# **SM15**

# Juncus maritimus—Triglochin maritima salt-marsh community

#### Synonymy

Juncetum maritimi auct. angl. p.p.; Triglochin-Juncus maritimus nodum Adam 1976.

#### Constant species

Juncus maritimus, Plantago maritima, Triglochin maritima.

#### Physiognomy

Tall tussocks of Juncus maritimus are always overwhelmingly dominant in this association and the associates are rather variable. However, Triglochin maritima and Plantago maritima are constant in usually small amounts in the understorey and various Puccinellion species, such as Puccinellia maritima, rayed Aster tripolium, Armeria maritima and Glaux maritima, occur frequently throughout. The association differs from the Juncus maritimus salt-marsh in the relative infrequency of Agrostis stolonifera, Festuca rubra and Juncus gerardii. Commonly the bases of the J. maritimus shoots support a variety of epiphytic algae, notably Bostrychia scorpioides and Catenella repens, and there may be an extensive algal mat, locally rich in dwarf free-living fucoids, on the substrate surface. Stands are often based upon discrete and sometimes large clones of J. maritimus but may also form a distinct zone within the marsh.

#### **Sub-communities**

Adam (1977) suggested that there are three centres of variation within the association around which sub-communities might be erected: stands which are very speciespoor, sometimes pure *J. maritimus* in vigorous, tall and dense patches; stands in which *Halimione portulacoides* and *Limonium* cf. *vulgare* are conspicuous and fairly rich stands lacking these two species.

#### Habitat

J. maritimus is tolerant of a wide range of salinities and soil moisture conditions (Ranwell et al. 1964, Gillham

1957b) and the association occurs at all levels on salt-marshes and on a variety of substrates. Soil pH is generally around 7.0 but loss-on-ignition varies from 3% to more than 40%.

The most species-poor stands are found on the low marsh, usually on soft anaerobic mud (Gillham 1957a, Chater 1973, Adam 1976, 1977, Proctor 1980), though sometimes, as in Scottish sites, on shallow peaty soils over shingle (Gillham 1957b, Adam et al. 1977). The lowest stand for which accurate data are available experiences 220 submergences/year but many stands seem to occur at lower levels. Richer stands lacking *H. portulacoides* and *Limonium* cf. vulgare also occur at low levels, on western salt-marshes frequently along the foot of small erosion cliffs where there is perhaps water-seepage. Stands with these two species are found as a narrow zone in the upper parts of salt-marshes in south-east England (the Juncetum maritimi Chapman 1934).

The association occurs on both grazed and ungrazed salt-marshes but, even where there is grazing, stands tend to be avoided by stock.

#### **Zonation and succession**

There is a marked difference in the relative position of the association on salt-marshes in south-east England and those elsewhere but lack of submersion data makes it difficult to assess these variations in terms of absolute relationships to tidal levels. On the west and Channel coasts, the association generally occurs at relatively low levels in association with the Spartinetum townsendii or more usually within or at the upper limit of the Puccinellietum maritimae. In the south-east, a narrow belt of the association occurs normally between the Puccinellietum maritimae, Limonium-Armeria sub-community, and the Atriplici-Elymetum pycnanthi or the tall Festuca rubra sub-community of the Juncetum gerardi. The association grades smoothly into the Puccinellietum which effectively constitutes the understorey of the Juncus-Triglochin vegetation. On those few ungrazed western marshes where the Puccinellietum maritimae,

Limonium-Armeria sub-community occurs, the association occupies the position typical of south-east salt-marshes.

In at least one site, *Juncus maritimus* has been seen as a coloniser with *Spartina anglica*.

#### Distribution

The association is the most widespread community dominated by *J. maritimus* in Great Britain. It is common on the west coast and is the major *J. maritimus* community in south-east England. One of the most extensive stands in the country is at Cefni Marsh, Anglesey where the association forms mosaics with *Scirpetum maritimi* over much of the marsh (Packham & Liddle 1970).

### **Affinities**

The association can be seen as the northern extremity of a continuum of vegetation types in which *J. maritimus*, *Triglochin maritima*, *Limonium vulgare* and *Aster tripolium* are important components and which reaches down to the Mediterranean in the *Junco maritimi-Triglochine-tum maritimi* Br.-Bl. 1931 (Braun-Blanquet & de Ramm 1957, Adam 1977). Such a range of vegetation types could be accommodated within the Puccinellion of the Asteretea which would also allow some weight to be given to the interesting low-level occurrences of *J. maritimus* vegetation.

