MC1

Crithmum maritimum-Spergularia rupicola maritime rock-crevice community

Crithmo-Spergularietum rupicolae Géhu 1964

Synonymy

Armeria maritima-Aster tripolium provisional nodum Ivimey-Cook & Proctor 1966 *p.p.*; *Crithmum maritimum* rock-crevice community Proctor 1975; Crithmion communities Shimwell 1976 ms.

Constant species

Crithmum maritimum, *Spergularia rupicola*, *Festuca rubra*, *Armeria maritima.*

Rare species

Parapholis incurva, *Limonium recurvum* (and probably other apomicts of the *L. binervosum* group, e.g. *L. paradoxum*, *L. transwallianum*; see also Ingrouille 1981).

Physiognomy

The *Crithmo-Spergularietum* has a low-growing, very open cover of scattered vascular perennials rooted in rock crevices. The distribution of the plants and the overall appearance of the vegetation are strongly influenced by the nature of the substrate and, in general, none of the association constants can be said to be truly dominant, though all but *Spergularia rupicola* may be particularly abundant in individual stands. *Plantago maritima* is the most frequent associate throughout the association. Bryophytes are rarely conspicuous with only *Schistidium maritimum* and *Tortella flavovirens* recorded very occasionally. The only lichens are epilithic.

Sub-communities

Typical sub-community: *Crithmo-Spergularietum rupicolae typicum* Géhu 1964. The four association constants here account for the bulk of the vegetation cover and, of the associates, only *Plantago maritima* and *P. coronopus* attain a constancy above I.

***Inula crithmoides* sub-community:** *Crithmo-Spergularietum rupicolae plantaginetosum coronopi* Géhu 1964 p.p. *Spergularia rupicola* is rather less frequent in this sub-community but *Inula crithmoides* and *Plantago coronopus* are both constant and the former may be abundant. *Limonium binervosum* (including its apomicts), *Parapholis incurva* and *Desmazeria marina* are all preferentially frequent.

Rayed *Aster tripolium* sub-community: *Armeria maritima-Aster tripolium* provisional nodum Ivimey-Cook & Proctor 1966. Apart from *Armeria maritima*, the frequency of the association constants is reduced in this, the most open of the sub-communities. Rayed *Aster tripolium* is constant and *Cochlearia officinalis*, *Atriplex hastata*, *Cerastium tetrandum* ssp. *diffusum*, *Matricaria maritima* and *Silene vulgaris* ssp. *maritima* are all preferentially frequent.

Habitat

Within its geographical range, the *Crithmo-Spergularietum* occupies the most maritime zone of vascular plant vegetation on rocky cliffs, where there is the largest input of salt from sea-spray and onshore winds and the highest salt content in the soil (Malloch & Okusanya 1979). *Crithmum maritimum*, *Spergularia rupicola* and *Inula crithmoides* have all been shown to germinate and grow adequately at high salinities (Okusanya 1979*a*, *b*).

Within this extreme maritime zone, the occurrence of the association is limited mainly by the availability of crevices, narrow ledges and friable rock surfaces: it is, for example, rare on massively-jointed granites even where these are very exposed as on much of the Land's End peninsula. The chemical composition of the rock and of the soils, which are generally simply skeletal accumulations of mineral and organic debris, seems to be of minor importance, though there is a tendency for the *Inula* sub-community to be associated with more calcareous situations, especially where the bedrock surface is friable, as on thinly-bedded limestones. Higher soil calcium content may also derive from accumulation of wind-blown shell-sand or shells dropped by sea-birds or from input of calcium-rich drainage waters

from above. Soil pH is consistently high (mean = 7.5) irrespective of rock and soil type because of the high input of sodium ions from spray. The soils are usually free-draining and may experience summer parching. The association also occurs in the crevices of harbour walls and moles.

The *Crithmo-Spergularietum* is rarely grazed, being usually inaccessible to stock but the vegetation is sometimes disturbed and enriched manurially by sea-birds.

Zonation and succession

Seawards, the *Crithmo-Spergularietum* overlaps with and grades into the grey xeric-supralittoral lichen zone, generally occupied by the *Ramalinetum scopularis* (DR 1925) Klem. 1955 (Fletcher 1973*a*, *b*; James *et al.* 1977). Above, there is usually an abrupt transition to the *Festuca-Armeria* maritime grassland on deeper, moister soils in less maritime conditions. In some cases, the zonation occurs gradually over progressively deeper and less saline soils through the *Crithmum* sub-community of the grassland. Where excessively-drained soils occur above the most maritime zone on cliffs, the *Crithmo-Spergularietum* gives way to the *Armeria-Cerastium* community.

On sea-walls, the association may be replaced by crevice vegetation which has a mixture of maritime and inland mural species like the *Cymbalarietum*.

There is no evidence of any successional progression from *Crithmo-Spergularietum.*

Distribution

The association can be seen as the northernmost extension of a complex of maritime communities centred around the Mediterranean. It is restricted in Britain to the south and west coasts, terminating northwards at the Mull of Galloway where it is replaced by the *Armeria-Ligusticum* community in an abrupt transition that is probably governed by temperature acting directly on *Crithmum maritimum*, *Spergularia rupicola* and *Inula crithmoides* or retarding their flowering and fruiting (Okusanya 1979*c*).

The typical and *Inula* sub-communities occur throughout the range of the association, though the latter is commonest on the limestones of south Wales and southern England. By contrast, the *Aster* sub-community appears to be more Atlantic in its distribution, being confined in Britain to the western extremities of Wales and Cornwall, with the very similar community described by Ivimey-Cook & Proctor (1966) occurring widely on the western coast of Eire. This distribution may be a response to the higher precipitation/evaporation ratios on this extreme seaboard.

