

## OBSERVATIONS ON SOME RARE OR UNUSUAL MOSSES OF CANTERBURY

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The Canterbury region, with its topographic, geologic, and climatic diversity, has a correspondingly rich moss flora. However, many botanists, both professional and amateur, largely overlook the diversity and the beauty of the mosses, probably because they have a reputation for being difficult taxonomically. This reputation is undeserved; the recognition of mosses in the field is generally no more difficult than that of flowering plants. The differences are largely a matter of scale and with a good quality 10–14 × hand lens the observant field botanist can learn to recognize nearly all genera and the majority of species.

The New Zealand moss flora is currently considered to include 516 species in 207 genera (Fife 1995 and unpublished data). Of this number 493 species are considered to be indigenous, 113 endemic, and 28 adventive. Ten genera, but no moss families, are considered endemic.

Some 50 species are being recommended (by Fife, Beever, and Brownsey, based on unpublished data) to the Department of Conservation for inclusion on a list of nationally rare or threatened species.

Although no firm figures are available for the moss flora of Canterbury, Macmillan (1996) has published a useful catalogue of 234 species found on Banks Peninsula. William Martin (1946) published a still useful discussion of the mosses of Arthur's Pass National Park. I have also attempted to produce an updated list of the mosses of the Park; it presently includes 261 species (Fife, unpublished) and is based partially on an earlier compilation by Colin Burrows.

It is difficult to isolate just a few rarities worthy of special comment from the Canterbury flora; a preliminary attempt to do so for the purposes of this paper resulted in a list of over 30 species. Two species and two varieties (*Entosthodon muehlenbergii*, *E. subnudus* var. *subcuspidatus*, *Crossidium davidai*, and *Pseudocrossidium crinitum* var. *obscurum*) have each been collected at only one site in Canterbury. But such obscure and difficult-to-recognise taxa are unlikely to attract enthusiasm from amateurs.

It seems more appropriate here to discuss a handful of somewhat better known, albeit still rarely collected species. There are many well-documented but rare species in Canterbury that have an interesting tale to tell, often involving colourful Canterbury botanists, and sometimes present or past members of the Canterbury Botanical Society.

One such species has until recently been known as *Chorisodontium burrowsii* Allison. This species is known from the upper reaches of Rough Creek, whence collected by Colin Burrows in 1960, from Mt. Wakefield, near Mt. Cook, as well as from two high-elevation localities in Otago. It grows adjacent to alpine streams and late snowbeds, and has a habit somewhat suggestive of a robust and thick-leaved

*Dicranoloma*. Bartlett and Frahm (1983) suggested that it might be misplaced in *Chorisodontium*. A recent re-examination of all the New Zealand collections shows convincingly that they are referable to *Verrucidens turpis* (Cardot) Cardot, (see p. 20) a species described from Tierra del Fuego and previously thought to be confined to southernmost South America. *Verrucidens* is a small austral genus allied to the better-known *Blindia* and to *Seligeria*, mentioned later in this article. The occurrence of *V. turpis* in alpine habitats of Canterbury provides a dramatic example of the well-known New Zealand–Patagonian disjunction pattern, first commented on in detail by J. D. Hooker (1852).

*Ptychomnion densifolium* (Brid.) A.Jaeger, a species of subalpine grasslands, is known from only two Canterbury localities but also from other recent collections the length of the South Island. It exhibits a similar “austral” distribution, including Patagonian and subantarctic island localities (Tangney and Fife 1997). David Glenny (pers. comm.) informs me that this species, known from mainland New Zealand for less than a decade, is particularly abundant near tree-line on the Barron Range, just west of the Main Divide.

Another plant associated with alpine streams and seepages, *Entosthodon laxus*, is a personal favourite of mine. For many decades the name *Funaria subattenuata* was applied to this species in New Zealand; the type of this name was collected from the “swamp at the top of Arthur’s Pass” by T. W. N. Beckett. *Funaria subattenuata*, which can be easily viewed in seeps along the Otira Valley Track, was thought to be a New Zealand endemic until I made a detailed study of its distribution (Fife 1987) and showed it to be identical to plants collected from Patagonia, high elevation in the Andes as far north as Venezuela, Kerguelen and other subantarctic islands, Tasmania, and Victoria. *Entosthodon laxus* was first collected on the island of Kerguelen by J. D. Hooker on the Erebus and Terror Expedition; it has been redescribed from other localities and under other names eight times, including two times from Canterbury material. It occurs on at least two oceanic volcanic islands (Marion Id. and Macquarie Id.) where the oldest rocks are less than a million years old (McDougall 1971; (Selkirk et al. 1990 pp. 40 and 49) and is thus a convincing candidate for a species that has obtained its present distribution by means of recent (post-Tertiary) long-distance dispersal.

