

Bryological Notes

New national and regional bryophyte records, 24

Intending contributors to this column should consult the Instructions for Authors in part 1 of this volume, and should address their contributions to the column editor.

1. *Campylopus pilifer* var. *lamellatus* (Mont.) Gradst. & Sipman

Contributors: Guillermo M. Suárez and María M. Schiavone

Argentina: SALTA. Depto. Orán, Bosque Montano con abundante *Podocarpus* sp., sobre talud rocoso, 23°04'S, 64°50'W, 1650–1700 m a.s.l., 24 November 1999, *leg.* M. Schiavone, B. Biasuso & S. Churchill 3718 (LIL). JUJUY. Depto. Ledesma, Parque Nacional Calilegua, El Monolito, Bosque Montano con abundantes 'alisos', sobre talud rocoso, 23°40'S, 64°54'W, 1721 m a.s.l., 29 May 2007, *leg.* M. Schiavone 3370 (LIL).

Campylopus pilifer var. *lamellatus* (Mont.) Gradst. & Sipman has a trans-Atlantic distribution, recorded from Costa Rica, Ecuador, Peru and Bolivia, and also in tropical Africa (where it was described as *C. introflexus* var. *altecristatus* (Renauld & Cardot) Thér.) (Frahm, 1991). Churchill & Linares (1995) suggest that this variety possibly occurs in Colombia along the Andean corridor. In Argentina it grows in the upper montane forest between 1650 and 1750 m a.s.l. on rocky, exposed banks, together with *Polytrichum juniperinum* Hedw. These new records for Argentina represent the southernmost limit of the known distribution for this variety.

Var. *lamellatus* differs from var. *pilifer* by the lamellae on the dorsal side of the costa, which are 5–6(–7) cells high. In the type variety these lamellae reach only 3–4 cells high.

2. *Campylopus trivialis* Müll. Hal. ex E. Britton

Contributors: Guillermo M. Suárez and María M. Schiavone

Argentina: JUJUY. Depto. Ledesma, Parque Nacional Calilegua, El Monolito, Bosque Montano con abundantes 'alisos', sobre talud rocoso, 23°40'S, 64°54'W, 1721 m a.s.l., 29 May 2007, *leg.* M. Schiavone 3371 (LIL).

During the revision of samples collected recently in the Calilegua National Park (Jujuy Province) certain plants were identified as *Campylopus trivialis* Müll. Hal. ex E. Britton, a species not previously reported from north-western Argentina.

Campylopus trivialis is frequent in tropical and subtropical areas of America. It grows in high alpine regions from Costa Rica to Bolivia (Churchill & Linares, 1995; Frahm,

1986, 1991; Menzel, 1986) through the Andean corridor. It is rarely found at low elevations, reaching 3000 and 4900 m a.s.l. in Bolivia (Frahm, 1991). In the northwest of Argentina it occurs in the mountain forests on rocks in exposed banks between 1700 and 1800 m a.s.l.

3. *Encalypta microstoma* Bals.-Criv. & De Not

Contributors: James H. Dickson and Diana Horton

Italy: ÖTZTAL ALPS, SE facing slope behind the Similaun Hut, 3050 m a.s.l., 7 July 1994, *leg.* J. Dickson *s.n.* (IB).

JHD collected a small fruiting specimen from a rock crevice at about 3050 m on the steep, southeast-facing slope immediately behind the Similaun Hut at 3019 m only a short way inside Italy in the Ötztal Alps. In the nival zone, this discovery is about 350 m above the previous highest record from the Austrian mountains (Grims, 1999) and several hundred meters above the highest from the Italian mountains (Schumacher *et al.*, 1999). However, it is about 40 m lower than the highest record from Switzerland (Online Atlas of Swiss Bryophytes). The identity having been confirmed by DH, the specimen, a new altitudinal record for Italy, is lodged in the herbarium of the Botanical Institute, University of Innsbruck.

4. *Fissidens sublimbatus* Grout

Contributors: C. Lobo, S. Fontinha, L. Luis and M. Sim-Sim

Portugal, Madeira Region: SELVAGENS ARCHIPELAGO: Selvagem Grande, Pico dos Tornozeles, North and Northeast side on rock cracks and under the rocks on coastal exposed areas, 30°08'54.485"N, 15°51'57.079"W, *ca* 136 m a.s.l., 30 April 2005, *leg.* I. Silva *s.n.* (LISU); Selvagem Grande, plateau between Pico dos Tornozeles and Pico Atalaia, exposed, dry and rocky areas, 30°08'54.581"N, 15°52'09.772"W, *ca* 100 m a.s.l., 6 August 2008, *leg.* S. Fontinha & M. Sim-Sim *s.n.* (LISU).

Fissidens sublimbatus Grout shows an American–Macaronesian/N African disjunction. It occurs in western North America and in Argentina, whereas east of the Atlantic it has been recorded from the Canary Islands and from Morocco (Ros *et al.*, 2001, Pursell, 2004). *Fissidens sublimbatus* is here newly recorded for the Selvagens Archipelago and the Madeira region. It was collected in two localities on Selvagem Grande Island, namely Pico dos Tornozeles and the plateau between Pico dos Tornozeles and Pico Atalaia. This moss was found growing in coastal areas on calcareous soil, under rocks and in rock crevices in very dry and exposed conditions. It occurred in association

with *Bryum dichotomum* Hedw., *Riccia atlantica* Sérgio & Perold, *Tortella flavovirens* (Bruch) Broth., *Tortula atrovirens* (Sm.) Lindb., *Tortula pallida* (Lindb.) R.H.Zander, and *Tortula solmsii* (Schimp.) Limpr.

Fissidens sublimbatus is considered frequent in the Canary Islands where it has been found on five islands (González-Mancebo *et al.*, 2008). In the Madeira region it is very rare, being restricted to two localities in the Selvagens Archipelago.

