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Amendments to the bryophyte flora of the Cape Verde and Canary Islands

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Abstract – This contribution lists a series of new records as well as deletions from the bryophyte check-list of the Canary and Cape Verde islands based on field observations as well as revisions of herbarium material. *Rhabdoweisia crispata* is reported for the first time in the Canary Islands, new to Macaronesia. *Aneura pinguis* is a new record for the Cape Verde archipelago. Within the Canaries, 14 species are reported as new for several individual islands: *Lejeunea cavifolia, Plagiochila stricta, Grimmia ungeri,* and *Scorpiurium deflexifolium* in La Palma; *Metzgeria leptoneura* in Gran Canaria; *Plagiochila maderensis, Pohlia cruda*, *Pteryginandrum filiforme,* and *Tortella inflexa* in Tenerife; *Plagiochila virginica* in El Hierro and Fuerteventura; *Cratoneuron filicinum* in La Gomera; *Orthotrichum acuminatum* in El Hierro and Gran Canaria; *Cryptoleptodon longisetus* and *Polytrichum juniperinum* in Fuerteventura. In the Cape Verde Islands, *Orthotrichum diaphanum* is reported for the first time from Santo Antão. Revisions of herbarium material also conclude that *Grimmia donniana*, *Sciuro-hypnum populeum* and *Plagiochila spinulosa* were erroneously reported from the Canary Islands.

Bryophytes / Canary Islands / Cape Verde Islands/ new records / deletions

INTRODUCTION

The Macaronesian bryophyte flora has recently been the focus of intense floristic research (Gabriel *et al*., 2005; Sérgio *et al*., 2008; Patiño Llorente & González Mancebo, 2005; González-Mancebo *et al*., 2008a; Luis *et al.*, 2008, Kürchner *et al*., 2008; Werner, 2008). The most recent check-list for the Canary

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and Cape Verde Islands documents the occurrence of 499 (352 mosses and 147 liverworts and hornworts) (González-Mancebo *et al*., 2008a) and 161 species (124 mosses and 37 liverworts) (Patiño Llorente & González-Mancebo, 2005), respectively.

In this note, we present a series of amendments to these check-lists, including the first report of *Rhabdoweisia crispata* for Macaronesia and *Aneura pinguis* for the Cape Verde archipelago. Fourteen and one new records are reported for individual islands within the Canaries and Cape Verde, respectively. Based on revisions of herbarium material and field prospections, we also suggest that *Grimmia donniana*, and *Sciuro-hypnum populeum* and *Plagiochila spinulosa* were erroneously reported from the Canary Islands.

ADDITIONS TO THE BRYOPHYTE FLORA OF THE CANARY AND CAPE VERDE ISLANDS

Nomenclature follows Ros *et al*. (2007) for hepatics and Hill *et al*. (2006) for mosses.

Liverworts

Aneura pinguis (L.) Dumort.

Santo Antão, Ribeira do Antão, 25 m a.s.l., *J.M. González-Mancebo & J. Leal s.n.*, November 2005, TFC Bry 17359.

This is the first report of this species for Cape Verde. It was collected on a sheltered wall with dripping water around a crop field. Associated species included *Adiantum capillus-veneris* L. and *Philonotis* spp.

Lejeunea cavifolia (Ehrh.) Lindb.

La Palma, Barlovento, *A. Vanderpoorten A053*, September 2007, LG and TFC Bry 17093**.**

Although Augier & Noailles (1968) reported *L. cavifolia* from Tenerife, all Canarian records of the species were considered to have been confused with *L. eckloniana* by Dirkse *et al*. (1993) based upon Arnell (1961). Recently, we collected a specimen on sheltered rocks in a ravine of the laurel forest, whose large lobules, angled sinus between the keel and the postical margin, and rounded leaf apex, perfectly match *L. cavifolia* (M. Wigginton, pers. comm.). This is the first record for La Palma. Due to previous confusion with *L. eckloniana*, a thorough revision of the collections of the latter is, however, necessary to document the actual distribution of *L. cavifolia* in the Canaries. Attention should also be paid to the closely related and taxonomically difficult *L. holtii* (see Paton, 1999).

Metzgeria leptoneura Spruce

Gran Canaria, Barranco del Andén, 1116 m a.s.l., *J.M. González-Mancebo & J. Leal s.n.*, October 2007, TFC Bry 17097.

