S23
Other water-margin vegetation
Glycerio-Sparganion Br.-Bl. & Sissingh *apud* Boer 1942 *emend.* Segal

Constant species

The vegetation included here is characteristically heterogeneous but the most frequent species are *Apium nodiflorum*, *Nasturtium officinale* (including *N. microphyllum*) and *Veronica beccabunga*. Some authorities have also erected vegetation types on the constancy of *Catabrosa aquatica* or *Glyceria plicata*.

Physiognomy

Though floristically varied, this vegetation has a highly distinctive structure. Most of the species are small perennials with shoots that are procumbent and rooted below and ascending (or sometimes floating) above. These form a bushy and often patchy canopy of somewhat uneven height, though generally less than 30 cm. Each of the most frequent species can be locally dominant, forming quite large pure clumps which monopolise long stretches of water margin or alternate with patches of other species. In other cases, there is a more intimate mixture of smaller individuals of two or more of these most frequent species with a variety of associates, the commonest of which are *Myosotis scorpioides*, *Mentha aquatica*, *Alisma plantago-aquatica*, *Berula erecta* (in the south and east) and small *Glyceria* spp. (*G. fluitans*, *G. plicata*, their hybrid *G.* × *pedicellata* or *G. declinata*). Each of these may also assume local prominence, too, and there may be patches of *Ranunculus sceleratus*, *Juncus bufonius* or *Callitriche stagnalis* on bare mud. Then, there are often occasional records for species from a variety of vegetation types which are frequently in close juxtaposition at water margins, most notably swamps, tall-herb fens and some mesotrophic grasslands. Added to this spatial variation, there is often an element of seasonal change in the vegetation in relation to natural periodicity in growth patterns (*Apium nodiflorum*, for example, often spreading markedly in late summer and *Berula erecta* in early spring: Haslam 1978) or in response to disturbance such as dredging or cutting.

Habitat

This vegetation is most typical of the unshaded margins of mesotrophic to eutrophic waters where there is some accumulation of medium- to fine-textured mineral sediments. It may be a temporary feature fronting emergents as they colonise shallow open waters but, where there is some measure of marginal disturbance by turbulence in running waters or from dredging, cutting or moderate trampling or where there is seasonal drying up of standing or running waters, it often forms a permanent, though temporally variable, fringe. It is very common around small standing waters like field ponds, along canal and dyke margins and in the shallows of low-order streams.

The most frequent and abundant species are well adapted to the moderate or periodic instability in such habitats. Though they offer a high resistance to moving waters because of their bushy habit and are often shallow-rooted (both features in which they differ markedly from most emergents), they are relatively robust and can survive in moderate to fast flows. Spates tend to uproot rather than break the plants (Haslam 1978) but they can readily re-root if thrown up in congenial situations. Of all the communities in this section (except perhaps the *Phalaridetum*), it is this kind of emergent vegetation which penetrates furthest towards the head of rivers and, over a wide variety of bedrocks, it constitutes the bulk of any emergent cover along the margins of swifter streams.

In such situations, these species are well able to encourage the dropping of suspended sediments by interrupting the flow of the moving waters and trapping particulate matter among their numerous branching shoots. Most can also readily produce nodal roots at progressively higher levels, thus surviving any deposition, and a capacity for rapid growth enables them to capitalise on even temporary sedimentation.

It is features such as these which also enable this vegetation to respond quickly after artificial disturbance

and these species are often the first to return along dyke and canal margins after dredging and cutting.

Small shifts in the level of the water-table do not seem to affect the vegetation adversely, even when they are unseasonal. The shoots of many species can float in shallow water and some have thinner cuticular layers on their lower organs, which suggests that they may be able to benefit from surface exchange of dissolved gases and nutrients. Indeed, on occasion, some of the species, e.g. *Apium nodiflorum* and *Berula erecta*, are encountered as submerged carpets. The vegetation can also tolerate the temporary drying out of shallow waters such as occurs in small ponds and in the upper courses of Chalk winterbournes.

Zonation and succession

In shallow, standing or sluggish waters, the vegetation often occurs as a fringe to the *Glycerietum maximae*, the *Typhetum latifoliae* and the *Sparganietum erecti* and in more intact sequences, some of its species may run under more open stands of these emergents to constitute a sparse understorey of the assemblage G type. Often, however, zonations are very much compressed and, along many dykes and canals, clumps of this vegetation alternate with stands of emergents. These more patchy and fragmentary mixtures also occur with swamps like the *Caricetum acutiformis*, the *Acoretum calami* and the *Sagittaria sagittifolia* and *Carex pseudocyperus* communities.

In running waters with a moderate flow, the most frequent neighbouring swamp is the *Sparganietum erecti* but, in more swiftly moving waters, even this may disappear, leaving a broken fringe of this Glycerio-Sparganion vegetation, perhaps backed by clumps of the *Phalaridetum*. Such patterns are also characteristic of the margins of some more permanent river shoals.

Another very common pattern, around the edges of ponds and along stream margins where stock water, is for this vegetation to occur with the *Glycerietum fluitantis* in transitions to damp mesotrophic pastures such as the *Holco-Juncetum* or certain kinds of *Lolio-Cynosuretum*. Slumped fragments of these communities often occur intermixed with Glycerio-Sparganion vegetation in a confusing jumble along stream beds.

Periodic disturbance often sets back any seral progression in the habitats in which this vegetation typically occurs but, in more stable situations, it seems to give way to swamps like the *Glycerietum maximae*, the *Typhetum latifoliae* and the *Sparganietum erecti*. Its most frequent species are light-demanding (Haslam 1978) and, though they may persist for some time as a swamp understorey, they disappear as the emergents advance and become more dense.

Distribution

This vegetation is very common throughout the lowlands of Britain though certain species are more frequent in some regions than others: *Berula erecta*, for example, is largely restricted to the south and east and *Apium nodiflorum* seems particularly common in the south-west. There are also some associations with geological variations: *Nasturtium officinale* is especially prominent in Chalk streams and *Veronica beccabunga* seems better able than many of the other species to survive in streams over nutrient-poor sedimentary rocks.

Affinities

The general affinities of this vegetation are clearly with the Glycerio-Sparganion alliance. With further sampling, it would probably be possible to recognise distinct communities dominated by *Nasturtium officinale* (as in Seibert 1962, Oberdorfer 1977), *Apium nodiflorum* (cf. Westhoff & den Held 1969) and *Veronica beccabunga* (the *V. beccabunga*-Gesellschaft of Oberdorfer 1977). Birse (1980) recognised a *Catabrosetum aquaticae* Rübel 1912 and some Continental studies have characterised a *Glycerietum plicatae* (Kulcz. 1928) Oberdorfer 1954.