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Some remarkable bryophyte records from La Gomera, Tenerife and Madeira

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Abstract – The author reports some remarkable bryophyte records from La Gomera, Tenerife (Canary Islands) and Madeira. *Metzgeria temperata* is new to Tenerife. *Jungermannia callithrix*, *Gymnostomum calcareum* var. *atlanticum* and *Grimmia meridionalis* are new to La Gomera. *Jungermannia callithrix*, and *Gymnostomum calcareum* var. *atlanticum* are new, as well, to the Canary Islands. Rare species observed include *Anthoceros caucasicus* (Tenerife), *Cololejeunea schaeferi* (La Gomera), *Riccia gougetiana* var. *armatissima* (Tenerife), *Dicranella howei* (Tenerife), *Ditrichum punctulatum* (Madeira), *Rhynchostegiella bourgeana* (Tenerife) and *Tortula solmsii* (La Gomera, Tenerife).

Canary Islands / La Gomera / Tenerife / Madeira / hornworts / liverwort / mosses

Résumé – L'auteur rapporte quelques observations de bryophytes remarquables, faites à Madère, La Gomera et à Ténériffe (Iles Canaries). *Metzgeria temperata* est nouveau pour Ténériffe. *Jungermannia callithrix*, *Gymnostomum calcareum* var. *atlanticum* et *Grimmia meridionalis* sont nouveaux pour La Gomera. *Jungermannia callithrix* et *Gymnostomum calcareum* var. *atlanticum* sont également nouveaux pour les Iles Canaries. Parmi les espèces rares citées on trouve *Anthoceros caucasicus* (Ténériffe), *Cololejeunea schaeferi* (La Gomera), *Riccia gougetiana* var. *armatissima* (Ténériffe), *Dicranella howei* (Ténériffe), *Ditrichum punctulatum* (Madère), *Rhynchostegiella bourgeana* (Ténériffe) et *Tortula solmsii* (La Gomera, Ténériffe).

Iles Canaries / La Gomera / Ténériffe / Madère / anthocérotes / hépatiques / mousses

The Atlantic Islands have attracted many bryologists during past decades. Macaronesia on a whole was given a bryophyte checklist by Eggers (1982), which enabled Losada-Lima (1988) to observe a strong affinity between the bryophyte floras of the Canary Islands and Madeira, especially as far as mosses are concerned. Eggers' checklist is however largely obsolete, considering the progress of floristic research, nomenclature and taxonomy during the last twenty-five years. The checklist of Dirkse *et al.* (1993) is more up to date, but it covers only the Canary Islands. The papers of Koppe & Düll (1982, 1986) on Tenerife and Madeira and of Schwab *et al.* (1986) on La Gomera are worth mentioning. These authors shortly described the temperate-oceanic climate of the Canaries and Madeira and the typical vegetation types of these islands, especially the relict cloud and laurel forests, favoured by the trade winds.

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This paper deals with the author's recent bryophyte records from three Macaronesian islands: La Gomera (2002), Tenerife (2006) and Madeira (2003), including collections from Robert Thorn (Spring 1988 and 1990) and Thierry Mahévas (April 2001). Part of the records are from classical sites of laurel forest, like Ribeiro Frío (Madeira), central La Gomera and the Anaga peninsula (Tenerife) and are not, to a large extent, novelties to these islands. On the other hand many records pertain to sites poorly visited by bryologists, like open soil in gardens, exposed rock and walls and rocky road-sites.

Thorn's records are kept in the author's private herbarium. Those of Mahévas are conserved at NCY, some of them after examination by the author, who keeps duplicates. On the whole, 148 different bryophyte taxa were observed, but only the most striking finds are published here. Nomenclature and author's abbreviation follow Grolle & Long (2000) and Hill *et al.* (2006). The complete list of records, with maps and localities, will be available on the author's Internet site http://www.mnhn.lu/colsci/weje/default.asp.

COMMENTS ON REMARKABLE TAXA

Anthocerotae and Hepaticae

Anthoceros caucasicus Steph. *in* Woronow

TENERIFE: Anaga peninsula, Monte de la Mercedes, on open soil, leg. *Mahévas*, 4. 2001 (NCY, herb. Werner 7260).

This hornwort is rare in Europe and on the Canary Islands. According to Schumacker (2001) it is a neotropical species, which might be a recent introduction.

Aphanolejeunea microscopica (Taylor) A. Evans

TENERIFE: Cruz del Carmen (Anaga), epiphytic in laurisilva, leg. *Mahévas*, 1.4.2001.

This tiny oceanic liverwort was not cited by Dirkse e*t al.* (1993), but has been collected by several authors (Arnell, 1961; Boecker *et al*., 1993; Blockeel, 2002) in the same area.

Cololejeunea schaeferi Grolle

LA GOMERA: N of Laguna Grande, 1200 m., on small stones amidst shaded soil in the laurisilva, growing together with *Marsupella emarginata* (Ehrh.) Dumort., leg. *Werner 7490*, 26.3.2002.

Schwab *et al.* (1986) first mentioned this liverwort on La Gomera. It is a Macaronesian endemic species.