This species was previously reported for the Canary Islands from Tenerife, by Hallingbäck (1980). The present specimen represents a new report for Gran Canaria. It was collected as epiphyte on *Laurus novocanariensis* Rivas-Mart. *et al*., in one of the few remains of laurel forest of this island.

Plagiochila maderensis Gottsche *ex* Steph.

Tenerife, El Pijaral, 850 m a.s.l., *J. Patiño s.n.*, February 2008, TFC Bry 17220, 17221; Idem, *A. Losada, W. Wildpret & C. León s.n.*, January 1993, TFC Bry 9561; Cruz del Carmen, 950 m a. s.l., *J. Patiño & J.M. González-Mancebo s.n.*, October 2005, TFC Bry 17219.

Plagiochila maderensis was reported from the Canary Islands by Sim-Sim *et al*. (2005), based on herbarium specimens previously identified as *P. spinulosa* and, more recently, from La Gomera (González-Mancebo *et al*., 2008b). We report here its first records in Tenerife, from several localities on the Anaga Mountains.

Plagiochila stricta Lindenb.

La Palma, Barranco de Los Tilos, 450 m a.s.l., *J. Patiño & J. Leal s.n.,* October 2008, TFC Bry 17029.

Plagiochila stricta was reported to Macaronesia for the first time by Rycroft *et al*. (2002). This species was subsequently reported from Tenerife by Blockeel (2002) in several localities of the laurel forest of Anaga. Manuela Sim-Sim (Sim-Sim *et al*., 2004) also revised material from Tenerife named under *P. spinulosa,* which corresponded to *P. stricta* (Herbarium Rin). It is here first reported from La Palma Island, where it was found in sheltered sites on streamside rocks.

Plagiochila virginica A. Evans

El Hierro, near Cueva de las Pipas, 1022 m a.s.l., *J.M. González-Mancebo & J. Leal s.n.*, October 2008, TFC Bry 17229. **Fuerteventura**, Pico de Ingenieros, 793 m a.s.l., *J. Patiño & J. Leal s.n.*, November 2008. TFC Bry 17122.

This species was reported for the first time for the Canary Islands from La Gomera, La Palma and Tenerife by Heinrichs *et al*. (2002). In the present study, we report the first localities from El Hierro and Fuerteventura. On El Hierro, it was found on wet, shaded walls within laurel forest areas, while on Fuerteventura, this species inhabits the northern slopes of the top of Pico de Ingenieros. Despite the fact that the Fuerteventura locality is included in a protected area, the small population is seriously threatened by cattle grazing.

Mosses

Cratoneuron filicinum (Hedw.) Spruce

La Gomera, Barranco de Guadá, 520 m a.s.l., *A. Vanderpoorten A057*, October 2007, Herb. A.Vanderpoorten and TFC Bry 15335. **La Palma**, Fajana de la Plata, 500 m a.s.l., *J. Leal s.n.*, November 2007, TFC Bry 17361.

This species was known in the Canary Islands only from Cubo de la Galga on the island of La Palma (Düll, 1980). Our finding from La Gomera is a new record for the island representing also a new reference 30 years after the first mention for the archipelago. The moss was found on sheltered, vertical rock cliffs with running water, together with *Platyhypnidium riparioides* (Hedw.) Dixon.

Cryptoleptodon longisetus (Mont.) Enroth

Fuerteventura, Pico de Ingenieros, 793 m a.s.l., *J. Patiño & J. Leal s.n.*, November 2008, TFC Bry 17121, 17122, 17124, 17125.

This species was known from all western Canary Islands, where it is quite frequent in *Erica-Myrica* and laurel forests. The present record represents a very interesting finding, since the population of Fuerteventura is located within a non-wooded

area. The species was collected as epiphyte on *Asteriscus sericeus* L. fil. Only *Leptodon smithii* (Hedw.) F. Weber *et* D. Mohr was previously reported for this island (Malme, 1988; Dirkse *et al*., 1993; Lara *et al*., 2003). However, the latter is very rare in this area, and at least some of the collections referred to *L. smithii* likely correspond to *C. longisetus*.

Grimmia ungeri Jur.

La Palma, Caldera de Taburiente National Park, near Morro de la Cebolla/Pico de la Cruz, Cabecera del Barranco del Diablo, 2260 m a.s.l., *A. Losada & K. Martín s.n.*, May 1999, TFC Bry 10786.

