

Additions and amendments to the moss flora of the Canary Islands

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Abstract – We provide first Canary Islands reports of *Diphyscium foliosum* (Hedw.) D. Mohr, *Entosthodon longicolle* (Trab.) Ros et M.J. Cano, *Tortella alpicola* Dixon and *T. bambergeri* (Schimp.) Broth., being the last three also new to Macaronesia. First individual island reports are given for *Acaulon mediterraneum* Limpr. (Gran Canaria, Tenerife), and *Tortella limbata* (Schiffn.) Geh. et Herzog (Tenerife). Brief taxonomic notes are added. *Entosthodon fascicularis* (Hedw.) Müll. Hal. is removed from the list of Fuerteventura and *Tortella fragilis* (Hook. Wilson) Limpr. from the list of the Canary Islands.

Canary Islands / new records / Macaronesia / Bryophyta / *Tortella*

INTRODUCTION

The updates to the bryophyte list of the Canary Islands (González-Mancebo *et al.*, 2008b; González-Mancebo *et al.*, 2009) reflect the recent increase in bryological knowledge of these fascinating islands. Yet, the study of the Canarian bryophyte flora is fragmented and taxonomic problems remain to be solved. During our on-going work on the bryophyte flora of the Canary Islands, we found several species, hitherto un-noticed on all or some islands. We report our findings in alphabetical order of the species.

MATERIAL AND METHODS

Our report is based on bryological fieldwork in the Canary Islands from 1984 onwards. During this period we collected some 30.000 specimens from all major islands. Collecting was based on a 5 × 5 km UTM grid (Dirkse, 1995). Specimens mentioned in the text refer to selected specimens studied; all of which are kept in Herbarium G. M. Dirkse or TFC-bry. Nomenclature follows Hill *et al.* (2006).

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RESULTS AND DISCUSSION

Acaulon mediterraneum Limpr.

A. mediterraneum has a scattered distribution in S Europe. Outside this area it occurs in S England, S Sweden and Australia (Smith, 2004). In Macaronesia it became only known from Gomera (González-Mancebo *et al.*, 2007). We report it as new to Tenerife and Gran Canaria.

Tenerife: La Laguna, UTM 28R 370-3150, 648 m a.s.l., loamy soil, *Losada-Lima* 2006, TFCBry 17090. Gran Canaria: NE-facing slope of Montaña de los Horgazales, along the old road to San Nicolás de Tolentino, UTM 28R 420-3090, 550 m a.s.l., small barranco grazed by goats, *Dirkse* 1993, Hb. GM Dirkse 19987.

A related species, *A. muticum* (Hedw.) Müll. Hal., also occurs in the Canary Islands. It differs from *A. mediterraneum*, which has spinous spores, in having the spores rather smooth or rough (Casas *et al.*, 1990; Guerra, 2006; Hill, 1982; Holyoak, 2003). Although the distinction between *A. mediterraneum* and *A. muticum* may be difficult in England and Scandinavia (Holyoak, 2003; Hallingbäck *et al.*, 2008), it is clear in the Canary Islands.

Diphyscium foliosum (Hedw.) D. Mohr

D. foliosum has a disjunct but wide distribution on the northern hemisphere. It is absent from Africa (Ros *et al.*, 1999). In Macaronesia it occurs in Madeira and the Azores (Magombo, 2003; Smith, 2004). We report it for Tenerife as new to the Canary Islands.

Tenerife: Vueltas de Taganana near the Casa Forestal, UTM 28R 375-3155, 700-800 m a.s.l., loamy bank along path through *Erica-Myrica* woodland on steep N-facing slope, *Losada-Lima* 1993, TFCBry 9580.

Entosthodon longicolle (Trab.) Ros et M.J. Cano

Many occurrences of *E. longicolle* are in the steppe areas of central-eastern Europe and western Asia. In Italy (Sicily), Spain, and North Africa it has been found on saline or basic soils (Hébrard & Lo Giudice, 1997; Cano *et al.*, 1999; Ros & Cano, 2008). We report it for Fuerteventura and Lanzarote as new to the Canary Islands and Macaronesia.

Fuerteventura: Barranco de la Antigua and Llanos de la Cancela, UTM 28R 605-3135, 50 m a.s.l., dry soil on gentle slope, *Dirkse* 1992, Hb. GM Dirkse no 10208. Lanzarote: El Rubicón, Llano de las Maretas, UTM 28R 610-3190, 15 m a.s.l., *Reyes Betancort* 1996, TFCBry 17113.

