Grimmia tergestina in Britain

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Description of *Grimmia tergestina* and related species

Grimmia tergestina is a thermophilous, basicolous species with a Mediterranean distribution. It generally occurs on limestone, calcareous sandstone and basic volcanic rock and is known from lowland to alpine zones. In The Netherlands it has also been recorded on concrete and on an asbestos roof. It forms black-green, hoary flat mats that with age can become loose and patchy. The leaves are shiny and concave with long hair points, although male plants have shorter hair points and are smaller (see front cover).

Well-grown plants of *Grimmia tergestina* are similar to *G. laevigata*. Both plants have leaves bistratose above, but in *G. laevigata* the basal cells are characteristically transversely oblong. Further, in contrast to *G. tergestina*, *G. laevigata* is a plant of acidic to slightly basic rocks. *G. ovalis* is also similar to *G. tergestina* but differs in having acuminate leaves as opposed to leaves tapering to a broad apex.

European and world distribution

Grimmia tergestina is commonest in the southern and eastern countries of Europe, including some Mediterranean islands. Outside of Europe it is known in central Asia, northern Africa, and South America. Greven (1991) describes a recording in Belgium in 1982 and over 30 subsequent records from Belgium and France; he makes the suggestion that the species has spread recently northwest through Europe, possibly to include Britain.

British distribution

The British records of *Grimmia tergestina* are summarised in Table 1 and Figure 1. Greven (1994) examined a specimen of supposed *Grimmia anodon* collected by E.C. Wallace in Argyll in 1966 and identified it as *G. tergestina*. In light of this Blockeel (1996) examined herbarium material of *G. anodon* and *G. laevigata* to see if any of these

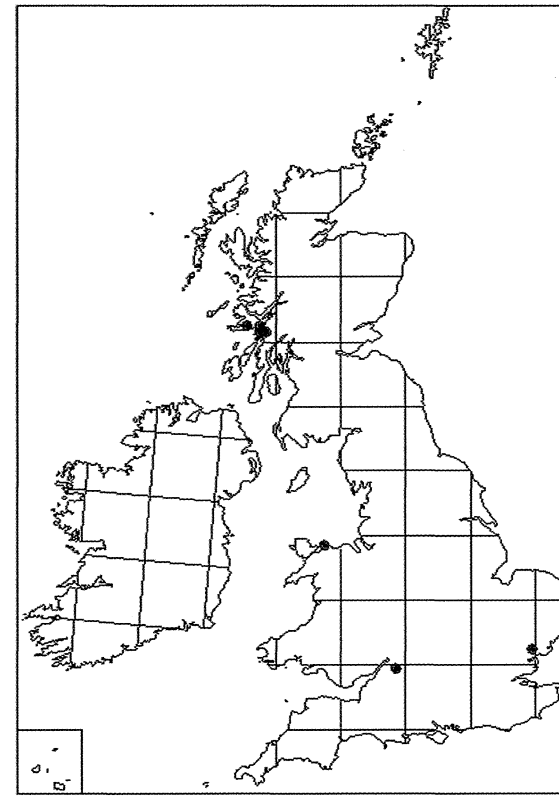

Figure 1. *Grimmia tergestina* records in Britain.

Location	Grid ref.	V.-c.	Date	Collector	Sex
Creagan Sturra, above Melfort-Degenish Road, Loch Melfort	NM821143	98	08/09/1965	M. Corley	male
Basic rocks on cliff, Creagan Sturra, Loch Melfort, Argyll	NM821142	98	12/08/1996	Whitehouse, Greven & Porley	male, female and fruit
Creagan Sturra, Loch Melfort, Argyll	NM821143	98	09/08/1966	E.C. Wallace	male
Creagan Sturra, Loch Melfort	NM821143	98	May-67	A. Stirling & A. Kenneth	male
Dun Cratagain, Loch Melfort	NM786137	98	Aug-71	M. Corley	female
Coastal rocks, Rubha na Feundain, Kerreara	NM786267	98	May-92	G. Rothero	?
Sea cliff Carsaig Bay, Isle of Mull	NM550211	103	May-68	James & Duncan	female
Cliffs, W. end of Ogof Deubar, Great Ormes Head, N.Wales	SH775823	49	18/02/2003	N. Hodgetts	female
Church porch, Myland near Colchester	TL989275	19	14/02/2004	T. Pyner	?
Chest tomb, St Mary's church, Tetbury	ST891930	34	11/11/2006	P. Martin	male
Wall top, 60 West St, Tetbury	ST888930	34	14/11/2006	P. Martin	male

