

VASCULAR PLANTS COMMON TO THE ARCTIC AND THE BRITISH ISLES : ENUMERATION OF SPECIES

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The availability of (a) a 'working' delimitation of the Arctic (Polunin 1951), (b) a manuscript 'Circumpolar arctic flora' in which I have treated all of the recognized species of vascular plants known to reach the prescribed area, and (c) a modern British flora (Clapham, Tutin and Warburg, 1952, hereafter referred to as '*F.B.I.*'), has made it desirable, with much further exploration in the Arctic and botanical discovery in the British Isles (cf. Lousley 1951, 1952; Polunin 1953), to undertake a more adequate treatment than was formerly available (Polunin 1939a, 1939b) of the subject of 'arctic plants in the British Isles.' The bases and results in outline of this revised analysis of the vascular plant species common to the Arctic and the British Isles have recently been published (Polunin 1954), and it now seems desirable, as on the former occasion before the war, to offer also details of the plants concerned in the various ecological (or sometimes phytogeographical) categories.

In the lists given below the order is that of *F.B.I.*, as are in general the orthography and nomenclature. Where the nomenclature differs from that used in *F.B.I.*, or where this last supplants some more familiar designation, sufficient synonymy is given to orientate the reader : this is especially necessary with some widely inclusive species (indicated by "s.l.") which have been maintained here for reasons either of taxonomic preference or personal uncertainty (e.g. where insufficient material has been available for demonstration of conspecificity or for satisfactory appraisal of the situation in the British Isles and the Arctic together). This has allowed the inclusion in some instances of different subspecies, admittedly with probably different ecological relationships, as representatives of a species in the north and south ; but there are doubtless more segregations and discoveries to come. There were also occasional needs for changes (usually indicated by citing authorities) in accordance with the *International code of botanical nomenclature* as recognised in my 'Circumpolar arctic flora' or otherwise in relation thereto, though in general where matters of mere personal preference were concerned I have given precedence in the present lists to the *F.B.I.* and merely indicated by adding synonyms that other opinions exist.

Worse difficulties have been encountered in the assignment of some species to their proper ecological, etc., category ; and indeed the categories, like all too many biological entities, are somewhat nebulous and apt to overlap. When the entire picture is considered as a whole, however, these components stand out with fair clarity, and it is certainly hoped that anyone interested in the subject will supplant the old analysis with this new one which is much more worthily based. Especially has it a far less restricted and more logical and scientific 'Arctic' as its basis.

A single asterisk before the name of a plant indicates that it is, supposedly, introduced in the Arctic, and a double asterisk at the end of a plant's treatment indicates that it appears to be introduced in the British Isles : a few species are both. Introduced plants are taken as those of which the ancestral disseminules were supposedly transported by man to the region concerned, whether in ancient or modern times, so long as they appear to be established and able to persist from generation to generation without his continued intervention. When an otherwise introduced species appears to be native in any place in a

region it is counted as native, but in cases of serious doubt – as for instance when collection data have been inadequate – such species have been counted as introduced.

The symbols following plant names indicate the numbers of vice-counties of Great Britain (112 in all) and Ireland (designated “H” and 40 in all) in which the species concerned is known to occur. Usually these numbers are taken from *F.B.I.* but in a few cases in which the species concerned or at least the numbers are lacking in that work, they have been supplied from other sources – in particular Druce (1932). In some other instances, recent finds have had to be added to bring the vice-county numbers more nearly up-to-date. Further symbols have been employed in the case of group 2, comprising plants of sea-shore, lake-margin, aquatic and allied habitats: these indicate the group and sub-group to which each species would have been assigned if it had not been so specially selected.