5. *Grimmia dissimulata* E. Maier

Contributor: J. Kučera

Czech Republic. SOUTHERN MORAVIA, PAVLOVSKÉ VRCHY HILLS, Mikulov: nature reserve Šibeničnick, ca 50 m SSW of the summit of Šibeniční vrch, fissures of warm SW-facing limestone rock outcrops, 48°47'21"N, 16°37'48"E (WGS 84), 220 m a.s.l., 1 November 2006, *leg. & det.* J. Kučera 12690, 12693 (CBFS).

Grimmia dissimulata E.Maier was differentiated from the *G. trichophylla* Grev. complex based predominantly on material from southern Europe, and scattered collections from western Europe, Turkish Anatolia and Iraq (Maier, 2002). Porley (2004) later showed that the species also occurred sparsely in central England and northern Scotland, and was relatively common in North Essex in eastern England, growing typically on limestone tombs. Erzberger & Papp (2007) reported new finds from Montenegro and Hungary in SE Europe, and (with data provided by E. Maier) from Morocco and Syria. The excellent revision of *Grimmia* occurring in Hungary by P. Erzberger (2009) enabled me to revise my European collections of the *Grimmia trichophylla* complex, and two specimens of typical *G. dissimulata* from the Czech Republic were revealed. They grew under conditions fully comparable to those reported for this species in northern Hungary and Spain. The Czech locality is an isolated limestone hill between the main Moravian ridge of Pavlovské vrchy hills and its Austrian extension, notable for the occurrence of *Helictotrichon desertorum* (Less.) Pilg., a relic species from the cold continental steppe conditions of the late Ice Age. Associated species included among others *Schistidium brunnescens* Limpr. subsp. *brunnescens*, *S. crassipilum* H.H.Blom, *Tortula muralis* Hedw., *Syntrichia calcicola* J.J.Amann, *Pseudocrossidium revolutum* (Brid.) R.H.Zander and *Pleurochaete squarrosa* (Brid.) Lindb.

6. *Hypnum heseleri* Ando & Higuchi

Contributors: André Sotiaux, Lars Hedenäs and Alain Vanderpoorten

Belgium: PROVINCE DE LIÈGE, Horion-Hozémont, 50°N37' and 5°E23', base of *Acer pseudoplatanus* L. with *Orthotrichum affine* Schrad. ex Brid., *O. diaphanum* Schrad. ex Brid., *Hypnum cupressiforme* Hedw., *Syntrichia papillosa* (Wilson) Jur. along an ancient railway within an open, rural landscape, 153 m a.s.l., 4 February 2010, *leg.* A. Vanderpoorten F637-sn (S, reg. no. B172157) and *leg.* A. Sotiaux 38523 (Priv. *Herb.* Sotiaux).

Hypnum heseleri Ando & Higuchi is an extremely rare moss known from two localities in the UK and one in France, five in Germany, and seven in The Netherlands (Meinunger & Schröder, 2007; Blockeel & Stevenson, 2006). The species has been considered as a somatic mutant

of *H. cupressiforme* Hedw. owing to its sharing some identical enzyme systems (Blockeel & Stevenson, 2006). We argue that sharing some identical genes is, by no means, evidence for somatic mutation. In addition, isozymes display much slower substitution rates than non-coding regions of the genome and may not contain the appropriate level of variation to discriminate species within the *H. cupressiforme* complex. At best, the sharing of some genes between putative parental and daughter species may indicate a recent origin of the latter (Sotiaux *et al.*, 2009). *Hypnum heseleri* has a morphology strikingly different from that of *H. cupressiforme*. This morphology is not the result of plasticity, or of the recurrent *in situ* evolution of local *H. cupressiforme* (Blockeel & Stevenson, 2006). This means that the species has a genetically-based extremely characteristic morphology, which is transmitted to its progeny. On this basis, we question its reduction as a variety of *H. cupressiforme* (Hill *et al.*, 2006).

7. *Hypnum imponens* Hedw

Contributors: Michael Stech and Hans (J.D.) Kruijer

Norway: SVALBARD (SPITSBERGEN): Kongsfjorden, Juttaholmen Island, northeast facing slope on the eastern side of the island, ca 20 m a.s.l., 15 July 2008, *leg.* M. Stech & J. D. Kruijer 08-253 (L).

Hypnum imponens Hedw. is an amphi-Atlantic species (Schofield, 1972, 2006). It occurs in temperate and montane Europe northwards to about 67°N, Cyprus, the Azores, southern Greenland, and eastern North America (e.g., Smith, 2004; Frey *et al.*, 2006; Schofield, 2006), mainly on wet heath over mineral soil, but in northern Europe also on rotting wood in damp forests (Frey *et al.*, 2006). This is the first report of *Hypnum imponens* for the European High Arctic, which expands its latitudinal range to almost 79°N. The plants were found in dry tundra with *Cassiope tetragona* (L.) D.Don. and *Hylocomium splendens* (Hedw.) Schimp. No sporophytes were observed, but the characteristic gametophytic features such as the often coloured, heterogeneous alar cells, usually reddish stem, and usually numerous long-toothed foliose pseudoparaphyllia, were sufficient to clearly identify the collection as *H. imponens*. In total, five *Hypnum* species are now reported for Svalbard (cf. Frisvoll & Elvebakk, 1996).

8. *Macromitrium rigbyanum* Dixon

Contributors: Harsh Singh, Vinay Sahu, Tariq Husain and A.K. Asthana

India: WESTERN HIMALAYA: Pithoragarh District, Gangolihat, Haat Kali Sacred Grove (Uttarakhand), epiphytic on *Quercus leucotricophora*, ca 1750 m a.s.l., 20 May 2009, *leg.*, H. Singh *s.n.*, *conf.* A.K. Asthana & Vinay Sahu (LWG, no. 249199A).

