

## Coastal ecotypic variants of two vetches, *Vicia sepium* L. and *V. sylvatica* L. (Fabaceae), in Britain and Ireland

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### ABSTRACT

Plants from some coastal populations of *Vicia sepium* L. and *V. sylvatica* L. (Fabaceae) in Britain and Ireland are dwarfed and prostrate in habit. The taxonomy, nomenclature, morphology, ecology and distribution of these variants are discussed. *Vicia sepium* var. *hartii* Akeroyd, var. nov., from sand-dunes in north-western Ireland and northern and western Scotland, and *V. sylvatica* var. *condensata* Druce, a plant of shingle beaches and occasionally cliffs in the north and west of Britain and Ireland, and also in Denmark, are described.

KEYWORDS: Denmark, Bush Vetch, Wood Vetch.

### INTRODUCTION

A number of widespread species in our flora occur on the coast as distinctive variants recognizable even to the casual observer. I have been recording and studying these variants since 1975, with a view to publishing accounts of individual species. Although they were well-known to nineteenth century botanists, at the present day they are largely neglected by both field recorders and by the authors of Floras.

About 200 such variants, the majority of them named taxa, have been described from the coasts of Europe, mostly from the British Isles and from Scandinavia. The apparent north-westerly trend in their distribution reflects both the thorough exploration of the flora of this part of Europe, and perhaps also the relatively severe northern Atlantic climate, with strong winds. Coastal variants tend to be dwarfed or compact relative to plants from all, or the great majority of, inland populations of the same species. Some have hairy or more dissected leaves, or have different flowering times, growth rates and germination requirements; some are salt-tolerant and many are more perennial than plants from inland habitats. These features are probably all of some adaptive significance, reflecting different ecological conditions between the contrasting habitats, and many of them have at least some genetic basis.

Many examples of coastal ecotypic variation in our flora were noted by G. C. Druce (1850–1932), who described large numbers of intraspecific taxa of British and Irish plants. Druce's herbarium at the Botany School, University of Oxford (OXF), together with duplicates at other institutes, is a major source of information and is important for the typification of any published names for coastal and other intraspecific variants. The present paper looks at two native species of *Vicia*, *V. sepium* L. (Bush Vetch) and *V. sylvatica* L. (Wood Vetch), within each of which Druce reported a coastal variant of prostrate and compact habit, in contrast to the sprawling, trailing or scrambling habit of typical plants. Both coastal variants are here recognized at varietal rank, and it is hoped that this paper will stimulate the search for further records of these and other similar coastal variants. Details of all distribution records are held at the Biological Records Centre, Abbots Ripton.

### VICIA SEPIUM VAR. HARTII AKEROYD

#### TAXONOMY

This variant was first reported from Ireland. Hart (1898: 141) observed plants of *Vicia sepium* on sand-dunes at Kincashla Point, W. Donegal (v.c. H35), that were small, prostrate, and with stems

that "creep under the sand". He remarked that "Mr [A.G.] More has met a similar form . . . in Scotland". Praeger (1905) recorded *V. sepium* from sand-dunes on the remote Mullet Peninsula, W. Mayo (H27), "in a dwarf form six inches [15 cm] high and almost devoid of tendrils, . . . forming patches many yards in area amongst the bent [*Ammophila arenaria* L.]". During the summer of 1979, I collected this variant in open *Ammophiletum* communities on the Mullet, where it forms mats and hummocks on the loose sand. The plant was common on the sand-dunes west of Carn Prospect, south of Annagh Head (Curtis *et al.* 1981). Similar plants, but with tendrils reduced to a terminal leaflet, were reported from the island of Duvillaum More, off the coast of the Mullet by Walsh (1968). There are apparently no other Irish records.