There follow the detailed results of this analysis which, although it is in general based on that published in 1939, has the first and third categories somewhat broadened in other ways besides the geographical. There are also unfortunately many of the seemingly inevitable nomenclatural changes. It may be noted that further field experience and general considerations have led to (1) the omission of *Luzula arcuata* owing to prevailing doubts about its being in full development in the Arctic, (2) changing of *Carex lachenalii* from a plant of open soil to one characteristically of closed habitats though sometimes found in open areas, (3) changing of the polymorphic and often apomictic *Poa pratensis* s.l. in precisely the reverse manner, (4) the ‘sinking’ of *Cochlearia groenlandica* (which apparently differs from *C. scotica* and never was a British plant) in the polymorphic *C. officinalis* s.l., (5) the omission of *Senecio congestus* (R.Br.) DC. (*S. palustris* (L.) Hook.) as being apparently extinct in Britain, and (6) the changing of *Eriophorum angustifolium* from the category of plants of closed communities to that of plants to be found in open areas though characteristic of closed ones.

1. *Plants commonly of open soil or rocky, etc., habitats with little or no competition (although humus may be plentiful) at least in the Arctic.*

- (a) found in all three latitudinal arctic zones and of wide distribution meridionally in the Arctic (occurring in at least 5 of the 10 sectors – cf. Polunin 1951, 1954).

Lycopodium selago – 89, H40.
Equisetum variegatum – 34, H21.
E. arvensis s.l. – 112, H40.
Cystopteris fragilis s.l. (incl. *C. dickiana*) – 90, H34.
Woodsia alpina – 6.
Cardamine pratensis s.l. – 112, H40.
Arabis alpina – 1.
Silene acaulis – 25, H5.
Cerastium alpinum s.l. – 20.
Sagina intermedia – 2.
Minuartia rubella (Wahlenb.) Hiern (*Arenaria rubella* (Wahlenb.) Smith) – 5.
M. stricta (Sw.) Hiern (*Arenaria uliginosa* Schleich. ex DC.) – 1.
Potentilla crantzii – 21 (incl. recent addition).
Dryas octopetala – 19, H10.
Sedum rosea – 45, H17.
Saxifraga nivalis – 16, H1.
S. hirculus – 10, H6.
S. cernua – 2.
S. rivularis – 4.
S. cespitosa – 3.
S. aizoides – 33, H6.
S. oppositifolia – 35, H7.
Koenigia islandica L. – 1 (not mentioned in *F.B.I.*)

Polygonum viviparum - 35, H4.
Oxyria digyna - 31, H8.
Salix herbacea - 38, H17.
S. reticulata - 5.
Diapensia lapponica L. - 1 (not mentioned in F.B.I.)
Armeria maritima s.l. - 82, H27.
Matricaria maritima s.l. (*M. inodora* L. s.l.) - 112, H40.
Juncus castaneus - 9.
J. biglumis - 5.
J. triglumis - 25.
Kobresia simpliciuscula - 6.
Carex capillaris s.l. - 20.
C. saxatilis - 14.
C. glacialis - 1.
C. atrofusca - 2.
C. bigelowii - 39, H15.
C. rupestris - 6.
Festuca vivipara - uncertain but indicated as widespread and locally common.
Poa alpina - 17, H2.
P. glauca - 14.
P. pratensis s.l. - 112, H40.
Deschampsia cespitosa - 112, H40.
D. alpina - 17, H3.
Alopecurus alpinus s.l. - 7.

TOTAL = 47.

- (b) occurring northward at least to the middle-arctic zone and found in at least three sectors (cf. Polunin 1951, 1954).

Woodsia ilvensis - 9.
Thalictrum alpinum - 80, H5.
Draba norvegica s.l. (incl. *D. rupestris* at least of some authors) - 6.
D. incana - 32, H9.
Cardaminopsis petraea (L.) Hiit. (*Arabis petraea* (L.) Lam.) - 20, H2.
Viscaria alpina (L.) Don (*Lychnis alpina* L.) - 3.
Cerastium cerastoides - 8.
Arenaria ciliata s.l. - H1.
Montia lamprosperma - widespread in the British Isles.
Chamaenerion angustifolium (L.) Scop. (*Epilobium angustifolium* L.) - 108, H11 (H17 according to Druce, 1932).
Rumex acetosella - "widespread and common."
R. graminifolius Georgi ex Lambert (if incl. *R. tenuifolius* (Wallr.) Löve) - "probably widespread."
Arctous alpinus (L.) Niedenzu (*Arctostaphylos alpinus* (L.) Spreng.) - 9.
Veronica alpina s.l. - 10.
Pinguicula vulgaris - 100, H38.
Thymus serpyllum s.l. - widespread.
Plantago maritima s.l. - 86, H29.
Gnaphalium supinum - 16.
Juncus trifidus - 21.
Luzula spicata - 21.
Carex bicolor - 1 (by some considered an introduction).
C. microglochin - 1.
C. capitata s.l. - 1 (by some considered doubtful).

