



New national and regional bryophyte records, 77

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1. *Amblystegium serpens* (Hedw.) Schimp.

Contributors. R. D. Cedrés-Perdomo, C. Polaino-Martín and R. Gabriel

Portugal. Macaronesia. Azores Islands, Terceira, Angra do Heroísmo, Altares, Gruta do Natal, 540 m a.s.l., 38° 44’15.5”N, 27°16’04.5”W, 14 May 2019, *leg.* C. Polaino-Martín *s.n.*, *det.* R. D. Cedrés-Perdomo, R. Gabriel (TFC).

Although *Amblystegium serpens* in the family Amblystegiaceae is frequently designated as a cosmopolitan species (Dierßen 2001), it is actually a very widespread and locally common panholarctic moss that occasionally penetrates to Central and northern South America (Hedenäs 2003) and tropical East Africa (O’Shea 2006), although these records need to

be verified. It is absent from tropical Asia and Oceania and doesn’t occur in the Southern Hemisphere, except for some records in Australasia which apparently represent recent introductions, and others from subantarctic islands and southern South America that mainly refer to *Cratoneuropsis chilensis* (Lorentz) Ochyra (Ochyra, Lewis Smith et al. 2008). It is a polyedaphic species that exhibits a very wide ecological amplitude growing in a wide range of dry to moist epigeal, saxicolous and epiphytic habitats (Dierßen 2001; Blockeel 2014). In May 2019 research aiming to characterise the biodiversity in Azorean caves was carried out in Terceira Island. *Amblystegium serpens* was found on the rocky floor of Gruta do Natal,

50 cm away from an artificial light source. It was identified in two different places, growing associated with *Conocephalum conicum* (L.) Dumort., *Fissidens* Hedw. spp., *Kindbergia praelonga* (Hedw.) Ochyra and *Dumortiera hirsuta* (Sw.) Nees.

Previously in the Azores, *Amblystegium serpens* was reported from São Miguel Island, Vila Franca do Campo, by Teotónio da Silveira (Silveira 1937) and in two further locations by Herman Persson in 1937: Lagoa do Congro (Allorge and Persson 1938) and Terra Nostra Park (Allorge and Allorge 1952). The species was also referred to São Jorge Island, without location, in 1965 (Smookler 1967), and Fajã Grande (100–130 m a.s.l.), on Flores Island (Swedish Museum of Natural History, 2000). This is the latest occurrence of this species in the Azores. With the discovery on Terceira Island, the distribution of *A. serpens* covers four out of the nine islands in the archipelago, being very rare and occurring in small populations.

2. *Anastrophyllum donnianum* (Hook.) Steph.

Contributors. K. Hylander and N. Lönnell

Sweden. Jämtland, Kall, Skäckerfjällen, Lill-Gaunvalen, 63.93595°N, 12.79445°E, c. 540 m.a.s.l., 7 July 2023, leg. K. Hylander and N. Lönnell s.n. (S B326544).

This is the first confirmed report of *Anastrophyllum donnianum* from Sweden. There exists one old specimen, originally labeled *Anastrepta orcadensis* (UPS B-657784), that is most probably mislabeled (Söderström 1995) and has thus not been included in previous Swedish floras or checklists. In the Nordic countries, besides in Sweden, the species occurs only in the Faroe Islands and in Norway (Lönnell et al. in prep.). The nearest confirmed occurrence to the new Swedish locality is more than 200 km away towards the coast in Norway. The Swedish site is the most northerly location in the Nordic countries and much further inland than all occurrences in Norway and the Faroe Islands. However, the area in which the species was found is among those with the highest annual precipitation in Sweden with > 1000 mm/year (Raab and Vedin 1995). The species was found on a north facing slope in the low alpine zone just above the forest limit in small depressions in the alpine heath leaning towards a sloping mire in almost pure, scattered, up to 1 dm² large patches. Other species in the vicinity are *Narthecium ossifragum* (L.) Huds., *Scirpus caespitosus* Kunth, *Calluna vulgaris* (L.) Hull, *Racomitrium lanuginosum* (Hedw.) Brid. and *Mylia Taylorii* (Hook.) S.F.Gray. Perianths or sporophytes were absent. Given the large patches, the occurrence is most certainly old but overlooked. Nonetheless, the species is likely very rare in Sweden as areas with such high precipitation only cover small parts of the country.