Macromitrium rigbyanum Dixon belongs to the moss family Orthotrichaceae in the order Isobryales and has been considered endemic to Eastern Himalaya. Gangulee (1976) reported nine species of *Macromitrium* from India, and two species from Nepal. *Macromitrium moorcroftii* (Hook. & Grev.) Schwägr. and *M. hymenostomum* Mont. were reported from Western Himalaya by Lal (2005) and Vohra (1970) reported *M. sulcatum* (Hook.) Brid. from

Didihat, Pithoragarh. *Macromitrium rigbyanum* has been discovered during a recent investigation of the mosses in Pithoragarh, and represents a new addition to the bryoflora of Western Himalaya. This species usually grows in shade on branches of *Quercus leucotrichophora* A. Camus. It occurs in dense cushions of creeping shoots with numerous erect secondary branches. The leaves are ovate-lanceolate to linear-lanceolate with multipapillose apical cells and a prominent costa; capsules are erect and cylindrical with a hairy calyptra.

9. *Oedipodiella australis* (Wager & Dixon) Dixon

Contributor: J. Eckstein

Canary Islands, Tenerife: ANAGA-MOUNTAINS: Punta del Hidalgo, west-foot of Roques dos Hermanos, 28°34'10"N, 16°18'46"W, 44 m a.s.l., on soil in abandoned terraced fields, 28 March 2009, *leg.* J. Eckstein 7365 (JE).

This South African species is also known from France, Spain, Madeira, and from the Canary Islands of Fuerteventura, Gran Canaria and La Palma (Kürschner *et al.*, 2008, González-Mancebo *et al.*, 2008). Here it is reported for the first time from Tenerife, the largest of the Canary Islands. Owing to its reproduction by large lenticular gemmae and large spores, long-range dispersal is nearly impossible. Therefore, *Oedipodiella australis* was probably introduced to Europe and Macaronesia by man (Kürschner *et al.*, 2008). On Tenerife, *O. australis* was found scattered on open soil in abandoned terrace fields about 500 m from the coast. Frequently associated bryophytes include *Mannia androgyna* (L.) A. Evans, *Exormotheca pustulosa* Mitt., *Riccia nigrella* DC., *Riccia trabutiana* Steph., *Tortula atrovirens* (Sm.) Lindb. and *Leptophascum leptophyllum* (Müll. Hal.) J. Guerra & M. J. Cano. This bryophyte community may represent the recently described association and subassociation *Mannia androgynae-Exormothecetum pustulosae oedipodielletosum australis* Kürschner (Kürschner *et al.*, 2008).

10. *Orthotrichum cupulatum* Hoffm. ex Brid. var. *bistratosum* Schiffn.

Contributor: V. Hugonnot

France: GORGES DU VERDON, La Palud sur Verdon, Saint-Maurin, 43°50'16.0"N, 6°13'42.6"E, 650 m a.s.l., 10 April 2009, *leg.* V. Hugonnot *s.n.* (Herb. Conservatoire botanique national du Massif central).

Orthotrichum cupulatum var. *bistratosum* Schiffn. was originally described from Syria (type : Jebel Abd-el Aziz) (Schiffner, 1913). Since then, its known distribution has slightly extended towards the Middle East and greatly extended towards the western Mediterranean. The variety is recorded from Iraq (Kürschner & Erdağ, 2009), and Turkey (Frey & Kürschner, 1991; Kürschner & Erdağ, 2005, 2009; Kirmacı & Erdağ, 2009). Reports from Israel are not explicit but from an examination of the figures and the description provided in Heyn & Herrnstadt (2004), we feel confident in recording the variety from that country. Guerra (1984) mentioned the occurrence of the taxon in the central part of Spain and other localities have been added by Casas (1986, 1993) and Heras *et al.* (2004). The range is then mostly south-west Asian and western Mediterranean.

O. cupulatum var. *bistratosum* was recently found in south-eastern France, a locality 600 km from the nearest Spanish record and a notable range extension towards the north. This new data strongly suggests that the distribution of this variety could extend further in the Mediterranean region and in the Alps. The variety cannot be considered a south-western Asian (Irano-Turanian) endemic with a northern origin (Kürschner, 2008).

Orthotrichum cupulatum var. *bistratosum* is an epilithic moss, typically recorded in dry environments on various types of rock (calcareous, volcanic, plutonic). Kürschner & Erdağ (2009) consider that the variety is one of the characteristic taxa in *Grimmietum commutato-campestris* v. Krus. 1945 *Orthotrichetosum bistratosae* Kürsch. & Erdağ 2009, a thermo-xerophytic subassociation on acidic to subneutric rocks of the Turkish Phrygian highlands. It has also very infrequently been seen on tree bark (Heyn & Herrnstadt, 2004). In France, the variety was found growing on a steep slope, over small calcareous massive rocks (Jurassic) with a western aspect, together with *Orthotrichum cupulatum* Hoffm. ex Brid. var. *cupulatum*, *Schistidium brunnescens* subsp. *griseum* (Nees & Hornsch.) H.H. Blom, *S. crassipilum* H.H. Blom, *Syntrichia calcicola* J.J. Amann, and *Grimmia orbicularis* Bruch ex Wilson. The surrounding vegetation was typically a supra-Mediterranean *Quercus humilis* Miller woodland remnant and *Juniperus phoenicea* L. matorral.