This species was reported for the first time from Tenerife by Winter (1914) as *G. canadensis* H. Winter, and its presence was later confirmed by Muñoz (1998). After the revision of herbarium specimens, it turns out that *G. ungeri* also occurs in La Palma, where it has been previously confused with *G. orbicularis* Bruch (González-Mancebo *et al*. 2004). *Grimmia ungeri* is presently considered to be very rare in Macaronesia, but, since sterile specimens are impossible to distinguish from the common *G. montana* Bruch & Schimp., *G. ungeri* could be more common in the Canaries than previously thought.

Orthotrichum acuminatum H. Philib.

Gran Canaria, Barranco de los Cernícalos, 1275 m a.s.l., *J.M. González-Mancebo & J. Leal s.n*., March 2008, TFC Bry 17388; barranco del Andén, 1116 m. a.s.l., *J.M. González-Mancebo & J. Leal s.n.*, March 2008, TFC Bry 15955; carretera del Roque Nublo al Pico de las Nieves, 1700 m a.s.l., *R. Medina s.n.*, April 2004, TFC Bry 17385; Pico de las Nieves, 1850 m. a.s.l., *R. Medina s.n.*, April 2004, TFC Bry 17386; Caldera de los Marteles, 1500 m. a.s.l., *R. Medina s.n.*, April 2004, TFC Bry 17387. **El Hierro**, carretera de Valverde a Frontera km. 23, 1300 m a.s.l., *F. Lara & E. San Miguel s.n.*, 29 September 2002, TFC Bry 17384.

Orthotrichum acuminatum was first reported for the Canaries from La Palma (Lara *et al*., 1999), where it is locally abundant in montane areas between 1500 and 2000 m a.s.l. Recently, *O. acuminatum* was also reported for the island of La Gomera (González-Mancebo *et al.*, 2007), growing as epiphyte on *Erica arborea* L., *Juniperus turbinata* Guss and *Euphorbia lambii* Svent. Here, we report new records of this species from Gran Canaria and El Hierro. On El Hierro, intensive fieldwork resulted in the discovery of a single, small population on a trunk of *Chamaecytisus proliferus* (L. f.) Link, near the top of the island, which suggests that this species is very rare on this island. Conversely, it is quite frequent on Gran Canaria, especially at high altitude in the central part of the island, were it grows both on native (*Pinus canariensis* Chr. Sm. *ex* DC. and *Laurus novocanariensis* Rivas-Mart. *et al.*) and alien (*Castanea sativa* Miller and *Prunus avium* L.) phorophytes. Until now, *O. acuminatum* has not been found on Tenerife, in spite of intensive, targeted research.

Orthotrichum diaphanum Schrad. *ex* Brid.

Santo Antão, the passage of Cova to Ribeira do Paul, 1300 m a.s.l., *J.M. González-Mancebo & J. Leal s.n.*, November 2005, TFC Bry 17360.

Previously reported for the archipelago of Cape Verde only from São Nicolau and Santiago (Patiño Llorente & González Mancebo, 2005), this is the first record of *O. diaphanum* from Santo Antão island. It was found on trunks of several exotic tree species (e.g. *Pinus*) along the northern area of the Caldeira do Coba.

Pohlia cruda (Hedw.) Lindb.

Tenerife, Teide National Park. Guajara, 2404 m. a.s.l. *J.M. González-Mancebo & J.D. Marrero-Barreto s.n.*, April 2008, TFC Bry 16192.

Previously reported for the Canaries only from La Palma (Nordhorn-Richter, 1986), this is the first record of this species from Tenerife. It was found in small crevices of a north-facing wall.

Polytrichum juniperinum Hedw.

Fuerteventura. Pico de la Zarza, 790 m a.s.l., *J. Leal & J. Patiño s.n.,* November 2008, TFC Bry 17303.

This is the first record of this species, which was previously reported from all other Canary Islands (González-Mancebo *et al*., 2008a), for Fuerteventura. The species was found in sheltered crevices of a north-facing wall in the most humid area of this island.

Pterigynandrum filiforme Hedw.

Tenerife, Teide National Park, Siete Cañadas, 1986 m a.s.l., *J.M. González-Mancebo & J.D. Marrero-Barreto s.n.*, April 2008, TFC Bry 17000; Idem, Cuevas de Los Roques, 2272 m a.s.l., *J.M. González-Mancebo s.n.*, May 1984; TFC Bry 17213.

