



New national and regional bryophyte records, 63

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1. *Bucklandiella subsecunda* (Harv.) Bedn.-Ochyra & Ochyra

Contributor. R. Ochyra

Madagascar. Diana Region, Tsaratanana Massif, 14° 01'S, 48°56'W, 1200–2400 m a.s.l., April 1924, *leg.* Perrier de la Bathe *s.n.* (H-Brotherus, JE-Herzog, PC-P.de la Varde 0707821, PC-Thériot 0708099).

Racomitrium Brid., in its traditional circumscription is poorly represented in the moss flora of Madagascar and hitherto only one specimen of this genus has been discovered on this fourth largest island in the world. It was collected in 1924 by Perrier de la Bathie on the Tsaratanana Massif, and Thériot (1926) reported it as an unnamed form of *Racomitrium lepervanchei* Besch., a species endemic to Réunion Island. As *Racomitrium* proved to be heterogeneous, it was split into six segregates (Ochyra, Zarnowiec et al. 2003; Bednarek-Ochyra, Ochyra, Sawicki et al. 2014; Bednarek-Ochyra, Sawicki, Ochyra, et al. 2015; Sawicki et al. 2015), *R. lepervanchei* was placed in the genus *Bucklandiella* Roiv. Nevertheless, the voucher specimen was not studied by De Sloover

(1977) in his survey of African *Racomitrium* and this material was assigned either to *R. crispulum* (Hook.f. & Wilson) Wilson (Crosby et al. 1983) or *Bucklandiella membranacea* (Mitt.) Bedn.-Ochyra & Ochyra (Marline et al. 2012), as *R. lepervanchei* was considered to be conspecific with these species (Clifford 1955; Lawton 1973). The specimen from the Tsaratanana Massif has distinct auricles and broad, flattened costa with 6–8 enlarged ventral guide cells, which are typical of *Bucklandiella subsecunda*. This is a pantropical oreophyte, widespread in tropical and subtropical Asia (Frisvoll 1988), sub-Saharan Africa (Bednarek-Ochyra and Ochyra 2012a, 2013; Ochyra and van Rooy 2013), Central and South America (Bednarek-Ochyra et al. 1999; Bednarek-Ochyra and Ochyra 2012b; Ellis, Bakalin et al. 2013) and the maritime Antarctic (Ochyra, Lewis Smith et al. 2008).

2. *Calymperes afzelii* Sw.

Contributors. A. Martins, N. Hodgetts, F. Monteiro, L. Catarino and M. Sim-Sim

Republic of Guinea-Bissau. Bijagós Archipelago, Marine National Park of João Vieira Poilão, Cavalos Island, 11.011528°N 15.708694°W, ca. 20 m a.s.l., on trunk of *Sterculia tragacantha* Lindl., 11 July 2016, *leg.* L. Catarino & B. Indjai *s.n.* (LISU).

Calymperes afzelii is known from Mexico, the West Indies, Central and South America, Asia, Africa, the Indian Ocean islands, the Pacific islands and Australia (Reese 2007).

Calymperes afzelii from Guinea-Bissau exhibits leaves bordered by a polystratose marginal rib, which in the chlorophyllose limb, incorporates stereids. In the leaf base the hyaline lamina is bordered by a narrow intramarginal rib of thick-walled linear cells. The marginal ribs in the chlorophyllose limb are denticulate and/or dentate. The modified apices of gemmiferous leaves are narrow and parallel-sided, running to a rounded tip (Ellis 2018).

This species was collected from the trunk of *Sterculia tragacantha* in a palm grove.

3. *Calymperes erosum* Müll.Hal.

Contributors. A. Martins, N. Hodgetts, F. Monteiro, L. Catarino and M. Sim-Sim

Republic of Guinea-Bissau. Bijagós Archipelago: (1) Bolama Island, Bolama village, 11.3430°N, 15.2904°W, 25 m a.s.l., on trunk of *Faidherbia albida* (Delile) A.Chev., 26 October 2018, *leg.* F. Monteiro *s.n.* (LISU); (2) Marine National Park of João Vieira Poilão, Meio Island, 11.033611°N, 15.623861°W, ca. 15 m a.s.l., on trunk of *Elaeis guineensis* Jacq., 6 July 2016, *leg.* L. Catarino & B. Indjai *s.n.* (LISU); (3) Marine National Park of João Vieira Poilão, Meio Island, 11.989806°N, 15.671917°W, ca. 17 m a.s.l., on trunk of *Elaeis guineensis*, 6 July 2016, *leg.* L. Catarino & B. Indjai *s.n.* (LISU); (4) Marine National Park of João Vieira Poilão, Cavalos Island, 11.022167°N 15.710750°W, ca. 15 m a.s.l., on trunk of *Elaeis guineensis*, 11 July 2016, *leg.* L. Catarino & B. Indjai *s.n.* (LISU).

Calymperes erosum occurs in Florida (USA), Mexico, the Caribbean, Central and South America, Asia, Africa, some Atlantic islands, some Indian Ocean islands, some Pacific islands, Australia (Reese 2007), and Italy (Pantelleria) (Brullo et al. 2001). The specimens identified from Guinea-Bissau have leaves bordered by an intramarginal rib extending from the base to near the apex, which in the chlorophyllose limb, incorporates stereids. At the apex of the hyaline lamina, the hyaline cells become acutely protuberant and overlap adjacent cells in the chlorophyllose lamina (Ellis 2018).

On Bolama Island, *C. erosum* grew on the trunk of *Faidherbia albida* in an open forest. In the Marine National Park of João Vieira Poilão, this species was recorded on Meio and Cavalos Islands, growing on the trunk of the palm-tree *Elaeis guineensis* in a dense forest.

4. *Calymperes pallidum* Mitt.

Contributors. A. Martins, N. Hodgetts, F. Monteiro, L. Catarino and M. Sim-Sim

Republic of Guinea-Bissau. Bijagós Archipelago, Bolama Island, Granja do Estado, 11.558912°N, 15.471169°W, 21 m a.s.l., on a cashew (*Anacardium occidentale* L.) trunk during the rainy season, 27 October 2018, *leg.* F. Monteiro *s.n.* (LISU).

Calymperes pallidum has been recorded from the West Indies, South America, Africa and Asia (Reese 2007), and is characterised by the lack of stereids in the costa (Ellis 2018). On Bolama, this species grows in a habitat dominated by cashew trees (95%) with few native plant species, belonging to a cashew orchard promoted by the Ministry of Agriculture of Guinea-Bissau.

5. *Calymperes tenerum* Müll.Hal.

Contributors. A. Martins, N. Hodgetts, F. Monteiro, L. Catarino and M. Sim-Sim

Republic of Guinea-Bissau. Bijagós Archipelago, Marine National Park of João Vieira Poilão, Cavalos Island, 11.022167°N, 15.710750°W, ca. 15 m a.s.l., on trunk of *Spondias mombin* L., 11 July 2016, *leg.* L. Catarino & B. Indjai *s.n.* (LISU).

Calymperes tenerum occurs in Mexico, the West Indies, South America (southern Brazil), Asia, Africa, the Indian Ocean islands, the Pacific islands and Australia (Reese 2007). Leaves in *C. tenerum* have an excurrent costa, and in the leaf base, the hyaline lamina is bordered by a broad band of quadrate to shortly subrectangular cells with thickened angles (Ellis 2018). On Cavalos Island this species was collected in a palm grove from the trunk of *Spondias mombin*.

6. *Campylopus subulatus* Schimp. ex Milde

Contributors. D. Dagnino, C. Turcato and L. Minuto
Italy. Liguria Region, Beigua Regional Natural Park, Mt. Beigua, Prariondo, Pian Fretto, 1064 m a.s.l. 44° 25' 52.46"N, 8° 36' 3.31"E, 11 November 2017, *leg.* D. Dagnino *s.n.*, *det.* D. Dagnino & C. Turcato (GE B138).

