

Foliicolous Bryophytes in Worcestershire

Ann Hill (with introductory note by Brett Westwood)

On February 22 2023 I was exploring a private woodland at Wolverley near Kidderminster when I noticed shaggy growths of moss festooning a large clump of Box trees *Buxus sempervirens*. The luxuriance of the moss and liverworts prompted me to look more closely at the Box foliage. I have long been fascinated since reading in the Collins New Naturalist No 97 *Mosses and Liverworts* (Porley & Hodgetts 2005) by the scarcity of epiphyllous bryophytes in the UK and had been casually looking for them ever since. Here, to my surprise, many of the leaves had prolific growths of liverworts and in a few cases a moss, so I invited county Bryological recorder Dr. Ann Hill to visit the site to determine which species were involved and to establish the record in a local and national context. Her excellent account follows. Brett Westwood.

Woodland bryophyte flora in the UK is usually predictable. However, a recent walk through a woodland in north Worcestershire, revealed an unexpected foliicolous community growing in the understorey: an exciting find for the county. Foliicolous (also known as epiphyllous) plants grow on the living leaves of another plant. Epiphyllous bryophytes are a feature of tropical regions and very rare elsewhere.

There are a few isolated records of epiphyllous bryophytes at scattered locations throughout England, Scotland and Wales but no epiphyllous bryophytes have been recorded in Worcestershire (Porley, 1996; British Bryological Society (BBS) Database 27/02/2023; S. Bosanquet, Pers. comm. 27/02/2023; S. Pilkington, Pers. comm. 02/03/2023; D. Lister, Pers. comm. 04/03/2023; J. Duckett, Pers. comm. 04/03/2023; D. Callaghan, Pers. comm. 04/03/2023; L. Parkeson, Pers. comm. 05/03/2023; N. Hodgetts, Pers. comm. 06/03/2023). The majority of the epiphyllous bryophyte records in the UK are of liverworts: the most common species being Forked Veilwort *Metzgeria furcata* and Bluish Veilwort *M. violacea* with Fairy Beads *Microlejeunea ulicina* and Dilated Scalewort *Frullania dilatata* also recorded. The most common substrate was Box *Buxus sempervirens* although liverworts have been recorded growing on willows, ivies and conifer leaves. In addition, the liverworts *Colura calyptrifolia* and *Lejeunea lamacerina* have been recorded growing on fern species. There are also two epiphyllous moss records *Orthotrichum pulchellum* (in London) and *Zygodon conoideus* (in Wales).

The Worcestershire epiphyllous community was growing in a mixed canopy woodland on a north-west facing hill-side. The wooded ground sloped down to a small watercourse and pond. Growing on an area of the upper wooded slopes was a thick under-storey of Box with a sparse ground flora.



01. Box understorey growing in woodland in North Worcestershire. Ann Hill.

In the sheltered and lightly shaded conditions within the understorey of Box there were extensive patches of epiphyllous bryophytes and lichens growing on the hard, smooth, leathery surfaces of the Box leaves. Epiphyllous growth was most luxuriant on the older Box leaves that were >1.5m off the ground and sheltered by the surrounding Box scrub. The leaves appeared to be first colonised by lichens, then by liverworts, and then a few mosses which appear to grow onto them from neighbouring twigs.



02. Box leaves and twigs colonised by growth of lichens, liverworts and mosses. Ann Hill.

The thallose liverwort *Metzgeria violacea* was the dominant epiphyll growing predominantly on the upper surface (adaxial) of the Box leaves. The liverwort formed thin intricate mats of narrow, yellowish green thalli (up to approximately 1.5mm wide) with ascending to erect attenuated branches. Gemmae were abundant: mostly forming an apical cluster but also on both sides of the thallus as well as on the margins.



03. *Metzgeria violacea*, with apical clusters of gemmae, growing on Box leaves. Ann Hill.

Although epiphytic mosses were plentiful on the surrounding growth, they were seldom found to be established on the leaves and only in a few places had Elegant Bristle-moss *O. pulchellum* managed to grow onto leaves. The associated epiphyte flora on the twigs and branches included the liverworts Forked Veilwort *Metzgeria furcata* and Even Scalewort *Radula complanata* and the mosses Lateral Cryphaea *Cryphaea heteromalla*, Cypress-leaved Plait-moss *Hypnum cupressiforme*, Wood Bristle-moss *Orthotrichum affine* and Elegant Bristle-moss *O. pulchellum*.



04. The moss *Orthotrichum pulchellum* and liverwort *Metzgeria violacea* growing on Box leaves. Ann Hill.



05. Mixed moss and lichen growth on box leaves. Ann Hill.

The occurrence of epiphyllous bryophytes growing in Worcestershire is both interesting and remarkable. One of the limiting factors that prevents epiphyllous bryophytes from making leaves their home in the UK is the need for a stable, persistent substrate that lasts several years: many plant leaves are short-lived and the bryophyte is slow-growing. The leathery leaves of Box are relatively long-lived making it possible for bryophytes to become established on the leaf. Box grows in woodlands and scrub in southern England, with notable populations found on Box Hill in Surrey, the North Downs, the Chilterns and the Cotswolds. In Worcestershire, Box was widely planted as woodland game cover and therefore it is very likely that Box occurs as a patchy understorey within many of the county woodlands.

Establishment on the host leaves is the next most difficult step, requiring adherence of a spore, gemma or other propagule lasting through adverse weather conditions *i.e.* rainstorms that would attempt to wash them off. It is likely that colonisation of Box leaves by, in particular *Metzgeria* species, will be a combination of direct establishment via gemmae and thallus growth from stems onto the petioles and leaf laminae: much of the *Metzgeria violacea* was highly gemmiferous. In addition, *Metzgeria* species are highly anchored to the leaf surface by rhizoids that arise randomly from the ventral thallus surface: the tiny leaves looked as if they were ironed to the substrate.

Epiphyllous bryophytes can only germinate when they find a suitable niche. This woodland's topography and the partial shade within the understorey of Box created a micro-climate with sufficient humidity for their growth. Habitat conditions were different to the surrounding woodland and countryside. It was more sheltered under the Box understorey that protected plants from extremes of weather. The Box was mature with a height of

approximately 12 -15m and was estimated to be circa 100years old. Whether through design or neglect the Box provided a continuity of cover and a more-or-less stable micro-climate. In summary, chance clearly plays a significant role in the establishment of epiphyllous bryophytes.

References

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Images

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