The status of *Grimmia austrofunalis* in Britain and Ireland is controversial. Here, **Henk Greven** expresses his opinion that this taxon does indeed exist in this region.

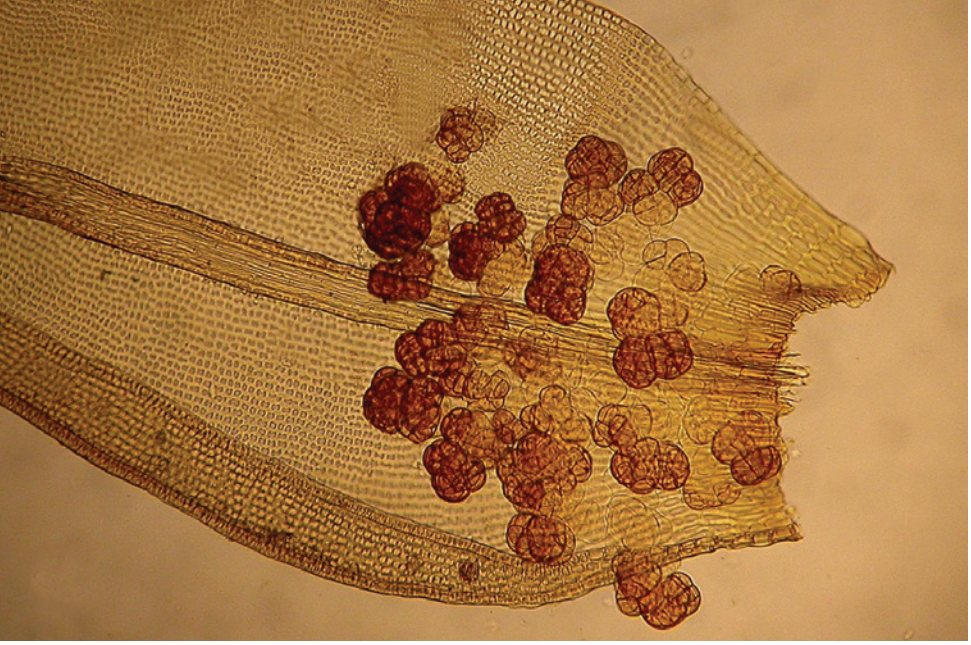
Grimmia austrofunalis Müll. Hal. in Britain and Ireland?

In March 1883, the Australian botanist D. Sullivan collected an unknown *Grimmia* species from the slopes of Mt William (alt. 1,167 m), the highest peak in the mountainous Grampians of Victoria, south-eastern Australia. The material was stored in the Melbourne herbarium and subsequently sent for identification to Carl Müller in Halle, Germany, who described it as a new species (Müller, 1898). I have studied the type of *Grimmia austrofunalis* (MEL 29152), which has a stem length of 3–4 cm (Fig. 1). Later, this species was variously described from Latin America as:

- *Grimmia pansa* R.S.Williams; Bolivia [*Bull New York Bot Gard* **3**, 125 (1903)]
- *Racomitrium austrosudeticum* Herzog; Bolivia [*Biblioth Bot* **87**, 60 (1916)]
- *Grimmia crassiretis* Cardot & Brotherus; Argentina [*Kongl Svenska Vetenskapsakad Handl* **63(10)**, 27 (1923)]
- *Grimmia benoistii* Thériot; Ecuador [*Rev Bryol Lichénol* **9**, 10 (1936)]

In 1872, the British bryologist J. Fergusson described a new species from Scotland as *Grimmia robusta* (Braithwaite, 1872). Braithwaite sent material to Prof. Lindberg, who answered: '*I am quite unable to separate* G. robusta *from* G. decipiens *(Schultz) and* G. schultzii *(Bridel)*'. Subsequently, *G. robusta* was reduced to a variety

◁ Fig. 1. *G. austrofunalis* Müll. Hall. Australia, Victoria, Grampians, Mt William (alt. 1167 m), Leg. D. Sullivan, March 1883, Type specimen, MEL 29152. *Henk Greven*