This is the first record of *Campylopus subulatus* for the Liguria Region. This circumpolar species shows a fragmented distribution within both boreal and tropical mountains (Dierßen 2001), and it is rare in the Mediterranean Basin where it is known only from Italy, Spain, Portugal, France, Serbia and Slovenia (and other few countries with single records; Ros et al. 2013). In Italy *C. subulatus* has been reported only in four administrative regions (i.e. Piemonte, Toscana, Trentino Alto Adige and Lombardia; Aleffi et al. 2008) and was recently discovered in the Marche Region (Tacchi et al. 2009).

Campylopus subulatus was found on small serpentine outcrops occupied by a discontinuous plant community, with a paucispecific contingent of phanerogams dominated by succulent chamaephytes

and therophytes (referring to the *Sedo-Scleranthetalia* order) and a richer contingent of bryophytes including *Racomitrium elongatum* (Ehrh.) ex Frisvoll, *Hypnum callichroum* Brid., *Ceratodon purpureus* (Hedw.) Brid., *Grimmia donniana* Sm., *Dicranum scoparium* Hedw. and *Bryum* Hedw. spp. These outcrops occur in a marshy area, mainly characterised by mountain grasslands and beech forests growing under a sub-oceanic climate.

7. *Dichodontium flavescens* (Dicks. ex With.) Lindb.

Contributor. A. Graulich

Corsica. Corse du Sud, Bocognano, Busso, wet rocks along the Gravona river, associated with *Lejeunea lamarcerina* (Steph.) Schiffn. and *Plagiochila asplenioides* (L.) Dumort., 42°05'32"N, 9°03'34"E, 510 m a.s.l., 07 July 2018, leg. A. Graulich s.n., det. A. Graulich & A. Vanderpoorten, (Herb. Graulich Corsica 31/18).

This is the first report from Corsica for *D. flavescens*, and it is largely unrecorded around most of the Mediterranean basin. However, its distribution area is poorly known (Ros et al. 2013), because the relevant vegetative features that distinguish it from the similar *D. pellucidum* (Hedw.) Schimp. were described only relatively recently (Werner 2002).

8. *Ditrichum heteromallum* (Hedw.) Britt.

Contributors. P. Saha, Md. N. Aziz and D. Maity

India. West Bengal: Darjeeling, Kalimpong, Rishop, growing on soil with *Pogonatum neesii* (Müll.Hal.) Dozy, 27°06'13.90"N, 88°39'05.65"E, 2179 m a.s.l., 13 June 2013, leg. Pamela Saha 64602a (CAL).

The genus *Ditrichum* Timm. ex Hampe has 69 species worldwide (Crosby et al. 1999) and Lal (2005) reported 12 species from India, distributed in the Eastern and Western Himalayas as well as South India. Gangulee (1971) recorded six species and two infraspecific taxa from the Darjeeling district.

The plants were small, yellowish-green with sparsely branched stems. The leaves were slightly homomalous, appressed when dry, lanceolate, abruptly narrowed to a long subula, with the costa filling almost the entire subula; leaf margins were plane and entire, and leaf cells linear. The capsule was erect, cylindrical with linear peristome teeth, divided from the middle.

Ditrichum heteromallum has been found in some areas in Arunachal Pradesh (Eastern Himalaya), Uttarakhand (Western Himalaya) and Uttar Pradesh, and is recorded for the first time from Darjeeling Himalaya in West Bengal.

9. *Ditrichum tortuloides* Grout

Contributors. P. Saha, Md. N. Aziz and D. Maity

India. West Bengal: Darjeeling, Kalimpong, Lava, growing on soil, 27°05'11.82"N, 88°39'39.93"E, 2060 m a.s.l., 10 June 2013, leg. Pamela Saha 64559 (CAL).

Ditrichum tortuloides is known from Meghalaya in the Eastern Himalaya and Uttarakhand in Western Himalaya. The species is here recorded for the first time from the Darjeeling Himalaya in West Bengal. Plants in the new collection can be described as follows: shoots small, yellowish-brown; stems simple; leaves appressed to stem when dry, lanceolate, leaf apex gradually narrowed to a subula, margins strongly toothed above, but mostly entire, sometimes recurved below; leaf base broadly triangular; lamina cells elongate-rhomboid, becoming quadrate towards margin.

10. *Dryptodon austrofunalis* (Müll.Hal.) Ochyra & Żarnowiec

Contributors. R. Ochyra and V. Plášek

Chile. Provincia Coyhaique, XI Región de Aisén del General Carlos Ibáñez del Campo: (1) El Maqui (El Chacon) on Río Toqui, 7 km to the east of Santa Magda and about 65 km north of Coyhaique by Ruta X-421 from Lago Pedro A. Cerda to El Maqui, 45°00'53"S, 71°59'08"W, 535 m a.s.l., on dry and exposed boulder growing together with *Bucklandiella didyma* (Mont.) Bedn.-Ochyra & Ochyra, 20 January 2015, leg. H. Bednarek-Ochyra & R. Ochyra 896/15 with V. Plášek (KRAM B-245695, SGO); (2) Laguna Bravo by Ruta X-423 about 3 km before El Gato and about 65 km north of Coyhaique, 45°05'26"S, 71°51'12"W, 815 m a.s.l., on dry boulders associated with *Schistidium Bruch & Schimp. sp.*, 20 January 2015, leg. H. Bednarek-Ochyra & R. Ochyra 949A/15 with V. Plášek (KRAM B-245709); (3) same locality, on dry boulders in a thin plantation of pines, associated with *Bucklandiella striatipila* (Cardot) Bedn.-Ochyra & Ochyra and *B. didyma*, 10 January 2015, leg. H. Bednarek-Ochyra & R. Ochyra 946/15 with V. Plášek (KRAM B-245708); (4) northern end of Lago Castor about 20 km east of Coyhaique at Ruta X-667, 45°35'40"S, 71°47'39"W, 797 m a.s.l., on dry and exposed rock, 22 January 2015, leg. H. Bednarek-Ochyra & R. Ochyra 1000/15 & 1001/15 with V. Plášek (KRAM B-245722 & B-245725, SGO); (5) Large rock west of Los Huemules opposite the small peninsula on the northern shore of Lago Atrovesado at Ruta X-608 from Coyhaique to Lago Portales, 20 km south-west of Coyhaique, 45°41'22"S, 72°16'57"W, 370–380 m a.s.l., on very large stone covered with a carpet of *Bucklandiella striatipila* forming quite large patches in dry and exposed sites, associated with *B. striatipila*, *B. didyma* and *Acroschisma wilsonii* (Hook.f.) Lindl., 18 January 2015, leg. H. Bednarek-Ochyra & R. Ochyra 710/15, 712/15, 721/15 & 722/12 with V. Plášek (KRAM B-245624, B-245625, B-245629 & B-245630, SGO).

Dryptodon austrofunalis is the largest representative of the genus in South America, usually imitating racomitrialean mosses by having sinuose laminal cells. However, it is easily known by its costal anatomy and

frequent formation of multicellular stalked gemmae on the dorsal side of the proximal part of the costa. The species is widely scattered in the Andes from southern Chile to Venezuela (Muñoz 1999). Its distribution in Chile is still inadequately known and it was recorded only from some stations in the Regiões of O'Higgins, La Araucanía and Los Lagos (Muñoz 1999) and Maule, Bío-Bío and Aisén, largely without indication of the sources (Müller 2009). Recently, the species was reported from Última Esperanza Province in the Región Magallanes (Larraín and Bahamonde 2017) and Capitán Prat Province in the Región Aisén (Larraín 2016), as well as from all provinces in the Región Bío-Bío (Ireland et al. 2017). Herein, *D. austrofunalis* is recorded from Coyhaique Province in the Aisén Región where it occurs in abundance. *Dryptodon austrofunalis* was originally described from Australia, and it is widely distributed in Australasia. It had also been reported from Europe (Ireland, Scotland, England, Greece) (Greven 1997), but these records proved to be incorrect and actually refer to various other species of *Dryptodon* Brid. (Maier 2010). Thus, *D. austrofunalis* has to be considered a south-amphipacific-temperate species. This is a relatively rare distribution pattern, exhibited only by a small group of austral mosses (Ochyra and Lewis Smith 1998; Bednarek-Ochyra and Ochyra 2011; Ochyra, Crabtree et al. 2015).

