



LURONIUM NATANS / BALDELLIA RANUNCULOIDES / ALISMA

Although the stronghold of the statutorily protected species *Luronium natans* (L.) Raf. is Wales and the Welsh borders (*Scarce Plants*), it has been found recently in Cumbria, Scotland and Ireland where it is probably an over-looked native rather than a recent arrival; it may well be more widespread still. Full details of all sites should be recorded. Specimens should only be taken, preferably under license, to confirm identification at new sites.

Luronium is under-recorded due to its generally submerged aquatic habitat, shy flowering, great phenotypic plasticity (many floras account do not adequately cover the range of variation) and similarity to other aquatic plants. The leaves do not tend to be caught on grapnels or get washed ashore and often the easiest way to find it in water is to dive or use a long hooked pole. It may also be found easily when exposed in seasonal ponds. The species can grow in both isolated clumps or extensive lawns on the bottom of canals, lochs, ponds, etc., in water up to 4 m depth in clear lakes.

In flower when exposed or in shallow water, *Luronium* is unlikely to be mistaken for other species. The flowers are usually in groups of 1-5, about 12-18 mm in diameter, often floating on the surface of the water, with white petals with a yellow base. Cleistogamous flowers are a common feature of many British canal and lake populations, especially where the plants are poorly illuminated.

Submerged plants are distinct from isoetids with terete leaves (cf. page 382) due to the flat, translucent leaves and ready development of stolons (they look rather like the indoor 'spider plant' except that they have flat leaves). In still or gently flowing water the submerged rosette leaves are typically *c.* 5-15 cm long, strongly flattened, linear-triangular, tapering uniformly from a base *c.* 4-7 mm wide to a fine acute tip (not obtuse). They are pale green and translucent with a thicker, greener, midrib occupying about the central half of the leaf (most noticeable when fresh). In flowing water, submerged leaves may be parallel-sided, up to 50-60 cm long, *c.* 5-8 mm wide and appear very different to those of still-water plants; these leaves resemble those of *Sparganium* but snap easily when bent double and have an acute rather than acuminate apex. Runners/stolons from the base of the rosettes are about 1 mm in diameter and up to *c.* 20 cm long, and they may be green or white (Figs. a, b). The stolons develop small tufts of leaves at regular intervals along their length even when they are not rooted in the substratum.

The aerial or floating leaves when present can vary markedly between populations (Fig. e). In deep water, leaves may float on the surface with very slender petioles up to twice the depth of water. The blades are typically 1-4 cm long, obovate, elliptic or lanceolate, with a retuse to obtuse apex. When plants are exposed or in very shallow water, the leaves are similar but may be held erect (like *Baldellia* or *Alisma*) and maybe acute at the apex (NB the latter will key out incorrectly in Stace's *New Flora*). They have a distinct venation of a central vein and one strong lateral vein on either side of the midrib, with smaller cross-connecting veins between. When floating, at first glance they look like those of *Potamogeton gramineus*.

Luronium is very similar vegetatively to *Baldellia ranunculoides* (L.) Parl. which has similar submerged leaves, though these are less flattened and often slightly widened at the apex, and the aerial or floating

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leaves are usually acute and lanceolate. *Baldellia* may sometimes develop stolons, or the flowering stems may trail and produce roots and tufts of leaves (especially late in the season). It is unclear to which of these two forms the name *B. ranunculoides* var. *repens* Davies has been applied, but plants of the latter form are sold under this name in garden centres. Depauperate *Baldellia* plants may only have one or two flowers. A very useful character is that when fresh, crushed *Baldellia* leaves also smell quite distinctly and strongly of Cumin/Coriander (absent in *Luronium* but sometimes present weakly in *Alisma*) (N. Willby, pers. comm. 1994).

Sterile, linear-leaved *Luronium* could also be confused with young *Alisma plantago-aquatica* / *A. lanceolatum* plants, which however do not produce stolons and generally have more acute floating leaf apices (Fig. i.). *Alisma* can develop linear underwater leaves like those of *Luronium* when they first germinate and possibly in deeper water, but in the latter case almost always have the typical large leaves present. Both can have \pm parallel sided floating leaves, though the leaf apex of *Alisma* tends to be more acute and *Luronium* obtuse. It is not yet possible to name seedlings.

Key to vegetative *Luronium* / *Baldellia* / *Alisma* (excluding *A. gramineum*)

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| 1 | Stolons present (see note 1), or plants creeping and rooting at the nodes (Figs a, b, d, f) | 2 |
| 1 | Stolons absent, and not creeping or rooting at the nodes (Figs. c, g, h, i) | 5 |
| 2 | Floating/aerial leaves absent (Figs. b, f) (see note 2) | 3 |
| 2 | Floating/aerial leaves present (Figs a, d) | 4 |
| 3 | Submerged leaves sword-shaped, \pm parallel for much of their length and tapering to a fine tip (Figs. a, b) | <i>Luronium</i> |
| 3 | Submerged leaves distinctly widened towards apex before tapering to a fine tip (Figs. f, g) | <i>Baldellia</i> |
| 4 | Crushed leaves not smelling noticeably; plant truly stoloniferous (Fig d) | <i>Luronium</i> |
| 4 | Crushed leaves smelling strong of Cumin/Coriander; inflorescence developing roots and tufts of leaves | <i>Baldellia</i> |
| 5 | Crushed leaves smelling strong of Cumin/Coriander, attenuate at the base | <i>Baldellia</i> |
| 5 | Crushed leaves not smelling noticeably, cordate to attenuate at the base | <i>Luronium</i> / <i>Alisma plantago-aquatica</i> / <i>A. lanceolatum</i> (flowers/fruits required) |

Notes

1. Stolons are put out from the base of the plant and will be obvious when above the substrate, but may be hidden in the sediment especially in soft mud; it may be necessary to excavate some plants (extensive 'lawns' of plants are generally indicative of stolons). Stolons are usually absent in winter.
2. Submerged leaves are not differentiated into a distinct petiole and blade but are flattened, thin, \pm translucent with an obvious central vein. Floating/aerial leaves are clearly differentiated into a distinct petiole and blade, are thicker and opaque. Plants may or may not have some leaves transitional between the two forms.

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Luronium natans (a) plant with submerged rosettes, stolons, floating leaves and flowers, (b) submerged rosettes and stolons only, (c) no stolons, (d) aerial leaves, flowers and stolons (no submerged leaves), (e) variation in floating leaves. *Baldellia ranunculoides* (f) stolons and submerged leaves, (g) submerged leaves and flowers, (h) aerial leaves and flowers. *Alisma-plantago-aquatica* (i) seedling with submerged leaves and young floating leaves (silhouettes del. S. Williams & T. C. G. Rich).

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- References* Rich, T. C. G., Kay, G. M. & Kirschner, J. (1995). *Irish Naturalists' Journal* **25**: 140-145.
Willby, N. J. & Eaton, J. W. (1993). *Journal of Aquatic Plant Management* **31**: 70-76.

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