

New national and regional bryophyte records, 29

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1. *Barbilophozia atlantica* (Kaal.) Müll.Frib.

Contributors: C. Garcia, C. Sérgio and S. Stow

Portugal: Minho, Serra do Gerês, Fonte das Letras, 29TNG7025, 774 m, in crevices of granitic rocks, 8 June 2010, *leg.* C. Garcia *s.n.* (LISU241449).

Infante *et al.* (1998) revised the Iberian distribution of *Barbilophozia atlantica*, confirming the presence of this species in different regions in northern Spain (Cantabria, Asturias, Vizcaya, Guipúzcoa and La Rioja). In the Iberian Red List, it is considered a vulnerable hepatic (Sérgio *et al.*, 2007).

The plant was found in the north of Portugal in good quantity, growing in granitic rock crevices. It possessed characteristic red-vinaceous gemmae and showed such very distinctive characters as small underleaves, lobes with relatively large cells (25–40 µm) and having some shoots ascending to erect.

The location, Serra do Gerês in the Province of Minho, is in a National Park (Peneda-Gerês) with a very diverse bryoflora, and with a strong Atlantic influence (Sérgio & Schumacker, 1992). This specimen constitutes a new record for the Iberian Peninsula, and a new important area for the species in Europe.

The ecological conditions in its mountain habitat accord closely with those found for the species' Euro-Siberian montane range in the Northern Hemisphere. *B. atlantica* is considered a relict northern suboceanic-alpine species and is also known from southern and southwestern Greenland, Iceland and North America (Damsholt, 2009).

2. *Bryohumbertia flavicoma* (Müll.Hal. *ex* Broth.) J.-P.Frahm

Contributor: T. A. Hedderson

La Réunion: Commune Plaine des Palmistes, Forêt de Bélouve, Sentier du Trou de Fer depuis le Gîte de Bélouve. 21°03.69'S, 55°32.32'E, 1460 m a.s.l., on rotting wood in *Acacia heterophylla* (Lam.) Willd. stand, 24 September 2006, *leg.* T.A. Hedderson 16280 (BOL).

Bryohumbertia flavicoma is known from a wide range across tropical Africa, including Madagascar

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(Frahm & O'Shea, 1996), and its occurrence on Réunion is thus not surprising. Reports of the otherwise neotropical species *B. filifolia* (Hornsch.) J.-P. Frahm from Réunion, Mauritius and Madagascar (Een, 1993 cited in O'Shea, 2006) need to be verified and may well represent this species instead. Although preliminary molecular data (Stech, 2004) suggest that *Bryohumbertia* might be nested within *Campylopus*, support for the relationship is weak, and their reciprocal monophyly cannot be confidently rejected. Given the significant morphological differences between the two (Frahm & O'Shea, 1996) I have opted to retain *Bryohumbertia* for the present.

3. *Bryum kunzei* Hornsch.

Contributors: C. Sérgio and S. Stow

Portugal: Beira Alta, Lamego, Britiande, 29TPF 0147, 680 m a.s.l., crevices in exposed rocks, 4 October 2000, leg. C. Sérgio 11537 (LISU 234619).

Bryum kunzei had long been considered a synonym of *Bryum caespiticium* var. *imbricatum* Bruch & Schimp., but according to recent taxonomic accounts (Holyoak, 2004; Guerra *et al.*, 2010) it is an independent species distinguished by its concave leaves with plane and unbordered margins, quadrate to shortly rectangular marginal basal cells and a shorter excurrent nerve.

It exhibits a widespread distribution occurring in North America and in Europe from Great Britain and the Azores to the Mediterranean area where it has recently been reported in Corsica (Sotiaux *et al.*, 2007). It is also present in Southeast Asia and North Africa although records from these two regions require confirmation (Hill *et al.*, 1994). However, its actual distribution is uncertain; owing to taxonomic uncertainty and a lack of records this species may have been overlooked (Preston, 2010).