## Floristic table SM15

Triglochin maritima Plantago maritima IV (2-8)  Aster tripolium (rayed) Puccinellia maritima III (2-7) Armeria maritima III (2-5) Glaux maritima III (2-5) Algal mat III (2-8) Limonium cf. L. vulgare III (1-6) Cochlearia anglica III (1-4) Juncus gerardii III (2-8) Halimione portulacoides Festuca rubra III (2-8) Agrostis stolonifera III (2-8) Aster tripolium III (2-8) Aster tripolium III (2-6) Aster tripolium III (2-7)  Cochlearia officinalis III (2-6) Aster tripolium III (2-7) III (2-8) III (1-6) III (2-6) III (2-7) III (2-8) III (2-8) III (2-8) Agrostis stolonifera III (2-8) III (2-6) Aster tripolium II (1-5) Cochlearia officinalis II (2-3) Salicornia agg. II (2-5) Suaeda maritima II (2-3) Spartina anglica II (1-5) Spergularia media II (2-4) Turf fucoids II (3-6) Phragmites australis II (2-6) Carex extensa II (1-3) Atriplex prostrata II (1-3) Limonium humile II (1-3) Oenanthe lachenalii II (3-4) Artemisia maritima II (1-4)  Number of samples Mean number of species/sample Mean vegetation height (cm) III (2-4) IIII (2-4) III (2-4) III (2-5) III (2-6) III (2-8) III (2-6) III (1-6) III (2-7) III (2-8) III (2-8) III (1-6) II (1		
Plantago maritimaIV (2-8)Aster tripolium (rayed)III (2-4)Puccinellia maritimaIII (2-7)Armeria maritimaIII (2-5)Glaux maritimaIII (2-5)Algal matIII (2-8)Limonium cf. L. vulgareII (1-6)Cochlearia anglicaII (1-4)Juncus gerardiiII (3-7)Halimione portulacoidesII (1-6)Festuca rubraII (2-8)Agrostis stoloniferaII (2-6)Aster tripoliumI (1-5)Cochlearia officinalisI (2-3)Salicornia agg.I (2-3)Spartina anglicaI (1-5)Spergularia mediaI (2-4)Turf fucoidsI (3-6)Phragmites australisI (2-6)Carex extensaI (1-3)Atriplex prostrataI (1-3)Limonium humileI (1-3)Oenanthe lachenaliiI (3-4)Artemisia maritimaI (1-4)Number of samples63Mean number of species/sample10 (2-14)Mean vegetation height (cm)57 (25-100)	Juncus maritimus	V (5-10)
Aster tripolium (rayed) Puccinellia maritima III (2-7) Armeria maritima III (2-5) Glaux maritima III (2-5) Algal mat III (2-8) Limonium cf. L. vulgare II (1-6) Cochlearia anglica II (1-4) Juncus gerardii II (3-7) Halimione portulacoides II (1-6) Festuca rubra II (2-8) Agrostis stolonifera II (2-8) Aster tripolium II (2-8) Aster tripolium II (1-5) Cochlearia officinalis II (2-3) Salicornia agg. II (2-3) Spartina anglica II (2-3) Spartina anglica II (2-3) Spergularia media II (2-4) Turf fucoids II (3-6) Phragmites australis II (2-6) Carex extensa II (1-3) Atriplex prostrata II (1-3) Limonium humile II (1-3) Oenanthe lachenalii II (3-4) Artemisia maritima II (1-4) Number of samples Mean number of species/sample Mean vegetation height (cm) III (2-7) III (2-7) III (2-8) III (2-8) II (1-6) C-8 II (1-6) C-9 II (1-6) II (2-8) II (1-6) II (2-8) II (1-6) II (2-8) II (1-6) II (2-8) II (1-6) II (1-5) C-9 II (1-6) II (1-7) II (2-7) III (2-7) III (2-8) II (1-6) II (	Triglochin maritima	IV (2-6)
Puccinellia maritima  Armeria maritima  Glaux maritima  III (2-5)  Algal mat  Limonium cf. L. vulgare  Cochlearia anglica  Juncus gerardii  Halimione portulacoides  Festuca rubra  Agrostis stolonifera  Aster tripolium  Cochlearia officinalis  Salicornia agg.  Suaeda maritima  Spartina anglica  Tuff ucoids  Phragmites australis  Carex extensa  Atriplex prostrata  Limonium humile  Oenanthe lachenalii  Artemisia maritima  Number of samples  Mean number of species/sample  Mean vegetation height (cm)  III (2-5)  III (1-6)  III (1-6)  III (1-6)  II (1-6)  Festuca rubra  II (1-6)  II (1-6)  Festuca rubra  II (1-6)  II (1-6)  Festuca rubra  II (1-6)  II (1-6)  II (2-8)  II (1-6)  II (2-8)  II (1-6)  II (2-8)  II (1-5)  Salicornia agg.  II (1-5)  II (2-6)  II (2-6)  II (2-3)  Spartina anglica  II (1-3)  II (1-3)  Atriplex prostrata  II (1-3)  II (1-3)  II (1-3)  II (1-4)  Number of samples  Mean number of species/sample  Mean vegetation height (cm)  57 (25-100)	Plantago maritima	IV (2-8)
