

**Note 1.** Tubers on *Campylopus flexuosus* have been found by S.D.S. Bosanquet on a specimen collected at Mynydd Preseli (v.-c. 45) in 2003.

**Note 2.** The report of tuber-bearing *Campylopus fragilis* in Cornwall is based on a specimen collected by S.D.S. Bosanquet at St Genys (v.-c. 2) in 2000.

**Note 3.** Arts (1986b) did not publish the details of the Irish specimen of *Campylopus pyriformis* with tubers; it was collected at Letterdyfe, Roundstone (v.-c. H16) in 1986 (Arts 13208) and is now in BR (H. Stieperaere, in litt., 2003).

**Note 4.** The report of tuber-bearing *Cynodontium bruntonii* from Monmouthshire is based on a specimen collected by S.D.S. Bosanquet on Mynydd Bedwellte (v.-c. 35) in 2001.

**Note 5.** D.T. Holyoak detected tubers on male plants of *Ditrichum lineare* collected by S.D.S. Bosanquet in Fwng Forest, Carmarthenshire (v.-c. 44) in 2002.

**Note 6.** The report of tuber-bearing *Epipterygium tozeri* from Carmarthenshire is based on a specimen collected by S.D.S. Bosanquet near Newcastle Emlyn (v.-c. 44) in 2000.

**Note 7.** Tuber-bearing plants of *Fissidens taxifolius* were illustrated by Whitehouse (1966) from Witchford, Cambridgeshire (v.-c. 29). Since 2001, I have examined material from 10 arable fields in the county and found tuber-bearing plants at only two sites. However, S.D.S. Bosanquet has recently found tubers in three out of four samples from arable fields in Monmouthshire (v.-c. 35), and in one sample from an arable field in Pembrokeshire (v.-c. 45).

**Note 8.** Since 2001, S.D.S. Bosanquet, J.D. Sleath and I have found tubers on material of *Poblia melanodon* from arable fields in v.-c. 1, 9, 29, 35, 36, 37, 40, 41, 52, 61, 89, 93, H11, H19, H21, H22, H23 and H31.

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# *Grimmia nutans* Bruch: ecology, morphology and distribution

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## Original description of *Grimmia nutans*

In 1828, a certain Fleischer botanised in the mountains around Smyrna (present-day Izmir) in Turkey. His moss collections were published by a friend, the pharmacist Fr. A. Müller (1829). Some of these were new to science, among them a *Grimmia*. Müller, who had insufficient knowledge about *Grimmias*, sent the material to a pharmacist colleague, Ph. Bruch, in Zweibrücken, Germany. Bruch, one of the authors of the *Bryologia Europaea*, described the material as *Grimmia nutans* Bruch. After this, the species disappeared from the literature for 160 years.

## *G. nutans* in Greece and the Canary Islands

In 1987, Cliff Townsend collected near the Varlaam monastery of the Meteora at Kalabaka, Greece, a *Grimmia* that was unknown to him. He

tried to identify the species but, finding no helpful notes in works such as Loeske (1930), Henderson & Prentice (1969), Savicz-Ljubitskaya & Smirnova (1970) and Cetin (1988), he published his species as *Grimmia meteorae* sp. nov. (Townsend, 1989). Characteristic features of the species included secund leaves with bistratose upper laminas running down the leaf in ridges, 3-4 stratose leaf margins, straight cell walls, cygneous setae and smooth capsules. At almost the same time, the Dutch bryologist Gerard Dirkse found an unknown *Grimmia* on Gran Canaria (Pozo de las Nieves, 1620 m alt.). When he described to me the rather peculiar morphology and ecology of his species, I told him that he had probably found *G. meteorae*. This appeared to be correct, and consequently Dirkse & Greven (1993) published *G. meteorae* as new to the Canary Islands.