Orthotrichum cupulatum Hoffm. ex Brid. is mainly characterized by the following combination of characters: robust blackish plant, with immersed sporophytes, 16-ribbed capsules with cryptoporous stomata and 16 patent exostome teeth. Var. *bistratosum*, considered a species by Guerra (1985), is further differentiated in that its leaves are bistratose from their middle (or below) up to their apex, and are obscurely papillose; in the sporophyte there is marked striation of the outer peristome layer. Our material possesses these characters but departs from most published descriptions by having a slightly pilose vaginula. The other taxa of the complex were once treated as species: *Orthotrichum nudum* Dicks. and *O. limprichtii* I. Hagen, but are now considered at the rank of variety, respectively var. *riparium* Huebener and var. *fussum* (Venturi) Boulay (Lara *et al.*, 2009). In France, the var. *riparium* is widely distributed in the Mediterranean area while the var. *fussum* seems to be restricted to calcareous Alps of the interior (Boudier & Pierrot, 1992).

11. *Orthotrichum shawii* Wilson

Contributors: M. Kirmacı and A. Erdağ

Turkey: PROVINCE DENİZLİ: Honaz Mountain, deep valley, epiphytic on trunk of *Juglans regia* L., 37°40'N, 29°13'E, 800 m a.s.l., 22 November 2003. *leg. & det.* M. Kirmacı & A. Erdağ, *conf.* R. Garilleti (AYDN, no. 2493).

Orthotrichum shawii Wilson is recorded for the first time for the bryophyte flora of Turkey. It was described and discussed in great detail by Mazimpaka, Lara & Garilleti (2000) and Garilleti, Lara & Mazimpaka (2006). According

to these authors, this species has been overlooked in some countries because of its similarity to *O. striatum* Hedw. and *O. rupestre* Schleich. ex Schwägr., or ignored because of disagreements about its taxonomic status. *O. shawii* is easily distinguished from related species by sporophytic characters: the capsule is scarcely ribbed or not ribbed, the exostome consists of 16 whitish and opaque teeth which are recurved to the theca when dry, and the endostome is absent or consists of eight vestigial segments. Additionally, the areolation of the exothecium and ornamentation of the peristome differ significantly from those of *O. striatum*. The Turkish specimen is quite similar to collections from Europe. In its Turkish locality the species is regularly associated with *O. pumilum* Sw. ex anon., *O. affine* Schrad. ex Brid., *O. rupestre* and *O. pallens* Bruch ex Brid.

Orthotrichum is one of the largest moss genera in Turkey. In the last decade, eight taxa have been added to the Turkish bryoflora, i.e. *O. tortidontium* F. Lara, Garilleti et Mazimpaka (Mazimpaka et al., 2000), *O. sprucei* Mont. (Erdağ & Kürschner, 2000), *O. rivulare* Turn (Erdağ & Kürschner, 2002), *O. scanicum* Grönvall and *O. macrocephalum* F. Lara, Garilleti et Mazimpaka (Erdağ, Kürschner & Parolly, 2004), *O. hispanicum* F. Lara, Garilleti et Mazimpaka (Garilleti et al., 2009), *O. vittii* F. Lara, Garilleti & Mazimpaka and *O. consobrinum* Cardot (Lara et al., 2009). The new record, *O. shawii*, raises to 31 (28 species and 3 varieties) the number of taxa in *Orthotrichum* known to occur in Turkey. It provides an extension in range for the species and makes a conspicuous new addition to the flora of SW Asia.

12. *Porella cordeana* (Huebener) Moore

Contributor: J. Eckstein

Canary Islands: TENERIFE: Orotava valley above Agumansa, forest road between recreation area 'La Caldera' and El Topo near a stone house at small barranco, 28°21'36"N, 16°29'15"W, 1140 m a.s.l., on wet volcanic rocks, 3 March 2005, leg. J. Eckstein 2322, conf. J. Hentschel, conf. S. Fontinha (JE, TFC).

Porella cordeana (Huebener) Moore is widespread in montane regions across Europe. In Macaronesia, it was known only from Madeira (Sérgio et al. 2008), and therefore, this report of *P. cordeana* on Tenerife represents the first record for the Canary Islands. Associated bryophytes at this new locality included *Thamnobryum alopecurum* (Hedw.) Gangulee, *Anoetangium angustifolium* Mitt. and *Porella arboris-vitae* (With.) Grolle.

13. *Pottiopsis caespitosa* (Brid.) Blockeel & A.J.E.Sm.

Contributors: M. Sim-Sim, L. Luis and S. Fontinha

Portugal, Madeira Region: SELVAGENS ARCHIPELAGO: Selvagem Grande, Topo, exposed, dry and rocky area, 30°08'54.581"N, 15°52'09.772"W, ca 100 m a.s.l., 7 February 2005, leg. I. Silva s.n. (LISU).

Pottiopsis caespitosa (Brid.) Blockeel & A.J.E.Sm. is a new record for the Macaronesian bryoflora. This species is restricted to Europe, mostly to lowland areas of the Mediterranean region, although it also occurs in the south of England (Dierßen, 2001; Frey et al., 2006). In the Selvagens Archipelago, this moss was collected from a

single locality, Topo in Selvagem Grande Island. It occurred in a coastal area on calcareous soil in very dry and exposed conditions, and was associated with other Pottiaceae, such as *Tortula atrovirens* (Sm.) Lindb. and *Tortula pallida* (Lindb.) R.H.Zander, as well as with *Bryum dichotomum* Hedw. and some liverwort species such as *Riccia sorocarpa* Bisch. and *Riccia lamellosa* Raddi.

In the Iberian Peninsula *Pottiopsis caespitosa* is a 'Data Deficient' species. It seems to be very rare in the Madeira region, where it is known from only this one location in the Selvagens Archipelago.