The first record of this species for the Canary Islands, in Gran Canaria, was made by Geheeb & Herzog (1910). Recently, it was rediscovered by González-Mancebo *et al*. (2004) on La Palma Island, where it occurs in areas above 1900 m. These two new reports represent the first ones for the island of Tenerife, where it occurs in protected habitats, caves and crevices, in the Supramediterranean bioclimatic belt.

Rhabdoweisia crispata (Dicks. *ex* With.) Lindb.

La Palma, Los Tilos. 1000 m a.s.l. *A. Vanderpoorten A043,* September 2006, LG and TFC Bry 17007.

Rhabdowesia crispata is reported here for the first time to Macaronesia. It was found in La Palma growing with *Pogonatum aloides* (Hedw.) P. Beauv., on acidic shrubby slopes dominated by *Erica*.

Scorpiurium deflexifolium (Solms) M. Fleisch. *et* Loeske

La Palma, between Los Sauces and San Andrés, 240 m a.s.l. *A. Vanderpoorten PALM 1456*, September 2006, LG and TFC Bry 17006.

This is the first report for the island of La Palma, where it was collected on a wall of the water system in a banana plantation. This species was previously reported for the Canaries from Tenerife (Bryhn, 1908; Koppe & Düll, 1982), growing in a ravine and on humid rocks in the laurel forest, and on Gran Canaria (Bryhn, 1908) on an open water channel, a type of habitat that is gradually becoming rare in the Canaries. The Iberian and Macaronesian distribution is presented by Casas *et al*. (1996).

Tortella inflexa (Bruch) Broth.

Tenerife, Malpaís de Güimar, 250 m a.s.l., *F. Romaguera & J.M. González-Mancebo s.n.*, April 2005, TFC Bry 17095, 17096.

The first report of this species for the Canaries was from Lanzarote (During, 1981). Subsequently, it was reported from La Palma and La Gomera

(González-Mancebo *et al*., 2003, 2004, 2008b). The wide altitudinal range (200-1350 m a.s.l.) of its localities indicates that it is probably not a rare species and future records from other islands are likely.

DELETIONS FROM THE BRYOPHYTE FLORA OF THE CANARY ISLANDS

Plagiochila spinulosa (Dicks.) Dumort.

This species was reported for the Canaries from El Hierro (Pitard & Corbière, 1907; Arnell, 1961), La Palma (Düll, 1980; González-Mancebo & Hernández-García, 1996), La Gomera (Pitard & Corbière, 1907; Gola, 1911; Schwab *et al.*, 1986; Zippel, 1998; González-Mancebo *et al.*, 2003) and Tenerife (Bryhn, 1908; Arnell, 1961; Koppe & Düll, 1982; Zippel, 1998). We have visited most of the reported localities and only found *P. maderensis, P. punctata* (Taylor) Taylor or *P. stricta*. In addition, through revisions of the collections housed at TFC Bry revealed that all the specimens attributed to *P. spinulosa* from the Canary Islands turned out to belong to other species. Although *Plagiochila spinulosa* occurs on the more temperate island of Madeira (Sim-Sim *et al., 2005*), its presence in the Canaries, with a more dry climate, has not been demonstrated in this work; for practical reasons this species should be excluded from the check-list of Canarian bryophytes.

Grimmia donniana Sm.

The presence of this species in the Canaries (Renauld & Cardot, 1902) was considered doubtful by González-Mancebo *et al.* (2008a) because, due to an inappropriate synonymy in Index Muscorum (van der Wijk *et al*., 1962), the name *G. donniana* was used instead of *G. montana*. Dixon's report (1911) was based on sterile specimens that the author himself considered doubtful. The material reported by González-Mancebo *et al*. (1991) was revised and actually corresponds to *G. montana*. The species should therefore be deleted from the Canary Islands check-list, and its occurrence in Madeira (Greven, 1995; Sergio *et al.,* 2008) should be checked.

Sciuro-hypnum populeum (Hedw.) Ignatov *et* Huttunen

González-Mancebo *et al*. (2008a) considered the occurrence of this species in the Canaries to be uncertain. It was reported for Tenerife by González-Mancebo *et al.* (1991) from the Teide National Park. Subsequent revision of all herbarium specimens from this area turned out to correspond to *Rhynchostegium megapolitanum* (Blandow *ex* F. Weber *et* D. Mohr) Schimp. Consequently, this species must be deleted from the species lists of the Canary Islands.

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