In Scotland, Druce collected this variant at Bettyhill, W. Sutherland (v.c. 108) in July 1907 (material at **BM**, **OXF**; Fig. 1A, left), reporting that this "pretty dwarf procumbent form of the Hedge Vetch occurred in some quantity on the sandy bay between Betty Hill and Four Points" (Druce 1908b). Elsewhere, Druce (1908a) described his gathering as "forma *prostrata*". There is further material at **OXF**, for Murkle Bay, Caithness (H. E. Fox, 5 August 1885), from where it had been collected in the same summer by F. J. Hanbury (5 July 1885, **BM**). In 1919, Druce collected the plant at Reay, Caithness, and named it as "*Vicia sepium* var. or forma *dunensis*" (Druce 1920). He thus appears to have been undecided both about the taxonomic status of this variant and what to call it.

*Vicia sepium* L., *Species plantarum* 737 (1753)

(i) var. *sepium* (Fig. 1A, right)

Stems 30–120 cm, ascending, climbing or trailing. Leaves 3–7 cm. Leaflets 8–18, 8–30(–40) × 4–12(–18) mm, ovate to ovate-oblong, subacute, obtuse or truncate. Tendrils 1–3 cm, 1- to 4-branched. Hedges, woodland margins and scrub; widespread in Europe.

(ii) var. *hartii* Akeroyd, var. nov. (Fig. 1A, left)

SYNONYMS: *V. sepium* forma *prostrata* Druce, *Annals of Scottish natural history* **1908**: 42 (1908); "forma or var. *dunensis*" Druce, *Report of the Botanical Exchange Club of the British Isles* **1919**: 814 (1920), nomen nudum.

A var. *sepium* caulibus plerumque procumbentibus vel decumbentibus, caulibus foliisque brevioribus, et cirrhis saepe simplicibus differt.

Stems 5–20(–35) cm, procumbent, decumbent or weakly ascending, forming mats and low hummocks (sometimes climbing *Ammophila arenaria* stems). Leaves 2–4 cm. Leaflets 6–14, 5–13 × 3–5 mm, ovate to elliptical or suborbicular, truncate to rounded. Tendrils 0.5–2 cm, usually unbranched or 1- to 2-branched, often absent or vestigial, sometimes replaced by a terminal leaflet. Sand-dunes.

HOLOTYPE: W. Donegal, Rosses, Kincashla Point, bare sandhills, July 1894, *H. C. Hart*, **DBN**. Isotypus: **BM**.

SPECIMENS SEEN. Mid Ebudes (v.c. 103): Isle of Coll, sandhills, July 1896, *S. M. Macvicar*, **BM**; Sutherland (v.c. 108): Bettyhill, July 1907, *G. C. Druce*, **BM**, **OXF**; Melvich, sandhills, 23 July 1887, *F. J. Hanbury*, **BM**; Caithness (v.c. 109): Murkle Bay, sands, 5 July 1885, *F. J. Hanbury*, **BM**; Murkle Bay, sandy shore, 5 August 1885, *H. E. Fox*, **OXF**; Reay, July 1919, *G. C. Druce*, **BM**; W. Mayo (v.c. H27): Mullet peninsula, south of Annagh Head, GR FF/67.33, open sand-dune community, 28 June 1979, *J. R. Akeroyd* H119, **CGE**, **DBN**, **TC**; W. Donegal (v.c. H35): Kincashla Point, bare sandhills, July 1894, *H. C. Hart*, **BM** (isotypus), **DBN** (holotypus).

Druce (1908a) described forma *prostrata* from Bettyhill, Sutherland, and later described "forma or var." [sic] *dunensis* from Caithness (Druce 1920). Rather than take the earlier of Druce's two epithets (he seems himself to have been rather muddled about what to call his plant), I have described this as a new variety, based on a collection made by Henry Chichester Hart (1847–1908) in W. Donegal that was reported in his *Flora of Donegal* (Hart 1898). I am pleased to commemorate Hart in the epithet, as both the first botanist known to have published a description of this variant,