14. *Tortula pallida* (Lindb.) R.H.Zander

Portugal, Madeira Region: SELVAGENS ARCHIPELAGO: Selvagem Grande, Pico Atalaia (N), exposed, dry, windy and rocky area, 30°08'49.567"N, 15°52'25.022"W, ca 153 m a.s.l., 30 April 2006, leg. S. Fontinha s.n. (LISU); Selvagem Grande, Topo, exposed, dry and rocky area, 30°08'54.581"N, 15°52'09.772"W, ca 100 m a.s.l., 7 February 2005, leg. I. Silva s.n. (LISU); Selvagem Grande, Pico dos Tornozeiros (N, NE), rock cracks and under the rocks, 30°08'54.485"N, 15°51'57.079"W, ca 136 m a.s.l., 30 April 2005, leg. I. Silva s.n. (LISU); Selvagem Grande, Pico dos Tornozeiros (N), 30°08'54.485"N, 15°51'57.079"W, ca 136 m a.s.l., 6 June 2008, leg. S. Fontinha & M. Sim-Sim s.n. (LISU); Selvagem Grande, plateau between Pico dos Tornozeiros and Pico Atalaia, exposed, dry and rocky area, 30°08'54.581"N, 15°52'09.772"W, ca 100 m a.s.l., 6 August 2008, leg. S. Fontinha & M. Sim-Sim s.n. (LISU); Selvagem Grande, Topo, exposed, dry and rocky coastal area, 30°08'54.581"N, 15°52'09.772"W, ca 100 m a.s.l., 6 August 2008, leg. S. Fontinha & M. Sim-Sim s.n. (LISU); Selvagem Grande, Topo, exposed, dry and rocky area, 30°08'54.581"N, 15°52'09.772"W, ca 100 m a.s.l., 6 August 2008, leg. S. Fontinha & M. Sim-Sim s.n. (LISU).

Tortula pallida (Lindb.) R.H. Zander is here newly recorded for the bryoflora of Selvagens Archipelago and the Madeiran region. In Europe it is restricted to the Mediterranean area, and in Macaronesia is reported only from Gran Canaria in the Canary Islands (Frey et al., 2006). *T. pallida* thrives in dry conditions and prefers saline soils (Frey et al., 2006). It was recently found in coastal areas on the island of Selvagem Grande, growing on calcareous soil in very dry, exposed conditions, associated with *Bryum dichotomum* Hedw., *Pottiopsis caespitosa* (Brid.) Blockeel & A.J.E.Sm., *Riccia atlantica* Sérgio & Perold, *Riccia lamellosa* Raddi, *Riccia sorocarpa* Bisch., *Tortella flavovirens* (Bruch) Broth., *Tortula atrovirens* (Sm.) Lindb., and *Tortula solmsii* (Schimp.) Limpr. It seems to be frequent on the island, being found in five localities. Although it is considered a rare taxon in Europe (Frey et al., 2006), in the Iberian Peninsula it is classified as a taxon of 'Least Concern' (Sérgio et al., 2006). In the Madeira region it is infrequent, occurring only in Selvagem Grande Island.

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Zygodon oeneus Herzog (Bryophyta: Orthotrichaceae) new to Uganda and Africa

During the 1998 British Bryological Society – Tropical Bryology Group visit to Mount Elgon, Uganda, collections were made of epiphytes growing at high altitude on the two

endemic *Dendrosenecio* species [*D. elgonensis* (T.C.E. Fries) E.B. Knox subsp. *elgonensis* and *D. elgonensis* subsp. *barbatipes* Hedberg]. Several of these 1998 moss collections

consist of a distinctive small, claret-red *Zygodon* species which remained unidentified at the specific level.

Recently HWM, at the invitation of the Natural History Museum, London (BM), has been working on unidentified moss collections from sub-Saharan Africa with the emphasis on collections made by the late Francis Rose during 1961 from Uganda and Sudan. While looking at collections from Mt Elgon the unidentified *Zygodon* was seen growing with *Zygodon intermedius* Bruch & Schimper in a collection gathered from *Dendrosenecio elgonensis* subsp. *barbatipes* (Rose 392, BM!). This plant did not match any other *Zygodon* species described from Africa. When considering previous examples of the disjunctive distribution of several high altitude species between Africa and South America, (e.g. *Hypodontopsis mexicana* (Thér.) H.Rob., Uganda–Mexico, (Hodgetts & Goffinet, 1998 O'Shea 2006); *Leptodontium proliferum* Herzog, Lesotho–Bolivia and Mexico, (Hodgetts, Matcham & Duckett, 1999; O'Shea, 2006); *Adelothecium bogotense* Hampe, Tanzania–Venezuela (Ochyra *et al.*, 1992; O'Shea, 2006); it seemed prudent to check the *Zygodon* species found in South America. It quickly became apparent that *Zygodon oeneus* Herzog recorded from Bolivia and Venezuela

(Churchill, *s.d.*) could be very similar to the gatherings from Mt Elgon. The identification key to *Zygodon* species of the South American Andes, published on the *Mosses of the Tropical Andes* website (Churchill, *s.d.*), describes these plants as rusty to burgundy-red with leaves which are ligulate, broadly acute and 0.5–0.6 mm long. The ecology and distribution is given as 'montane forest, including Tucumano-Boliviano; on tree trunks (including *Podocarpus*), at elevations from 1500 to 4000 m (Venezuela: 2700–3800 m, Bolivia: 1500–4000 m)'. Consequently, a loan of the holotype material was requested (Herzog 3620, JE!), which confirmed identification of the Ugandan material as *Z. oeneus*. The Bolivian type material had taller shoots than the specimens examined from Uganda, reaching up to 4 cm tall compared to a maximum 1.5 cm in the Ugandan plants. In other respects they were found to be identical.