TOTAL = 23.

- (c) limited to the low-arctic zone or otherwise of restricted distribution in the Arctic.

Asplenium viride - 49, H12.
Athyrium alpestre - 14.
Dryopteris filix-mas - 112, H40.
Polystichum lonchitis - 30, H6.

- **Ranunculus repens* - 112, H40.
 **Chelidonium majus* - 96, H40, according to Druce (1932).
 **Thlaspi arvense* - 101, H19.
 **Capsella bursa-pastoris* - 112, H40.
Rorippa islandica - 93, H38
Erysimum cheiranthoides - 76, H18**
Viola canina s.l. - at least 106, H38.
Cerastium arvense - 81, H12.
C. holosteoides Fries ampl. Hylander (*C. vulgatum* of many authors) - 112, H40.
 **Stellaria media* - 112, H40.
Sagina procumbens - 112, H40.
S. saginoides - 11.
S. nodosa - 106, H40.
Minuartia verna (L.) Hiern (*Arenaria verna* L.) - 31, H3.
 **Erodium cicutarium* - 111, H25.
 Potentilla norvegica* - 47.
Alchemilla alpina - 28, H2.
Sedum acre - 111, H40.
S. villosum - 34, according to Druce (1932).
Saxifraga stellaris - 45, H18.
Parnassia palustris - 90, H33.
Polygonum aviculare s.l. (incl. *P. heterophyllum* Lindm.) - 112, H40.
 **P. lapathifolium* - 110, H38.
Rumex maritimus - 57, H4.
Arctostaphylos uva-ursi - 34, H8.
Gentianella amarella s.l. (*Gentiana amarella* L.) - at least 89, H30.
 Asperugo procumbens* - "rare and usually casual" according to F.B.I.
 **Myosotis arvensis* - 112, H40.
Veronica fruticans - 5.
 V. persica* - 112, H40.
Thymus drucei Ronn. (*T. arcticus* (E. Durand) Ronn.) - 70, H13.
 **Lamium amplexicaule* - 105, H26.
 **L. moluccellifolium* - 42, H25.
 **L. purpureum* - 112, H40.
 **Plantago major* - 112, H40.
Galium boreale - 46, H24.
 **Senecio vulgaris* - 112, H40.
Tussilago farfara - 112, H40.
 **Gnaphalium uliginosum* - 112, H40.
Erigeron acris - 72, H17.
 Matricaria matricarioides* - 91 (incl. recent addition), H40.
 **Artemisia vulgaris* - 112, H40, according to Druce (1932).
 **Cirsium arvense* - 112, H40.
Allium schoenoprasum s.l. - 12, H1.
Juncus bufonius - 112, H40.
J. filiformis - 5.
J. balticus - 17.
J. alpinus - 9.
Eleocharis pauciflora - 104, H34.
Festuca [cf.] *ovina* - 112, H40.
 **Puccinellia distans* - 74, H12.
 **Poa annua* - 112, H40.
P. laxa s.l. (incl. *P. flexuosa* Sm.) - 2.
 **Agropyron repens* - 112, H40.
 Hordeum jubatum* - "occasionally as a casual."*

TOTAL = 59.

2. Plants of sea-shores or lake, etc., margins (including aquatics) with little or no competition.

Isoetes lacustris - 42, H18 - group 1 (c).

