

Mossing around in Eden

Thamnobryum angustifolium and *Anomodon attenuatus* must be high on the wanted list of many a UK bryologist. **Mark Lawley** describes how he stumbled upon both species one heady day in May in the River Eden in Cumbria.



Riverbanks in the middle and lower reaches of rivers provide good sport for bryologists because their flood zone offers a combination of conditions not found elsewhere – flowing water brings nutrients from upstream and washes away metabolic wastes, as well as eroding the ground and excoriating leaves and stems. In addition, riparian plants have to withstand varying levels of water and speed of flow, as well as periods of desiccation. Uncommon species may therefore turn up, especially where rocks, trees and soil provide a variety of substrates, as beside the river near the village of Armathwaite in Cumbria (NY5044 and 5045, v.c. 70), where the Eden cuts a wide gorge through Permian Sandstone. Flood zones become especially attractive to bryologists when a spell of dry weather exposes ground that is normally either underwater or dangerous to reach, and I felt like Ratty in *Wind in the Willows* while pottering about in and beside the Eden one balmy day in May 2008 – rather appropriate, really, being the centenary of Kenneth Grahame’s classic tale.

Numerous quite base-rich places along this particular stretch of the Eden enable *Apometzgeria pubescens*, *Ctenidium molluscum*, *Fissidens limbatus*, *Trichostomum brachydontium* and *T. crispulum* to thrive. But these bryophytes grow above the flood zone, and I was keen to search for riparian bryophytes by taking advantage of the low level of water on the day of my visit.

Orthotrichum rivulare and *O. sprucei* both grew on one or two alder trees, *Didymodon nicholsonii* appeared (new to Cumberland) in its natural habitat on soil in several places, and *Scleropodium cespitans* on a boulder in the river had not been vouched for Cumberland for more than 50 years.

More interesting still, an odd-looking pleurocarp growing on rock in the flood zone attracted attention because its branch leaves were held almost at right angles to the branch stems, and on examination later under the microscope proved to be *Thamnobryum angustifolium*. *T. angustifolium* has much narrower branch leaves than the common *T. alopecurum*, with nearly parallel sides for most of their length, narrowing only near the



tip, where fearsome fangs distinguish it from the very similar and equally rare *T. cataractarum*.

Tom Blockeel kindly examined the Eden material, and concluded that it should indeed be recorded as *T. angustifolium*, although apparently not a perfect fit for that species. The plants in the voucher from the Eden are small for *T. angustifolium*, with the stem leaves having shorter laminar cells (ellipsoid-rhomboidal rather than linear), the nerve in the branch leaves less diffuse at the base (in *T. angustifolium* the nerve is usually ill-defined at the extreme base of the branch leaves, with patches of incrassate, linear cells occupying much of the width of the branch leaf), the teeth of the branch leaves being less coarse, and the branch leaves not widening above the base. The *Thamnobryum* from the Eden differs from *T. cataractarum* in its stem leaves having a clearly differentiated nerve, the branch leaves having a well-defined nerve, strongly toothed apex, and more distinctly angular upper laminal cells.

Tom also commented that the differences noticed in the moss from the Eden may prove to be less marked if more material is examined.

△ River Eden, Cumbria. *Robert Goodison*

Derbyshire plants, for example, may have a few branch leaves that do not widen above the base, and their stem leaves can also vary according to where they occur on the frond.

T. angustifolium is endemic to Britain, otherwise known only from one rock in the Derbyshire Dales, where George Alfred Holt (1852–1921, a pharmacist from Manchester) discovered it in 1883. So its discovery by the Eden in Cumberland doubles the number of sites where it is known to occur. Classified as Critically Endangered, *T. angustifolium* is the subject of a Biodiversity Action Plan, and receives full protection under domestic legislation, as well as being one of only three British bryophytes on the International Union for Conservation of Nature's (IUCN) *World Red List*.