11. *Ectropothecium cyperoides* (Hook.) A. Jaeger

Contributors. P. Saha, Md. N. Aziz and D. Maity

India. West Bengal: Darjeeling, Kalimpong, Lava, growing on rock in association with *Thuidium cymbifolium* (Dozy & Molk.) Dozy & Molk., 27°05'08.06"N, 88°39'47.76"E, 2040 m a.s.l., 10 June 2013, *leg.* Pamela Saha 64555b (CAL).

Worldwide, *Ectropothecium* M.Fleisch. is represented by 203 species (Crosby et al. 1999), of which 12 occur in India. These are mostly distributed in the Eastern Himalaya, and restricted in Western Himalaya and South India (Lal 2005). Gangulee (1980) reported five species from the Darjeeling district.

The plants were glossy, yellowish-green with ovate-lanceolate, falcate, concave, leaves. These had a double costa, linear-rhomboidal lamina cells, and alar cells not well differentiated, with only a few inflated, rectangular cells present at the basal angles. The leaf margins were serrate above and in places, irregularly recurved.

Ectropothecium cyperoides is distributed in Arunachal Pradesh, Assam, Nagaland, Uttarakhand and South India. It is here recorded for the first time from Darjeeling Himalaya in West Bengal.

12. *Fissidens celticus* Paton

Contributors. A. Uygur, T. Ezer, S. K. Erkul and M. Alataş

Turkey. Mersin Province, Taşeli Plateau, Bozyazı District, Kömürler Village road: 36°8'N, 32°57'E, growing on moist soil, 240 m a.s.l., 29 January 2019, *leg.* and *det.* T. Ezer, A. Uygur & M. Alataş s.n. (A.U.324).

Fissidens celticus was identified among collections from the Bozyazı District in the southern part of the Taşeli Plateau (Mediterranean Region of Turkey, Mersin). It is an oceanic stenotopic species, reported here for the first time from Turkey and southwest Asia. *Fissidens* Hedw. has been represented by about 25 taxa in Turkey (Ezer 2016; Erdağ and Kürschner 2017). The latest taxonomic and distributional status of the species was determined by reference to Ros et al. (2013), and Erdağ and Kürschner (2017). This new record, *F. celticus*, brings the total to 26 taxa in *Fissidens* known from Turkey.

The species has been reported from several European localities: Britain and Ireland, Belgium, northern and western France, Italy (Sardinia), Spain (Iberian Peninsula), Switzerland, and western Germany (Vanderpoorten and Sotiaux 2002; Guerra et al. 2012; Ros et al. 2013; Hodgetts 2019). In addition, the species is included in the IUCN Red List of Threatened Species in the LC category (Hodgetts 2019).

Fissidens celticus is a European endemic moss, characterised by unbordered leaves, distinctly bent costa, and crenulate leaf margin (Vanderpoorten and Sotiaux 2002; Smith 2004). The present record of *F. celticus* from Anatolia is an important extension of range southwards. The region is characterised by a Mediterranean climate with mild wet winters and warm to hot, dry summers. The specimens occurred on moist calcareous soil together with *Bartramia stricta* Brid., *Bryum dichotomum* Hedw., *Didymodon tophaceus* (Brid.) Lisa, *Targionia hypophylla* L., and *Timmia barbuloidea* (Brid.) Mönk. The population was sterile, and therefore, sporophytes are unknown in Turkey.

13. *Fissidens submarginatus* Bruch.

Contributors. R. A. Cabral, S. Jimenez and G. M. Suárez

Argentina. Corrientes Province: Reserva Natural Privada Paraje Tres Cerros, 29°06'32.79"S, 56°55'55.82"W, 175 m a.s.l., en suelo húmedo sobre la ladera Sur del cerro Nazareno, 16 April 2019, *leg.* R. A. Cabral 56 (CTES).

The Paraje Tres Cerros Private Nature Reserve (Corrientes, Argentina) was created to protect the unique landscape within Corrientes Province, with rocky outcrops of sandstones and basalts that protrude from the vast plain that surrounds them. The southern slopes are more pronounced and retain moisture, creating characteristic plant formations on the opposite side of the hills (e.g. gramineous shrub-steppe on the northern slope and hygrophilic forest on the southern slope) (Carnevali 1994). This phenomenon generates a great diversity

of microhabitats (Cajade et al. 2013) suitable for bryophyte colonisation. Samples recently collected were processed according to the classic methodology for this group and deposited at CTES herbarium (Anderson 1954; Gradstein et al. 2001). One such sample was identified as *Fissidens submarginatus* Bruch, a species characterised by the presence of a vaginant lamina, not clasping the stem; limbidium present on all leaves, extending the entire length or nearly so of the vaginant laminae; laminal cells unipapillose, and costa percurrent or sub-percurrent ending one or two cells below the leaf apex (Pursell 2007).

Fissidens submarginatus inhabits soil, rock or termite mounds, and also at the bases of decomposing trunks and branches (Bordin and Yano 2013). In Argentina the species was found growing mixed with *Lophocolea bidentata* (L.) Dumort. and *Lejeunea lepida* Lindenb. & Gottsche. Its distribution includes Africa and America, from United States to southern Paraguay and Brazil (Pursell 2007), and is here recorded for the first time for Argentina, representing its southernmost extent.

14. *Grimmia incurva* Schwägr.

Contributor. A. Graulich

Corsica. Haute-Corse, Vivario, Punta dell'Oriente, near the summit on the north face, on granite in a large crevice, 42°05'28"N, 9°08'03"E, 2090 m a.s.l., 13 July 2018, leg. A. Graulich s.n., det. A. Graulich & A. Sotiaux, (Herb. Graulich Corsica17/18).

This alpine species is reported from Corsica for the first time. In Europe, *Grimmia incurva* is present in nearly every montane area (Smith 2004). Nevertheless this species has hitherto, never been reported from the Mediterranean islands (Ros et al. 2013).

15. *Hygrohypnum eugyrium* (Schimp.) Broth.

Contributor. A. Graulich

Corsica. Haute-Corse, Vivario, Vizzavona, near the cave of Southwell, on rocks flushed by a tributary (Ruisseau de Speloncello) of the Vecchio river, with *Marsupella emarginata* (Ehrh.) Dumort., *Plagiomnium undulatum* (Hedw.) T.J.Kop., *Rhizomnium punctatum* (Hedw.) T.J.Kop. and *Thamnobryum alopecurum* (Hedw.) Gangulee, 42°08'14"N, 9°08'13"E, 880 m a.s.l., 4 July 2018, leg. A. Graulich, det. A. Graulich & A. Vanderpoorten (Herb. Graulich Corsica 24/18).

In Corsica, the only record of this pleurocarpous moss dates back to 1902. Indeed *H. eugyrium* was then reported from Aitone forest (Camus 1902). Since that report this species has never been reported from Corsica or from other Mediterranean islands (Ros et al. 2013).

16. *Hyophila involuta* (Hook.) A.Jaeger

Contributors. A. Martins, N. Hodgetts, F. Monteiro, L. Catarino and M. Sim-Sim

Republic of Guinea-Bissau. Bijagós Archipelago, Bolama Island, Ofir Beach, 11.3323°N, 15.2823°W, 8 m a.s.l., on artificial wall, 27 October 2018, leg. F. Monteiro s.n. (LISU).