3. *Bazzania denudata* (Torr. ex Gottsche, Lindenb. & Nees) Trevis.

Contributors. N. A. Konstantinova and V. A. Bakalin

Russia. (1) Republic of Buryatia, Khamar-Daban Ridge, narrow canyon in the middle reaches of the Left Anosovka River, 51.4282°N, 105.036°E, 820 m a.s.l., in *Pinus pumila* (Pall.) Regel thickets, at base of cliff, 4 August 2001, leg. N. A. Konstantinova & A. N. Savchenko 13-27-01 [KPABG102388]; (2) ibidem, lower reaches of the Pereemnaya River, 51.5129°N, 105.208°E, 540 m a.s.l., on cliffs on bank of river, dominated in mats with admixture of *Sphenolobus minutus* (Schreb.) Berggr., *Diplophyllum taxifolium* (Wahlenb.) Dumort., 7 August 2001, leg. N. A. Konstantinova & A. N. Savchenko 42-3-01 [KPABG102439].

This is the first report of *Bazzania denudata* for the Republic of Buryatia and for Siberia. It is a boreo-temperate East Asian-American species (Bakalin 2016). In East Asia it is frequent in the South Kurils, Hokkaido and Manchuria. The species is widespread in the south of the Far East of Russia, particularly in Primorsky Territory, and has scattered occurrences to the north up to Kamchatka Territory and Magadan Province (Bakalin 2016). The finding of the species in the Kamar-Daban Mountains, thousands of kilometers to the east of the main distribution, is of great interest. The specimen was previously identified as *Bazzania bidentula* (Steph.) Yasuda, which differs from *B. denudata* in possessing ovate leaves with narrow, strictly bilobed apices, brown secondary pigmentation and papillose leaf cuticle, versus ellipsoidal-ovate leaves with truncate and mostly 3-lobed apices, commonly free of secondary pigmentation and having a smooth leaf cuticle. Illustrations and morphological description of plants in the syntype of *Bazzania denudata*, as well as illustrations and morphological description of plants in the lectotype of *B. ovifolia* (Steph.) S.Hatt., a synonym of the former described from East Asia, were published in Bakalin and Maltseva (2023).

4. *Bucklandiella subsecunda* (Hook. & Grev. ex Harv.) Bedn.-Ochyra & Ochyra

Contributor. H. Bednarek-Ochyra

Mascarene Islands. Réunion Island: (1) Arrêt sous le Vent: along path up SW slopes of Cirque de Cilaos, above village of Cilaos, 23 km S by E of St. Denis, 21° 07'13''S, 55°29'05''E, 1350–1700m a.s.l., on rock, 28 November 1972, leg. Marshall R. Crosby & Carol A. Crosby 8971 (MO); (2) Cirque de Cilaos, GR-R1 trail from Le Forêt du Grand Matarum to the Piton de Neiges, 21°06'52''S, 55°29'16''E, 1960m a.s.l., on rock boulder along forest path, 01 October 1997, leg. Th. Arts RÉU 59/32 (as *Racomitrium lepervanchei* Besch.) (BR, KRAM B-126474); (3) same locality, 21°06'50''S, 55°29'31''E, 2100 m a.s.l., on rock side along forest path, 01 October 1997, leg. Th. Arts RÉU 59/67 (as *Racomitrium lepervanchei*) (BR, KRAM B-126477); (4) Cirque