A search through the African *Zygodon* collections at BM revealed a further two specimens of *Z. oeneus*, also from Uganda. The specimen collected by G.H.S. Wood (no. 1707) was misidentified in the herbarium as *Z. intermedius* var. *strictifolius* Thér. and that collected by L. Bessone (no. 9) was determined by H.N. Dixon as his unpublished

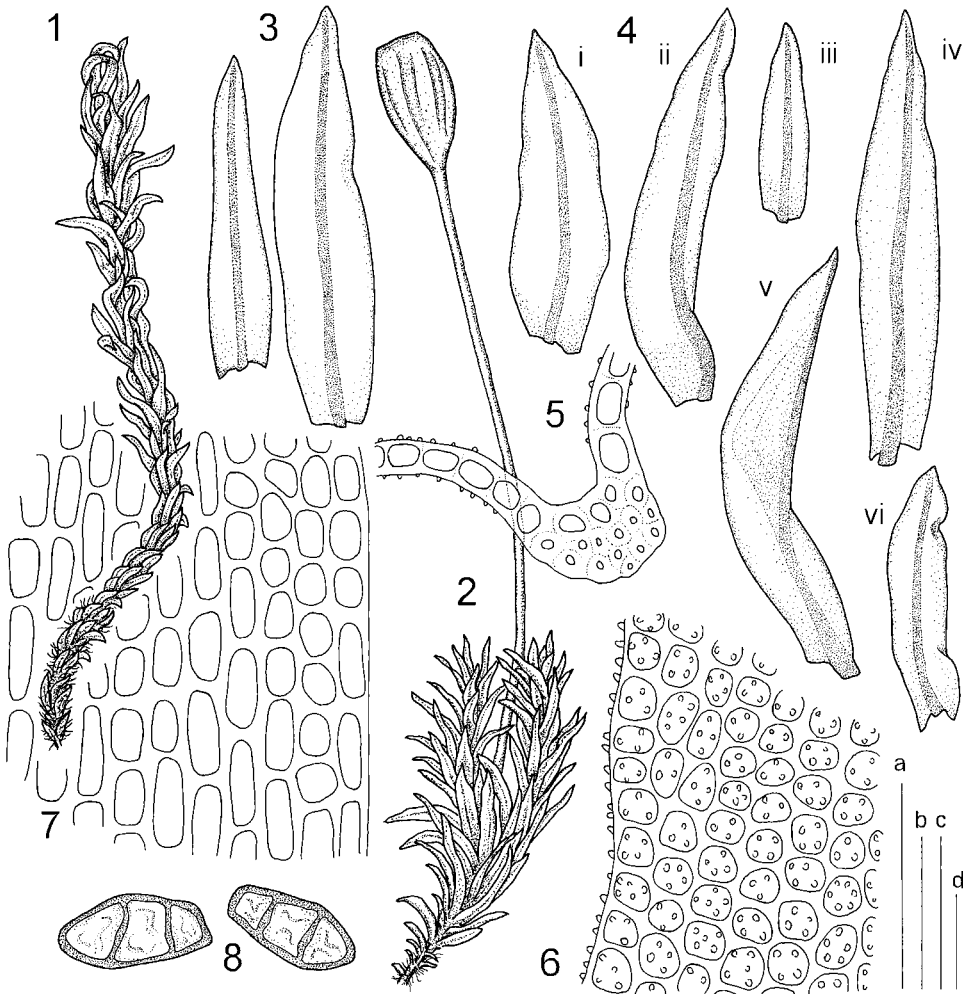


Figure 1. *Zygodon oeneus*. 1: habit, dry; 2: habit, moist; 3: perichaetial leaves; 4: vegetative leaves; 5: cross-section mid-leaf; 6: upper laminal cells; 7: basal laminal cells; 8: gemmae. (1–3, 4 iv–vi, 5–7) Drawn from *Porley 9134b* (BM); (4 i–iii) drawn from *Rose 392* (BM); (8) drawn from *Wood 1707* (BM). Scale bars: a=2 mm (1, 2); b=0.5 mm (3, 4); c=5 µm (5, 8); d=20 µm (6, 7).

herbarium name '*Zygodon ruber*'. Identification characters for *Z. oeneus* are described, illustrated and discussed below, based on the specimens examined from Uganda.

Zygodon oeneus Herzog, *Biblioth. Bot.* 87: 61. 21 a–c. 1916. Type: Bolivia. Im oberen Chocayatal, über 4000 m, Herzog 3620 (Holotype – JE! S – isotypes B173557, B173558). Fig. 1.

Plants small, slender, often forming compact tufts of upright shoots up to 15 mm tall, claret red with new growth pale yellow green; rhizomatous below; with filiform 'micro' branches. *Leaves* of upper shoots larger than those below, dry leaves appressed to twisted about stem, spreading when moist; oblong-lanceolate, 0.5–1.5 mm long, apex acute, margins plane sometimes slightly undulate; costa ending below apex; upper laminal cells irregular rounded, 6.6–11.6 μm , with 3–6 small conical papillae per cell, cell walls often reddish; basal cells quadrate to long rectangular, 8.3–11.6 μm wide and 8.3–49.5 μm long, smooth, cell walls usually with red colouration, laminal cell walls react red to KOH. *Gemmae* infrequently observed, consisting of three cells with transverse septa. *Dioicous*. *Perigonia* bud like, occurring laterally, leaves 0.5–1.0 mm. *Perichaetia* terminal, perichaetial leaves similar to vegetative ones, though basal cells longer and narrow rectangular. *Seta* elongate, 3–8 mm long. *Capsule* eight-ribbed, 1.0–1.5 mm. *Peristome* absent. *Calyptra* cucullate, naked.

Zygodon oeneus could be confused with *Z. intermedius* as both species possess identical gemmae in the leaf axils, consisting of three cells with transverse septa. *Zygodon oeneus* is distinguished from other *Zygodon* species in Africa, including *Z. intermedius*, by a combination of its small size, the filiform micro-branches, red pigmentation of the laminal cells, red reaction of the laminal cell walls to KOH and absent peristome. In comparison, *Zygodon intermedius* does not feature red pigmentation of the laminal cells and has a peristome, though this can be fragile and occasionally missing from specimens. *Zygodon oeneus* is recorded here as new to Uganda and the African

continent, where it so far appears restricted to growing on *Dendrosenecio* species at high altitudes above 3000 m.