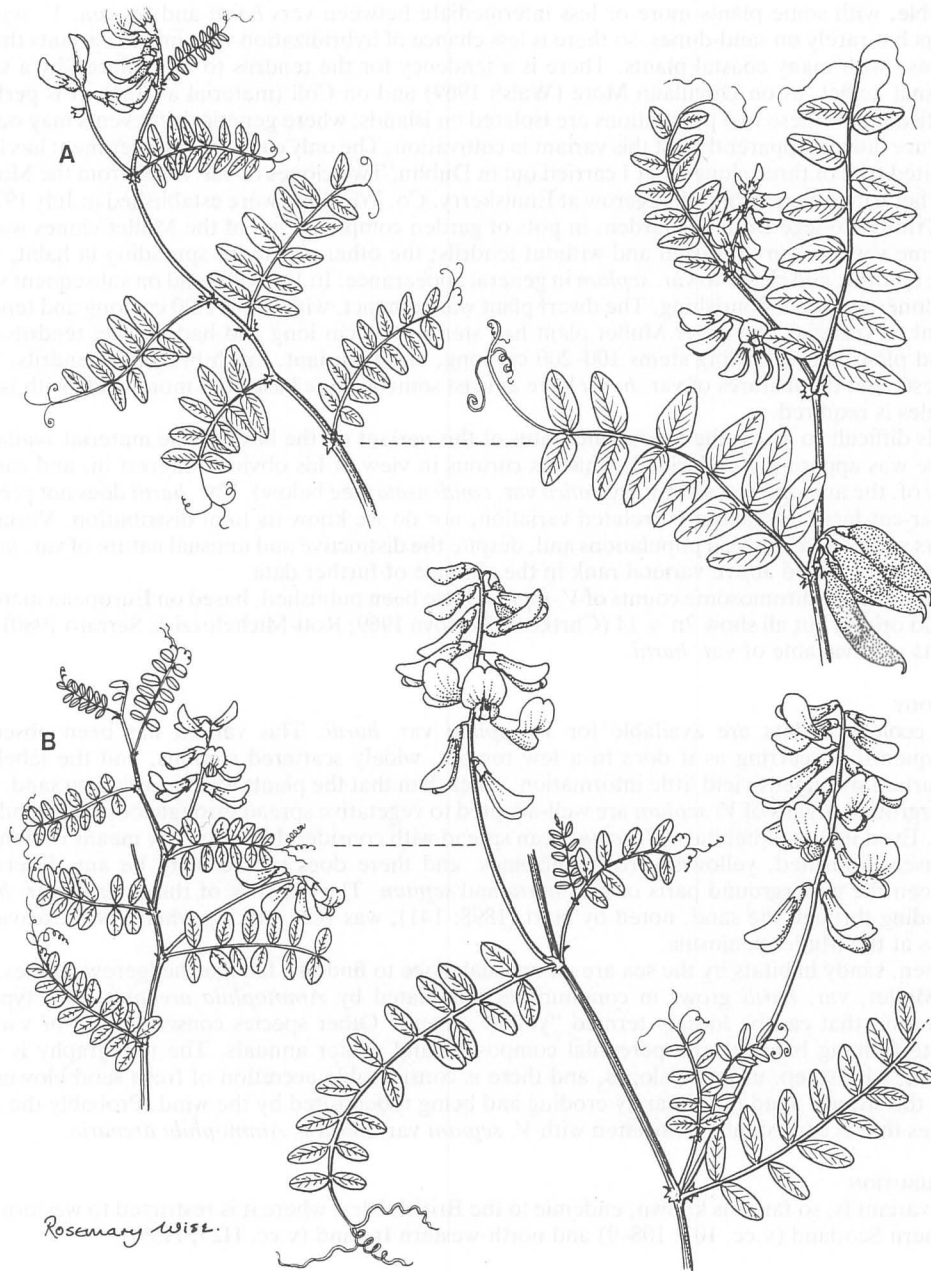


FIGURE 1. A. Left. *Vicia sepium* var. *hartii*. Sutherland, Bettyhill, G. C. Druce OXF; Right. *V. sepium* var. *sepium*. Bucks, Great Marlow, W. H. Holliday, OXF. B. Left *V. sylvatica* var. *condensata*. Angus, between Lunan Bay and Redhead, G. C. Druce, OXF; Right. *V. sylvatica* var. *sylvatica*, Oxon., Windrush Valley below Burford, R.C. Palmer 67/57, OXF. Drawings by Rosemary Wise.

and as a significant, vigorous and colourful figure of late nineteenth century Irish floristic botany (Webb 1986).