◁ Fig. 2. Propagules formed on dorsal side of basal lamina of *G. austrofunalis* Müll. Hal. Australia, New South Wales, Southern Tablelands, Talbingo, leg. M.E. Philips nr. 2147, MEL 33792. *Henk Greven*

of *G. decipiens* by Braithwaite (1888–95) and was treated as a subspecies of *G. decipiens* by Dixon & Jameson (1924). Loeske (1930) remarked that he had seen two British specimens of subsp. *robusta*, but that he could not see any relation with *G. decipiens* and he noticed: 'G. robusta *seems, just like* G. retracta *and* G. subsquarrosa *to belong to one of the Atlantic modifications or races*'. Smith (1978) treated the taxon as a variety of *G. trichophylla*, remarking that the nature and the status of the five varieties – *robusta*, *subsquarrosa*, *trichophylla*, *stirtonii* and *tenuis* – was not clear. Smith (1992) wrote that he had seen many specimens of var. *robusta* and had not encountered any intermediates between it and var. *trichophylla*, and that Alan Crundwell (pers. comm.) had expressed a similar view. After examination of 18 specimens in herberia A.J.E.S. and NMW, he came to the conclusion that there seemed to be no reason for treating var. *robusta* as anything other than a distinct species. As Ferguson's epithet *robusta* is an illegitimate homonym of the 1827 *G. robusta* Nees & Hornsch. (=*Schistidium robustum*), a new name was required and, because in the opinion of Smith the species was endemic to the British Isles, *Grimmia brittannica* A.J.E.Smith nom. nov. would seem appropriate.

In 1995, I accepted *G. brittannica* A.J.E.Smith as a good species (Greven, 1995). However, during a revision of about 1,700 *Grimmia* samples from AK, E, HO, MEL, OTA, PERTH and WELT, 52 specimens of *G. austrofunalis* were encountered and I sent a sample from Tasmania, and one from New Zealand to Tony Smith, who replied that the specimens were undoubtedly *G. brittannica*, upon which I described the differences between *G. trichophylla*, *G. austrofunalis* and *G. decipiens*, noting that *G. austrofunalis* is a common species in Australia and New Zealand, but that it also occurs in Ireland, Scotland and Wales (Greven, 1997).

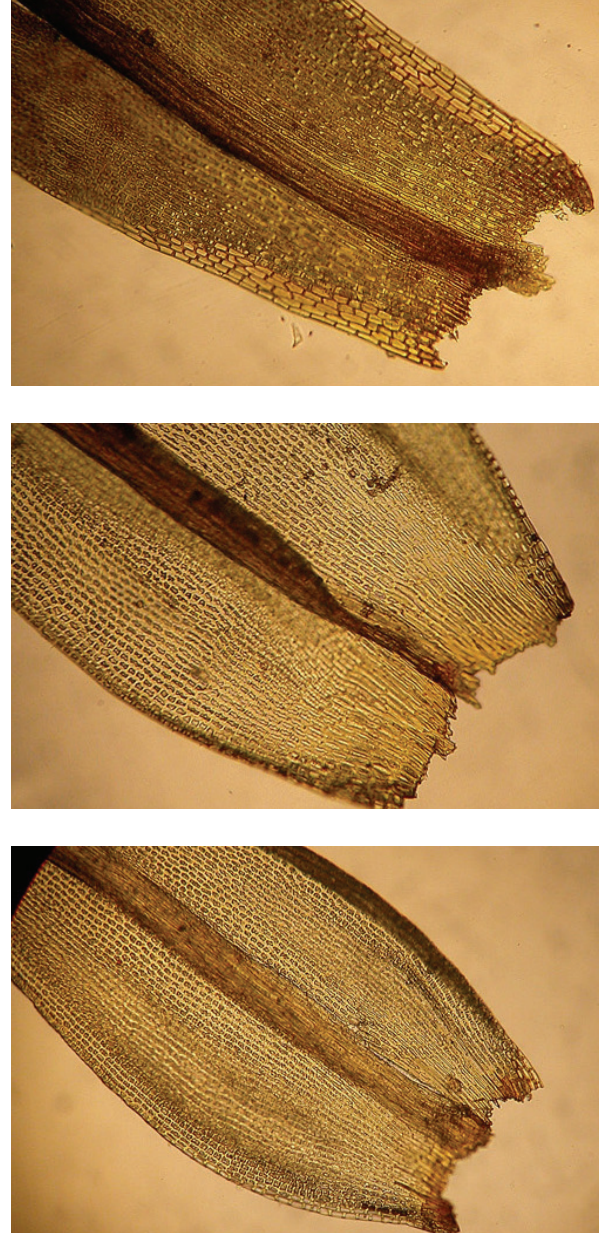
After a herbarium revision of *Grimmia* in Latin America, Muñoz (1999) noted in his key:

36a *Propagulae sessile on lamina, seldom on the costa, no stalk remaining after propagulae libation, which causes leaf destruction; lamina bistratose at margins and in streaks; plants less than 3 cm; spores minutely granulose, apparently smooth under light microscope* ..... ***G. trichophylla***

36b *Propagulae on stalks at dorsal base of costa, the stalk 1(2) cells long remaining attached to the costa after propagulae liberation, which does not affect the leaf; lamina unistratose except the sometimes 2-stratose 1 or 2 marginal rows; plants to 8 cm; spores coarsely and distinctly granulose under compound microscope* ..... ***G. austrofunalis***

Subsequently, Muñoz wrote in Muñoz & Pando (2000): '*All European specimens, identified as* G. austrofunalis *are other species. Greven (1997) listed several specimens, from which the first author was only able to study Greven 2020 (S). It is typical* G. longirostris*, with reniform costa, long-rectangular, nodulose, juxtacostal cells, and no gemmae at costa back.*'

Smith (2004a) described the above-mentioned key couplet from Muñoz (1999) as '*striking differences*' between *G. trichophylla* and *G. austrofunalis*. It is true that Latin American *G. austrofunalis* specimens from the Andes, probably as an adaptation to high altitude, deviate from Australian, New Zealand and UK lowland specimens, in growth form as dense cushions with black undivided, long stems (4–6 cm), somewhat glossy leaves, and very short hair points. This might be the reason why Muñoz previously considered *G. pansa*, described by Williams from the Bolivian Andes (alt. 3,450 m), as a good species; in PC, I found two samples of *G. pansa* and two samples of *G. crassiretis*, identified by Muñoz as *G. pansa*. However, just like other Grimmias, especially those from the *G. trichophylla* group, *G. austrofunalis* is very variable in colour, stem length, appearance of the leaves and occurrence of propagules. I studied this variability in the field by collecting numerous samples in Australia, New Zealand, Bolivia, Venezuela, Mexico and in the UK. Over time I have seen nearly 100 samples of *G. austrofunalis* – propagules are usually absent, capsules are extremely rare and the stem length ranges from 1.5 to 4.0 (6.0) cm. The type specimen of *G. pansa* has a stem length of 4.0 cm and the type specimen of *G. crassiretis* has a stem length of 3.0 cm. Also, in *G. trichophylla*, propagules are sometimes formed on stalks at the base of the costa; in *G. austrofunalis* propagules are also found on the leaf base of the lamina (Fig. 2). But



△ Fig. 3. Leaf of *G. trichophylla* Grev. from Ireland (top) compared with leaves of *G. austrofunalis* Müll. Hall. from Australia (type specimen – middle) and Ireland (bottom). *Henk Greven*

more importantly, in the type specimen of *G. austrofunalis*, propagules are absent, and they are also not noticed in the protologue. Furthermore, there is no character in *Grimmia* as variable as stem length. I have seen many specimens of *G. austrofunalis* from Australia and New Zealand with a stem length less than 3 cm. As a result of this, the majority of the *G. austrofunalis* specimens cannot be identified by the key of

△ Fig. 4. Habit of *G. austrofunalis* Müll. Hall (type specimen from Australia – left) and a sample from Scotland (right). *Henk Greven*

Muñoz, especially because in *G. trichophylla* the lamina is also usually unistratose, and *G. austrofunalis* capsules are extremely rare.