Although it is a relatively common species in Spain, where it is present in more than 12 provinces, found on soil overlying rocks and in rock crevices at altitudes between 100 and 3200 m (Guerra *et al.*, 2010), this is the first record of this species in Portugal. The Portuguese material has morphological characteristics that agree with those given by Holyoak (2004).

4. *Bryum mildeanum* Jur.

Contributors: C. Sérgio and S. Stow

Portugal: Trás-os-Montes, road from Morais to Mogadouro, Ponte do Sabor, damp crevices in exposed rocks, 29TPF8585, 500 m a.s.l., 22 November 2000, leg. C. Sérgio *et al.* 11495 (LISU 235843); Ribatejo, Ponte de Sôr, Horta da Cordeira, 1 km from the road, on soil in *Pinus pinaster* Aiten plantation, near running water, 29SND8940, 185 m a.s.l., 17 November 1993, leg. C. Sérgio 8827 (LISU 235842).

In a recent revision of Portuguese material in LISU, the presence of *Bryum mildeanum* in Portugal

was confirmed. This was achieved with reference to the taxonomic study of *Bryum* presented in the most recent Iberian flora (Guerra *et al.*, 2010) and by comparison of material with a Spanish specimen confirmed as *B. mildeanum*. In the Iberian flora (Guerra *et al.* 2010), *B. mildeanum* was not considered to be present in Portugal, as the existing specimens that were first identified as *Bryum mildeanum* were not typical and lacked sufficient characters to enable the identification of this species with certainty.

This species has a narrow distribution range in Spain. It is found in mountainous areas near the Pyrenees and in the south of the country. The habitat of the Portuguese specimens is consistent with its typical ecology, inhabiting damp soils, although the Atlantic influence allows its existence at lower altitude.

5. *Bucklandiella microcarpa* (Hedw.) Bednarek-Ochyra & Ochyra

Contributors: H. Bednarek-Ochyra, P. Erzberger and R. Ochyra

Hungary: Korom-Esztergom County (Megye), Gerecse Mts, Kisgalla near Tatabánya, Tarjáni mélyút, 47°36'07.2"N, 18°24'07.5"E, ca 270–300 m a.s.l., 7 May 1938, leg. L. Vajda *s.n.* (BP-160790).

Bucklandiella microcarpa is a moss one would expect to find in Hungary since there are no phytogeographical or other reasons why it should not appear here just as it does in other conterminous central European countries. This is an acidophilous moss growing on a variety of non-calcareous rocks, and Hungary, with its great diversity of rocks, has suitable habitats in which *B. microcarpa* could occur. This assumption can now be substantiated. When revising the herbarium holdings of *Racomitrium*-related mosses in BP we traced a single specimen of *B. microcarpa* from the Gerecse Mountains which was originally named *Racomitrium heterostichum* (Hedw.) Brid. The material is sterile but it represents a typical expression of *B. microcarpa*. In the latest checklist of the Hungarian bryophytes (Papp *et al.*, 2010), seven species of *Racomitrium*-related mosses have been recorded, including three which are currently placed in the genus *Bucklandiella* Roiv., one of the segregates of the traditionally conceived genus *Racomitrium*. These are *Bucklandiella affinis* (F. Weber & D. Mohr) Bednarek-Ochyra & Ochyra, *B. heterosticha* (Hedw.) Bednarek-Ochyra & Ochyra and *B. obtusa* (Brid.) Bednarek-Ochyra & Ochyra. Unfortunately, the present discovery of *B. microcarpa* does not increase the number of species in this genus occurring in Hungary, because the material reported from Hungary as *B. obtusa* actually represents epilose ecads of *B. heterosticha* (see also Frisvoll 1988: 116). Thus, *B. microcarpa* only replaces this deletion from the list of Hungarian *Bucklandiella*.