Frullania azorica Sim-Sim, Sérgio, Mues & Kraut

MADEIRA: Ribeiro Frío, 650 m, epiphytic, leg. *Werner 7476*, 12.4.2003.

The differences of this endemic species with other taxa of subgenus *Trachycolea* is given by Sim-Sim (1999).

Frullania polysticta Lindenb.

MADEIRA: Ribeiro Frío, near the levada, 700 m, epiphytic on other bryophytes, *leg. Thorn*, 10.5.1990.

This Macaronesian endemic liverwort is considered to be overall rare (R) by Schumacker & Martiny (1995) and Schumacker & Váňa (2005).

Jungermannia callithrix Lindenb. et Gottsche

LA GOMERA: N of Alojera, 1000 m, shaded ravine, near a brook, on moist soil, leg. *Werner 7494* (sterile!), 26.3.2002.

This liverwort is very close to *J. hyalina*, differing from the latter by broadly decurrent and larger oval leaves, as well as by larger cells, especially at the base of the leaves. It is a neotropical species, recently discovered on the Azores – where many localities are known – and on Madeira, where only two localities are cited (Schumacker & Váňa, 1999). The transportation of spores by strong winds from the Caribbean to Macaronesia has been discussed by Schumacker & Váňa (1999) and is very likeley. *Jungermannia callithrix* is new to La Gomera and to the Canary Islands, where it is perhaps a very recent introduction!

Jungermannia hyalina Lyell

TENERIFE: road from Taganana to las Mercedes, on soil, leg. *Mahévas* 6.4.2001.

According to Schumacker & Váňa (1999), all Canarian collections of *J. hyalina*, examined by them appeared to be correctly named.

Metzgeria temperata Kuwah.

TENERIFE: Anaga peninsula, near the road from Taganana to las Mercedes, epiphytic, leg. *Mahévas,* 6.4.2001 (NCY).

This hepatic has a broad western distribution in Europe (Düll, 1983). It had however not yet been collected on the Canary Islands, but only on Madeira (Eggers, 1982).

Riccia gougetiana Durieu et Montn. var. ***armatissima*** Levier ex Müll.Frib.

TENERIFE: Masca, footpath descending to the Sea, ± 550 m., soil of a well-exposed slope amongst xerophytic vegetation, leg. *Mahévas*, 1.4.2001 (NCY, herb. *Werner 7261*).

Musci

Aloina ambigua (Bruch & Schimp.) Limpr.

TENERIFE: Punta del Teno, on soil (c.sp!), leg. *Mahévas 1041*, 4. 2001.

Dirkse *et al.* (1993) do not mention this moss, which they considered to be conspecific with *A. aloides*.

Anomobryum juleaceum (Schrad. *ex* P.Gaertn., Meyer *et al.*) Schimp.

MADEIRA: (1) Rabaçal, NW Paul da Serra, 1300 m, on exposed rock, leg. *Werner 7297*, 3.2003; (2) Aira do Serrado, 1090 m, on volcanic rock, leg. *Werner 7280*, 3.2003.

Anoectangium angustifolium Mitt.

MADEIRA: Ribeiro Frío, shaded rock near levada, laurel forest, alt. 680 m, leg. *Werner 7289*, 16.4.2003.

Dirkse *et al.* (1993) merge this taxon with *Anoectangium aestivum.* Molecular studies could eventually reveal wether this taxon can be maintained at a sub-specific level.

Antitrichia californica Sull.

MADEIRA: Ribeiro Frío, 680 m, epiphytic and epilithic, leg. *Werner 7271*, 16.4.2003.

Atrichum angustatum (Brid.) Bruch & Schimp. var. ***rhystophyllum*** (Mül.Hal.) P.W. Richards & E.C. Wallace

MADEIRA: S of Faial, 350 m, rocky-earthy slope, leg. *Werner 7336*, 16.4.2003.

Dicranella howei Ren. & Card.

LA GOMERA: Playa Santiago, 60 m, on soil in hotel garden, leg. *Werner 7475*, 10.4. 2002.

Dirkse *et al.* (1993) put this species in synonymy with *D. varia*, a view that is not shared by most continental authors. The material collected is entirely bistratose, with a large, not clearly delimitated nerve. Notwithstanding the absence of sporophytes, the collection can only be attributed to *D. howei,* which is thus known from a second locality on La Gomera (Schwab *et al.,* 1986).

Didymodon australasiae (Hook. & Grev.) R.H. Zander

LA GOMERA: Between Igualero and Chipude, 1250 m, rocky slope, exposed to the south, leg. *Werner 7179*, 1.4.2002.

Ditrichum punctulatum Mitt.

MADEIRA: S of Faial, 350 m, rocky-grassy slope, leg. *Werner 7339*, 16.4.2003.

This is an ill-known and rarely recorded species (Sérgio, *in litt.*). It is also considered as vulnerable by Sérgio *et al.* (1992).

Fissidens asplenioides Hedw.