Affinities

The Crithmo-Armerietalia was defined by Géhu (1964) within the Crithmo-Limonietea as containing maritime crevice communities of the Atlantic coast of Europe and the vegetation described here is essentially identical to the *Crithmo-Spergularietum* of Brittany. A similar community has been described from Alderney (Proctor 1975).

Géhu's *typicum* is identical to the typical sub-community described here and the *Inula* sub-community is similar to his *Plantago coronopus* sub-association. Although *Aster tripolium* is absent from the Brittany stands, Géhu has a variant of *Cochlearia officinalis* which bears some resemblance to the *Aster* sub-community.

Floristic table MC1

	a	b	c	1
Armeria maritima	V (2–7)	V (2–7)	V (1–7)	V (1–7)
Festuca rubra	V (1–5)	V (1–8)	III (1–7)	IV (1–8)
Crithmum maritimum	V (2–7)	V (1–8)	III (1–4)	IV (1–8)
Spergularia rupicola	V (1–5)	III (1–5)	III (1–4)	IV (1–5)
Inula crithmoides		V (1–8)	I (1)	III (1–8)
Plantago coronopus	II (1–3)	IV (1–4)	I (1–4)	II (1–4)
Limonium binervosum		III (1–7)		II (1–7)
Parapholis incurva	I (2–3)	II (2–4)		I (2–4)
Desmazeria marina	I (1–2)	II (1–3)	I (1–3)	I (1–3)
Aster tripolium (rayed)		I (1–4)	V (1–4)	II (1–4)
Cochlearia officinalis	I (1–2)	I (1–4)	III (1–4)	II (1–4)
Atriplex prostrata	I (1–3)	I (2)	II (1–3)	I (1–3)
Cerastium diffusum diffusum	I (3)	I (2)	II (1–4)	I (1–4)
Matricaria maritima	I (1)	I (1–3)	II (1–3)	I (1–3)
Silene vulgaris maritima	I (1–4)	I (2–3)	II (1–5)	I (1–5)
Plantago maritima	III (1–4)	II (1–5)	II (1–3)	II (1–5)
Asplenium marinum	I (1)	I (1–2)	I (1–3)	I (1–3)
Beta vulgaris maritima	I (1–4)	I (1–4)	I (3–4)	I (1–4)
Cochlearia danica	I (1–3)	I (1–4)	I (2)	I (1–4)
Daucus carota gummifer		I (1–4)	I (2)	I (1–4)
Tortella flavovirens	I (2–3)	I (2–4)	I (2–5)	I (2–5)
Number of samples	26	60	37	123
Number of species/sample	6 (3–12)	8 (3–12)	6 (3–13)	7 (3–13)
Vegetation height (cm)	8 (3–20)	13 (3–50)	10 (3–50)	11 (3–50)
Total cover (%)	26 (5–8)	46 (5–98)	20 (5–80)	34 (5–98)
Altitude (m)	10 (3–40)	16 (3–30)	13 (3–29)	14 (3–40)
Slope (°)	35 (4–80)	30 (0–90)	36 (5–90)	33 (0–90)
Soil depth (cm)	3 (1–5)	11 (2–40)	9 (3–20)	9 (1–40)
Number of soil samples	6	15	7	28
Superficial pH	6.8 ±0.3	7.8 ±0.2	7.3 ±0.2	7.4 ±0.1
Water content (% soil dry weight)	73 ±24	31 ±6	47 ±16	46 ±7
Loss on ignition (% soil dry weight)	21 ±6	11 ±2	19 ±9	15 ±3
Sodium (mole g^{-1})	89 ±32	82 ±23	80 ±54	83 ±18
Potassium (mole g^{-1})	14 ±3	13 ±2	8 ±3	12 ±1
Magnesium (mole g^{-1})	101 ±25	55 ±8	50 ±11	64 ±7
Calcium (mole g^{-1})	49 ±9	73 ±9	65 ±9	66 ±6
Phosphorus (mole g^{-1})	6.2 ±2.5	0.8 ±0.4	1.1 ±0.5	2.0 ±0.7
Sodium/loss on ignition (mole g^{-1})	411 ±44	830 ±190	593 ±194	681 ±115

a Typical sub-community
b *Inula crithmoides* sub-community
c *Aster tripolium* sub-community
1 *Crithmo-Spergularietum rupicolae* maritime rock-crevice community (total)

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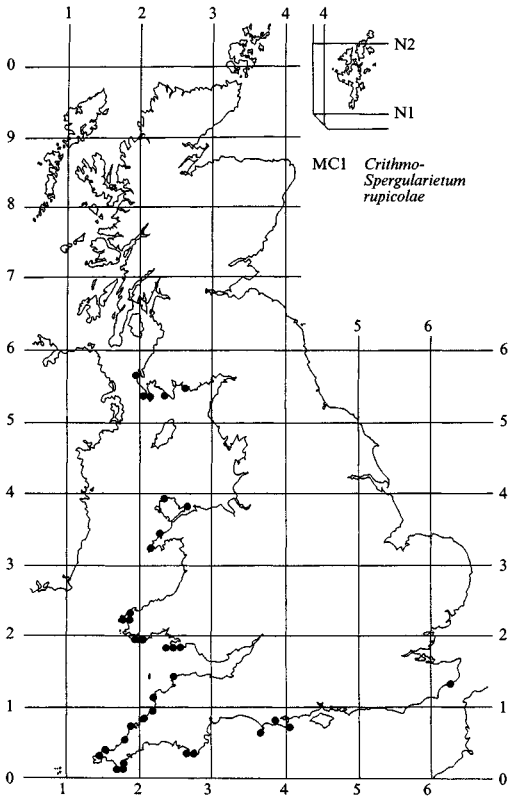

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