de Cilaos, Piton des Neiges trail, ca. 2200 m a.s.l., 21° 06'47"S, 55°29'34"E, humid ericaceous forest, on rocks, 29 December 1973, *leg.* J. L. De Sloover 17906 (as *Racomitrium alare* (Broth.) Paris), *det.* H. Bednarek-Ochyra (BR, KRAM B-027115); (5) Arrêt sous le Vent: along path up SW slopes of Cirque de Cilaos, above village of Cilaos, 23 km S by E of St. Denis, 21° 06'47"S, 55°29'34"E, 1350–1700m a.s.l., on rock, 28 November 1972, *leg.* Marshall R. Crosby & Carol A. Crosby 8971 (MO); (6) Arrêt sous le Vent: vicinity of "gîte" at summit of trail up SW slopes of Cirque de Cilaos, near Caverne Dufour, 22 km S of E of St. Denis, 21°06'36"S, 55°29'42"E, ca. 2500 m a.s.l., on rock, 29 November 1972, *leg.* Marshall R. Crosby & Carol A. Crosby 9169 (MO); (7) SW part of the village of Hell-Bourg, near Gîte de la Caverne Dufour below Piton des Neiges, 21°06'19"S, 55°29'57"E, 2450 m a.s.l., rocky blocky section with sparse *Philippia* Klotzsch bushes, on rocks, 22 September 1998, *leg.* F. Müller R642, *det.* H. Bednarek-Ochyra (DR, KRAM B-271810) & R684 (DR, KRAM B-271812); (8) Cirque de Mafate, footpath GR R1 from the Pas de Col du Boeuf (Grand Îlet) to La Nouvelle, 21°04'24"S, 55°27'03"E, 1900m a.s.l., on rock boulder at the pass, *leg.* Th. Arts RÉU 61/02 (as *Racomitrium lepervanchei*) (BR, KRAM B-126476); (9) Forêt de Tevelave, Ravine du Gol trail, near view of Les Makes, 21°10'20"S, 55°22'48"E, 1830 m a.s.l., Forêt de Tamarin des Hauts, on rock boulder in ravine in the forest, 19 November 1998, *leg.* Th. Arts RÉU 120/35 (BR, KRAM B-271811).

The subfamily Racomitrioideae is poorly represented on the East African Indian Ocean islands and its members occur mainly on La Réunion island. It is represented here only by two genera, *Racomitrium* Brid. s.str. and *Bucklandiella* Roiv. which are segregates of the broadly interpreted genus *Racomitrium* (Ochyra et al. 2003; Bednarek-Ochyra et al. 2014; Sawicki et al. 2015). De Sloover (1977) reported two species from this island, *R. alare* (Broth.) Paris and *R. lepervanchei* Besch., whereas Ah-Peng and Bardat (2005) recorded *R. membranaceum* (Mitt.) Paris and *R. subsecundum* (Hook. & Grev. ex Harv.) Wilson and Frahm (2010) accepted the latter three species. Of these, *R. membranaceum* should definitely be excluded from the island's moss flora because this is an amphiatlantic south-cool-temperate species (Ellis, Bakalin et al. 2013; Ochyra et al. 2015), but the other two, *Bucklandiella lepervanchei* (Besch.) Bedn.-Ochyra & Ochyra and *B. subsecunda*, are firmly established members of the island's flora, occurring at altimontane elevations. *Bucklandiella subsecunda* was first recorded from this island by De Sloover (1977 as *R. alare*) and herein some additional specimens of this species are provided. This is a pantropical oreophyte, widespread in tropical and subtropical Asia (Frisvoll 1988; Ellis, Aleffi et al. 2018), sub-Saharan Africa (Bednarek-Ochyra and Ochyra 2012a, 2013; Ochyra and van Rooy 2013) and

on Madagascar (Ellis et al. 2020), Central and South America (Bednarek-Ochyra et al. 1999; Blockeel et al. 2001, 2010; Lüth and Schäfer-Verwimp 2004; Bednarek-Ochyra and Ochyra 2012b) and the maritime Antarctic (Ochyra, Bednarek-Ochyra et al. 2008; Ellis, Ah-Peng et al. 2017 as *Bucklandiella subcrispipila* (Müll.Hal.) Bedn.-Ochyra & Ochyra).