- I. echinospora* s.l. - 21, H5 - group 1 (c).
Equisetum fluviatile - 110, H40 - group 1 (c).
Ranunculus reptans - 5 - group 1 (b).
R. trichophyllus - probably 112, H40 - group 1 (a).
Cakile maritima - 69, H19 - group 1 (c).
Cochlearia officinalis s.l. - 87, H25 - group 1 (a).
Subularia aquatica - 32, H6 - group 1 (c).
Honkenya peploides (L.) Ehrh. (*Arenaria peploides* L.) - 83, H24 - group 1 (a).
Atriplex [cf.] *glabriuscula* - 80, H24 - group 1 (c).
Suaeda maritima - 74, H24 - group 1 (c).
Lathyrus maritimus (L.) Bigel. (*L. japonicus* Willd.) - 11, H1 - group 1 (b).
Myriophyllum spicatum s.l. - 108, H39 - group 1 (b).
M. alterniflorum - 100, H39 - group 1 (c).
Hippuris vulgaris s.l. - 102 (incl. recent addition), H40 - group 1 (a).
Callitriche verna - 47, H8 - group 1 (b).
C. intermedia s.l. (incl. *C. hamulata* Kütz. ex Koch) - 99, H23 - group 1 (c).
C. hermaphroditica L. (*C. autumnalis* L.) - 43, H18 - group 1 (b).
Cicuta virosa - 36, H16 - group 1 (c).
Ligusticum scoticum - 29, H5 - group 1 (c).
Menyanthes trifoliata - 111, H40 - group 1 (c).
Mertensia maritima - 37, H7 - group 1 (a).
Limosella aquatica - 56, H2 - group 1 (c).
Utricularia intermedia - 39, H23 (or more) - group 1 (c).
U. minor - 87, H39 - group 1 (c).
Zostera marina - 63, H26 - group 1 (c).
Potamogeton natans - 112, H40 - group 1 (c).
P. gramineus - 77, H36 - group 1 (c).
P. alpinus - 88, H27 - group 1 (c).
P. berchtoldii Fieb. (*P. pusillus* of many authors) - 72, H35 - group 1 (c).
P. filiformis - 21, H13 - group 1 (b).
P. pectinatus - 94, H29 - group 1 (c).
Lemna trisulca - 80, H36 - group 1 (c).
L. minor - 109, H40 - group 1 (c).
Sparganium angustifolium - 53, H25 - group 1 (c).
Eleocharis acicularis - 79, H24 - group 1 (b).
Carex rostrata - 110, H40 - group 1 (c).
C. aquatilis - 31, H13 - group 1 (a).
C. maritima s.l. - 19 - group 1 (a).
Puccinellia maritima - 81, H23 - group 1 (c).
Catabrosa aquatica - 104, H40 - group 1 (c).
Elymus arenarius s.l. - 54, H5 - group 1 (b).
Alopecurus aequalis - 38 - group 1 (b).

TOTAL = 43.

3. Plants to be found in open areas but characteristic of closed habitats.

- Lycopodium clavatum* - 101, H27.
L. alpinum - 70, H13.
Selaginella selaginoides - 61, H33.
Equisetum trachyodon - 2, H16.
E. palustre - 111, H40.
E. pratense - 23, H4.
Dryopteris austriaca s.l. (incl. *D. spinulosa*) - 112, H40.
Thelypteris phegopteris (L.) Slosson (*Dryopteris phegopteris* (L.) C. Chr.) - 84, H21.
Botrychium lunaria - 107, H38.
Caltha palustris - 112, H40.
Ranunculus auricomus - 87, H36.
Viola palustris - at least 104, H40.
Polygala serpyllifolia - 110, H40.
Stellaria palustris - 67, H21.

