

Confusing urban mosses part 2: mortar-dwellers

Sharon Pilkington continues her column for beginners with the second of two articles describing how to differentiate the array of mosses likely to be encountered in urban environments.

Urban walls (Fig. 1), buildings, stairwells, bridge masonry, gravestones and other man-made hard structures all offer good habitats for a number of common, small acrocarpous mosses. Like their ground-dwelling counterparts, many of these can look rather similar to the inexperienced eye and can therefore be rather daunting to get to grips with. Many wall-dwellers, and especially those growing in dry, sunny places such as wall tops, have obvious, silvery hair points – very common examples include *Bryum capillare*, *Tortula muralis*, *Grimmia pulvinata* and the *Schistidium* complex. Often, however, it is the small species without hair points that cause

confusion to new bryologists, so in this article I shall examine some of the more commonly encountered ones in detail.

Bear in mind that some of the ground-dwelling mosses covered in part 1 of this feature (*Field Bryology* 104, 38–43) are equally at home on stonework. *Barbula convoluta*, *B. sardoa* and *B. unguiculata* often grow on walls and other masonry, as do *Didymodon sinuosus*, *D. insulanus* and *Bryoerythrophyllum recurvirostrum*.

However, there is a distinct group of small species that often grow as cushions or tufts 1–3 cm tall on urban stonework. These all have tapering leaves roughly 2–4 mm long without silvery hair points.

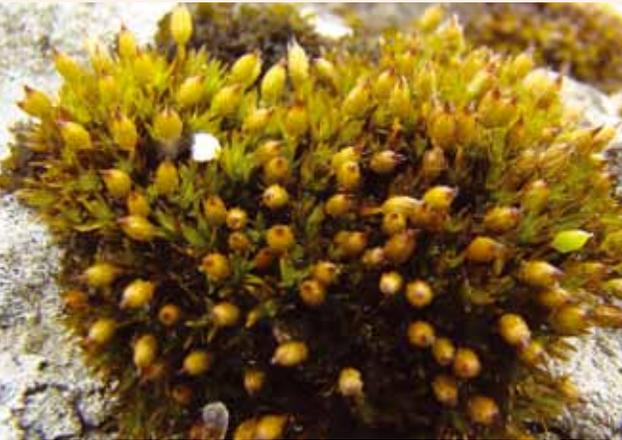
▽ Fig. 1. This old mortar-topped brick wall in Marlborough is a haven for mosses. S. Pilkington



ORTHOTRICHUM MOSSES

Shared characters

Orthotrichum mosses are most frequently encountered as epiphytes on trees and shrubs, but several species characteristically grow on mortar and stonework. They form dense, rounded cushions or looser tufts only a few centimetres tall and have a broad, ovate-lanceolate (egg- to spearhead-shaped) leaf with distinctly recurved margins and a bluntly pointed leaf tip. Typically, upper leaf cells are small, opaque and relatively isodiametric (as long as wide), contrasting with translucent, rectangular basal cells. Usefully, the species that are commonly found on stone in urban situations often bear distinctive, erect capsules, which help greatly in identification.



large, barrel-like capsules are distinctive (Fig. 2). Unlike most other species in the genus, *O. anomalum* raises its capsules just above its leaves on a short seta which, at 2–4 mm, is longer than the capsule (compare with *O. cupulatum* below).

Orthotrichum cupulatum

Growing in similar places to *O. anomalum* and sometimes along with it, *O. cupulatum* (Fig. 3) usually prefers slightly more sheltered places, such as street cellars and river weir masonry. Although it has a slightly more straggly growth form, the two species can only be reliably separated when mature capsules are present. In spring, *O. cupulatum* bears a capsule on a barely visible seta that is only 1–1.5 mm long and shorter than the capsule. Capsules are therefore only just emergent from the leaves.

In humid parts of the country, watch out for *Orthotrichum affine* (Fig. 4) on base-rich wall tops in sheltered positions just below trees on which it is growing as an epiphyte. It is a similar size and habit to the above species but bears capsules which are definitely immersed in the leaves. *O. anomalum* and *O. cupulatum* both have 16 outer peristome teeth at the mouth of the capsule, whereas *O. affine* has 8.

▽ Fig. 4. *O. affine* always has immersed capsules.
S. Pilkington

△ Fig. 2 (top). *O. anomalum* capsules usually develop in abundance in spring. S. Pilkington

△ Fig. 3 (bottom). *O. cupulatum*. R. Lansdown

When dry, the leaves are usually more or less erect and appressed to the stems. Plants are highly hygroscopic (able to absorb moisture) and rehydrate very quickly on wetting.

Orthotrichum anomalum

A true saxicole (rock-dweller), this is the *Orthotrichum* most commonly associated with man-made limestone and mortar, and its tufts, 1–2 cm tall, sometimes catch the eye when it adorns headstones in churchyards. It is frequently fertile and then its



DIDYMODON MOSSES

Shared characters

There are two species in this genus that commonly grow on walls – especially those made of hard, calcareous substrates such as limestone or concrete. Unlike their ground-dwelling cousins, they grow in small cushions or tufts and they both have narrow, lanceolate leaves that taper from the base to the tip. Once dried out, they can take several minutes to rehydrate fully.