5. *Cephaloziella verrucosa* Steph.

Contributor. Yu. S. Mamontov

Chile. Los Lagos Region, Palena Province, Chaitén Commune, Sendero Ventisquero Yelcho, 43° 16'32.5"S, 72°25'31.0"W, 155 m a.s.l., evergreen-coniferous-bamboo-fern-moss forest, on bark of living tree, with *Anastrophyllum crebrifolium* (Hook.f. & Taylor) Steph., *Leptoscyphus cuneifolius* subsp. *fragilis* (J.B.Jack & Steph.) Grolle, and *L. expansus* (Lehm.) Grolle, 29 November 2021, *leg.* Yu. S. Mamontov & A. V. Shkurko 928-3-7468 (MHA). Plants sterile.

Cephaloziella verrucosa is a relatively rare and scattered species in southern South America. It is known from the Argentine part of Isla Grande de Tierra del Fuego from where it was described as *C. hispidissima* R.M.Schust. (Schuster 1973). It is more frequent in Southern and Western Patagonia in the Chilean Regions of Magallanes and Aisén (Hässel de Menéndez and Rubies 2009), where it was also described as *C. serrata* Steph. and *C. gemmata* J.J.Engel. These three aforementioned names were reduced to synonymy with *C. verrucosa* (Váňa et al. 2014). The present discovery of this species in Palena Province in the Los Lagos Region extends its geographical range in Western Patagonia from Rio Aysén for about 250 km to the north. The range of *C. verrucosa* now includes epiphyte habitats besides those previously known for this species, namely cliff faces and peaty, damp soil between mosses along rills. Outside Patagonia, *C. verrucosa* has been reported from San Antonio and Petorca Provinces in the Valparaíso Region in Chile (Hässel de Menéndez and Rubies 2009).

The studied plants from the Los Lagos Region differ from the descriptions and illustrations of this species provided by, for instance, Schuster (1973, 2002 as *Cephaloziella hispidissima*), Engel (1973 as *C. gemmata* J.J.Engel) and Bednarek-Ochyra et al. (2000 as *C. hispidissima*) by the almost entire leaf margins, but are similar by the combination of the following characteristics: (1) plants relatively vigorous, grey- to olive-green; (2) stem surface hispid with numerous sharp, 1–2(–3)-celled projections, the terminal cell of which is thick-walled at the apex; (3) leaves bifid for 0.65–0.75 of their length, loosely conduplicate, the folded keel spreading, the abaxial face of disc hispid with sharp tubercles; (3) leaf lobes adaxially convex, weakly canaliculated; (4) underleaves large, leaf-like, bifid.

Cephaloziella verrucosa is a panholantarctic south-cool-temperate species having an optimum occurrence in southern South America. Outside this continent it is known from solitary locations in the South Island of New Zealand (Engel and Glennly 2008), subantarctic Marion Island and South Georgia (Ellis, Alataş et al. 2016), while it penetrates to the northern maritime Antarctic (Ochyra and Váňa 1989a; Ochyra and Váňa 1989b; Bednarek-Ochyra et al. 2000).

6. *Cheilolejeunea ornata* C.Bastos

Contributors. D. B. L.Tucker and B. M. Starzomski

Costa Rica. District: Tronodora, Cantón: Tilarán, Province: Guanacaste, Area: Monteverde 10°22'4.152"N, 84°49'31.692"W, On canopy branch 12.33 m above the ground, 1404 m a.s.l., 24 May 2023, *leg. D.B.L.Tucker 1676,1677 det.* D. B. L. Tucker and Robbert Gradstein s.n.(CR 5153451, UBC B253459, USJ *D.B.L.Tucker 1676,1677*).

