

Bryophytes of the Borders and Beyond

On the 20th of November (despite appalling wind and rain that evening) Berwick Wildlife Group members were fortunate to have Dr. David Long to talk to them about mosses and liverworts. Dr. Long, who works at the Royal Botanic Gardens in Edinburgh and has travelled all over the world in search of bryophytes, is an internationally renowned expert on these fascinating plants.

Bryophytes have been around on our planet for about 400 million years (compared to 200 million years for flowering plants). They are the “oldest” known land plants, thought to have evolved from aquatic algae. They are all small, mostly because they have no vascular tissue to transport water and nutrients around the plant, and are able to colonise extremely dry or cold habitats although they need liquid water at some time to grow and reproduce. Bryophytes are divided into 3 main groups: the liverworts (8,000 species in the world, 292 in Britain) which can be flat thick plates of tissue or have stems and leaves; mosses (10,000 in the world, 752 in Britain) and all of which are leafy; and hornworts (200 in the world, 4 in the UK, 3 in Berwickshire) which are small and flattish but have different reproductive structures.

Despite their diminutive size, bryophytes are an important component of natural ecosystems. They are particularly valuable in colonising and stabilizing bare ground (e.g. road cuttings), in holding water and preventing rapid run-off and floods in wet periods and retaining water for other plants in dry times, and in producing peat, a valuable store of carbon among other things. Several Berwick and Berwickshire residents have been distinguished bryologists, for example George Johnston who was a doctor in Berwick from 1818 to 1853, and founded the Berwickshire Naturalists' Club, collected the oldest known moss specimen from Berwickshire (*Hedwigia stellata*, Starry Hoar-moss) from Lamberton Moor in 1827. James Hardy from Coburnspath (1815 to 1898) wrote a moss flora of Eastern Berwickshire in 1868, and John Bishop Duncan who lived in Berwick from 1923 to 1953, left a bryological collection now with the Royal Botanic Garden in Edinburgh. Their studies included some excellent local bryophyte sites which hold rare species to this day, such as the cliff gullies of St Abbs (appropriately including Bird's-foot Wing-moss, *Pterogonium gracile*), Siccar Point, Holy Island, the Tweed bank woods, Dogden Moss, Traprain Law and others.

Dr Long has been on expeditions all over the world to study particularly good sites for mosses and liverworts, and he introduced the Group to some of these places and their bryophyte flora. The plants not only look beautiful, but have attractive Latin and English names. The Atlantic Oakwoods of western Britain are a key habitat of international importance for bryophytes, as are more open maritime areas like St. Kilda where Arctic and Mediterranean species grow side-by-side, or the quartzite top of Beinn Eighe where there are several endemic species. Other interesting and important sites that Dr. Long has visited include unusual wet evergreen forests high in the mountains of China (where the team discovered a new moss, *Shevockia inunctocarpa*), and New Zealand where there are many representatives from the southern temperate bryophyte flora. Unfortunately some of these species now grow in Britain, having been imported with garden plants like tree-ferns, and some are becoming common throughout Europe.

As well as the problems of competing southern hemisphere species, bryophytes like other plants are retreating from areas subject to development and agricultural improvement, and they are also being damaged by pollution, muirburn, hydro-electric schemes, disturbance associated with windfarms, and by climate change. These diminutive but very important plants deserve better protection, which can only come through increased awareness and better scientific understanding, leading to conservation initiatives, such as protection of broadleaved woodlands.

As anyone who has ever tried to remove mosses from their lawn will know, given the right conditions they will thrive and multiply. One of the best ways to really encourage moss on the lawn is to rake it "out", as each fragment of moss broken off has the potential to grow into a complete new plant. Much better to learn to love the moss, you'll find it needs a lot less maintenance than the grass.

Fiona