Although the specimen of *Bucklandiella microcarpa* was collected in an area of calcareous bedrock with, in places, a thick loess cover, its presence implies the occurrence of a siliceous substrate. It can only be assumed that at the collection site there is (or was?) some kind of a siliceous boulder, on which the species could have grown. Such boulders do in fact occur in the Gerece Mountains, but they are occasional, and local experts do not know of any at the site in question (Barina, 2006).

6. *Cephalozia macounii* (Austin) Austin

Contributors: M. V. Dulin and D. A. Philippov

Russian Federation: Vologda Region, Vytegra District, 50 km to E from settlement Oktyabr'skiy, Andomskaya height, 4 km to SE from lake Soydozero, mire Il'inskoe, 61°26'23.6"N, 37°37'27.2"E, ca 240 m a.s.l., at the aapa mire (string bogs of circumpolar distribution, found particularly in Fenno-Scandinavia) wooded edges, on wet decaying log of *Pinus sylvestris* L. with cover of mosses, among other bryophytes, e.g. *Calypogeia suecica* (Arnell & J.Perss.) Müll.Frib., *Crossocalyx hellerianus* (Nees ex Lindenb.) Meyl., *Lepidozia reptans* (L.) Dumort., *Lophozia ventricosa* (Dicks.) Dumort., *Orthocaulis attenuatus* (Mart.) A.Evans, *Ptilidium pulcherrimum* (Weber) Vain., *Schistochilopsis incisa* (Schrad.) Konstant. et al., plants with perianths and sporophytes, 18 August 2010, leg. D.A. Philippov, 10-766 (IBIW, SYKO).

This is the first report of *Cephalozia macounii* from the Vologda Region. It is a northern suboceanic-montane, probably circumboreal species (Damsholt, 2002), and is classed as vulnerable in the *Red Data Book of European Bryophytes* (ECCB, 1995).

C. macounii is known from several countries in Europe (Poland, Switzerland, Finland, Sweden), from some localities in North America, and is also reported from Iceland (Damsholt, 2002; Schumacker & Váňa, 2005), it also occurs in a few localities in northern Russia. In the European part of Russia, it is recorded only in the Leningrad Region (Potemkin & Andrejeva, 1999), Karelia Republic (Bakalin, 1999) and Komi Republic (Zheleznova, 1985; Dulin, 2007, 2008), and also from the Northern Urals (Konstantinova & Bezgodov, 2006), western Siberia (Lindberg & Arnell, 1889) and South Siberia (Konstantinova et al., 2003; Konstantinova & Savchenko, 2008). A record of *Cephalozia macounii* from the Putorana Plateau (Zhukova, 1986) seems to be erroneous, as the habitat described 'on peat in tundra', is uncharacteristic for the species (Konstantinova et al., 2009).

7. *Cladopodiella fluitans* (Nees) H.Buch

Contributors: D. Claro and C. Sérgio

Portugal: Beira Litoral, Figueiró dos Vinhos, Fragas de São Simão, 29SNE5818, 250 m a.s.l., on

a wet slope of shale rocks, 28 February 2011, David Claro s.n. (LISU 241440).

This is the first report of *Cladopodiella fluitans* for Portugal. This liverwort species is widespread throughout northern and central Europe, where it is a circumboreal element and has a suboceanic distribution (Zubel, 2009); moreover, it has already been reported for Spain (Söderström et al., 2002). The first collection in Spain was made in Galicia (Allorge, 1935), and more recently it was discovered in Aragon (Infante & Heras, 2000), Asturias (Fernández Ordoñez, 2006) and Cantabria (Infante et al., 2006). Nevertheless, it is considered an endangered species in the Iberian Peninsula (Sérgio et al., 2006), and mainly owing to habitat destruction, regionally extinct in Cantabria (Infante et al., 2006).

Cladopodiella fluitans in Portugal was found in the central part of the country in an interesting area with a strong oceanic influence. In this area, its most southern locality in the Iberian Peninsula, *C. fluitans* was found in its typical habitat, in a *Sphagnum* community on dripping, shaded rocks.

