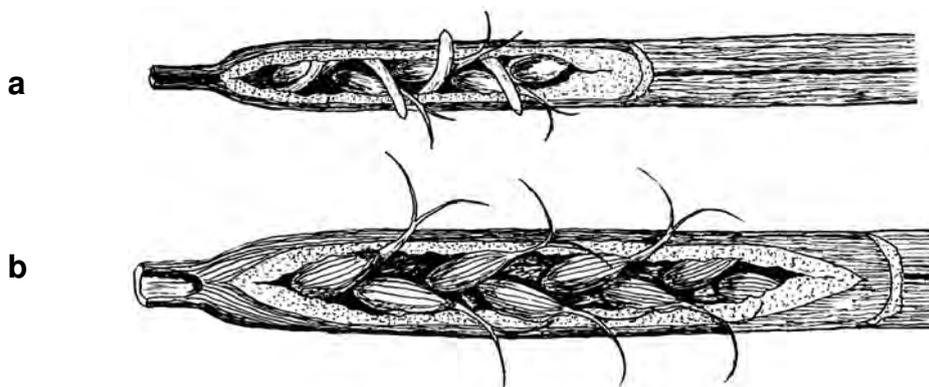


ZOSTERA

Zostera species grow on fine gravel, sand or mud, from half-tide mark down to about 4 m depth in the sea, the three species varying in their exposure ranges. Because of the comparative inaccessibility of the habitat they are somewhat neglected by recorders, but leaves and sometimes plants are regularly washed along the tide line. Only record rooted plants or those which if washed up occur in such freshness and quantity that they must be rooted nearby.

There should be relatively little difficulty in identifying material from optimal habitats, but material growing on exposed mud flats or in sites subject to large tidal range and race, such as the Severn Estuary, is more difficult to identify (Evans 1985). Flowering stems of *Z. noltei* are easiest to separate because of the regularly spaced flaps (retinaculae) in its inflorescence (see Fig. a). The larger specimens of *Z. marina* cause little problem as they have large rhizomes and leaves wider than 4 mm. The branched fruiting stem of *Z. angustifolia* separates it from *Z. noltei*, and from *Z. marina* provided its leaves are narrower than 2 mm wide. In the Severn Estuary, *Z. marina* has leaves frequently 2 mm wide and then it is impossible to say which is *Z. angustifolia* and which is *Z. marina*. The result of exposure is to concentrate the size characteristics so that it is not easy to distinguish the species. Exposure tends to result in a reduction of leaf width in *Z. marina* and a reduction of inflorescence length in all species.

The following Table is based on the descriptions in *CTM*, Evans (1985) and Madden, Jennings & Jeffrey (1993). Note that apart from the larger specimens of *Z. marina*, the rhizomes gradate upwards in size depending on the covering of mud (do older, well-buried rhizomes give rise to younger and less thick ones?) and when plants grow together it is not easy to separate the brittle, twisted rhizomes. Seeds taken out of the same inflorescence have shown both smooth and ribbed surfaces (Evans 1985). Many characters overlap in size and identification should be made on a combination of characters.



Retinaculae (flaps) in inflorescences (a) *Z. noltei*, present (b) *Z. marina*, absent.

Plant Crib

| | <i>Zostera noltei</i> Hornem. | <i>Zostera angustifolia</i> (Hornem.) Rchb. | <i>Zostera marina</i> L. |
|--------------------------|--|---|---|
| Rhizomes | 0.5-1 mm thick; cortex with vascular bundles in its innermost layers | 1-2 mm thick; cortex with 2 vascular bundles in its outer layers | 2-5 mm thick; cortex with 2 vascular bundles in its outer layers |
| Leaves of sterile shoots | (4-)6-20(>20) cm long × up to 1 mm wide; tip emarginate | 15-30 cm long × 2 mm wide in summer (shorter and c. 1 mm wide in winter); tip obtuse and rounded when young, emarginate later | 20-50(-200) cm long × (2-) 5-10 mm wide; tip rounded and mucronate when young, sometimes emarginate later where exposed |
| Leaves of fertile shoots | (not stated) | 4-15 cm long × 2-3 mm wide | Shorter and narrower, sometimes emarginate |
| Sheaths | Open | Closed when young (splitting later) | Closed when young (splitting later) |
| Flowering stems | Simple or with 1-2 branches near base | 10-30 cm, branched | Up to 60 cm, much branched |
| Inflorescence | 3-6 cm in sheltered areas, averages below 2 cm when exposed | 8-11 cm in sheltered areas, averages below 2.5 cm when exposed | (4-)9-12(-14) cm, in sheltered areas, averages 5 cm when exposed |
| Retinaculæ | Present (Fig a.) | Absent | Absent (Fig. b) |
| Stigma | Shorter than style | About as long as style | 1-2 × style |
| Seeds | c. 2 mm | 2.5-3 mm | 3-3.5 mm |

Some authors suggest that *Z. angustifolia* auct. should be treated as a variety of *Z. marina* (e.g. Sell & Murrell 1996). Recent maps of all three species in Britain are given in the *Scarce Plants*.

References Evans, T. G. (1985). *BSBI Welsh Bulletin* **41**: 27-28.
Madden, B., Jennings, E. & Jeffrey, D. W. (1993). *Irish Naturalists' Journal* **24**: 303-310.

Author T. G. Evans, January 1988, updated November 1997.