MADEIRA: Ribeiro Frío, levada, alt. 650 m, leg. *Thorn* 10.5.1990 (herb. Werner 5064), det. G. Schwab.

Fissidens luisierii P. de la Varde

MADEIRA: Ribeiro Frío, 700 m, levada, leg. *Thorn* 10.5.1990 (herb. Werner 5066).

This *Fissidens* is considered to be rare (R) at a European-Macaronesian level by Schumacker & Martiny (1995).

Grimmia lisae De Not.

LA GOMERA: Laguna Grande, 1200 m, on south-exposed siliceous rock, leg. *Werner 7186,* 26.3.2002.

Grimmia meridionalis (Müll. Hal.) E. Maier

LA GOMERA: Between Igualero and Chipude, 1250 m, on south-exposed siliceous rock, leg. *Werner 7201*, 1.4.2002.

This newly described species (Maier, 2002) has been reported for two other Macaronesian islands (Gran Canaria, Tenerife), but it seems to be new to La Gomera.

Gymnostomum calcareum Nees & Hornsch. var. ***atlanticum*** Sérgio

LA GOMERA: Playa Santiago, near the sea, garden of a hotel, soil on a on palm tree base, growing together with *Leptophascum leptophyllum*, leg. *Werner 7309*, 10.4.2002.

Sérgio (in litt., 2003) at first interpreted the collected material as a possible strong form of *G. lanceolatum*, a species described by Cano *et al.* (1994), which has recently, however, been recognized only at a sub-specific level of *Gymnostomum calcareum* (Sérgio, 2006). I re-examined the collection and came to the conclusion that it pertains to *G. calcareum* var. *atlanticum,* another new infraspecific taxon described by Sérgio (2006): Uniseriate protomenal gemmae (> 120 µm) could be observed; the ratio of leaf length to width appeared to be high (> 6:1) on all leaves; the margin was bistratose at least in the upper half of the leaves. This variety was observed only once on a Macaronesian island (on Madeira; Sérgio, 2006). It is new to La Gomera and to the Canary Islands. The ecology is quite untypical for a *Gymnostomum.*

Isothecium algarvicum Nicholson & Dix.

MADEIRA: Ribeiro Frío, 680 m, on moist, shaded rock near the levada, leg. *Werner 7283*, 16.4. 2003.

Leptophascum leptophyllum (Müll. Hal.) J. Guerra & M.J. Cano

LA GOMERA: Playa Santiago, hotel garden, on soil on palm tree base, leg. *Werner 7409*, 10.4.2002. –TENERIFE: Puerto de la Cruz, Jardín Playa, hotel garden, on soil, leg. *Werner 7464*, 2.5.2006.

Neckera pumila Hedw.

TENERIFE: Anaga peninsula, Cruz del Carmen, epiphytic in laurel forest, leg. *Mahévas* 6.4.2001.

This *Neckera*, which is common in European sheltered and moist woods, seems to be much rarer on Tenerife than *Neckera cephalonica* Jur. & Ung. or *Neckera intermedia* Brid.

Rhynchostegiella bourgeana (Mitt.) Broth.

TENERIFE: Taganana, 300 m shaded rock ledge, exp NE, leg. *Mahévas 1012*, 4.2001 (herb. Werner 7498).

This Macaronesian endemic is quite distinct from *R. litorea* and *R. tenella* (the latter is unknown to the Canary Islands, but not to Madeira). The sterile collection is glossy, the leaves are a little concave, quite narrowed before insertion and a group of alar cells (Dirkse & Bouman, 1995) is easily visible.

Rhynchostegiella litorea (De Notaris) Limpr.

MADEIRA: Caniço, shaded wall in hotel garden, near spring, *Werner 7278*, 7.4.2003. – LA GOMERA: Playa Santiago, on soil in hotel garden, leg. *Werner 7489*, 10.4.2002.

Dirkse *et al.* (1993) have put this species in synonymy with *R. tenella. Rhynchostegiella litorea* has more recently been treated as a separate species by Dirkse & Bouman (1995).

Tortula bolanderi (Lesq. & James) Howe

LA GOMERA: SE of the Garajonay mountain peak, 1250 m, soil on a rocky slope, leg. *Werner 7183*, 26.3.2002. – TENERIFE: El Bebedero, (S of La Orotava), 650 m.rocky soil at the edge of the main road to El Teide, leg. *Werner 7470*, 30.4.2006.

Tortula cuneifolia (With.) Turn.

LA GOMERA: Between Igualero and Chipude, 1250 m, rocky slope, leg. *Werner 7193*, 1.4.2002.

Tortula solmsii (Schimp.) Limpr.

LA GOMERA: N of Alajeró, Buen Paso, rocky slope, alt 1000 m, leg. *Werner 7188*, 27.3.2002. – TENERIFE: (1) Puerto de la Cruz, Playa Jardín, hotel garden, on soil, leg. *Werner 7465*, 2.5.2006. - (2) Punta de Teno, on soil, leg. *Mahévas*, 5.4.2001.

This *Tortula* is considered to be rare (R) at a European-Macaronesian level by Schumacker & Martiny (1995).

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