Greven (1997) gives a table with the differences between *G. trichophylla*, *G. decipiens* and *G. austrofunalis*. Since *G. decipiens* is autoicous, capsules are usually present and the perichaetial leaves have long sharply denticulate hair points, we need to describe steady characters in which *G. austrofunalis* differs from *G. trichophylla*. After a renewed comparison of a large number of *G. austrofunalis* samples from Australia, New Zealand, Latin America and the UK with *G. trichophylla* samples from the UK, it appears that characters from the protologue are appropriate to distinguish both species, as described below.

G. austrofunalis plants are reddish-brown above, blackish below, the leaves are ovate-lanceolate, of more or less uniform length along stem. The lamina cells are yellowish, with sinuosely incrassate walls, running down nearly to the leaf base.

G. trichophylla plants are yellowish- to blackish-green, the leaves are oblong-lanceolate, and the upper leaves are longer than the lower leaves. Lamina cells with sinuosely incrassate walls are, just like propagules, occasionally present but never run down nearly to the leaf base (Fig. 3).

When Tony Smith worked on the second edition of *The Moss Flora of Britain and Ireland*, he asked Jesus Muñoz to assist him with the genus *Grimmia*. As a result of this, in Smith (2004b) the British plants of *G. austrofunalis*, carefully mapped by Smith in Hill *et al.* (1992), have been considered synonymous with *G. trichophylla*. That is a regrettable loss because Tony Smith and Alan Crundwell were correct in their opinion that var. *robusta* differs significantly from var. *trichophylla*, and Smith was correct when he wrote to me that the samples of *G. austrofunalis*, that I had sent him from 'down under', were undoubtedly *G. britannica* A.J.E.Smith (Fig. 4).

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References

Braithwaite, R. (1872). Recent additions to our moss flora. V. *Journal of Botany (London)* **10**, 193–199.

Braithwaite, R. (1888–1895). *The British Moss Flora, Vol. 2. Acrocarpi 2*. London: Reeve.

Greven, H.C. (1995). *Grimmia Hedw. (Grimmiaceae, Musci) in Europe*. Leiden, The Netherlands: Backhuys Publishers.

Greven, H.C. (1997). *Grimmia austrofunalis* C. Müll., a species with a misleading name and a disjunct distribution. *Journal of Bryology* **19**, 829–832.

Dixon, H.N. & Jameson, H.G. (1924). *The Student's Handbook of British Mosses*, 3rd edn. Eastbourne: Sumfield & Day.

Hill, M.O., Preston, C.D. & Smith, A.J.E. (1992). *Atlas of the Bryophytes of Britain and Ireland*. Colchester: Harley Books.

Loeske, L. (1930). *Monographie der Europäischen Grimmiaceen*. Stuttgart: Nägele.

Müller, C. (1898). Symbolae ad Bryologiam Australiae II. *Hedwigia* **37**, 165.

Muñoz, J. (1999). A revision of *Grimmia* (Musci, Grimmiaceae) in The Americas. 1: Latin America. *Annals of the Missouri Botanical Garden* **86**, 118–191.

Muñoz, J. & Pando, F. (2000). *A World Synopsis of the Genus Grimmia (Monographs in systematic botany from the Missouri Botanical Garden, vol. 83)*. Missouri Botanical Garden Press.

Smith, A.J.E. (1978). *The Moss Flora of Britain and Ireland*. Cambridge: Cambridge University Press.

Smith, A.J.E. (1992). The taxonomic status of the British varieties of *Grimmia trichophylla* Grev. *Journal of Bryology* **17**, 269–273.

Smith, A.J.E. (2004a). Notes on British and Irish *Grimmia* species. *Field Bryology* **82**, 8–10.

Smith, A.J.E. (2004b). *The Moss Flora of Britain and Ireland*, 2nd edn. Cambridge: Cambridge University Press.