
OV36

Lythrum hyssopifolia-*Juncus bufonius* community

Synonymy

Lythrum hyssopifolia stands Preston & Whitehouse 1986.

Constant species

Anagallis arvensis, *Juncus bufonius*, *Lythrum hyssopifolia*, *Matricaria perforata*, *Plantago major*, *Polygonum aviculare*, *Polygonum persicaria*, *Bryum klinggraeffii*, *Pottia starkeana* ssp. *minutula*, *Riccia glauca*.

Rare species

Lythrum hyssopifolia.

Physiognomy

The *Lythrum hyssopifolia*-*Juncus bufonis* community comprises ephemeral vegetation which, by mid-summer, is typically dominated by mixtures of the nationally rare *Lythrum hyssopifolia*, together with *Juncus bufonius*, *Plantago major* (diagnosed as ssp. *intermedia* by Preston & Whitehouse 1986), *Polygonum persicaria* and *P. aviculare*. Also frequent throughout among the vascular associates are *Mentha arvensis*, *Rumex crispus* and seedlings of *Salix* spp. *Elymus repens* is occasional and, in sites which have been undisturbed by recent ploughing, *Polygonum amphibium* tends to increase. Bryophytes are an important element in the vegetation with *Bryum klinggraeffii* and *Riccia glauca* common throughout, the former with modest abundance.

Preston & Whitehouse (1986) noted a consistent, but overlapping, contrast between the stands they sampled but not sufficiently sharp to characterise sub-communities. To one extreme, species such as *Anagallis arvensis*, *Alopecurus myosuroides*, *Kickxia elatine*, *K. spuria* and more obviously *Anthemis cotula* and *Aethusa cynapium* ssp. *agrestis*, tended to be associated with *Pottia starkeana* ssp. *minutula*, *Barbula unguiculata*, *B. argenteum*, *Dicranella staphylina* and *D. varia*. To the other, *Matricaria perforata* and *Equisetum arvense* were found with *Physoctitrella patens*, *Riccia cavernosa*, *R. subbifurca* and *Pohlia carnea*.

Habitat

The community is confined to winter-flooded hollows in annually-ploughed arable fields in Cambridgeshire where long inundation kills the cereal crop and allows the reappearance of this distinctive combination of opportunist vascular plants and cryptogams.

The most distinctive plant of the community, *Lythrum hyssopifolia*, is characteristic of seasonally-flooded habitats (Coombe *et al.* 1959) and may not be native: at least, its native distribution is greatly confused by its sporadic appearance as an obviously introduced plant through the more Continental parts of south-east England. In this community, first characterised in detail by Preston & Whitehouse (1986), it colonises shallow periglacial ground-ice hollows which persist in the arable landscape of south Cambridgeshire. These experience periodic flooding in winter, of variable duration and depth but sufficient to kill off the cereals sown into the fields after autumn ploughing. As the hollows dry out, the assemblage reappears on the damp, bare mud.

Both flooding and ploughing are essential in maintaining a suitable habitat for the community. *Lythrum* itself is absent from both unflooded areas in the arable fields and in the hollows following winters when there is no flooding (Walters 1978). Hollows which are not ploughed quickly become dominated by dense swards of perennials, some of which, like *Polygonum amphibium*, *Elymus repens* and *Equisetum arvense* are occasional in this vegetation but whose robust rhizomes are prevented from extensive spread by the physical disruption of cultivation.

In contrast to these scarcer companions, most of the commoner vascular species of the community are ephemerals. All but *Plantago major* among the vascular constants are annuals and, even this hemicryptophyte can behave as an annual in this vegetation: such a strategy (Sagar & Harper 1960) is especially typical of the var. *intermedia* characteristic of unstable habitats.

Lythrum itself, though capable of autumn germination (Salisbury 1968), appears to establish only in spring

in this community (Preston & Whitehouse 1986) and *P. aviculare* and *P. persicaria* have seeds which remain dormant until after moist conditions and low temperatures have ensued (Justice 1941, Timson 1965, Courtney 1968, Henson 1969). The seeds of *Plantago major* also have a chill requirement (Sagar & Harper 1960) while *Juncus bufonius* (Cope & Stace 1978) and *Matricaria perforata* (Roberts & Feast 1970) show maximum germination as the weather warms in March. The constants of the community also show considerable seed longevity (Preston & Whitehouse 1986).

The species of the community are well adapted to survival through the disruptions of ploughing and flooding and to rapid reappearance on the bare, damp ground created by these events. Their seeds are also probably easily able to be carried from hollow to hollow or to different fields, by gulls and waders for example (Walters 1972), which would assist local survival.