Armeria maritima  Glaux maritima  HII (2-5)  Algal mat  Limonium cf. L. vulgare  Cochlearia anglica  Juncus gerardii  Halimione portulacoides  Festuca rubra  Agrostis stolonifera  Aster tripolium  Cochlearia officinalis  Salicornia agg.  Suaeda maritima  Festua anglica  Spartina anglica  Spartina anglica  Festuca rubra  II (2-6)  Aster tripolium  II (2-5)  Cochlearia officinalis  II (2-6)  Suaeda maritima  II (2-3)  Spartina anglica  Spartina anglica  II (1-5)  Cochlearia officinalis  II (2-3)  Spartina anglica  II (2-3)  Spartina anglica  II (1-5)  Spergularia media  II (2-4)  Turf fucoids  II (3-6)  Phragmites australis  II (2-6)  Carex extensa  II (1-3)  Atriplex prostrata  II (1-3)  Limonium humile  Oenanthe lachenalii  Artemisia maritima  II (1-4)  Number of samples  Mean number of species/sample  Mean vegetation height (cm)  57 (25-100)	Aster tripolium (rayed)	III (2-4)
Glaux maritima         III (2-5)           Algal mat         III (2-8)           Limonium cf. L. vulgare         II (1-6)           Cochlearia anglica         II (1-4)           Juncus gerardii         II (3-7)           Halimione portulacoides         II (1-6)           Festuca rubra         II (2-8)           Agrostis stolonifera         II (2-8)           Aster tripolium         I (1-5)           Cochlearia officinalis         I (2-3)           Salicornia agg.         I (2-3)           Suaeda maritima         I (2-3)           Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Puccinellia maritima	III (2–7)
Algal mat  Limonium cf. L. vulgare  Cochlearia anglica  Juncus gerardii  Halimione portulacoides  Festuca rubra  Agrostis stolonifera  Aster tripolium  Cochlearia officinalis  Salicornia agg.  Suaeda maritima  I (2–3)  Spartina anglica  Spergularia media  Turf fucoids  Phragmites australis  Carex extensa  Atriplex prostrata  Limonium humile  Oenanthe lachenalii  Artemisia maritima  Number of samples  Mean number of species/sample  Mean vegetation height (cm)  II (1–6)  II (1–6)  FII (1–6)  FII (1–6)  FII (1–6)  FII (1–6)  Festuca rubra  II (2–8)  II (1–6)  Festuca rubra  II (2–8)  II (1–5)  II (2–6)  II (2–6)  II (2–3)  Spartina anglica  II (1–3)  II (1–4)  Number of samples  Mean number of species/sample  Mean vegetation height (cm)  Fig. Carex  II (1–6)  II (1–5)  II (1–6)  II (1–5)  II (1–5)  II (1–5)  II (1–5)  II (2–6)  II (1–5)  II (2–6)  II (1–5)  II (1–5)  II (2–6)  II (1–5)  II (1–5)  II (2–6)  II (1–5)  II (2–6)  II (1–5)  II (1–5)  II (1–5)  II (1–5)  II (1–6)  II (1–5)	Armeria maritima	III (2-5)
Limonium cf. L. vulgare  Cochlearia anglica  Juncus gerardii  Halimione portulacoides  Festuca rubra  Agrostis stolonifera  Aster tripolium  Cochlearia officinalis  Salicornia agg.  Suaeda maritima  Spartina anglica  Spergularia media  Turf fucoids  Phragmites australis  Carex extensa  Atriplex prostrata  Limonium humile  Oenanthe lachenalii  Artemisia maritima  II (1-6)  II (1-7)  II (1-7)  II (1-8)  II (1-9)  I	Glaux maritima	III (2–5)
Cochlearia anglica         II (1-4)           Juncus gerardii         II (3-7)           Halimione portulacoides         II (1-6)           Festuca rubra         II (2-8)           Agrostis stolonifera         II (2-6)           Aster tripolium         I (1-5)           Cochlearia officinalis         I (2-3)           Salicornia agg.         I (2-5)           Suaeda maritima         I (2-5)           Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Algal mat	III (2–8)
Juncus gerardii         II (3-7)           Halimione portulacoides         II (1-6)           Festuca rubra         II (2-8)           Agrostis stolonifera         II (2-6)           Aster tripolium         I (1-5)           Cochlearia officinalis         I (2-3)           Salicornia agg.         I (2-5)           Suaeda maritima         I (2-5)           Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Limonium cf. L. vulgare	II (1–6)