The localities in the Canary Islands are the westernmost of the species' range, and the nearest localities are the above referred Spanish and Moroccan ones. The first and only report of *E. fascicularis* (Hedw.) Müll. Hal. for Fuerteventura by Dirkse *et al.* (1993) refers to *E. longicolle*. This results from a revision of the collection on which the report was based (Llanos de Cancela, Bouman 1992, Hb. AC Bouman no 92946). Therefore, *E. fascicularis* should be removed from the bryophyte flora of Fuerteventura. However, the report of *E. fascicularis* for Gran Canaria by the same authors is correct.

Tortella alpicola Dixon

T. alpicola was described from the Himalayas (Dixon, 1930). It is widely distributed: U.S.A., Canada, Colombia, Uzbekistan, Kyrgyzstan, Mongolia, India,

Hawaii, and Antarctica (Otnyukova *et al.*, 2004) and also occurs in S Spain (Rams *et al.*, 2006). We report it for Tenerife as new to the Canary Islands and Macaronesia.

Tenerife: E slopes of Montaña Blanca, 4 km E of Pico de Teide, UTM 28R 340-3125, 2400 m a.s.l., crevices and irregular small holes in N-facing obsidian rocks, in dry volcanic landscape with little vegetation, *Dirkse* 2008, Hb. GM Dirkse no 25583.

The first and only report for the Canary Islands of *T. fragilis* (Hook. *et* Wilson) Limpr. by Dirkse & Bouman (1990) refers to *T. alpicola*. The collection on which the report was based (Montaña Blanca, 2400 m, *Bouman* 1988, Hb. AC Bouman 88501) consists of small, hardly tomentose plants, having a distinct central strand, and leaves with long, fragile subulate tips with a narrow, only occasionally bistratose lamina. These characters comply with *T. alpicola* (Eckel, 1998). As a consequence, *T. fragilis* should be removed from the Canarian bryophyte flora.

***Tortella bambergeri* (Schimp.) Broth.**

For a long time, *T. bambergeri* (Schimp.) Broth. had its main distribution in mountains of Central Europe (Dierßen, 2001; Ignatova & Doroshina, 2008). After 2000, many localities have been discovered outside its classical range: western parts of the British Isles (Bosanquet, 2006), the Caucasus (Ignatova & Doroshina, 2008), and the Iberian Peninsula (Brugués *et al.*, 2009). We report it from Tenerife as new to the Canary Islands and Macaronesia.

Tenerife: Parque Nacional del Teide, Vuelta del Carnero, UTM 28R 342-3129, 2433 m a.s.l., crevices and small holes in rocks, in *Spartocytisus supranubius* (L. f.) Christ *ex* G. Kunkel vegetation, *Losada-Lima* 2008, TFCBry 15.838.

In the Canary Islands, *T. bambergeri* is confined to Tenerife where it occurs in fissures in volcanic rocks above 2000 m in Cañadas del Teide and adjacent mountains.

Tortella tortuosa (Hedw.) Limpr. is a close relative, but differs in the absence of a central strand and in having smooth elongate cells at the back of the apical part of the nerve. In *T. bambergeri* a central strand is present and quadrate, papillose cells occur at the back of the apical part of the nerve (Bosanquet, 2006; Ignatova & Doroshina, 2008; Brugués *et al.*, 2009).

The report of *T. tortuosa* from La Gomera, in the preliminary list of bryophytes of the Garajonay National Park by González-Mancebo *et al.* (2003) refers to *T. flavovirens* (Bruch) Broth. The report is not repeated in the final list (González-Mancebo *et al.*, 2008a). Since neither May (1986), who studied *Tortella* from Macaronesia, nor we did see any true *T. tortuosa* from the Canary Islands, its occurrence in these islands needs to be confirmed.

***Tortella limbata* (Schiffn.) Geh. *et* Herzog**

T. limbata is confined to Macaronesia, where it has been found in Gran Canaria (Schiffner, 1902), La Gomera, and Madeira (Cezón & Muñoz, 2006). We report it as new to Tenerife.

Tenerife: Monte de Agua García y Cerro del Lomo (Tacoronte), UTM 28R 360-3145, 875 m a.s.l., on earth slope along a forest track in *Erica-Myrica* woodland, *Losada-Lima & Beltrán Tejera* 1984, TFCBry 2281.

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