- **Trifolium repens* – 112, H40.
Astragalus alpinus – 3.
Oxytropis campestris – 2.
Lathyrus palustris – 19, H13.
Rubus saxatilis – 70, H31.
Potentilla fruticosa – 4, H4.
Sibbaldia procumbens – 22.
Alchemilla vestita (A. minor of many authors) – 4, H1.
A. filicaulis – mountains in Great Britain.
A. acutidens s.l. (incl. *A. wichurae* (Buser) Stéfanss.) – 7.
Chrysosplenium alternifolium s.l. – 81.
Drosera rotundifolia – 108, H40.
Epilobium palustre – 112, H40.
E. anagallidifolium – 23.
Chamaepericlymenum suecicum (L.) Aschers. & Graebn. (*Cornus suecica* L.) – 20.
 Carum carvi* – 49, H26.
Angelica archangelica – “locally abundant.”***
Polygonum bistorta – 102, H20 (or more).
Rumex acetosa – 112, H40.
 **R. longifolius* DC. (*R. domesticus* Hartm.) – 48.
 **Urtica dioica* – 112, H40.
Salix lanata – 3.
S. myrsinites – 13.
Loiseleuria procumbens – 19.
Phyllodoce caerulea – 1.
Vaccinium vitis-idaea – 73, H19.
Pyrola minor – 82, H12.
Primula farinosa s.l. – 14.
Gentiana verna – 4, H5.
G. nivalis – 2.
Myosotis palustris – 108, H40.
M. alpestris – 2.
 **Veronica serpyllifolia* – 112, H40.
Bartsia alpina – 6.
Campanula glomerata – 54.
C. rotundifolia s.l. – 111, H28.
Galium verum – 112, H40.
 **G. uliginosum* – 100, H18.
 **G. aparine* – 112, H40.
Senecio integrifolius – “local in England” (23 according to Druce, 1932).
Solidago virgaurea – 111, H40.
Erigeron borealis – 3.
Achillea millefolium s.l. – 112, H40.
 **Chrysanthemum leucanthemum* – 112, H40.
 **Cirsium heterophyllum* – 55.
Leontodon autumnalis – 112, H40.
Hieracium alpinum L. – 4.
Triglochin palustris – 111, H40.
T. maritima – 80, H27.
Lloydia serotina – 1.
Luzula multiflora s.l. – 112, H40.
Coeloglossum viride (L.) Hartm. (*Habenaria viridis* (L.) R. Br.) – 108, H40.
Leucorchis albida s.l. (*Habenaria albida* s.l.) – 61, H25.
Eriophorum angustifolium – 112, H40.
Trichophorum caespitosum (L.) Hartm. (*Scirpus caespitosus* L.) – 104, H40.
Eleocharis palustris s.l. – 112, H40.
Carex buxbaumii s.l. – 1.
C. atrata – 14.
C. norvegica – 3.
C. chordorrhiza – 1.

- C. lachenalii* – 5.
Festuca rubra s.l. – 112, H40.
 **Lolium perenne* – 112, H40.
Poa nemoralis – 106, H21.
Deschampsia flexuosa – 111, H38.
Agrostis canina – 110, H39.
 **A. tenuis* – 112, H40.
A. gigantea – “ 44 (incomplete).”
A. stolonifera – 12, H40.
 **Phleum pratense* – 112, H40, according to Druce (1932).
P. alpinum s.l. (incl. *P. commutatum* Gaudin) – 10.
 **Alopecurus pratensis* – 111, H40.
 **A. geniculatus* – 112, H40.
Hierochloa odorata – 3, H1.
Anthoxanthum odoratum – 112, H40.

TOTAL = 89.