8. *Climacium dendroides* (Hedw.) F.Weber & D.Mohr

Contributors: S. Shirzadian and S. Akhoondi Darzikolaei.

Iran: Gilan province, Masouleh to Khalkhal road, 48°49'E, 37°15'N, 1400 m, on moist soil, 2 June 1996, leg. S. Shirzadian 0297 (IRAN).

This species is found in very wet and damp grasslands and is distributed in Europe, America and Asia (Smith, 2004).

Many bryologists (e.g. Lawton, 1971; Horton & Vitt, 1976) have elaborately discussed the distinctiveness of *Climacium dendroides* and *C. americanum* Brid. These two species differ in the shape of their leaves, leaf cells, capsule size and peristome structure (Crum & Anderson, 1981). Shaw et al. (1994) indicated that, despite a lack of complete morphological discontinuity, *C. americanum* and *C. dendroides* are evolutionary distinct; reproductively isolated species. We concur with Shaw et al. (1994) that, among these taxa, there is no evidence that morphological intergradations could be caused by interspecific hybridization.

This newly reported Iranian specimen of *C. dendroides* was sterile, and represents a new record for the family Climaciaceae in Iran. The Climaciaceae are rather rare in the near and Middle East, represented only by a single species, i.e. *Climacium dendroides*, which was reported from Turkey (Ünal, 1973).

9. *Geocalyx graveolens* (Schrad.) Nees

Contributors: A. Schäfer-Verwimp and J. Váňa

Dominican Republic: Prov. Santiago, Cordillera Central, San José de las Matas, culture zone between Montones Arriba and Mata Grande, ca 19°08'N, 70°20'W, on shady earth cut along unpaved road,

840 m a.s.l., 11 April 2007, *leg.* Schäfer-Verwimp & Verwimp *s.n.*, *det.* J. Váňa (PRC, JE).

New to the West Indies and the Neotropics.

Geocalyx graveolens is a widespread species in the northern hemisphere, disjunctly circumboreal, predominantly of temperate climates, and not reaching the tundra (Schuster, 1980). It is known from most countries in Europe (usually infrequent); also occurs in Russia, Caucasus, Siberia, (in Japan replaced by the closely related *G. lancistipulus* (Steph.) S.Hatt.), Madeira and the Azores. In North America *G. graveolens* is abundant and ubiquitous from Alaska to California and common in the East from Labrador to North Carolina and Tennessee, but hardly penetrating to the south-eastern coastal plain, except in North Carolina (Schuster, 1980; Paton, 1999; Damsholt, 2002).

Although *Geocalyx graveolens* is so widespread and abundant in North America, the collection from the Dominican Republic is rather surprising. It represents not only the first (generic) record for the Greater Antilles but also for the West Indies and the Neotropics as a whole. However, considering the collection site, the species may have been introduced by human activity. Further genetic studies may reveal the geographical relationships of the plants found in the Dominican Republic.

10. *Leiocolea badensis* (Gottsche) Jörg.

Contributors: M. Sulayman, V. A. Bakalin and R. Eziz

China: Xinjiang Prov., Altay Mts., Qinggil County, Zhonghaizi, on soil. *ca* 48°03'N, 88°05'E, 2402 m a.s.l., July 2006, *leg.* M. Sulayman 14771 (IFP)

This species is distributed in boreal and hemiarctic zones of the northern hemisphere, being confined to calcium-rich substrates. In areas adjacent to China it is distributed in Russian southern Siberia (Konstantinova *et al.*, 2009) and its occurrence in North-West China seemed highly likely.

11. *Lobatiriccardia oberwinkleri* Nebel, Preussing, Schäf.-Verw. & D.Quandt

Contributors: A. Schäfer-Verwimp and M. Nebel

Brazil: Espírito Santo, Serra de Caparaó, 20°24'S, 41°50'W, remnants of upper montane rain forest along Rio José Pedro below Cachoeira Bonita, 1760–1820 m a.s.l., on humid earth, 21 July 1990, *leg.* Schäfer-Verwimp & Verwimp 13020, *det.* M. Nebel (JE, SP, STU).