Early indications suggest that considerably more *T. angustifolium* grows in the Eden than at its site in the Derbyshire Dales, making the Eden the world's premier known site for this species. It certainly occurs on numerous rocks



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△ This page. *T. angustifolium* habit (1) and light micrograph of the shoot apex (2).

▷ Opposite page. Moist (3) and dry (4) *A. attenuatus*, and its habitat at the Eden site (5).

All photos Robert Goodison

along the course of the Eden, although detailed investigation of its local distribution remains a task for the future.

Fred Rumsey and colleagues are currently comparing the DNA of *Thamnobryum* species, and intend to analyse the plant from the Eden, which will shed more light on its affinities with Derbyshire's *T. angustifolium*, as well as congeners.

To find one rare moss in a day might be regarded as careless, but discovering two is suspicious. About a kilometre upstream from where the *Thamnobryum* grew, I came across a small pleurocarp that at first glance superficially resembled the nearby *Leskea polycarpa* in its small size and imbricate leaves when dry. But the strange moss had a branched habit and was growing on a boulder, whereas *Leskea* prefers bark. On wetting, the leaves quickly became patent, just like *Anomodon viticulosus*, which was growing nearby, but were well under 2 mm in length, so the moss on the boulder had to be *A. attenuatus*. This is the first record of *A. attenuatus* in England, being otherwise currently known in Britain only from one site in Angus, Scotland, where the Rev. John Fergusson (1834–1907) discovered it in 1868

and Gordon Rothero rediscovered it in 1996. Robert Hunt Meldrum (1858–1933) also found *A. attenuatus* near Elcho in Perthshire at the beginning of the 20th century, but the moss is no longer known from there. *A. attenuatus* is classified as Endangered in the *Red Data Book*.

A. attenuatus grows on rocks in at least two locations beside this stretch of river, about 300 m apart. However, as with *T. angustifolium*, more detailed investigation remains to be made of the size and extent of its population along the Eden.

Not only do we not yet know the sizes and extents of the populations of *T. angustifolium* and *A. attenuatus* in the Eden valley, but one also wonders what other species wait to be found along this stretch of riverside. I am willing to bet that the Eden has yet more secrets to reveal, for other botanists who explore the river will assuredly notice what I missed. Every naturalist has his or her own unique search pattern and blind spots, finding some species but overlooking more that other naturalists do not. During their Summer Meeting of 1982, the BBS explored the Eden about a mile upstream of where I was recording, but the report in the *Bulletin* suggests they found a surprisingly different suite of species. Why did they find different species to me, and why did I find different species to them? Are the differences between our lists attributable to habitat and substrates, or to personnel, or (more likely) both? And if both, is personnel a more influential factor than environment?



A naturalist who is reasonably familiar with common species will find more when searching alone rather than in company, for chatting with companions always distracts from work in hand. Even without distractions, I regard concentrating on identifying species (rather than merely gazing passively at them) as jolly hard work that demands a good deal of mental exertion, and invariably find my eyes glazing over after a couple of hours in the field. Moreover, human nature being what it is, a naturalist in a large group inevitably wonders what others are finding, and whether they are on more rewarding ground, so his attention strays to what they are doing and

might be finding, rather than concentrating on what lies in front of him.

And how do individuals' predispositions for making fresh discoveries arise? Why do these abilities vary so much from one naturalist to another? The mysteries of how culturally inculcated search patterns and images develop – or fail to develop – are fundamental to understanding our abilities as field naturalists, and worthy of far more attention than they receive. Yet the psychology of discovering and distinguishing species remains taboo, and naturalists rarely if ever discuss this matter.

However all this may be, you can't beat a pleasant day in one's own company, quietly exploring a beautiful stretch of river, proceeding at one's own preferred pace, pausing at will, and moving on again without distraction or hindrance.

*'Heard the news?' said the Rat to the Mole.
'There's nothing else being talked about, all along
the riverbank.'*

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