SPECIMENS EXAMINED

UGANDA. Ruwenzori, Verso la Vetta, Margherita, 15 January 1938, *L. Bessone* 9 (BM). Mt Elgon, North Bugishu, by Sasa stream, near Butandiga ridge, 25 March 1951, *Wood, G.H.S.* 1707 (BM). Mt Elgon, October 1961, *F. Rose* 392 (BM). Mt Elgon, Caldera Ruin, 10 July 1998, *J.G. Duckett* 11245b (BM). Mt Elgon, Caldera Ruin, 10 July 1998, *R. Porley* 9134b (BM, E). Mt Elgon, Piswa to Hunter's Cave, 13 July 1998, *R. Porley* 9206b (BM, E). Mt Elgon, Kapchorwa, 1°10'N, 34°33'E, 8 July 1998, *R. Porley* 9096a (BM, E).

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Entosthodon mouretii (Corb.) Jelenc in Portugal: New areas of occurrence worldwide

The Tejo International Natural Park, situated in the central eastern part of Portugal, is considered an important area for Mediterranean vascular plants and also recently for bryophytes. While studying the material collected in this area, we found new localities

of *Entosthodon mouretii* (Corb.) Jelenc for the Iberian Peninsula.

Entosthodon mouretii was first described by Corbière (1913) from Morocco and subsequently recorded in two other localities within this country in 1932 and 1933 (Jelenc, 1955). It

was considered a Moroccan endemic until 1999 when it was discovered in the northeast and subsequently in central Spain (Brugués *et al.*, 1999). In 2006, *E. mouretii* was found for the first time in Portugal, Baixo-Alentejo, in the southeast of this country (Sérgio *et al.*, 2006). Most recently, its known distribution area was extended to the southeast of France (Thouvenot, 2008). The total distribution is shown in Fig. 1.

Entosthodon mouretii is a small plant, up to 5 mm, with a reddish-brown stem, yellowish-green leaves and a longly excurrent yellow-red nerve (Brugués *et al.*, 1999). It is morphologically similar to *E. fascicularis* (Hedw.) Müll.Hal. but can be distinguished by the excurrent yellow-red nerve. It also differs in leaf shape (Fig. 2) and a more strongly dentate leaf margin.

A revision of Portuguese herbarium material named as *Entosthodon fascicularis* revealed further collections of this moss, resulting in a total of eight known localities for *E. mouretii* in Portugal, thus expanding the known worldwide distribution of this moss (Fig. 1).

Entosthodon mouretii is a species associated with Mediterranean temporary pond communities, an exceptionally rich habitat for bryophytes and a priority habitat listed on Annex 1 of the EC Habitats Directive 92/43/CEE. In the Iberian Peninsula, it has also been found at locations with this type of vegetation community, such as the locations of Naves Frias, Alto Alentejo in Portugal and Sant Climent Sesebeles, Girona in Spain (Sérgio *et al.*, 1997–1998). Within the Tejo International Natural Park, it was rotundifolia found in an area of *Quercus rotundifolia*

woodland, the 'Montado' ecosystem, on periodically flooded sandy clay soils that are otherwise dry throughout most of the year, supporting characteristic xerophytic shrubby vegetation, with some eutrophication. Associated bryophytes species include *Riccia* spp. and *Fossombronia* spp., *Pseudephemerum nitidum* (Hedw.) Loeske, *Ephemerum minutissimum* Lindb. and *Archidium alternifolium* (Hedw.) Mitt. The occurrence of *E. mouretii* in this type of habitat reinforces the important contribution that the Mediterranean temporary pond community provides in terms of bryophyte diversity.

Entosthodon mouretii is currently listed as 'Data Deficient' on the 2006 Red List of Bryophytes of the Iberian Peninsula due to its recent discovery in the Peninsula (Sérgio *et al.*, 2007). These new data will greatly contribute to any future reassessments of its conservation status.

Portuguese material studied (Fig. 1).

Estremadura: Setúbal, Serra da Arrábida, C. Sérgio & M. Sim-Sim 85 (LISU 152436); C. Sérgio 13652 (LISU 233505). **Alto Alentejo:** Montemor-o-Novo, C. Sérgio, M. Brugués, R.M. Cros (LISU 233016); Naves Frias, C. Sérgio, M. Brugués, R.M. Cros & I. Granzow (LISU 164778, LISU 164776); **Baixo Alentejo:** Serpa, C. Sérgio, M. Brugués, R. Cros (LISU 213367); Barrancos, C. Sérgio, M. Brugués, R.M. Cros (LISU 213368, LISU 213369, LISU 213370). **Beira Baixa:** Parque Natural Tejo Internacional (PNTI), Cegonhas, C. Sérgio, M. Brugués, R.M. Cros (LISU 235423); PNTI, Segura, C. Sérgio, M. Brugués, R.M. Cros (LISU 235424).