Hyophila involuta has a pantropical distribution and is also known from Europe (Austria, Germany, France, Italy, Slovenia, Switzerland and Spain) (Eckel 2007; Hodgetts 2015). In Guinea-Bissau, *H. involuta* forms blackish green tufts, the leaves are lingulate with a broadly pointed apex. The upper leaf margins are denticulate and the lamina cells are mamilllose on the ventral surface (Frey et al. 2006).

This species was found on an artificial wall at Ofir beach, where it is periodically exposed to sea water.

17. *Hypnum cupressiforme* var. *lacunosum* Brid.

Contributor. A. Graulich

Corsica. Corse du Sud, Bocognano, Busso, on boulders with *Hedwigia ciliata* (Hedw.) P.Beauv., *Nogopterium gracile* (Hedw.) Crosby & W.R.Buck. [*Pterogonium gracile* (Hedw.) Sm.] and *Racomitrium elongatum* Frisvoll, 42°05'45"N, 9°03'55"E, 740 m a.s.l., 2 July 2018, leg. A. Graulich s.n., (Herb. Graulich Corsica25/18).

This is the first record from Corsica for this variety of *Hypnum* Hedw. that is widely distributed in the Mediterranean basin (Ros et al. 2013).

18. *Isopterygium albescens* (Hook.) A.Jaeger

Contributors. P. Saha, Md. N. Aziz and D. Maity

India. West Bengal: Darjeeling, Siliguri, Mahananda Wildlife Sanctuary, 26°53'25"N, 88°23'57"E, 1116 m a.s.l., 22 February 2014, leg. Pamela Saha 64724 (CAL).

Worldwide the genus *Isopterygium* Lindb. is represented by 150 species (Crosby et al. 1999); 21 of these are found in India, distributed both in the Eastern and Western Himalayas, and in southern India (Lal 2005). Gangulee (1980) recorded two species from the Darjeeling district. *Isopterygium albescens* is found in Arunachal Pradesh, Meghalaya, Sikkim, Assam Uttarakhand and Tamil Nadu, and is here recorded for the first time from the Darjeeling Himalaya in West Bengal. Plants in this new collection have: shoots slender, glossy, green; stems rounded in transverse section, central strand present, small; leaves ovate to ovate-lanceolate; apex gradually or suddenly acuminate; margins entire below, serrulate above; costa double, short or sometimes indistinct; leaf cells linear; cells of extreme base rectangular to sub-rectangular; alar cells not well differentiated, some irregular cells present in the alar region, not clearly distinct.

19. *Leucobryum glaucum* (Hedw.) Ångstr.

Contributor. M. Boiko

Ukraine. Steppe zone, Kherson region, Oleshky district, the village Chelburda. 46.611067°N, 32.892367°E, in sparse pine plantation of *Pinus sylvestris* L. with *Betula borysthena* Klok., in depression on damp sandy soil

covered with pine needle remains, in association with the epigeneic species *Dicranum scoparium* Hedw., *Hypnum cupressiforme* Hedw., *Brachythecium salebrosum* (Hoffm. ex F. Weber & Mohr) Schimp., *Polytrichum piliferum* Hedw. 20 October 2019, *leg.* V. Ishchenko *s.n.*, *det.* M. Boiko (KHER).

Leucobryum glaucum is a large cushion forming, pannemoral, mezophytic, helio-sciophytic, acidophilic, dioecious, oligomezotrophic and coenotically inactive species. It forms whitish-green, domed cushions, up to 6–8 cm high and up to 10–15 cm wide. In the Ukraine it is known from several localities: Zakarpattia, Ukrayins'ki Karpaty, Prykarpattia, Poliss'ia (boreal-nemoral zone) and Lisostep, but only two specimens are known from the far east of the steppe zone of the Ukraine (Boiko 1992, 2008, 2009). A record of the species in the Autonomous Republic of the Crimea is very doubtful (Partyka 2005). The species is generally distributed in Europe, the Caucasus, North Africa, Asia, North and Central America, and Oceania (Boiko 2009; Ellis, Aleffi, Asthana et al. 2018). The new discovery is the first for the Black Sea lowland of the subzone of fescue-feather grass steppes of southern Ukraine. The closest known other location for this species is more than 300 km to the north, near Irdin' Marsh in the Cherkassy region (D. Zerov's finding). The moss *L. glaucum* is dioecious, and rarely develops sex organs and spore capsules. In the conditions prevailing in the Ukraine, it propagates vegetatively by fragmentation and by buds on rhizoidal protonema. *Leucobryum glaucum* belongs to the category of 'regionally rare' species in the steppe physical and geographical zone of the Ukraine, in particular for Kharkiv, Kherson and Lugans'k regions.

20. *Lophozia perssonii* H. Buch & S.W. Arnell

Contributors. A. D. Potemkin and V. M. Kotkova

Russia. Pskov Region: Pechory District, Izborsk-Maly Valley, tuff outcrop, on hard tuff stones and projections, 57.72926°N, 27.84615°E, 72 m a.s.l., with gemmae and male plants, 10 September 2019, *leg.* V. M. Kotkova & A. D. Potemkin *s.n.*, *det.* A. D. Potemkin (LE).

Lophozia perssonii (\equiv *Oleolophozia perssonii* (H. Buch & S.W. Arnell) L. Söderstr., De Roo & Hedd.) is a rare and protected species in Russia (Red Data Book of Russian Federation 2008). In the adjacent Leningrad Region and St Petersburg it is also protected and occurs in similar habitats, on tuff outcrops, and tuff constructions, such as the bases of old, small bridges (Sofronova et al. 2015; Red Data Book of Leningrad Region 2018; Red Data Book of St. Petersburg 2018). The closest other location for this species is in the western part of Estonia where it grows on a sandstone cliff in Toriis. *Lophozia perssonii* has been monitored in Estonia since 2019 (Nele Ingerpuu, pers. com., 14 November 2019). It is protected in Estonia and has IUCN category CR based on criteria B2ab(iii) (Ingerpuu

et al. 2018). This record of *L. perssonii* is the southernmost in European Russia.

21. *Orthotrichum pilosissimum* R. Medina, F. Lara & Garilleti

Contributor. R. Medina

United States. Utah, Tooele Co., between Stockton and Rocky Peak, Soldier Creek, 40°25'43.5"N, 112°16'50.2"W, 1919 m a.s.l., bark of *Acer grandidentatum* Nutt. 1 m from creek, 6 June 2019, *leg.* R. Medina 1713a with A. Manteca (CONN, AUGIE).

This is the first record of *Orthotrichum pilosissimum* outside of Nevada, from where it was reported in six localities at the time of its description (Medina et al. 2011), plus a collection in 2015 (Churchill Co., *leg.* J. Nachlinger 3233, CAS). The new record represents a substantial expansion of the distribution range up to the eastern limit of the Great Basin Floristic Province. Three other collections in the east of Nevada, (R. Medina 1652, 1655a, 1656 with A. Manteca (CONN, AUGIE)), collected in May 2019, also indicate that the species is not restricted to the western half of the basin. These collections are morphologically consistent with the described specific variation, all of them showing the distinct tomentum on stems and leaf bases, interpreted as axillary hairs whose overdevelopment is not found in other mosses (Medina et al. 2011). The density of brood bodies is variable across colonies, being much higher in younger tufts without sporophytes. This suggests a reproductive strategy that combines asexual, short-distance, clonal propagation during early colonisation with longer-ranged spore dispersal once sexual reproduction has occurred (Kimmerer 1991). *Orthotrichum pilosissimum* is apparently an endemic of the Great Basin Floristic Province, colonising the creek valleys of mountain ranges dominated by pinyon-juniper woodlands between 1500 and 2300 m a.s.l. and growing on rocks and bark of different riverine phorophytes. Its presence in states within the same floristic province (adjacent regions of California, Oregon, and Idaho) is likely and a conservation status assessment for this scarcely known species will require further investigation.