Didymodon rigidulus

D. rigidulus grows in small, dense, dull green cushions 1–2 cm tall (Fig. 5). Upper leaf cells are small,

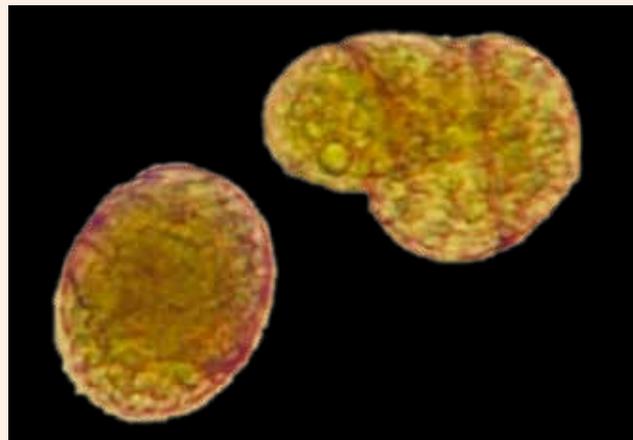
round-hexagonal and faintly papillose, contrasting with those in the leaf base which are shortly rectangular and translucent. The nerve is quite strong and disappears into a narrow, drawn-out apex with a blunt tip (Fig. 6). Unlike *D. vinealis*, the cells in the leaf tip are small and rather indistinct. Tapping some upper leaves gently in water on a microscope slide will usually dislodge small, round, multi-celled gemmae (Fig. 7) that are characteristic of *D. rigidulus* and help to distinguish it from *D. vinealis* (see below).

▽ Fig. 6 (top). The leaf tip of *D. rigidulus* is quite linear and ends in a blunt point. S. Pilkington

▽ Fig. 7 (bottom). *D. rigidulus* leaves bear spherical several-celled gemmae 25–80 µm wide. S. Pilkington



△ Fig. 5. A patch of *D. rigidulus* on a concrete river weir. S. Pilkington





D. rigidulus is a dioicous species (separate male and female plants) and female plants often produce erect, brown capsules with short peristome teeth in late summer and autumn.

Didymodon vinealis

This moss was once regarded as a variety of what is now *Didymodon insulanus* and indeed it resembles a smaller, greener version of that species.

D. vinealis forms bright green tufts or dense patches (Fig. 8) 0.5–2 cm tall in similar places to *D. rigidulus*. Its leaves are shorter and sharper than that species, with opaque and papillose upper



< Fig. 8. *D. vinealis*. Robin Stevenson

△ Fig. 9 (top). *D. vinealis* leaves taper gradually to a sharp point. S. Pilkington

△ Fig. 10 (bottom). The pointed and translucent cell at the leaf tip of *D. vinealis* is a very useful microscopic character. S. Pilkington

cells and recurved leaf margins (Fig. 9). Under the microscope, the single apical cell in the leaf tip (Fig. 10) is translucent and smooth and has a sharp point – this is a useful identification character. The plant does not bear gemmae and it is rarely fertile, although capsules are occasionally produced in spring and summer.

OTHER SPECIES

Pseudocrossidium revolutum

This small, bright green moss forms low, very dense tufts on limestone walls and mortar, especially in sheltered places (Fig. 11). Its leaves are small and very crowded, and because the upper cells are small, thick-walled and papillose, they look opaque and lack any gloss or sheen. The leaves also have a very stout nerve which often projects a little beyond the leaf tip. The most distinctive feature of this plant, however, is the way the leaf margins curl down. They are so widely revolute that the leaf margin can obscure the nerve on the lower side of the leaf near the leaf apex.

P. revolutum is dioicous and capsules are sometimes found on female plants in spring and summer.

▽ Fig. 11. *P. revolutum* on a wall top – note developing sporophytes. S. Pilkington



△ Fig. 12. *E. streptocarpa* growing on chalky talus. S. Pilkington

▽ Fig. 13. *E. streptocarpa* leaf showing contrast between upper and basal cells. S. Pilkington



Encalypta streptocarpa

Usually lurking in a damp crack on a shady limestone wall or similar place, this densely tufted moss has relatively large, tongue-shaped leaves which often look dull and pale yellow-green (Figs 12 & 13). Like all species of *Encalypta*, the leaves have a distinctive areolation (cell pattern). Upper cells are small, green and covered with wart-like papillae – making the leaves look matt and rather opaque – whereas basal cells are rectangular and hyaline (colourless). Capsules are rarely produced by this species. Sometimes masses of brown, thread-like gemmae are present in the leaf axils, their colour contrasting markedly with the leaves.

Zygodon viridissimus and *Z. stirtonii*

An unremarkable little moss which grows in small cushions or tufts, *Z. viridissimus* is commonly encountered as an epiphyte on the bark of trees and shrubs. However, in some districts it frequently grows on rocks and walls (Fig. 14), where its bright green colour often catches the eye. Individual plants are usually only 1–2 cm tall. Its leaves spread and are recurved, and have plane, papillose margins, tapering to a sharp apex. Like other members of the genus, *Z. viridissimus* usually bears abundant sausage-shaped gemmae on its leaves and these are an excellent identification feature (Fig. 15). When they are abundant, it is just possible to see them in the field with a $\times 20$ lens. They are 5–6 cells long with some longitudinal cell walls. *Z. viridissimus* is dioicous and occasionally bears capsules on long, pale setae in spring.

Z. stirtonii is frequent in some districts and is almost exclusively saxicolous. It looks very similar to *Z. viridissimus* but differs in having a stouter nerve, thickening toward the leaf tip, and projecting from it in a short stout point.

Zygodon species have leaves that are noticeably shorter (1.5–2 mm) than species of *Didymodon*, *Encalypta* or *Orthotrichum*. They also lack papillae and are therefore shiny.

Sharon Pilkington

(e sharon.pilkington1@btinternet.com)



△ Fig. 14 (top). *Z. viridissimus* on a shady wall.
S. Pilkington

▽ Fig. 15 (bottom). *Z. viridissimus* leaf gemma.
S. Pilkington