Var. *hartii* is a distinct coastal variant, although the population on the Mullet, for example, is variable, with some plants more or less intermediate between vars *hartii* and *sepium*. *V. sepium* occurs but rarely on sand-dunes, so there is less chance of hybridization with inland variants than is the case with many coastal plants. There is a tendency for the tendrils to be replaced by a small terminal leaflet, as on Duvillaun More (Walsh 1969) and on Coll (material at BM). It is perhaps significant that these two populations are isolated on islands, where genetic drift events may occur.

Druce did not apparently test this variant in cultivation. The only cultivation experiment has been a limited trial of three clones that I carried out in Dublin. Two clones of var. *hartii* from the Mullet, together with a clone from a hedgerow at Enniskerry, Co. Wicklow, were established in July 1979 in the Trinity College Botanic Garden, in pots of garden compost. One of the Mullet clones was an extreme variant, very dwarfed and without tendrils; the other was more spreading in habit, with short tendrils, and closer to var. *sepium* in general appearance. In July 1989 and on subsequent visits the clones were still flourishing. The dwarf plant was compact, with stems c. 20 cm long and tendrils absent to vestigial; the other Mullet plant had stems c. 50 cm long and had distinct tendrils; the inland plant had sprawling stems 100–200 cm long, and luxuriant, much-branched tendrils. This suggests that the features of var. *hartii* have at least some genetic basis, but more study with larger samples is required.

It is difficult to assess the taxonomic status of this variant on the basis of the material available. Druce was apparently undecided, which is curious in view of his obvious interest in, and careful study of, the analogous case of *V. sylvatica* var. *condensata* (see below). Var. *hartii* does not present a clear-cut facies of habitat-correlated variation; nor do we know its total distribution. Variation occurs within and between populations and, despite the distinctive and unusual nature of var. *hartii*, it is best not raised above varietal rank in the absence of further data.

A number of chromosome counts of *V. sepium* have been published, based on European material of wild origin, but all show  $2n = 14$  (Chrtkova-Žertová 1969; Roti-Michelozzi & Serrato 1980). No counts are available of var. *hartii*.

#### ECOLOGY

Few ecological data are available for *V. sepium* var. *hartii*. This variant has been observed infrequently, occurring as it does in a few remote, widely scattered stations, and the labels of herbarium specimens yield little information, other than that the plants were growing on sand. The underground organs of *V. sepium* are well-adapted to vegetative spread through loose, unstabilized sand. Even in inland habitats, *V. sepium* can spread with considerable vigour by means of slender, profusely branched, yellowish-brown rhizomes, and there does not seem to be any difference between the underground parts of vars *hartii* and *sepium*. The network of rhizomes of var. *hartii* spreading through the sand, noted by Hart (1898: 141), was very striking when I was excavating plants at the Mullet peninsula.

Open, sandy habitats by the sea are an unusual place to find this familiar hedgerow species. On the Mullet, var. *hartii* grows in communities dominated by *Ammophila arenaria*, in a type of vegetation that can be loosely termed "yellow dunes". Other species consist mostly of various rosette-forming biennial and perennial composites and winter annuals. The topography is very uneven, with steep, unstable slopes, and there is considerable accretion of fresh sand blowing in from the strand. Sand is constantly eroding and being redeposited by the wind. Probably the only species that is consistently associated with *V. sepium* var. *hartii* is *Ammophila arenaria*.

#### DISTRIBUTION

This variant is, so far as is known, endemic to the British Isles, where it is restricted to western and northern Scotland (v.cc. 103, 108–9) and north-western Ireland (v.cc. H27, H35).