Lobatiriccardia oberwinkleri has recently been described from lower montane rain forest in southern Ecuador, from an altitude of 1850 m (Preussing *et al.*, 2010). The collection from southeastern Brazil represents a remarkable range extension for the species and the second record for the western hemisphere. *Lobatiriccardia oberwinkleri* is also known to occur on shady humid earth and dripping cliffs in lower to upper

montane rain forest from 1760 to 2880 m in southern Ecuador (unpublished records of the authors).

12. *Lophozia lantratoviae* Bakalin

Contributors: M. Sulayman, V. A. Bakalin and R. Eziz

China: Jilin Prov., Mt. Changbai, Xiaotianchi, roadside, on soil. *ca* 41°25'N, 128°10'E, 1700 m a.s.l., 16 July 2000, *leg.* J. Sun 854 (IFP).

This is a recently described species (Bakalin, 2003) and therefore its distribution is poorly known. Currently it is recorded for some mountainous areas in southern Russia: Caucasus, South Siberia, and South of the Russian Far East (Konstantinova *et al.*, 2009). The available data on distribution suggest its presence in China and the Korean Peninsula.

13. *Microcampylopus khasianus* (Griffiths) Giese & J.-P.Frahm

Contributor: T. A. Hedderson

Africa, La Réunion: Commune Plaine des Palmistes, Forêt de Bélouve, Sentier du Trou de Fer depuis le Gîte de Bélouve. 21°03.31'S, 55°32.81'E, 1445 m a.s.l., on clay banks at edge of cleared *Cryptomeria* D.Don plantation, 24 September 2006, *leg.* T.A. Hedderson 16292 (BOL); Bélouve, vicinity of ONF station, 21°03.64'S, 55°33.17'E, 1515 m a.s.l., on compacted soil at base of earth bank near guest houses, 23 September 2006, *leg.* T.A. Hedderson 16252 (BOL); Mare au thym, 21°05.76'S, 55°33.05'E, 1480 m a.s.l., on soil in parking area, 23 September 2006, *leg.* T.A. Hedderson 16234 (BOL). Commune St. Benoit, Piton des Neiges, along trail from Caverne Dufour to Hell-Bourg, about 1.5 km below trail to main peak, 21°05'59"S 55°30'18"E, 2370 m a.s.l., on soil banks under bushes in *Erica*-dominated vegetation on basalt, 26 March 2008, *leg.* T.A. Hedderson 16642 (BOL).

The populations of *Microcampylopus khasianus* in Réunion are considerably disjunct from those in its otherwise SE Asian range where, according to Giese & Frahm (1986), it is known from Sri Lanka, India, Sikkim, Burma, and Java. It thus represents yet another addition to the growing list of Réunion species with Asian rather than African affinities (Ah-Peng *et al.*, 2010). The Réunion material clearly belongs here rather than to *Microcampylopus laevigatum* (Thér.) Giese & J.-P.Frahm, a species recorded from a wide range in Africa and Asia, based on spore ornamentation (papillose rather than warty), and capsule shape. It is not uncommon on the island, where it can be abundant on compacted clay soils or shaded vertical banks, but possibly overlooked because of its small size.

14. *Nardia geoscyphus* (De Not.) Lindb.

Contributors: V. A. Bakalin and W. Li

China: Jilin Prov., Changbai Mts., tundra, *ca* 41°25'N, 128°10'E, 2300 m a.s.l., July 2000, *leg.* J. Sun 401 (IFP)

This is a mostly boreal species, widely distributed in northern Europe and northern North America. Until now, its known Asian distribution was confined to Russia (Konstantinova *et al.*, 2009), and this is the first Asian record of the species outside of Russia.

15. *Nardia hiroshii* Amak.