Halimione portulacoides         II (1-6)           Festuca rubra         II (2-8)           Agrostis stolonifera         II (2-6)           Aster tripolium         I (1-5)           Cochlearia officinalis         I (2-3)           Salicornia agg.         I (2-5)           Suaeda maritima         I (2-5)           Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Cochlearia anglica	II (1–4)
Festuca rubra         II (2-8)           Agrostis stolonifera         II (2-6)           Aster tripolium         I (1-5)           Cochlearia officinalis         I (2-3)           Salicornia agg.         I (2-5)           Suaeda maritima         I (2-3)           Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Juncus gerardii	II (3–7)
Agrostis stolonifera         II (2-6)           Aster tripolium         I (1-5)           Cochlearia officinalis         I (2-3)           Salicornia agg.         I (2-5)           Suaeda maritima         I (2-3)           Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Halimione portulacoides	II (1–6)
Aster tripolium         I (1-5)           Cochlearia officinalis         I (2-3)           Salicornia agg.         I (2-5)           Suaeda maritima         I (2-3)           Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Festuca rubra	II (2–8)
Cochlearia officinalis         I (2-3)           Salicornia agg.         I (2-5)           Suaeda maritima         I (2-3)           Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Agrostis stolonifera	II (2–6)
Salicornia agg.         I (2-5)           Suaeda maritima         I (2-3)           Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Aster tripolium	I (1-5)
Suaeda maritima         I (2-3)           Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Cochlearia officinalis	I (2–3)
Spartina anglica         I (1-5)           Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Salicornia agg.	I (2-5)
Spergularia media         I (2-4)           Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Suaeda maritima	I (2-3)
Turf fucoids         I (3-6)           Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Spartina anglica	I (1-5)
Phragmites australis         I (2-6)           Carex extensa         I (1-3)           Atriplex prostrata         I (1-3)           Limonium humile         I (1-3)           Oenanthe lachenalii         I (3-4)           Artemisia maritima         I (1-4)           Number of samples         63           Mean number of species/sample         10 (2-14)           Mean vegetation height (cm)         57 (25-100)	Spergularia media	I (2-4)
Carex extensa I (1-3) Atriplex prostrata I (1-3) Limonium humile I (1-3) Oenanthe lachenalii I (3-4) Artemisia maritima I (1-4)  Number of samples 63 Mean number of species/sample 10 (2-14) Mean vegetation height (cm) 57 (25-100)	Turf fucoids	I (3–6)
Atriplex prostrata I (1-3) Limonium humile I (1-3) Oenanthe lachenalii I (3-4) Artemisia maritima I (1-4)  Number of samples 63 Mean number of species/sample 10 (2-14) Mean vegetation height (cm) 57 (25-100)	Phragmites australis	I (2–6)
Limonium humile I (1-3) Oenanthe lachenalii I (3-4) Artemisia maritima I (1-4)  Number of samples 63 Mean number of species/sample 10 (2-14) Mean vegetation height (cm) 57 (25-100)	Carex extensa	I (1-3)
Oenanthe lachenalii I (3-4) Artemisia maritima I (1-4)  Number of samples 63 Mean number of species/sample 10 (2-14) Mean vegetation height (cm) 57 (25-100)	Atriplex prostrata	I (1-3)
Artemisia maritima  I (1-4)  Number of samples  Mean number of species/sample  Mean vegetation height (cm)  I (1-4)  63  10 (2-14)  57 (25-100)	Limonium humile	I (1-3)
Number of samples  Mean number of species/sample  Mean vegetation height (cm)  63  10 (2–14)  57 (25–100)	Oenanthe lachenalii	I (3–4)
Mean number of species/sample 10 (2–14) Mean vegetation height (cm) 57 (25–100)	Artemisia maritima	I (1–4)
Mean vegetation height (cm) 57 (25–100)	Number of samples	63
Mean vegetation height (cm) 57 (25–100)	Mean number of species/sample	10 (2–14)
Mean total cover (%) 76 (70–100)	Mean vegetation height (cm)	
	Mean total cover (%)	76 (70–100)