Almost all species among the very distinctive bryophyte assemblage of this community are also ephemerals with adaptations for rapid vegetative or sexual reproduction. Most, including *Bryum klinggraeffii*, *B. rubens*, *B. ruderae*, *Dicranella staphylina* and *D. varia*, are dioecious species with rhizoid tubers, organs especially frequent in mosses of arable fields and probably able to remain dormant for years. Many of the other bryophytes are monoecious and without means of vegetative reproduction but they regularly produce cleistocarpous capsules with spores that can probably remain dormant for long periods (Preston & Whitehouse 1986).

Zonation and succession

The stands of the *Lythrum-Juncus* community are characteristically clearly marked off from their intensively arable context. By August, as Preston & Whitehouse

(1986) vividly describe the sight, they are picked out as pink islands, coloured by the flowers of *Polygonum persicaria*, among the golden ripening cereals.

Without the disturbance necessary for its reappearance, however, the community is rapidly overtaken by Polygono-Chenopodion vegetation with an increasing perennial element (as in the *Elymus-Potentilla* sub-community of the *Matricaria-Stellaria* community) or by tall-herb vegetation of the Artemisietea, where species like *Epilobium hirsutum* dominate. One long-uncultivated hollow noted by Preston & Whitehouse (1986) had progressed to *Salix atrocinerea* scrub.

Distribution

In the review of existing *Lythrum* sites of Preston & Whitehouse (1986), the plant was confined to a very limited part of south Cambridgeshire, all within one 10 × 10 km square of the National Grid.

Affinities

The *Lythrum-Juncus* community is a further British representative of the ephemeral vegetation of the Isoeto-Nanojuncetea Br.-Bl. & Tüxen 1943. However, although in France (Braun-Blanquet 1935), *Lythrum* has been reported from the diminutive open swards characteristic of the Mediterranean Nanocyperion, the vegetation described here clearly shows some Bidetion features. Preston & Whitehouse (1986) considered it to belong to the order Cyperetalia fusci (Klika 1935) Muller-Stoll & Pietsch 1961, characteristic of wetter habitats along the Atlantic fringes of Europe, but not all authorities recognise such a separate grouping. Certainly only two of the order character species, *Riccia cavernosa* and *R. glauca*, occur in the community.

Floristic table OV36

<i>Lythrum hyssopifolia</i>	V (4–8)
<i>Juncus bufonius</i>	V (2–7)
<i>Plantago major</i>	V (2–6)
<i>Polygonum persicaria</i>	V (1–7)
<i>Bryum klinggraeffii</i>	V (1–3)
<i>Polygonum aviculare</i>	IV (1–6)
<i>Riccia glauca</i>	IV (1–2)
<i>Matricaria perforata</i>	IV (1–4)
<i>Anagallis arvensis</i>	IV (1–5)
<i>Pottia starkeana</i> ssp. <i>minutula</i>	IV (1–3)
<i>Mentha arvensis</i>	III (1–2)
<i>Rumex crispus</i>	III (1–4)
<i>Salix</i> sp. seedling	III (1–3)
<i>Physcomitriella patens</i>	III (1–3)
<i>Alopecurus myosuroides</i>	III (1–5)
<i>Barbula unguiculata</i>	III (1–3)
<i>Elymus repens</i>	III (1–4)
<i>Equisetum arvense</i>	III (1–4)
<i>Riccia cavernosa</i>	III (1–3)
<i>Kickxia elatine</i>	III (1–2)
<i>Sonchus oleraceus</i>	III (1–2)
<i>Bryum argenteum</i>	III (1–3)
<i>Polygonum amphibium</i>	II (1–4)
<i>Ranunculus repens</i>	II (1–3)
<i>Kickxia spuria</i>	II (1–2)
<i>Dicranella staphylina</i>	II (1–3)
<i>Stellaria media</i>	II (1–2)
<i>Bilderdykia convolvulus</i>	II (1–2)
<i>Pohlia carnea</i>	II (2)
<i>Dicranella varia</i>	II (2–3)
<i>Bryum rubens</i>	II (1–3)
<i>Anthemis cotula</i>	II (1–4)
<i>Riccia subbifurca</i>	I (1)
<i>Epilobium hirsutum</i>	I (1)
<i>Medicago lupulina</i>	I (1–2)
<i>Viola arvensis</i>	I (1–2)
<i>Hordeum distichon</i>	I (4–5)
<i>Veronica persica</i>	I (2–3)
<i>Bryum violaceum</i>	I (2)
<i>Taraxacum officinale</i> agg.	I (1–4)
<i>Senecio vulgaris</i>	I (1)
Number of samples	10
Number of species/sample	25 (16–34)
Herb cover (%)	83 (60–100)
Bryophyte cover (%)	16 (0–40)