Cheilolejeunea ornata is a rare liverwort described from Brazilian Atlantic Forest (Bastos 2011), also known from lower montane rainforest in Ecuador (Gradstein and Benitez 2017) and Cuba (Ovelar and Bastos 2022). This collection from lower montane cloud forest on the Caribbean slope of the continental divide in Costa Rica is a new record for Central America and fills in the gap in the species distribution. The species can be recognised by its small size (<500 µm wide), its ventral merophyte 2 cells wide, dull greenish appearance, large tuberculate papillae (8–10 µm tall) on the leaf lobe, lobule, and keel (Bastos and Gradstein 2020; Gil-Novoa and Costa 2023), and cells with large trigones and multiple oil bodies. The leaf lobes are ovate-oblong with a recurved acute-apiculate apex (Bastos and Gradstein 2020). The underleaves are distant, obovate-ovate-oblong, bifid to 0.5 times the leaf length, with acute-obtuse apices (Bastos and Gradstein 2020). In this specimen, the underleaves are 2–3 times the stem width, which slightly expands on the variation known (1.5–2.0 times stem width) for the species (Bastos 2011, Ovelar and Bastos 2022). The discovery of *Cheilolejeunea ornata* growing as a corticolous epiphyte in humid montane rainforest of Costa Rica fits with the habitat described in previous collections from Ecuador and Cuba. Photographs of the species are available on iNaturalist: <https://inaturalist.ca/observations/191721678>.

7. *Cratoneuroopsis chilensis* (Lorentz) Ochyra

Contributor. H. Bednarek-Ochyra

Îles Crozet. Île de la Possession, eastern coast, Pointe Lieutard: (1) Port Alfred Faure base over Baie du Marin, in the fellfield near the chapel toward the sea-shore, 120 m a.s.l., 46°25'55.89"S, 51°51'36.68"E, on a small, dry and exposed boulder in the fellfield, 9

November 2006, *leg. R. Ochyra 4/06* (KRAM B-275592); (2) Port Alfred Faure base area, Baie du Marin, steep cliff overlooking Crique du Navire north-east of the station, 5–25 m a.s.l., 46°25'42.08"S, 51°51'48.02"E, forming small patches on rock face sprinkled with water, associated with *Bartramia patens* Brid. and *Clasmatocolea rigens* (Hook.f. & Taylor) J.J.Engel, *leg. Ochyra 65/06* with M. Lebouvier (KRAM B-275593); (3) in the valley of the Rivière du Camp, north of the Alfred Faure base, alt. 60 m a.s.l., 46°25'20"S, 51°50'E, 60 m a.s.l., under wet overhanging rock associated with *Schistidium falcatum* (Hook.f. & Wilson) B.Bremer, 10 November 2006, coll. Ochyra 105/06 with M. Lebouvier (KRAM B-275594); (4) rock outcrops 300 m south of Port Alfred Faure station over Baie du Marin, 100 m a.s.l., 46°26'02"S, 51°51'49"E, forming small thin patches on a moist rock ledge with *Marchantia berteroana* Lehm. & Lindenb., 16 November 2012, *leg. Ochyra 2682/12* (KRAM B-275595); (5) rock outcrops 100 m north-west of the Alfred Faure base and 250 m west of the road to Crique du Navire, 160 m a.s.l., 46°25'50"S, 51°51'10"E, on the cliff forming fairly large patches under overhang on calcareous detritus, in shaded and moist situation in association with *Plagiochila heterodonta* (Hook.f. & Taylor) Gottsche, Lindenb. & Nees and *Philonotis tenuis* (Taylor) Reichardt, 22 November 2012, *leg. R. Ochyra 3144/12* (KRAM B-275596); (6) between the chapel and the "Azorella" house in the Port Alfred Faure base over Baie du Marin, 120 m a.s.l., 46°25'59"S, 51°51'33"E; on dry soil over exposed basalt boulder in the fellfield, 18 November 2012, *leg. R. Ochyra 2885/12* (KRAM B-275597); (7) on the stone wall of the radio station building in the Port Alfred Faure base over Baie du Marin, 132 m a.s.l., 46°25'59"S, 51°51'32"E, on soil in the stone wall crevices, associated with *Pohlia wahlenbergii* (F.Weber & D.Mohr) A.L.Andrews and *Bryum argenteum* Hedw. var. muticum Brid., 23 November 2012, *leg. R. Ochyra 3157/12* (KRAM B-275598); (8) without any closer locality data on the label, but cited by Kaalaas (1912: p. 99) as follows: "Possession Island, an der Südseite von Ship Cove, ca. 30 m. ü. M.; kleine grüne Form [of *Dicranella hookeri* (Müll.Hal.) Cardot] mit *Bryum crozetense* [Kaal.] und *Amblystegium serpens* [(Hedw.) Schimp.] vergesellschaftet; steril"; 1907–1908, *leg. Ring & Raknes N° 60* (BG-Kaalaas M-18029); (9) Possession Island, Ship Cove, 20 m. u. M., spärlich in Rasen von *Dicranella Hookeri* eingemischt; steril, 1907–08, *leg. Ring & Raknes N° 43m^b* (GRO as *Amblystegium serpens*); (10) Crozet Islands but without any detailed locality data on the label, but cited by Kaalaas (1912: p. 99) as follows: "Spärlich in Rasen von *Brachythecium rivulare* [Schimp.] an einem nicht näher angegebenen Orte vorkommend; steril"; 1907–1908, *leg. Ring & Rakness N° 43c* (BG-Kaalaas as *Hygroamblystegium kerguelense* (Mitt) Broth., GRO); (11) American Bay, 3