22. *Orthotrichum scanicum* Grönvall

Contributors. V. Plášek, A. Nowak and M. Nobis

Tajikistan. 80 km ENE of Dushanbe capital city, N part of Obigarm town, NW edge of Sarykhorsky Nature Refuge, 38°43'14.6"N, 69°42'41.9"E 1359 m. a.s.l., along public road, on bark of shrub, 30 May 2011, *leg.* V. Plášek, *s.n.* with A. Nowak and M. Nobis (OSTR).

Until now, 18 species of orthotrichaceous mosses belonging to four genera (Sawicki, Plášek et al. 2017) have been reported from Tajikistan, including *Orthotrichum* Hedw. (11), *Lewinskya* F. Lara, Garilleti & Goffinet (6), *Nyholmia* Holmen & E. Warncke (1), and *Pulviger* Plášek, Sawicki & Ochyra (1) (Mamatkulov et al. 1998;

Ignatov et al. 2006; Blockeel et al. 2009; Ellis, Akhoondi Darzikolaei et al. 2011; Ellis, Alegro et al. 2012; Ellis, Aleffi, Tacchi et al. 2014; Ellis, Bayliss et al. 2014; Plášek et al. 2014). Herein, *O. scanicum* is added as a twelfth species of the genus to the moss flora of this country. It was first collected during a Czech–Polish expedition in 2011, which yielded a number of interesting bryophyte records (cf. Číhal et al. 2017), including a discovery of a new species, *O. pamiricum* Plášek, Sawicki & Číhal (Plášek et al. 2014). *Orthotrichum scanicum* grew on the branch of a mulberry shrub (*Morus* L. sp.) along a public road. The moss cushions were found at 1.5 m above the ground growing together with *O. crenulatum* Mitt. and *Lewinskya speciosa* (Nees) F.Lara, Garilleti & Goffinet and richly producing sporophytes. As currently known, *O. scanicum* has a highly dissected panholarctic geographic range with maximum occurrence in Europe (cf. Skoupá et al. 2018). In Central Asia, the species was recently discovered also in Kyrgyzstan (Ellis et al. 2015), in western China (Skoupá et al. 2018) and one historical record is known also from Kazakhstan (Lewinsky-Haapasaari 1996).

23. *Philonotis yezoana* Bisch & Cardot

Contributors. S. G. Kazanovsky and O. M. Afonina

Russia. Southern Siberia, Khamar-Daban Ridge, Republic of Buryatia, Kabansk District, Baikal State Nature Biosphere Reserve, upper course of Osinovka River, vicinity of scientific station ‘Chum’, 51°31′22″N, 105°22′33″E, 1035 m a.s.l., on wet stones along the stream, 30 July 1990, *leg.* S. G. Kazanovsky *s.n.*, *det.* O. M. Afonina (LE).

Philonotis yezoana is an Asian–North American species with its predominant distribution along the northern part of the coast of the Pacific Ocean. In Asia the species is known from Japan and Korea, and records in China, according to Koponen and Ignatova (2018), require confirmation. In North America it is distributed from Alaska to California and has isolated localities in Vermont and Newfoundland.

In Russia this species was first reported from Kamchatka (Czernyadjeva 1995). However, Ochi (1962, 1963) previously reported a specimen as *P. fontana* var. *seriata* (Mitt.) Kindb. from the Kurils (Koponen et al. 2012). Later this species was found on Sakhalin (Cherdantseva et al. 2006), the Kuril Islands (Bakalin and Cherdantseva 2006; Cherdantseva 2006), and in Primorye (Gorobets and Smirnova 2004). It was recently reported in Finnish Lapland as a new species for Europe (Ulvinen and Kypärä 2016). The location of *P. yezoana* in southern Siberia (Buryatia) is significantly removed from its main range, and also from the site in Finnish Lapland where it is apparently a relict. *Philonotis yezoana* is easily recognised by the laminal cells with central papillae.

24. *Pseudephemerum nitidum* (Hedw.) Loeske

Contributors. M. S. Ignatov, J. Larraín and E. A. Ignatova

Chile. Región de Los Ríos (XIV), Valdivia Province, along the road to Corral, pine plantation on slope to the river, meadow near the road, 25 m a.s.l., 39°57′0.9″S, 73°18′51.6″W, 11 June 2019, *leg.* M. Ignatov & E. Ignatova 19–37 *p.p.* (CONC, MHA).

This small cleistocarpic moss, described by Hedwig (1801) from Germany, is readily distinguished by the lax leaf areolation, denticulate leaf apex, and by the sporophytes appearing lateral along the stems due to subfloral innovations, sometimes more than one on a single stem. The studied specimen from Chile shows a typical morphology and matches in all traits with European material. The species is widely distributed in Europe, and also present in Macaronesia, Africa (Algeria, Morocco, Congo, Kenya, Rwanda, Zaire, Madagascar), Asia (Sri Lanka, Assam, Nepal, Japan), Tasmania, New Zealand, Mexico, and NW North America (Potier de la Varde 1955; Schofield 1968; De Sloover 1976; Smith 2004; Yip 2002, 2007). The species has seldom been collected in South America, known from only three other collections, two from Brazil and one from Colombia (da Silva and Peralta 2017). Iwatsuki (1980) suggests that this taxon might have been introduced in Japan, which might be also the case with the Chilean populations. Its habitat in Chile, loamy roadsides with numerous puddles, looks quite similar to habitats in e.g. European Russia.

25. *Racomitrium elongatum* Ehrh. ex Frisvoll

Contributors. D. Dagnino, C. Turcato and L. Minuto

Italy. Liguria Region, Beigua Regional Natural Park: (1). Mt Beigua, Prariondo, Bric Sciuè Gianche, 1161 m a.s.l., 44°26′14.78″N, 8°36′47.34″E, 11 November 2017, *leg.* D. Dagnino *s.n.*, *det.* D. Dagnino & C. Turcato (GE B129). (2). Mt Beigua, Prariondo, Pian Fretto, 1074 m a.s.l., 44°25′49.04″N, 8°36′4.18″E, 11 November 2017, *leg.* D. Dagnino *s.n.*, *det.* D. Dagnino & C. Turcato (GE B130).

This is the first record of *Racomitrium elongatum* for the Liguria Region, although this Euro–North American species is known to occur in most of the northern Italian administrative regions (Aleffi et al. 2008). *Racomitrium elongatum* typically grows on acid rocks in mountain areas with an oceanic climate. The species was found on serpentinite outcrops within the Beigua Regional Natural Park, in a beech forest and in marshy mountain grassland. This area is characterised by a sub-oceanic climate very close to that of the Mediterranean.

26. *Riccia huebeneriana* Lindenb.

Contributor. S. Ștefănuț

Romania. Botoșani County: Horodiștea, Prut Valley, 48°15′25.3″N, 26°42′20.0″E, 104 m a.s.l., on sandy-clayey alluvial bank, 24 August 2019, *leg.* S. Ștefănuț *s.n.*, *det.* S. Ștefănuț (BUCA B4900).

Riccia huebeneriana grew along with *Marchantia polymorpha* L., *Pellia neesiana* (Gottsche) Limpr. and *Riccia frostii* Austin. This is the first report of *Riccia huebeneriana* from Romania (Ștefănuț and Goia 2012). The conservation status of *R. huebeneriana* in Romania is Critically Endangered – CR B1ab(ii,iii) + 2ab(ii,iii).

27. *Schistidium andreaeopsis* (Müll.Hal.) Laz.