#### VICIA SYLVATICA VAR. CONDENSATA DRUCE

#### TAXONOMY

*Vicia sylvatica* var. *condensata* was described from coastal shingle at Port William in Wigtownshire

(v.c. 74) in south-western Scotland (Druce 1884). It was stated to differ from var. *sylvatica* in a number of features, notably the dwarf, procumbent habit, the smaller, subcoriaceous, somewhat glaucous leaves, and the shorter and denser racemes of fewer and smaller flowers (Druce 1884, 1885) (Fig. 1B, left). Druce later reported it from the Mull of Galloway in Wigtonshire and from Kirkcudbrightshire (Druce 1910a, b). He raised plants from seed that he had collected on coastal shingle on the Mull of Galloway and, after a year in cultivation in his Oxford garden, noted that they retained "their small size, with the glaucescent leaves, of a thicker texture than the type, and more roundly elliptic [and] very short racemes" (Druce 1911). He did not, however, report whether he had grown any plants of var. *sylvatica* for comparison. There has been little subsequent mention of this variant in the literature, although it has been collected fairly frequently in Galloway. Hansen & Peterson (1965) reported it from the coast of Denmark, where it had been collected as early as 1873.

*Vicia sylvatica* L., *Species Plantarum* 734 (1753)

(i) var. *sylvatica* (Fig. 1B, right)

Stems 50–100 cm, weak, trailing or scrambling. Leaves 4–8 cm. Leaflets 12–20, more or less distant, 8–18 × 4–8 mm, ovate to ovate-oblong or elliptical, thin in texture. Tendrils 2–7 cm, 2- to 4-branched. Peduncles 5–18 cm. Raceme usually distinctly exceeding the leaves, lax, with 8–20 flowers. Corolla 15–20 mm. Open woods, scrub, rocky slopes, sea-cliffs.

(ii) var. *condensata* Druce, *Naturalist (Hull)* 10 (n.s.): 85 (1884) (Fig. 1B, left)

SYNONYM: *V. sylvatica* var. *maritima* Lange, *Rettelser og Tilføjelser Haandbog i den Danske Flora* (1897).

Stems 20–50 cm, somewhat rigid, procumbent to decumbent, forming compact patches and low hummocks. Leaves 2.5–5 cm. Leaflets 8–14, rather crowded, 6–10(–12) × 3–6 mm, ovate to suborbicular or broadly elliptical, slightly fleshy, often glaucous. Tendrils 1–4 cm, unbranched or 1- to 3-branched. Peduncles 2–5 cm. Raceme about as long as or only slightly exceeding the leaves, compact, with 4–8(–12) flowers. Corolla 13–18 mm. Coastal shingle, sea-cliffs.

LECTOTYPUS (here designated): Wigton, Port William, shingly shore, July 1883, *G. C. Druce*, OXF. Isolectotypi: **ABN**, **CGE**. (Fig. 1B, left)

Var. *condensata* is distinct in appearance, but populations occur that are intermediate between it and var. *sylvaticum*. It can be distinguished by the condensed habit, the small and usually suborbicular leaflets, and the compact, few-flowered racemes that are about as long as the leaves. Var. *sylvatica* has a more trailing habit, variable but usually ovate to ovate-oblong leaflets, and lax racemes that distinctly exceed the leaves (Fig. 1B, right). Coastal populations of *V. sylvatica* may be variable, and most are indeed referable to var. *sylvatica*; however, only rarely do plants from inland habitats approach var. *condensata*. As noted above, Druce (1911) reported that var. *condensata* remained distinct when cultivated from seed. A letter from the collector attached to a gathering of var. *condensata* from the coast at Campbeltown, Kintyre (*Mrs Macneal*, 14 July 1910, **E**) reported differences between closely adjacent populations, noting the distinctness of plants "among the pebbles and stones of the shore . . . nearly a mile from the specimens in the wood".