Table 1. British records of *Grimmia tergestina.*

plants had been misidentified. He found three specimens recorded from S.W. facing basic rocks from Argyll and one from Mull that could be assigned to *G. tergestina*. In 1996 members of the BBS visited one of these sites, Loch Melfort, and recorded fruiting material for the first, and so far only, time in Britain (Porley 1997).

A further Scottish locality was identified on Kerreara in 1992. In 2003 *G. tergestina* was recorded from its only Welsh locality on the Great Ormes' Head in North Wales. The first record for England was in Colchester, Essex (2004). In 2006 a second record from southern Britain was found in the churchyard at Tetbury in Gloucestershire and soon after another record from a Tetbury garden wall (Peter Martin's!).

Grimmia tergestina in southern Britain

The plants from Colchester are growing on a west facing limestone buttress of a church porch at Myland, alongside *Grimmia pulvinata*. In Tetbury the largest colony is on the upper surface of a churchyard chest tomb that is constructed from the local oolitic limestone (Figure 2). The second Tetbury site is a south facing, 45° angle copingstone of a garden wall 300m from the church colony (Figure 3). It appears that the limestone used for the tomb and the wall top comes from a section of the oolitic limestone that is more durable and harder than the softer rock typically seen in Cotswold wall construction. In both the Tetbury sites the rock supports very little other bryophyte growth; on the tomb there are very small amounts of *Tortula muralis* and *G. pulvinata* and similarly little other bryophyte cover occurs on the garden wall top – a small amount of *T. muralis* only and this confined to a small crack in the stone.

Figure 2. *Grimmia tergestina* at St Mary's Church, Tetbury. Photo: Peter Martin.

Figure 3. *Grimmia tergestina* at 60 West Street, Tetbury.

Distribution of sex in *Grimmia tergestina*

Grimmia tergestina is dioicous. Although fruit production is uncommon in dioicous plants, fruit is not infrequent on *G. tergestina* in its stronghold in southern Europe. The sex of the northern European plants has been identified and an interesting pattern has emerged. The 30+ records from the 1980s in Belgium and France were all female. In contrast the first record in The Netherlands in 1990 was male. Since then fruit has been found in Belgium and France, but not in The Netherlands. This suggests the possibility of distribution not only by spore from populations in the south of Europe but also via vegetative propagation. The Tetbury wall population is made up of two small cushions separated by 1m, one clump presumably propagated from the other vegetatively.

The fruiting site at Loch Melfort includes both male and female plants. Female plants are known from nearby Dun Cratagain and from Mull. Further south female plants occur at the Great Ormes' Head in North Wales. The Tetbury plants are male. PM could not detect sex organs in the Colchester plants, though these are possibly male because of similarity to the Tetbury plants.

It is probable that populations in Tetbury and Colchester have arisen from fairly recently dispersed spores from northern Europe and not from the Scottish plants. The North Wales population may also be relatively recent since the Great Orme is well known bryologically. It is possible that populations containing both male and female plants can arise from the distribution of spores that are attached to each other.

Conclusion

Spore production in bryophytes allows opportunistic colonisation of new sites when suitable conditions prevail. The advance of *Grimmia tergestina* in northern Europe over the last 20 years has increased the possibility of the species occurring in southern Britain. Possibly, climate change has meant *G. tergestina* can establish itself in new territories. It is of course possible that there are yet undiscovered plants between North Wales and Argyll and the colonisation of southern Britain has been via that route. It will be interesting to see if further colonies of *G. tergestina* materialise in southern Britain. It is also possible that these climatic changes will lead to further records in southern Britain for other species such as *G. anodon* and *G. crinita*.

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