Contributors. I. V. Czernyadjeva and L. A. Konoreva

Russia. Franz Josef Land Archipelago: Ziegler Island, in the vicinity of Rods Strait, 3 m a. s. l., 80°52'28.4"N, 57°17'17.6"E, near rookery, on soil in swampy *Salix polaris*-moss-lichen tundra, with a small admixture of *Pseudocalliergon brevifolium* (Lindb.) Hedenäs, 25 July 2019, leg. L. A. Konoreva, # 911 (LE).

This is the northernmost record of *Schistidium andreaeopsis*. This species is distributed in the Arctic and Subarctic of Asian Russia, on the Taimyr Peninsula, on the October Revolution and Bolshevik Islands of the Severnaya Zemlya Archipelago, on Wrangel Island and Chukotka; it is known from a few localities in the permafrost zone of Yakutia, in European Russia from the Novaya Zemlya Archipelago, and in North America from Prince Patrick and Ellef Ringnes Islands of the Canadian Arctic Archipelago (Afonina et al. 2005; Afonina 2015; Ignatova and Blom 2017). Although *S. andreaeopsis* was intentionally omitted from the Flora of North America, with the supposed North American records reported as *S. holmenianum* Steere & Brassard (McIntosh 2007), all North American specimens of *S. andreaeopsis* in LE, reported by Afonina et al. (2005) and Afonina (2015) from the Canadian Arctic Archipelago, represent typical *S. andreaeopsis*.

Schistidium andreaeopsis is characterised by plants relatively large, with blackish colour, laminal cells sinuose with dark red-orange walls. This species is rather similar to *Schistidium holmenianum* in overall appearance and both species grow on soil in tundras. Other species of the genus prefer rocky substrates. Unlike *S. holmenianum*, *S. andreaeopsis* has larger and more sinuose distal laminal cells, darker red-orange cell walls, a much weaker costa, and predominantly unistratose and denticulate or papillose-denticulate leaf margins (Ignatova and Blom 2017).

28. *Schistidium subflaccidum* (Kindb.) H.H.Blom

Contributors. T. Kiebacher and H. H. Blom

Italy. South Tyrol: (1) St Ulrich, Seceda, near Cuca Sattel, 46.58833°N, 11.72150°E, ca. 2135 m a.s.l., S-facing rocks, on Breccia (calciferos matrix), 16 August 2017, leg. T. Kiebacher 1464 (priv. herb. T. Kiebacher), *conf.* H. Blom; (2) Stern, between Forcela de Gherdenacia and Gherdenacia-Hütte, ca. 2100 m a.s.l., rock boulder in pasture, on dolomite, 19 October 2017, leg. T. Kiebacher 1636 (priv. herb. T. Kiebacher), *conf.*

H. Köckinger; (3) Trentino, Vigo di Fassa, Mt. Latemar, 46.38328°N, 11.59128°E, 2685 m a.s.l., S-facing rocks, on basalt, 4 October 2018, leg. T. Kiebacher 1930 (priv. herb. T. Kiebacher); (4) Monte Vigina [?], 1900 m a.s.l., limestone, leg. Dott. Venturi di Trento, *det.* H.H. Blom (Pl).

Schistidium subflaccidum was described as *Grimmia subflaccida* Kindb. from Canada by Kindberg (1900). Blom et al. (2006) reported the taxon from the Caucasus and provided the first comprehensive description and illustrations. Subsequently the species was reported from a number of European countries including Austria, Albania, France and Switzerland (Köckinger, Suanjak et al. 2008; Ignatova et al. 2009; Chavoutier and Hugonnot 2013; Hodgetts 2015; Swissbryophytes 2019).

In the European Alps the species has been found to be widespread on base-rich siliceous and calcareous rock types (pers. obs.; see Köckinger et al. 2008; Chavoutier and Hugonnot 2013; Schröck et al. 2013; Swissbryophytes 2019).

Here, *S. subflaccidum* is added to the bryoflora of the Italian Alps, where it seems to be widespread, at least in the region of Trentino-Alto Adige. *Schistidium subflaccidum* is reported from Italy in the new European checklist of bryophytes (Hodgetts et al. in prep.) based on a pers. comm. of H. Blom in December 2018. This indication is herewith complemented with actual specimens.

29. *Seligeria brevifolia* (Lindb.) Lindb. & Arnell

Contributor. M. Philippe

France. Auvergne – Rhône – Alpes, Haute-Savoie department, Les Houches, north slope of the Mont Lachat, 45°52'42.16"N, 6°47'21.79"E, 1535 m a.s.l., Liassic shales of a forest track embankment, in a mixed forest (*Abies* Mill., *Fagus* L., *Picea* A.Dietr.), 18 July 2019, leg. M. Philippe *s.n.* (LY0027812).

Switzerland. Canton de Vaud, Les Plans sur Bex, Vallon du Nant, 46°14'42.54"N, 7°06'18.04"E, 1305 m a.s.l., large bloc of siliceous limestone in a spruce (*Picea abies* (L.) H.Karst.) forest, and Les Plans sur Bex, below La Thomasia, 46°15'12.78"N, 7°06'36.06"E, 1205 m a.s.l., limestone bloc in a mixed forest (*Fagus*, *Picea*), 23 July 2019, leg. M. Philippe *s.n.* (LY0027813 and LY0027814 respectively).

This Euro-Siberian species is of least conservation concern at the European scale (Hallingbäck 2019), but in Switzerland it is currently listed as critically endangered (Schnyder et al. 2004). For the European mainland, Scandinavia excepted, it is documented only from the Alps, in Austria, Germany, Switzerland and France (ECCB 1995). Only three of the fifteen total observations from the Alps are dated after 1980, with a single observation each from Austria (Grims 1999), Switzerland (Kiebacher et al. 2019) and Germany (Meinunger and Schröder 2007).

There have been no records of this species from France since 1977 (Chavoutier 2016). Old records from the French Pyrenees (Husnot 1884–1890) are probably based on a nomenclatural confusion, as Husnot distributed material (*Muscologia Gallica* n° 754) as *Seligeria pusilla* var. *brevifolia* Lindb. that he had received from Culmann, which was collected in the vicinity of Zurich in November 1884. This material was later revealed to be unrelated to *Seligeria brevifolia* (Lindb.) Lindb. (Culmann 1908). Our new data from France is from the locality described by Culmann (1930). Although works for a forest track have modified the site, probably some decades ago, the species could still be found there. Our data from the Canton de Vaud (two neighbouring sites) are the first reports for this species from this canton of Switzerland.

30. *Sphagnum medium* Limpr.

Contributors. A. V. Shkurko, A. I. Maksimov, O. V. Galanina and E. O. Korolkova

Russia. Pskov Province, Polistovsky State Nature Reserve, Polistovo-Lovatsky ombrotrophic mire massif: (1) 57°03'29.9"N, 30°26'47.3"E, ca. 96 m a.s.l., ombrotrophic bog, in wet hollow with *Scheuchzeria palustris* F.Muell., *Rhynchospora alba* (L.) Vahl, *Drosera rotundifolia* L., *Sphagnum majus* (Russow) C.E.O.Jensen, *S. cuspidatum* Ehrh. ex Hoffm., 27 June 2016, leg. A. Shkurko, E. Korolkova s.n., det. A. Shkurko (MHA); (2) the same area, 57°03'37.2"N, 30°27'14.9"E, ca. 97 m a.s.l., ombrotrophic carpet with *Andromeda polifolia* L., *Oxycoccus palustris* (Hill) A.Gray, *Carex limosa* L., *Scheuchzeria palustris*, *Rhynchospora alba*, *Drosera rotundifolia*, *Sphagnum fallax* (H.Klinggr.) H.Klinggr., 28 June 2016, leg. E. Korolkova, A. Shkurko s.n., det. A. Shkurko (MHA, MW); (3) the same area, 57°14'21.7"N, 30°27'37.2"E, ca. 92 m a.s.l., on hummock with *Pinus sylvestris* L., *Chamaedaphne calyculata* (L.) Moench, *Andromeda polifolia*, 23 July 2019, leg. G. Freydin s.n., det. A. Maksimov (PTZ); (4) 57°08'17.3"N, 30°30'53.7"E, on hummock, 26 July 2019, leg. O. Galanina s.n., det. A. Maksimov (PTZ); (5) 57°08'50.6"N, 30°31'10.6"E, on flat hummock with *Calluna vulgaris* (L.) Hull, *Eriophorum vaginatum* L., *Sphagnum fuscum* (Schimp.) H.Klinggr., *S. rubellum* Wilson, 26 July 2019, leg. O. Galanina s.n., det. A. Maksimov (PTZ).