This variant does not form a distinct regional or ecological facies, although locally it may be the predominant coastal variant, as in Galloway (Fig. 2), and the variation in relation to typical populations of *V. sylvatica* is quantitative and continuous. Although Druce collected a good deal of material of var. *condensata* from Drummore (v.c. 74), a specimen from shingle between Drummore and Sandhead (*G. Halliday* 21/71, July 1971, **OXF**) falls closer to var. *sylvatica*, and one of several specimens collected near Drummore by C. D. Preston (11 July 1986, **CGE**) is more or less intermediate between the two varieties. Var. *condensata* is therefore best retained at varietal rank.

A number of chromosome counts of *V. sylvatica* have been published, based on European material of wild origin, but all show  $2n = 14$  (Roti-Michelozzi & Serrato 1980). No counts of var. *condensata* are available.

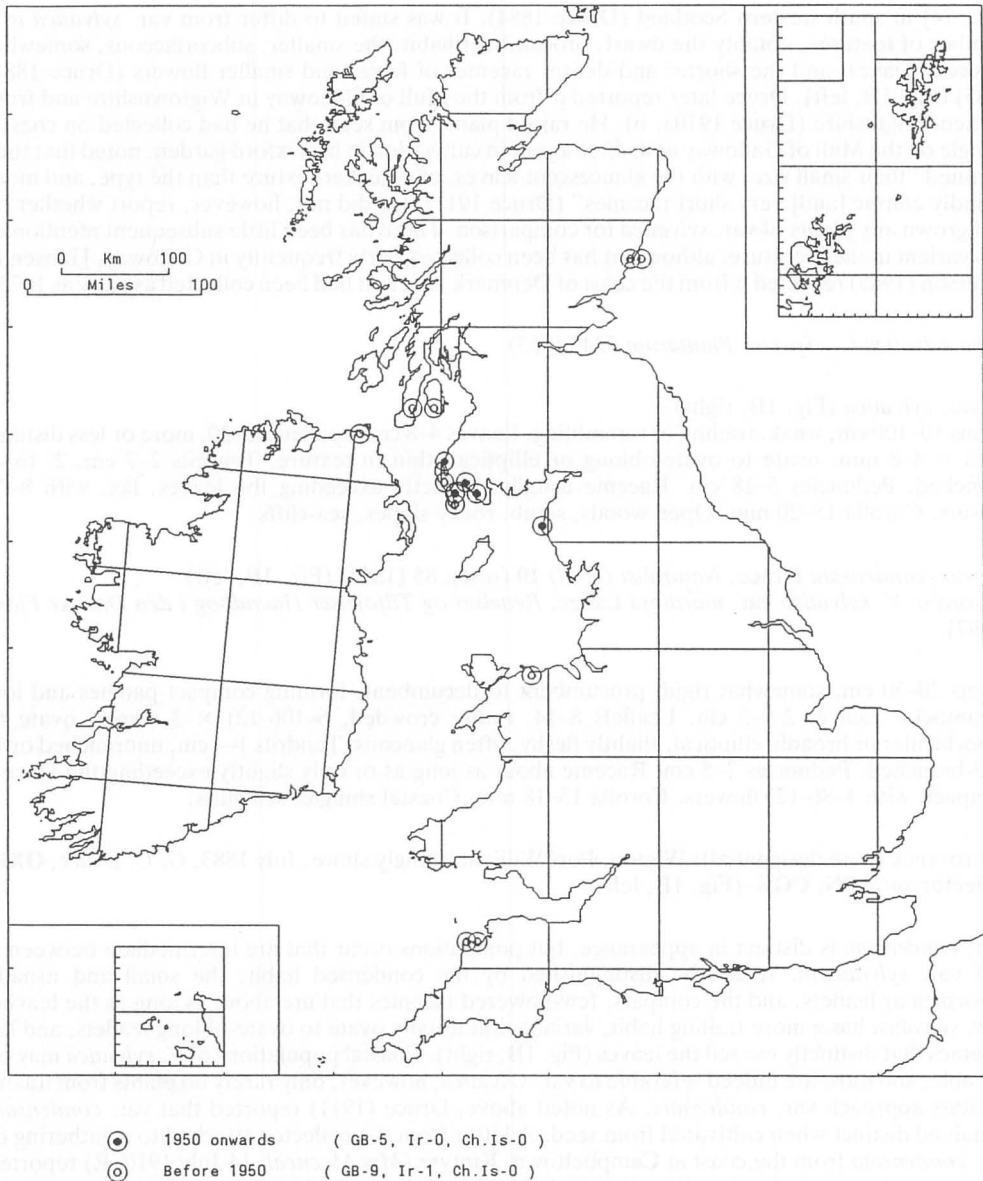


FIGURE 2. The distribution of *Vicia sylvatica* var. *condensata* in Britain and Ireland.

#### ECOLOGY

*V. sylvatica* var. *condensata* is a plant of coastal shingle beaches and, less frequently, low sea-cliffs. C. D. Preston recorded five relevés on shingle amongst open vegetation associated with this variant near Port William and Drummore in Wigtownshire in July 1986 (Table 1). These do not reveal any clear group of associated species, although they emphasize the open nature of the community. A number of other ecotypic variants of common species are present. Hansen & Petersen (1965) noted that *V. sylvatica* var. *condensata* has a similar ecology to *Galium aparine* L. var. *maritimum* Fries, *Geranium robertianum* L. subsp. *maritimum* (Bab.) H. G. Baker and *Solanum dulcamara* L. var.

TABLE 1. VEGETATION ASSOCIATED WITH *V. SYLVATICA* VAR. *CONDENSATA* IN FIVE QUADRATS (m<sup>2</sup>) ON COASTAL SHINGLE IN WIGTOWNSHIRE (V.C. 74).  
Nomenclature follows Kent (1992). Values record cover-abundance on the Domin scale.