4. Plants usually restricted to closed habitats.

- Lycopodium annotinum* – 24.
Equisetum sylvaticum – 103, H37.
Cystopteris montana – 10.
Thelypteris dryopteris (L.) Slosson (*Dryopteris disjuncta* (Rupr.) Morton) – 84, H5.
Juniperus communis s.l. – 82, H18.
Trollius europaeus – 56, H3.
Ranunculus acris s.l. – 112, H40.
Geranium sylvaticum – 56, H1.
 **Vicia cracca* – 112, H40.
V. sepium – 112, H40.
Filipendula ulmaria – 112, H40.
Rubus chamaemorus – 42, H1.
Potentilla palustris – 107, H40.
Geum rivale – 104, H35.
Alchemilla glomerulans – 8.
Sanguisorba officinalis – 70, H4.
Betula pubescens s.l. – 105, H40.
B. nana – 14.
Ledum palustre – 2** (or possibly native).
Andromeda polifolia – 35, H27.
Vaccinium myrtillus – 102, H40.
V. uliginosum – 23.
Oxycoccus palustris s.l. (*O. quadripetalus* Gilib.) – 76, H34.
O. microcarpus – 6.
Pyrola rotundifolia – 34 (incl. recent addition), H1.
Ramischia secunda (L.) Garcke (*Pyrola secunda* L.) – 33, H3.
Moneses uniflora – 11.
Empetrum nigrum s.l. (incl. *E. hermaphroditum*) – at least 77, H34.
Trientalis europaea – 43.
Rhinanthus minor – 112, H40.
R. borealis – 17, H1.
Euphrasia arctica Lange (*E. frigida* Pugsl.) – 13 or more.
Linnaea borealis – 18.
Adoxa moschatellina – 105, H1.
Gnaphalium norvegicum – 5.
Saussurea alpina – 31, H9.
Tofieldia pusilla – 18.
Juncus squarrosus – 109, H40.
Listera cordata – 65, H26.
Corallorhiza trifida – 19.
Eriophorum vaginatum s.l. – 94, H39.
E. brachyantherum – “ ? Native. In peat bogs on mountains, rare.”

Carex panicea - 112, H40.
C. vaginata - 16.
C. magellanica s.l. (incl. *C. paupercula* Michx.) - 18, H1.
C. rariflora - 6.
Calamagrostis neglecta s.l. - 6, H4.
Nardus stricta - 111, H39.

TOTAL = 48.

Extinct are :

Pinguicula alpina - formerly 1.
Senecio congestus - formerly 8, according to Druce (1932).

There are thus 309 species of vascular plants which are common to the Arctic and the British Isles - at all events according to my computation and rather broad view of specific limits. Of these a total of 172, or 55.66%, are to at least a considerable extent 'open soil' plants or ones commonly to be found in habitats where there is little or no competition, while a further 89, making a total of 84.98%, are fairly frequently to be found growing in such circumstances. These percentages are lower than in the former analysis, particularly owing to the extension southward of the coverage into regions where open habitats no longer preponderate, although the higher one is only slightly lower than its earlier counterpart. Altogether this affords solid confirmation of the earlier contention that the majority of British vascular plants which reach the Arctic grow largely in the absence of competition, while many more, comprising in all the vast majority, are fairly frequently to be found in open habitats. Moreover, many of the above-mentioned 48 species that are normally restricted to closed habitats are occasionally to be seen growing in open ones, though not to an extent which would seem to warrant any suggestion that this circumstance might be phytogeographically significant.

The further circumstance that many of the predominantly boreal plants which extend far south do so largely on calcareous substrata has been noted e.g. by Patton (1923); at least in some cases it seems likely that this may be due to the tendency for more open vegetation and less competition in such areas, especially where precipitation and temperatures are relatively low, although this would seem a worthy subject for future investigation.

In all, 874 species of vascular plants are so far known to inhabit the Arctic, of which 833 are native and 41 apparently alien. Of these last, as indicated in the above lists, at least 33 are natives of the British Isles, 6 more being considered aliens there also, while at least 3 native arctic species appear to have been introduced into Britain. It seems that only a single plant which has been introduced in the Arctic, *Agrostis scabra*, is unknown in Britain in anything approaching a wild state, though presumably others will be added when the arctic parts of the U.S.S.R. become better known to western civilisation. The above figures also indicate that in the present-day native British flora there are represented no less than 267 of the 833 recognized species of native arctic vascular plants; this is a percentage of just over 32. If aliens are included in the calculations, the percentage rises considerably.

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