Sphagnum magellanicum Brid. and *S. medium* were considered as synonyms, both names have been applied to a morphologically and ecologically variable species, widespread in the Northern Hemisphere. Brotherus (1901), Elenkin (1909), and Podpěra (1954) provided records of *S. medium* from Russian territory, which were later assigned to *S. magellanicum*. However, recent studies have demonstrated that several genetic groups and cryptic taxa exist within this species (Kyrkjeeide et al. 2016; Schwarzer and

Joshi 2017; Yousefi et al. 2017), and three species are now formally recognised (Hassel et al. 2018). According to their results, *S. magellanicum* has a strictly South American distribution, while the two other species occur in Northern Hemisphere. Of these, a widespread circumboreal species was described as *Sphagnum divinum* Flatberg & Hassel, while *S. medium* was proposed for an Amphi-Atlantic moss, described from the Alps, which occurs in the British Isles, Denmark, Estonia, Germany, Ireland, Latvia, Norway, Sweden, Canada and USA (Hassel et al. 2018). Recently this species was found in Turkey (Ellis, Amélio et al. 2019). Recent revision of collections from the European part of Russia, added some localities for *S. medium* in the Polistovsky State National Reserve, which are the first Russian records of *S. medium* s.str. The Reserve lies in the south-western part of the Polistovo-lovatsky mire system, regarded as the largest bog system in Europe (Nosova et al. 2019). The five reported localities of *S. medium* can be assigned to three different microhabitats: wet ombrotrophic hollows, carpets, and drier hummocks, demonstrating the wide ecological amplitude of the species despite its location at the eastern boundary of its European distribution.

31. *Stereophyllum radiculosum* (Hook.) Mitt.

Contributors. A. Martins, N. Hodgetts, F. Monteiro, L. Catarino and M. Sim-Sim

Republic of Guinea-Bissau. Bijagós Archipelago, Bolama Island, Bolama village, 11.3430°N, 15.2904°W, 25 m a.s.l., on trunk of *Faidherbia albida* (Delile) A.Chev., 26 October 2018, leg. F. Monteiro s.n. (LISU).

Stereophyllum radiculosum has been listed for Mexico, West Indies, Central and South America, Asia, Africa and Australia (Buck and Ireland 2014). This species is recognised by its dull, complanate, singly costate leaves with short, rhomboidal laminal cells usually with a single papilla over the lumen (Buck and Ireland 2014).

This collection was made in an open forest from a trunk of *Faidherbia albida*.

32. *Taxiphyllum wissgrillii* (Garov.) Wijk & Margad.

Contributors. D. Dagnino, C. Turcato and L. Minuto
Italy. Liguria Region, Beigua Regional Natural Park, Mt. Beigua, Prariondo, Bric Sciue Gianche, 1156 m a.s.l., 44°26'16.40"N, 8°36'49.03"E, 11 November 2017, leg. D. Dagnino s.n., det. D. Dagnino & C. Turcato (GE, B148).

This is the first record of *Taxiphyllum wissgrillii* for the Liguria Region. This species is distributed in Eurasia and northern Africa (Dierßen 2001) and occurs in several Mediterranean countries (Ros et al. 2013). In Italy *T. wissgrillii* was known from several administrative regions, particularly in the northern part of the Peninsula (Aleffi et al. 2008).

It usually grows in moist, shady places, on various types of substrate (Dierßen 2001). The site of the discovery is a serpentinite outcrop in a deciduous mesophilic forest dominated by beech (*Fagus sylvatica* L., referring to the *Fagion sylvaticae* alliance), in the Beigua Regional Natural Park. This area is characterised by a sub-oceanic climate, very close to that of the Mediterranean.

33. ***Thysananthus auriculatus*** (Wilson) Sukkharak & Gradst.

Contributors. A. Martins, N. Hodgetts, F. Monteiro, L. Catarino and M. Sim-Sim

Republic of Guinea-Bissau. Bijagós Archipelago, Marine National Park of João Vieira Poilão, Cavalos Island, 11.011528°N, 15.708694°W, ca. 20 m a.s.l., on trunk of *Sterculia tragacantha* Lindl., 11 July 2016, leg. L. Catarino & B. Indjai s.n. (LISU).

Thysananthus auriculatus [= *Mastigolejeunea auriculata* (Wilson) Steph.] is a widespread species in tropical America and tropical Africa (Sukkharak and Gradstein 2014). This is the first confirmed record of the species for Guinea-Bissau, although Catarino et al. (2006) reported '*Mastigolejeunea* aff. *auriculata*' for the Cantanhez region (Guinea-Bissau).

Thysananthus auriculatus is characterised by its dark green to blackish colour, the strongly convex, and sometimes subsquarrose, leaves with upcurved to incurved ventral margins, the apical margin of the lobule obliquely running into the ventral margin of the leaf lobe and the usually plane lateral margins of the underleaves (Sukkharak and Gradstein 2014).

The new specimen was found on the trunk of *Sterculia tragacantha* Lindl. in a palm grove.

34. ***Tortella alpicola*** Dixon

Contributor. T. Kiebacher

Italy. (1) Trentino, Vigo di Fassa, Kleine Latemarscharte, 46.38529°N, 11.59763°E, 2515 m a.s.l., E-facing rock, on dolomite, 4 October 2018, leg. T. Kiebacher 1929 (priv. herb. T. Kiebacher); (2) Belluno, Cortina d'Ampezzo, NNW ridge to the summit of Mt. Tofana di Rozes, along path to the summit, 46.54004°N, 12.04783°E, 3032 m a.s.l., exposed ridge, N-facing rocks, in rock fissure, on dolomite, 19 September 2019, leg. T. Kiebacher 2258 (priv. herb. T. Kiebacher), conf. H. Köckinger; (3) Belluno, Cortina d'Ampezzo, Mt. Tofana di Rozes, summit area, 46.53717°N, 12.05098°E, 3220 m a.s.l., NE-exposed ridge, exposed rock outcrops, on dolomite, 19 September 2019, leg. T. Kiebacher 2270 (priv. herb. T. Kiebacher).

The occurrence of *Tortella alpicola* in Europe was recognised some 15 years ago (Otnyukova et al. 2004; Rams et al. 2006) and this late discovery is surely due to the similarity of the taxon to *T. fragilis* (Drumm.) Limpr. *Tortella fragilis* is widespread and

locally abundant in European mountain regions. Both species have long acuminate and easily broken leaf apices that are usually erect when the plants are wet. However, *T. alpicola* differs from *T. fragilis* in the barrel-shaped segmentation of the leaf acumen where distinct constrictions predefine breaking points, and conspicuously shiny, white basal leaf cells. By contrast, *T. fragilis* lacks constrictions in the leaf acumen and the hyaline basal cells are yellowish-white.