November 1929, *leg.* B.A.N.Z.A.R.E. [The British Australian (and) New Zealand Antarctic Research Expedition 1929–1931) B-67 (BM as *Amblystegium serpens* (Hedw.) Schimp.).

Cratoneuroopsis chilensis is one of the most common moss species in the Subantarctic, although it has a checkered taxonomic history due to its extreme variability (Ochyra, Lewis Smith et al. 2008). It was first reported from Île de la Possession by Kaalaas (1912) as *Amblystegium serpens* and *Hygroamblystegium ker-guelense* on the basis of the specimens collected by the Norwegian sealing voyage in 1907–08. The former was found in Ship Cove, but no such place is available on the modern island's maps and possibly it was a working place name used by the expedition members. However, it is also likely that the specimen could have been collected in Ship's Cove on Marion Island, Prince Edward Islands, where on 16 October 1908 the expedition ship *Solglimt* was wrecked. The whole ship's crew lived for some time ashore until it was rescued and returned to Norway (Boschoff et al. 2015; Cooper 2016). Because subsequent records (Hébrard 1971 as *Pseudoleskea chalaroclada* (Müll.Hal.) Paris) also have no details, the species is here reported from stations with accurate data. Although many additions have been made to the moss flora of Îles Crozet in recent decades (e.g. Ochyra and Bell 1984; Ochyra 2002; Blockeel et al. 2006, 2007, 2008; Ellis et al. 2010, 2012, 2014, 2019; Ochyra and Bednarek-Ochyra 2013; Ellis, Aranda et al. 2013; Bednarek-Ochyra 2014; Ochyra et al. 2015; Ellis, Alataş et al. 2017; Ellis, Afonina et al. 2018) and it currently numbers about 75 species, this archipelago is still one of the least bryologically explored areas in the Subantarctic.

8. *Didymodon incurvus* J.A.Jiménez & M.J.Cano

Contributors. J. Larraín and V. Ardiles

Chile. Región de Arica y Parinacota (XV), Parinacota Province, Comuna de Putre, Zapahuira, en el tramo de la ruta A-31 que transita entre el puente Murmuntani y la localidad Zapahuira, aproximadamente en el kilómetro 163, a 1 km de la localidad de Zapahuira, 3440 m a.s.l., 18°20'18.5"S, 69°34'46.7"W, 1 June 2013, *leg.* V. Ardiles 62 (SGO 164230).