Contributors: V. A. Bakalin and W. Li

China: Jilin Prov., Changbai Mts., tundra, ca 41°25'N, 128°10'E, 2280 m a.s.l., July 2000, *leg.* J. Sun 96 (IFP)

This species was described as endemic to Japan (Amakawa, 1959), although it was later placed in synonymy with *Nardia unispiralis* Amak. by Váňa (1976). Here, we disagree and treat *N. hiroshi* as a good species. The distinguishing features of the two taxa have been described in Bakalin *et al.* (2009) as well as Amakawa (1959).

16. *Orthotrichum crenulatum* Mitt.

Contributors: V. Plášek and J. Sawicki

Tajikistan: Dushanbe city, central park, bark of *Platanus orientalis* L., *Acer pseudoplatanus* L., *Fraxinus excelsior* L., GPS coordinates (WGS 84): 38°34,9512N, 68°46,4497E, ca 900 m a.s.l., 12 June 2008, *leg.* Plášek *s.n.* (OP).

A total of 15 taxa of the genus *Orthotrichum* have previously been reported from Tajikistan (Ignatov *et al.*, 2006; Mamatkulov *et al.*, 1998; Plášek, 2009). The specimen cited above is an epiphytic moss new to the bryoflora of the country. The species had been considered endemic to the area around northeastern Afghanistan, northern India, western Tibet, Turkistan and Kazakhstan (Lewinsky, 1992), yet in 1991 it was found in France (published as *O. flowersii* Vitt in Boudier & Pierrot, 1992). Schäfer-Verwimp & Gruber (2002) reported that *O. crenulatum* had been found in Pakistan by Gruber in 1998. They also suggested that the species could occur in Tajikistan. However, there were no supporting data for this in their cited literature or from any other source. In Tajikistan, *O. crenulatum* was first collected by V. Plášek in 2008, in the central park of the capital city Dushanbe, growing on the bark of *Platanus orientalis*, *Acer pseudoplatanus* and *Fraxinus excelsior*. The moss cushions were located about 1–1.2 m above the ground, with a northeastern exposure. All of the populations were richly fertile. Examples of associated species include *Orthotrichum sordidum* Sull. & Lesq. (cf. Plášek, 2009), *Orthotrichum affine* Schrad. *ex* Brid., and *O. anomalum* Hedw.

17. *Pseudocrossidium replicatum* (Tayl.) R.H. Zander

Contributor: T. A. Hedderson

La Réunion: Commune La Possession, Cirque de Mafate, along trail between Cayenne and Grand Place, 21°02.47'S, 55°24.58'E, 700 m a.s.l., on soil

bank in open, dry forest with basalt outcrops, 13 October 2006, *leg.* T.A. Hedderson 16386 (BOL).

Elsewhere in Africa this species occurs in the Southern African Flora countries (Magill, 1981) as well as Ethiopia, Kenya, Somalia, and Sudan (O'Shea, 2006). In southern Africa, at least, it is typical of arid to semi-arid grassland and woodland habitats. On Réunion, it is known from open sites in the dry parts of Cirque de Mafate, where the microclimate may be rather similar to that of the mainland African woodlands.

18. *Riccia rhenana* Lorb. *ex* Müll.Frib.

Contributor: S. Ștefănuț

Romania: Muntenia Province, Sticlărie Valley, Ilfov County, 44°42'00"N, 26°00'44"E, 106 m a.s.l., on soil, 24 May 2011, *leg. et det.* S. Ștefănuț *s.n.* (BUCA B4302).

This is the first report of *Riccia rhenana* in Romania (Ștefănuț, 2008). The samples were collected from the right bank of Sticlărie Brook that crosses below the railroad and passes through Scroviștea Forest. This area is protected, being part of the ROSCI0224 Scroviștea, NATURA 2000 Site. The collected samples were terrestrial, forming incomplete rosettes on moist soil in the brook's floodplain at a distance of 10 cm from water in a slightly overshadowed area by the shore.