Species	Quadrat				
	1	2	3	4	5
<i>Vicia sylvatica</i> var. <i>condensata</i> Druce	9	8	5	6	5
<i>Arrhenatherum elatius</i>	1			1	
<i>Dactylis glomerata</i>	+			2	
<i>Galium aparine</i>		4			
<i>Festuca rubra</i>			8	8	
<i>Plantago lanceolata</i>			2	2	
<i>Senecio jacobaea</i>			+	2	
<i>Hypochoeris radicata</i>				1	
<i>Raphanus raphanistrum</i> subsp. <i>maritimus</i>				+	4
<i>Rumex crispus</i> subsp. <i>littoreus</i>				1	
<i>Taraxacum</i> sp.				1	
<i>Vicia hirsuta</i>				1	
<i>Prunus spinosa</i> (prostrate variant)					6
<i>Geranium robertianum</i> subsp. <i>robertianum</i>					4
Bare shingle (%)	20	35	1	1	50
Maximum sward height (cm)	30	15	25	25	15

*marinum* Bab. Populations of *Vicia sylvatica* on cliffs, where the plant is a member of a more closed, taller community, generally belong to var. *sylvatica*. It always grows in well-drained sites.

#### DISTRIBUTION

The distribution of var. *condensata* in Britain and Ireland, derived mostly from an examination of herbarium collections, is shown in Fig. 2. In Britain it occurs in v.cc. 4, 50, 70, 73 (Druce 1910a, b), 74, 100 and 101 (vide Cunningham & Kenneth 1979, p. 19), but in Ireland is known only from White Park Bay, Co. Antrim (v.c. H39). Most of the records are from the northern part of the Irish Sea, particularly Galloway, from where Druce (1884) first found the plant between Port William and Monreith Bay, Wigtown, although it occurs in scattered localities southwards to N. Devon. Outside these islands, var. *condensata* has been reported only from Denmark, on the Djurland peninsula in eastern Jutland (Hansen & Petersen 1965).

#### ACKNOWLEDGMENTS

I am grateful to C. D. Preston for his collaboration with me over 20 years of research on coastal ecotypic variants, for his help in preparing the list of localities of *V. sepium* var. *hartii* and the map of *V. sylvatica* var. *condensata*, and for allowing me free use of the data in Table 1.

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