Tortella alpicola was described from the Himalaya Mountains (Dixon 1930) and was first reported for Europe from the Urals (Otnyukova et al. 2004). Rams et al. (2006) reported the species from the Sierra Nevada and subsequently it was recorded in European mountain areas of France, Norway, Austria, Switzerland and the Canary Islands (Dirkse and Losada-Lima 2011; Chavoutier and Hugonnot 2013; Schröck et al. 2013; Bergamini et al. 2015, 2017; Köckinger et al. 2016; Swissbryophytes 2018). Here, the Italian Alps are added to the known distribution of the taxon. The species was recorded in the central Alps on calcareous schist and in the southern Alps on dolomite. All records are from high elevations, partly exceeding 3000 m a.s.l.

35. ***Tortella fragilis*** (Drumm.) Limpr.

Contributor. R. Ochyra

Antarctica, South Shetland Islands. Livingston Island: South Bay, Hurd Peninsula, Johnsons Dock area, 62° 39'38''S, 60°22'39''W, ca. 45 m a.s.l., in moist but exposed and sunny cracks of calciphilous rocks, 12 February 1992, leg. F. Schulz s.n. (KRAM B-250520).

Tortella fragilis is a fairly rare and localised species in the maritime Antarctic. It is locally common and abundant only on Alexander Island and on James Ross Island and occasional and widely scattered along the western and eastern coasts of the Antarctic Peninsula (Ochyra, Bednarek-Ochyra et al. 2008; Ochyra, Lewis Smith et al. 2008). In the peri-Antarctic archipelagoes it was only once recorded on King George Island, the largest of the South Shetland Islands (Wierzgoń et al. 2018) and herein it is recorded from Livingston Island, the second largest island of this archipelago. It was formerly recorded from this island as *T. fragilis* var. *tortelloides* (S.W.Greene) R.H.Zander & Hoe (Sancho et al. 1999). This is a notable addition to the moss flora of this island which currently consists of 57 species, eight of which belong to the Pottiaceae, including three of *Syntrichia* Brid., two of *Henediella* Paris and three each of *Tortella* (Müll.Hal.) Limpr., *Didymodon* Hedw. and *Bryoerythrophyllum* P.C.Chen (Ochyra and Zander 2002; Ochyra, Lewis Smith et al. 2008). *Tortella fragilis* is very rare in the austral polar regions and outside the Antarctic it is known only from subantarctic South Georgia (Ochyra, Bednarek-Ochyra et al. 2002) and Îles Kerguelen (Ochyra and Poulsen 2003).

36. *Tortella mediterranea* Köckinger, Lüth, O.Werner & Ros

Contributors. P. Erzberger and H. Köckinger

Montenegro. (1) Rumija Mts, at Skadarsko jezero (Lake Scutari), district of Ulcinj, at the border of Albania north-west to Shtegvasha village, limestone outcrops in open vegetation, 475 m a.s.l., 42°03'52.2"N, 19°22'31.2"E, 8 October 2003, *leg.* P. Erzberger & B. Papp *s.n.* (B-Erzberger 9715, 9718, priv. herb. Köckinger), [as *Tortella tortuosa* (Hedw.) Limpr., *rev.* H. Köckinger]. (2) Orjen Mts, district of Herceg Novi, between the villages Vrbanje and Kruševica, limestone rocks partly shaded by broad-leaved trees, 1010 m a.s.l., 42°32'58.0"N, 18°30'19.4"E, 16 July 2007, *leg.* P. Erzberger & B. Papp *s.n.* (B-Erzberger 12330, 12338, priv. herb. Köckinger), [as *Tortella tortuosa* *rev.* H. Köckinger].

A revision of collections of *Tortella* from the western Balkan Peninsula revealed the fourth and fifth record of the recently described *T. mediterranea* (Köckinger et al. 2018). These records from southern Montenegro form a bridge between two of the three hitherto known localities from Croatia and Greece. Four of the known occurrences are situated in the prominent mesozoic limestone mountain range east of the Adriatic that extends from Istria to northern Greece, which appears to be the main distribution area.

Habitat conditions of the newly found populations correspond to the previous finds, which were all from limestone. However, the second collection was from a distinctly higher elevation (1010 m a. s. l.) than previously recorded (200, 500 and 620 m a.s.l. respectively), and the associated bryophytes, *Plagiopus oederianus* (Sw.) H.A.Crum & L.E.Anderson, *Ctenidium molluscum* (Hedw.) Mitt., *Orthothecium rufescens* (Dicks. ex Brid.) Schimp. and *Gymnostomum aeruginosum* Sm., have to be regarded as more cryophilous than expected. Nevertheless, both localities are situated very close to the Adriatic. South-western Montenegro and in particular the Orjen Mountains receive Europe's heaviest precipitation (more than 6000 mm). Seemingly, *T. mediterranea*, prefers mountaineous limestone areas with heavy winter rain close to the sea, which is also true for the type locality on Mallorca.

Tortella mediterranea can be recognised by the following combination of characters: (1) absence of a stem central strand, (2) narrowly lanceolate leaves with an ovate base and a narrow mucro, (3) partial presence of elongate marginal cells in upper leaf, (4) small laminal cells, (5) rather gradual limb-sheath transition and (6) the ventral costal stereid band usually thicker than the dorsal.

37. *Warnstorfia sarmentosa* (Wahlenb.) Hedenäs

Contributors. I. Parnikoza, V. Ivanets, M. Wierzgoń and R. Ochyra

Antarctic Peninsula, Graham Coast. West Antarctic Peninsula, Kiev Peninsula, Oasis Rasmussen, western

slope, 65°14'52.116"S, 64°04'59.52"W, 25 m a.s.l., in wet place in moss carpet formation, associated with *Sanionia georgicouninata* (Müll.Hal.) Ochyra & Hedenäs, *Warnstorfia fontinaliopsis* (Müll.Hal.) Ochyra, *Pohlia nutans* (Hedw.) Lindb. and *Brachythecium austrosalebrosum* (Müll.Hal.) Kindb., 7 March 2019, *leg. et det.* I. Parnikoza *s.n.*, *ver.* R. Ochyra (KRAM B-248847).

Antarctica, Wilhelm Archipelago. Lemaire Channel, northern face of Booth Island, 65°02'40.956"S, 63°56'08.736"W, 28 m a.s.l., moss in the rock cervices, associated with *Sanionia uncinata* (Hedw.) Loeske and *Andreaea regularis* Müll.Hal., 1 April 2019, *leg. et det.* I. Parnikoza *s.n.*, *ver.* R. Ochyra (KRAM B-248841).

Warnstorfia sarmentosa is a common species in the South Orkney Islands and the South Shetland Islands in the northern maritime Antarctic. Additionally, it has been recorded from James Ross Island off the East Antarctic Peninsula and on Cape Kjellmann on Davis Coast on the West Antarctic Peninsula. Its southernmost locality was found at lat. 65°32'S on Lahille Island in the Granddier Channel off Graham Coast (Ochyra, Lewis Smith et al. 2008). Herein, *W. sarmentosa* is collected for the second time from the mainland Antarctic Peninsula from Rasmussen Oasis on Graham Coast and from Booth Island in Wilhelm Archipelago. At both sites it is a component of the moss carpet subformation which is widespread in this area (Parnikoza et al. 2018). In Wilhelm Archipelago only the moss flora of the Argentine Islands was surveyed by Lewis Smith and Corner (1973), whose moss collection consisted of 32 species (Ochyra, Lewis Smith et al. 2008). Recent field studies yielded four additional species (Blockeel et al. 2006; Ellis, Alataş et al. 2016; Ellis, Aleffi, Alegro et al. 2016; Ellis, Asthana, Srivastava, Omar, et al. 2016), increasing the moss flora of the Argentine Islands to 36 species. Generally, in the region between Lemaire Channel and Lahille Island in the north-south gradient and Cruis and Roca Islands – Graham Coast in the west-east direction some 49 moss species have been recorded (Ochyra, Lewis Smith et al. 2008). The species richness of this insular area is remarkable and justifies its recognition as an Antarctic Specially Protected Area.

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