

In 2009, *Grimmia horrida* J. Muñoz & H. Hespánhol was published as a new species from the north-west Iberian Peninsula (Muñoz *et al.*, 2009) and named for the intimidating appearance of the hairpoint, at least if one were the size of a springtail. The ciliate hairpoint is not the only feature that characterizes this species, but it provides a good field character. In the summer of 2011 I visited Covelos in Serra do Marão (Fig. 1) (UTM 29T 0594398 4575374) in the province of Trás-os-Montes, Portugal, where I had the opportunity of seeing *G. horrida*.

This little-known European *Grimmia* was originally collected by Jesus Muñoz in 1990 from the relatively remote Sierra de Ancares in north-west Spain. Although it was clearly distinctive, its identity was uncertain and it was put to one side provisionally as a form of *G. montana*. Then in 2005, Portuguese student Helena Hespánhol, working in northern Portugal, made several collections of a curious *Grimmia*, and uncertain of their identity sent them to Muñoz. The Portuguese collections were clearly the same plant that Muñoz had collected

▽ Fig. 1. Covelos in Serra do Marão, northern Portugal. *G. horrida* is scattered along the nearest ridge. Ron Porley

Grimmia horrida and its separation from *G. montana* and *G. incurva*

Although not yet known in Britain, *Grimmia horrida* is a newly described species from Portugal that could very well turn up in the right habitat in these isles. **Ron Porley** describes how to distinguish it from two of its closest congeners.



Grimmia horrida

◁ Fig. 2. *G. horrida* (neat dome in centre centre), with *G. montana*, *Campylopus pilifer* and *Andreaea rothii* subsp. *falcata*. Ron Porley

▽ Fig. 3. The eye-catching ciliate hairpoint of *G. horrida*. Des Callaghan

in Spain and subsequent study concluded that they represented a hitherto unknown species. Currently, *G. horrida* is known from three localities in northern Portugal and one in north-west Spain. Nevertheless it is quite possible that the species will be found in additional areas of the Iberian Peninsula and possibly in other montane regions within the Atlantic biogeographic zone.

The species is likely to be unfamiliar to most British bryologists as it is so far known from seldom-visited areas of the Iberian Peninsula. It is not included in the recent *Grimmia* monograph (Maier, 2010) as this was in press at the time *G. horrida* appeared in *The Bryologist*. Therefore the purpose of this present article is to make this distinctive plant better known and to differentiate it from other similar-looking *Grimmia* species.

Characteristics

G. horrida forms hoary cushions (Fig. 2) which, at a glance, look very similar to *G. montana*, a taxon that is abundant at Covelos but which is distinct. The most conspicuous feature of *G. horrida* is the ciliate hairpoint inserted on an abruptly contracted leaf apex, clearly visible with a hand lens. The hairpoint is typically well developed, about 1 mm long, with conspicuous ciliate teeth

many of which are longer than the width of the hairpoint and characteristically bent to various degrees (Fig. 3). The hairpoint of *G. montana* is at most denticulate with an acuminate leaf apex.

Under the microscope the differences between *G. horrida*, *G. montana* and *G. incurva*, another species it may be mistaken for (although not known from Portugal), are evident. The most striking difference can be seen in transverse sections of the mid- to upper half of the leaf: both *G. horrida* and *G. montana* have plane margins (the leaf of *G. incurva* is narrowly recurved near the base), but in *G. horrida* the strongly keeled lamina is



inserted ventrally on the costa and held upright, often touching for more or less half of the leaf width before spreading widely (like a child may draw a seagull in flight), not curving inwards to give the characteristic 'U' shape of *G. montana* leaves in transverse section. In addition the lamina is predominately unistratose (in contrast to *G. montana*) except at the margins (which appear tumid when moist under the dissecting microscope), scattered patches in the upper lamina and at the leaf apex. The extreme leaf apex is ventrally channelled to the hairpoint and does not form a rounded subula composed of homogenous costal cells that is so distinctive of *G. incurva*. Furthermore, the dorsal costal cells in the upper leaf are of similar lengths to the adjacent laminal cells, a character that excludes *G. incurva* in which the dorsal costal cells are markedly longer (Maier, 2010).

Microscopically, the basal leaf areolation in *G. horrida* is distinctive: the basal paracostal cells are elongate, rectangular, smooth to slightly nodulose, with slightly thickened transverse walls, becoming shorter at the margin; this pattern continues nearly to mid-leaf, then abruptly grades into quadrate sinuose cells in the transitional part. In *G. montana* the basal cells are predominately shortly rectangular or quadrate with heavily thickened transverse cell walls, and gradually merge with the quadrate sinuose transitional cells.

Many characters in *Grimmia*, including hairpoint length and degree of serration, are notoriously variable depending on environmental factors, and any one character alone should not normally be used to arrive at an identification. Understanding the range of variation within a taxon is critical to correct identification. However, the combination of ciliate hairpoints, the leaf and costa anatomy is not represented in any other taxon and *G. horrida* is therefore distinct at the species level.



△ Fig. 4. A typical niche of *G. horrida*, in the shelter of overhanging rock outcrops. Ron Porley

Habitat

At Covelos *G. horrida* occurs at moderately high altitudes (ca 1,070 m above sea level) in relatively sheltered niches on boulders and acidic rock outcrops, occasionally with *Marsupella funckii*, often under overhangs (Fig. 4). Mixed cushions with *G. montana* are frequent (the strongly toothed hairpoint revealing the presence of *G. horrida*), but *G. montana* extends also onto more exposed niches. Other bryophyte associates include *Andreaea rothii* subsp. *falcata*, *Campylopus pilifer*, *Dicranoweisia crispula* and *Racomitrium lanuginosum*. *G. horrida* is much less abundant at this locality than *G. montana*, but is not difficult to find and several plants upon later dissection were found to have archegonia.

Acknowledgements

I would like to thank Helena Hespanhol for providing information and maps, to Eva Maier whom I sent material to for study and to Des Callaghan for photographing a typical leaf tip with hairpoint.

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