The Castle Hill–Broken River basin contains several mosses of particular interest, of which I will mention only three. *Grimmia argentea* R. Br.bis is one of the most spectacular and significant mosses found there, forming hoary-white cushions to about 40 mm diameter atop limestone boulders and pinnacles. This species was thought for many decades to be a highly restricted New Zealand endemic, but recently two European botanists (Ochyra 1993; Greven 1998) have concluded that *Grimmia argentea* is conspecific with the rare European *G. plagiopodia* Hedw. There is no reason to suspect that *G. plagiopodia* is anything other than an indigenous moss at Castle Hill. Casual observations suggest that the population there has declined in the past fifteen years, probably due to rock-climbing activities in the Reserve. There is a strong case to be made for active management to prevent further decline of the only New Zealand population of this very rare and distinctive moss.

A much less conspicuous and less well-documented species at Castle Hill is the endemic *Seligeria diminuta* (R. Br.bis) Dixon. This is a minute plant that grows on

moist limestone, and is one of the most narrowly distributed of New Zealand's endemic mosses. It was first collected in 1891 by Robert Brown, a Glasgow-born naturalist who is surely among the most colourful of Canterbury botanists of his era (see Godley 1967, p. 251). In their treatment of *Seligeria* for New Zealand, Vitt and Bartlett (1983) were able to cite only three collections from the Castle Hill/Cave Stream area. In 1989, David Glenney made an additional collection from near Taylor's Stream at Mt. Alford. *Seligeria diminuta* grows as loose assemblages of inconspicuous plants, each with a strongly curved seta, and standing less than 3 mm tall. Unless fruiting, the plants are virtually invisible. *Seligeria* is a genus confined to calcareous rocks and, not unexpectedly, a second species of the genus, *S. cardotii* R. Br.bis, also occurs at Castle Hill. More often collected but equally inconspicuous, it is also a New Zealand endemic but is more widely distributed on the two main islands.

*Bartramia crassinervia* Mitt. belongs to a large genus of worldwide distribution and sometimes known as "apple-mosses" because of their globose, red capsules. There are five species of *Bartramia* in New Zealand, with two widespread and common in Canterbury. *Bartramia crassinervia*, however, is an exceedingly rare species and was first collected in 1863 by Julius von Haast on the Hopkins River in southern Canterbury. Subsequently, it has been found at Rough Creek (initially by Max Visch), and unlocalised in Mt. Cook National Park, and in the Hawkdun Ra. of Otago. It is an example of a rare endemic species which a keen-eyed amateur could profitably seek in subalpine areas in Canterbury and the South Island generally.

Another remarkable species known mostly from Canterbury is a striking species of *Racomitrium* described by Bednarek-Ochyra and Ochyra in 1996. This species, with the cumbersome name *R. curiosissimum*, was first recognised as a distinct species by K. W. Allison in 1964, based on earlier collections from Mt. Grey and Ben More. Unfortunately, Allison did not formally publish his name for this species. Bryony Macmillan collected *R. curiosissimum* from Bankside Reserve in 1970 and from Stony Bay Peak on Banks Peninsula in 1972, but it is possibly extinct at the latter site. It is well-documented and abundant on gravel at the crest of an alluvial terrace above Cave Stream. Like the related *Grimmia plagiopodia*, this is a hoary-looking plant when dry. It has generally been confused with *R. pruinatum*, a widespread species with conspicuous white hair-points, but *R. curiosissimum* is readily recognisable in the field by the lovely glass-like ("hyaline") appearance of its leaf hair-points. At present *R. curiosissimum* is known from 13 Canterbury and 3 Otago localities (Fife 2000) and several bryologists are seeking it in eastern districts throughout the country.

There are many other tales that could be related about Canterbury mosses, involving species notable for their rarity, their distribution, their beauty, or the personalities associated with their discovery. But, I will end here, much as I began: by pointing out that for botanists familiar with the flowering plants of Canterbury, the mosses are a major but largely understudied portion of the regional flora. Their perceived taxonomic difficulty is primarily a function of scale and the routine use of a good-quality hand lens can reveal a new dimension for botanists, either amateur or professional, who are looking for new challenges.

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