The nearest other record for this species is in Hungary. In Europe *R. rhenana* has been reported from Belgium, Britain, Czech Republic, Denmark (?), Finland, France, Germany, Hungary, Ireland, Luxembourg, the Netherlands, Poland, Portugal (?), Slovak Republic, northern, northwestern and eastern Russia, Sweden, Switzerland and the Ukraine (Söderström *et al.*, 2002, 2007).

19. *Scapania crassiretis* Bryhn

Contributors: V. A. Bakalin and W. Li

China: Jilin Prov., Changbai Mts, tundra, ca 41°25'N, 128°10'E, 2260 m a.s.l., July 2000, *leg.* J. Sun 450 (IFP)

This species has a mostly Arctic-alpine distribution but deeply penetrates the temperate zone along large mountain ranges. It is widely distributed on the southern flank of Sikhote-Alin Range in the Russian Far East (Bakalin, 2010), not more than 250 km distant from the present locality.

20. *Seligeria irrigata* (H.K.G.Paul) Ochyra & Gos

Contributor: J. Nieuwkoop

Italy: Lombardia, Lake Idro, Vesta, valley of the Rio Vesta, 45°47'N, 10°31'E, 400 m a.s.l. On wet dripping soft limestone rock wall, 31 August 2010, *leg.* J. Nieuwkoop 2010179 (*Herb.* Nieuwkoop).

Seligeria irrigata was described by Ochyra & Gos in 1992 (Ochyra & Gos 1992). It has the largest plants of any of the known species in the genus, characterized by long homomallous to falcate-secund leaves

composed of linear cells, a strong 3–5 stratose costa, excurrent as a bristle like subula, large spores and systylious capsules with highly reduced, broadly truncate peristome teeth.

Seligeria irrigata grows in blackish to dark brown turfs heavily encrusted with lime on permanently wet limestone in narrow, shaded valleys. At first glance it resembles falcate forms of *Andreaea rothii* F. Weber & D. Mohr. At the Vesta site the limestone was soft and crumbling, wetted by seepage and sprinkling water from a little fall. The stand of *Seligeria irrigata* occupied about one square meter with no other bryophytes growing in association. *Gymnostomum calcareum* Nees & Hornsch., *Hymenostylium recurvirostrum* (Hedw.) Dixon and *Seligeria trifaria* (Brid.) Lindb. occurred nearby on wet limestone.

Ochyra & Gos (1992) report six records of *Seligeria irrigata* from Bavaria, Germany and one each from Oberösterreich, Austria and the West Carpathians in Slovakia. Meinunger & Schröder (2007) report additional, more recent collections from Bavaria. All German localities are concentrated in a small area in the Chiemgauer and Berchtesgadener Alps. The Austrian record is from Ischl in the neighbouring Salzkammergut. Only the Slovakian record is outside this area, some 400 km to the east. The new Italian locality means a 200 km southwards extension of the range of this so far central European species.

21. *Tortella arctica* (Arnold) Crundw. & Nyholm

Contributors: L. Hedenäs and P. M. Eckel

Sweden: Jämtland, Åre, mountain heath ca 500–550 m E of Silverfallet, 63°15,228'N, 12°20,214'E, 690 m a.s.l., margin of periodically wet depression in mountain heath, 17 August 2010, leg. L. Hedenäs s.n., det. P. M. Eckel (S; reg. No. B182517).

During bryophyte studies in the mountains of central Sweden in the summer of 2010, the first author collected a *Tortella* that, in the field, looked unfamiliar. After microscopic examination it was suspected that it could possibly be *T. arctica*. Some of the material was sent to the second author, who identified the material as *T. arctica* without doubt.