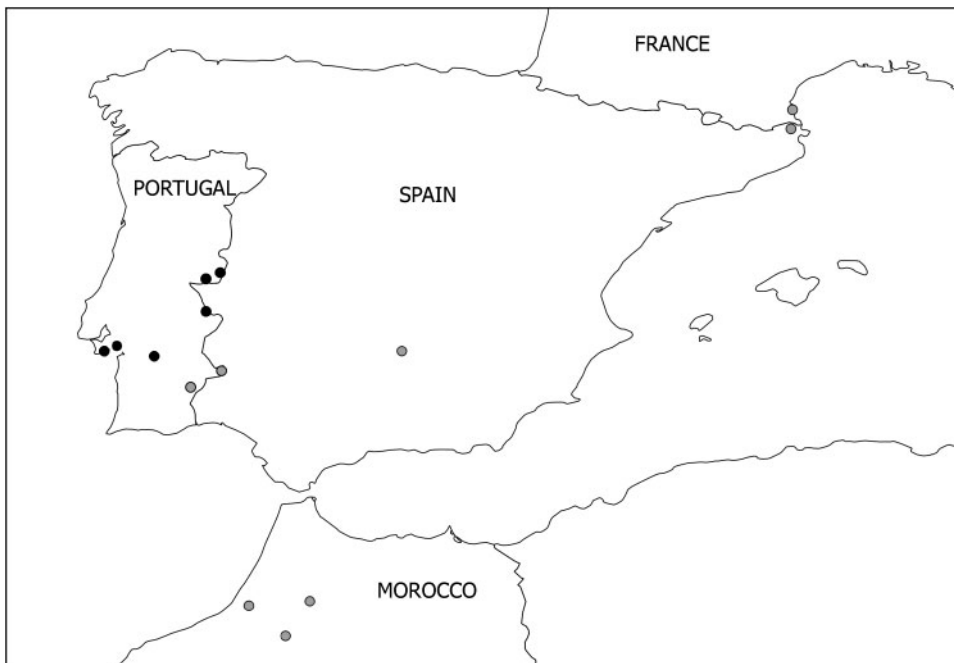


Figure 2. Worldwide distribution of *Entosthodon mouretii* (Corb.) Jelenc. • Previously known localities (grey) – Morocco: Forest of Mamora, 1912, (*Mouret*, Type, PC); Harcha, South of Oujda, 1932 (PC); Beni Amar, 1933 (PC). Spain: Catalunya, Alt Empordà, Sant Climent Sesebeles, 1995 (BCB). Ciudad Real, Madrona, San Lorenzo de Calatrava, 1984 (GDAC). France: Eastern Pyrenees, Canet-en-Rousillon, 2007 (herb. of L. Thouvenot). Portugal: Barrancos, Mina de Aparis, 1997 (LISU); Serpa, Ribeira da Lima, 1997 (LISU). • New localities in Portugal (black).

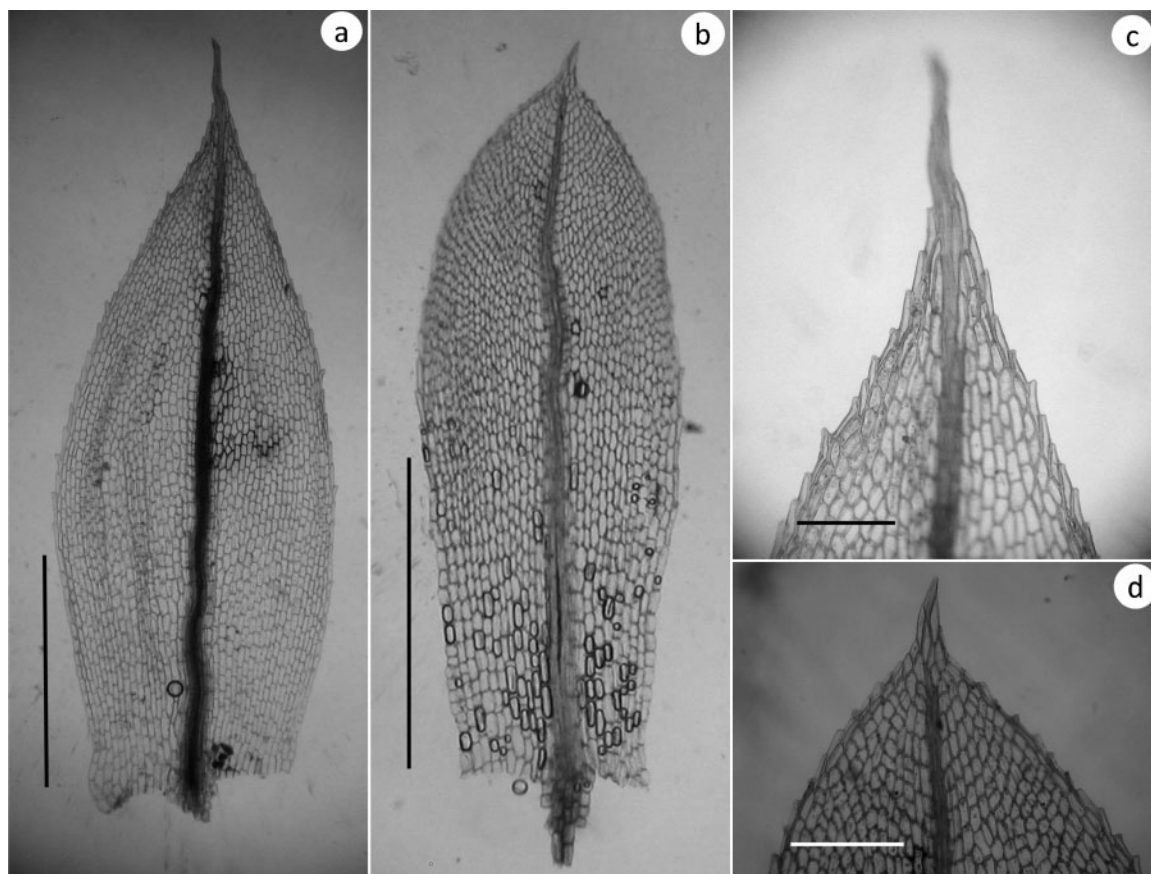


Figure 3. (a) Leaf of *Entosthodon mouretii*; (b) leaf of *E. fascicularis*; (c) leaf apex of *E. mouretii*; (d) leaf apex of *E. fascicularis*. Scales: a and b: 1 mm; c and d: 100 µm.

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