The recently described *Didymodon incurvus* is characterised by its oblong-lanceolate leaves, entirely unistratose lamina, distal margins incurved, and costa with a bulging ventral pad of cells (Jiménez and Cano 2008). The incurved distal leaf margins are unique within *Didymodon* Hedw., providing a useful diagnostic character for this taxon. The species was hitherto known as a Peruvian endemic, with three known collections from Puno Department in southern Peru. The specimen collected in northern Chile, close to the border with Peru, perfectly matches this species in all of its traits and represents its southernmost known population,

as well as occurring at a lower elevation than its previously known range of between 3915 and 4510 m a.s.l. The Chilean specimen was found on soil among rocks, growing together with *Pseudocrossidium apiculatum* R.S.Williams, in a thick Andean shrubland dominated by *Fabiana ramulosa* (Wedd.) Hunz. & Barboza and *Diplostephium meyenii* Wedd.

9. *Didymodon tophaceus* subsp. *erosus* (J.A.Jiménez & J.Guerra) Jan Kučera

Contributors. S. V. O'Leary and J. Kučera

United Kingdom. Medmenham, Buckinghamshire, 51.55259°N, 0.83565°W, ca. 30 m a.s.l., on shaded bricks and mortar by mill wheel, 22 February 2023, *leg.* S. V. O'Leary *det.* Jan Kučera, (CBFS 25207; Herb. S.V. O'Leary).

The material referred to here was collected while surveying a private garden. It resembled a stunted form of *Didymodon tophaceus* (Brid.) Lisa but differed in that the ventral superficial costa cells on most leaves were short-rectangular to quadrate and the leaf shape lanceolate to lingulate. Therefore, SVOL was unable to assign it to any previously known British species. After consultation with other British bryologists, who were also puzzled, a specimen was sent to JK for consultation. Upon morphological examination, the material proved to be somewhat intermediate between *Didymodon tophaceus* subsp. *tophaceus* and subsp. *erosus* with respect, e.g., to the lack of a strongly erose border as illustrated in Jiménez et al. (2004). Therefore, the plants were bar-coded molecularly (ITS: PP152364, *rps4*: PP171483) with the result that they were found to belong to a specific genotype shared with the specimen Köckinger 12353 from Austria, which was interpreted as *D. tophaceus* subsp. *erosus* by Kučera et al. (2018), in contrast to the original interpretation as *D. tophaceus* s.str. by Werner et al. (2009). The current record expands the known European distribution, where it has so far been reported from Spain, Portugal, France, Germany, Austria, Albania and Hungary (apart from the single non-European record from Ecuador, Kučera et al. (2018)).

10. *Frullania rigescens* Spruce

Contributors. B. Espinoza-Prieto, J. J. Atwood and J. Opisso

Peru. Departamento Cajamarca, San Ignacio provincia, San José de Lourdes distrito. Saliendo del centro poblado Potrero Grande. Borde de bosque montano y pastizales, 05°00'29.39"S, 78°55'59.88"W, 1438 m, 30 April 2021, *leg.* B. Espinoza-Prieto, S. Riva & P. Arista 2274 (CPUN, MO!, USM).

Frullania Raddi is one of the most speciose liverwort genera in the Neotropics (Gradstein et al. 2001) and the second largest genus of liverworts in the tropical Andes (Churchill et al. 2024). *Frullania rigescens*

Spruce is a rare Andean species, with specimens known from two localities in Peru's San Martín department (Spruce 1884–85; Stotler 1969; Menzel 1984; Söderstrom et al. in rev.). Although Churchill et al. (2009) also cite this species from Bolivia with reference to Stephani's (1912) treatment, the Bolivian record is dubious and may belong to *F. rigescens* var. *mollicula* Spruce (= *F. triquetra* Lindenb. & Gottsche fide Stotler 1969), the type of which is from Yungas, Bolivia, as Stephani's herbarium apparently contains no specimens of the type variety from Bolivia. A new Peruvian station for *F. rigescens* is here documented about 330 km NW of Tarapoto, and more than 150 years after Spruce's original collecting expedition (Richard Spruce stayed in Tarapoto for two years, between 1855 and 1857, see Spruce (1908)). Spruce's specimen labels for Lamas and Tarapoto do not include elevation, but these sites are located at 300 to 800 m. By comparison, the elevation of the Cajamarca collection is about 1440 m. All three localities are under strong pressure from agricultural expansion, although a Regional Conservation Area (Cordillera Escalera) is located near Spruce's collection sites, making it probable that more populations of *F. rigescens* may be found there.