I became more and more interested in this peculiar disjunct *Grimmia*. Both Townsend and Dirkse collected the species from damp, shaded rock with seeping water – an extreme habitat for a *Grimmia*. I studied their plants and found that they were clearly different from all other *Grimmia* taxa. I could hardly believe that this characteristic species had never been collected earlier. I realised that Kalabaka, in terms of the *Index Muscorum*, is on the fringe of Europe, and so the species could have been described from adjacent Asia. I searched for *Grimmias* described from As 5 in Wijk, Margadant & Florschütz (1962), and found *G. nutans* Bruch, a name that suggested an arcuate seta, which was present in the richly fruiting plants from Kalabaka and Gran Canaria. I received on loan from BM a gift from Bruch to William Wilson; on a card, a row of nicely fruiting *G. nutans* specimens had been glued, identical to the plants from Kalabaka and Gran Canaria. I mailed Cliff Townsend and told him that I had to synonymise his *G. meteorae* with this species; he mailed in return, 'No hard feelings Henk – I also have synonymised species described by others'.

### *G. nutans* in Cyprus

I considered that *G. nutans*, which grows in rather large, glaucous cushions, usually with clearly exerted capsules on cygneous setae, was almost certainly absent from the Austrian and Swiss Alps, as it would surely have been noticed there by alpine bryologists such as Amann, Breidler, Hornschuch and Mühlenbeck. It became increasingly clear to me that *G. nutans* was a native of Mediterranean areas. I therefore booked a journey to Cyprus, where I felt there was a good chance that I would encounter *G. nutans* in the Troodos Mountains. In addition, I would have the opportunity to visit the locus classicus of *G. ungeri* Jur., described from Mt Olympus, the highest peak in the Troodos. After five days driving through these mountains, I found *G. nutans* on Mt Kionia, along a small, winding mountain road with on one side a large ravine and on the other steep, damp rock with

running water in places. The conspicuous glaucous cushions with capsules on cygneous setae were unmistakable.

### Other records of *G. nutans*

After establishing the identity of *G. nutans* (Greven, 1994), I went in search of the missing link. The species was now known from Turkey, Greece, Cyprus and Gran Canaria. I could hardly imagine that it was absent from localities in between. As mentioned above, the Alps were disregarded, as *G. nutans* is too conspicuous to have been overlooked. The Pyrenees also have been thoroughly investigated since the beginning of the 19<sup>th</sup> century, but the High Atlas of Morocco seemed a possibility. In the *Index Muscorum*, I looked for *Grimmias* described from North Africa, and *G. verticillatula* Thér. & Trab., described from the High Atlas, seemed a good candidate. In the protologue, Thériot & Trabut (1930) state: 'Hab. in rupibus arenaceis Atlantis Majoris: in ditone Glaoua supra pagum Zerekten, ad. alt. 1400-1600 m, leg. Dr. R. Maire, 1926'. Type material from Paris (PC), appeared to be identical to *G. nutans*. I had found the missing link and booked a journey to Agadir. From this city it is rather easy to travel into the High Atlas by car. However, I could not find the village of Zerekten on maps bought in Agadir. I travelled around for some days in the Atlas mountains but nowhere located *G. nutans*. However, nice populations of *G. capillata* De Not., a Mediterranean species of sunny limestone and chalk, provided some consolation.

Subsequently, new localities for *G. nutans* have been discovered. Hébrard (2000) noted the species from the French departments Var and Alpes Maritimes. He made relevés of a vegetation type that he indicated as 'Association à *Grimmia nutans* et *G. lisaë*'. Thus, the distance between Greece and Morocco has been bridged.

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# *Petalophyllum ralfsii* inland in Carmarthenshire (and in a plant pot in Monmouthshire!)

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## The habitat of *Petalophyllum* in Britain

The habitat exploited by *Petalophyllum ralfsii* in Britain has long been considered to be relatively tightly defined – periodically flooded hollows and slacks in coastal dunes. The only confirmed record away from the coast is from a damp hollow in an old calcareous grit quarry in Sligo (v.-c. H28) (Paton, 1999). Published records from limestone turf in South Devon (v.-c. 3) (Pool, 1999), and from a fly-ash lagoon in Carmarthenshire (v.-c. 44) (Pryce, 1999) were both misidentifications of *Fossombronina* species.

## Previous records of *Petalophyllum* in Carmarthenshire

*Petalophyllum* was first recorded in Carmarthenshire at Tywyn Burrows by H.H. Knight in 1906. Much of this site was planted with conifers in the middle of the last century, but *Petalophyllum* was again reported from there in 1998 (Pryce, 1999). A subsequent search in 2001 by David Holyoak failed to find the species and, considering the past history of confusion between *Petalophyllum* and *Fossombronina* species, this record should be regarded as unconfirmed. The species has recently been reliably recorded