unobtrusively that its future here, as also in two gardens near Arisaig, seems secure. Of the annual species of *Lamium, L. hybridum*, which is recorded for Mull only from Iona and even there with some reservation, is in Morvern almost as common and widespread as *L. purpureum* itself and is locally plentiful also in squares 6.6 and 9.6. *L. amplexicaule* is abundant in two widely separated gardens near Drimnin (5.5) but to me at least is unknown elsewhere in either peninsula. Though I have often, and especially late in the season, found misleadingly abnormal forms of *L. purpureum*, I have yet to hear of an unquestionable record of *L. molucellifolium* from either Morvern or Ardnamurchan. And finally two members of the *Compositae* which hitherto are unknown in Mull have in recent years been recorded from Morvern. Unfortunately *Centaurea cyanus*, which some ten years ago appeared in quantity in a field of oats by the River Aline, disappeared, almost certainly for ever, when the field was permanently sowed down for silage. But happily *Mycelis muralis*, which somehow found its way to the solitary stone chimney which is the greater part of what remains of the original Killundine House (5.4), is gradually extending its footing on the neighbouring stone walls and foundations in what, according to the *Atlas*, is one of its only four stations in the whole of the Western Highlands and Islands.

MULL PLANTS UNKNOWN ON THE ADJACENT MAINLAND

Since the primary concern of this paper has been with those plants which occur on the nearest parts of the mainland but not on Mull, it may have conveyed a false impression of prejudice in favour of the former. In this brief concluding section I shall merely suggest that, though they are none of my present business, there are numerous native plants on Mull, in addition to the many I have already mentioned, whose apparent absence from the adjacent peninsulas is as interesting and probably also as significant as the absence from Mull of the plants which have been my concern. I shall do no more than list them (Table 4) in the order in which they are given by Bangerter & Cannon (1978) and, apart from hazarding a guess that one or two of the smaller, such as *Vicia lathyroides* or *Saxifraga tridactylites*, might yet be found at Sanna or Achateny and any of the aquatics in almost any of the countless lochs or lochans in the western half of Ardnamurchan, I shall leave the reader to draw his own conclusions concerning the factors determining the presence or absence of the rest.

TABLE 4. PLANTS KNOWN ON MULL BUT NOT ON MORVERN OR ARDNAMURCHAN

Teesdalia nudicaulis	*Potamogeton lucens*
Beta vulgaris subsp. *maritima*	*P. pectinatus*
Vicia lathyroides	*Naias flexilis*
Sorbus rupicola	*Corallorhiza trifida*
Saxifraga tridactylites	*Carex pendula*
Pimpinella saxifraga	*C. paupercula*
Vaccinium oxycoccus	*C. hirta*
Erigeron acer	*Poa compressa*

REFERENCES

BANGERTER, E. B. & CANNON, J. F. M. (1978). Flowering plants and conifers, in JERMY, A. C. & CRABBE, J. A., eds. *The island of Mull: a survey of its flora and environment*, pp. 11:1–11:77. London.

BANGERTER, E. B., CANNON, J. F. M., EDDY, A., HIBBERD, D. J. & JAMES, P. W. (1978). Patterns of distribution within the flora of Mull, in JERMY A. C. & CRABBE, J. A., eds. *The island of Mull: a survey of its flora and environment*, pp.2:1-2:25. London.

JERMY, A. C. (1978). Climate, in JERMY, A. C. & CRABBE, J. A., eds. *The island of Mull: a survey of its flora and environment*, pp. 6:1-6:11. London.

JERMY, A. C. & CRABBE, J. A., eds. (1978). *The island of Mull: a survey of its flora and environment*. London.

JERMY, A. C., JAMES, P. W. & EDDY, A. (1978). Terrestrial ecosystems, in JERMY, A. C. & CRABBE, J. A., eds. *The island of Mull: a survey of its flora and environment*, pp. 10:1-10:77. London.

KENNETH, A. G. & STIRLING, A. McG. (1970). Notes on the hawkweeds (*Hieracium sensu lato*) of western Scotland. *Watsonia*, **8**: 97–120.

PERRING, F. H. & WALTERS, S. M., eds. (1962). *Atlas of the British flora*. London.

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