Tortella arctica has not been found in Europe before (Hill *et al.*, 2006). It was reported from Svalbard by Düll (1984), but according to Frisvoll & Elvebakk (1996) this record was based on *Trichostomum arcticum* Kaal. From Russia, *Tortella arctica* is known only in the Arctic to subarctic regions of Asia (Abramova *et al.*, 1961; Ignatov *et al.*, 2006). It has been understood as an imperfectly circum-Arctic species that although most notably absent from Europe, has disjunct occurrences in British Columbia, Colorado and north-western Yunnan (Crundwell & Nyholm, 1963; Eckel, 1998; Steere, 1978). Despite the more southern disjunctions,

Brassard (1971a) has considered *Tortella arctica* as a high-Arctic species.

Tortella arctica occurs most abundantly in the coastal wet lowlands, gulfs and bays around the Arctic Ocean. It grows in calcareous habitats in open tundra, around fen edges, close to intermittent pools that dry up in summer, or on unstable seepage or solifluction slopes. The often unstable substrate allows numerous other mosses to establish in sparse populations (Brassard, 1971a, b; Eckel, 1998; Steere, 1978). The habitat of this Swedish occurrence, the margin of a periodically wet depression in mountain heath, is consistent with these environmental conditions, and the following species were noted in the immediate surroundings of *T. arctica*: *Campyliadelphus chrysophyllus* (Brid.) R.S. Chopra, *Ditrichum flexicaule* (Schwägr.) Hampe, *Grimmia funalis* (Schwägr.) Bruch & Schimp., *Hypnum bambergeri* Schimp., *H. hamulosum* Schimp., *Rhytidium rugosum* (Hedw.) Kindb. and *Tomentypnum nitens* (Hedw.) Loeske.

22. *Tritomaria scitula* (Taylor) Jörg.

Contributors: M. Sulayman, V. A. Bakalin and R. Eziz

China: Xinjiang Prov., Altay Mts., Qinggil County, Zhonghaizi, on soil, ca 48°03'N, 88°05'E, 2402 m a.s.l., July 2006, leg. M. Sulayman 14780 (IFP).

This species has a mostly Arctic-Alpine distribution in the Northern Hemisphere. In Asia, its known distribution was confined to mountain systems in Siberia, including the Russian Altai Mountains (Konstantinova *et al.*, 2009). Its occurrence in North-West China was highly likely.

23. *Zygodon rupestris* Schimp. ex Lorentz

Contributor: H. Kürschner

Saudi Arabia: Asir Mts., Raidah escarpment ca 15 km NW from Abha, 18°12'N, 42°24'E, 2700 m a.s.l., on bark of *Juniperus procera* Hochst. ex Endl., 28 March 1984, leg. H. Kürschner 84-361a (Priv. Herb. Kürschner); Asir Mts., Balqarn, ca 35 km S of Biljurshi, 19°01'N, 42°06'E, 2100 m a.s.l., on bark of *Juniperus procera*, 24 November 1981, leg. W. Frey & H. Kürschner 81-645 (B).

Z. rupestris is a characteristic species of the Holarctic, epiphytic Frullanio dilatatae-Leucodontetea sciuroidis Mohan 1978 class (Marsteller 1985), typical for old trees, forming yellowish green tufts in both shady and sunny sites (Dierßen, 2001; Marsteller, 2006). Epiphytes of this class were reported from Saudi Arabia for the first time by Kürschner (1984). They flourish in the monsoon-affected *Juniperus procera* and *Acacia origena* Asfaw woodlands of the Asir Mountains, which typically occupy most of the steep and cloudy escarpments, reaching from the al-Bahah area (Jabal Ibrahim, Asir Mts.) southwards to the south-western corner of the Arabian Peninsula (Jabal Eraf, Yemen). Two

drought-tolerant, thermo- and photophytic associations, the Leptodonto-Leucodontetum schweinfurthii, and the Orthotricho-Fabronietum socotranæ (Kürschner, 2003), are frequent and presently represent the southernmost outposts of the circum-Mediterranean Syntrichion laevipilae Ochsner 1928 alliance (Orthotrichetalia Hadač in Klika & Hadač 1944 order, Marstaller 1985). The new records of *Z. rupestris* within these associations enrich the epiphytic diversity of the communities and support the correct phytosociological classification.

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