11. *Funariella curviseta* (Schwägr.) Sérgio

Contributors. P. M. Mir-Rosselló, M. D. Cerrato, L. Gil and A. Ribas-Serra

Spain. Balearic Islands. Formentera, Cap de Barbaria, 38°39'18.6"N, 1°23'13.8"E, 60 m a.s.l., soil on a limestone rock, in a small depression near the coast, 21 January 2023, *leg.* P. M. Mir-Rosselló, M. D. Cerrato, L. Gil and A. Ribas-Serra *s.n.* (UIB:CBI:2023.1037).

Funariella curviseta can be easily recognised in the field by its short and curved seta (Sérgio and Brugués 2010). Although considered a Vulnerable species in Europe (Hodgetts et al. 2019), in the Balearic Islands it inhabits quite undisturbed areas and is relatively common, thus being considered a species of Low Concern (Cros et al. 2008; Sáez 2020). With this first citation for Formentera, *F. curviseta* has now been recorded from all the main islands of the Balearic archipelago. In Cap de Barbaria, it inhabited a small, shaded depression, in the rocky coast far from any potential human disturbance. The discovery of it growing alongside the liverwort *Petalophyllum ralfsii* (Wilson) Nees & Gottsche, and the fact that this is the southernmost locality for the archipelago, adds further interest to this record.

12. *Hydrogonium amplexifolium* (Mitt.) P.C.Chen

Contributor. S. Gey

Slovenia. Julian Alps, Triglav National Park, Upper Vrata valley, 1100 m a.s.l., 46°23'46"N, 13°50'14.17"E, on lime-rich soil on a stream bank about 1.5 km

above Aljažev dom, 15 September 2023, *leg. et det.* S. Gey (priv. herb. S. Gey), *conf.* M. Lüth.

Hydrogonium amplexifolium is a pioneer moss on embankments, stream banks and forest roads and looks similar to *H. croceum* (Brid.) Jan Kučera, but has differently shaped axillary brood bodies as well as entire leaves and a slightly different ecology. The species appears to be widespread from montane to alpine regions and grows on moist, loamy or sandy, lime-rich soil, never directly on limestone rock like *H. croceum*. The moss was overlooked in Europe for a long time and only became known with the publication of Köckinger and Kučera (2007). This made it possible to revise older herbarium specimens and thereby determine the species. The species was previously listed in the genus *Barbula* Hedw., but following a revision it was placed in the genus *Hydrogonium* (Müll.Hal.) A.Jaeger (Kučera et al. 2013). Since *H. amplexifolium* has been detected in most Alpine countries so far, it was also to be expected in Slovenia. The find during the BLAM excursion in the Vrata Valley represents the first record for the country.

13. *Leucobryum albidum* (Brid. ex P.Beauv.) Lindb.

Contributor. A. Graulich

Belgium. (1) Wallonia, Ardenne, Jalhay, Statte valley, saprolignicolous on rotten stump of oak with *Campylopus flexuosus* (Hedw.) Brid., *Dicranodontium denudatum* (Brid.) E.Britton, *Hypnum cupressiforme* Hedw., *Lepidozia reptans* (L.) Dumort. and *Leucobryum glaucum* (Hedw.) Ångstr., 50°31'13"N, 5°59'10"E, 410 m a.s.l., 01 August 2023, *det.* T. Blockeel, and *conf.* J. Kučera by molecular sequencing, *leg.* A. Graulich (Herb. Graulich BE56/23); (2) Wallonia, Condroz, Trooz, Vesdre valley, humicolous in a spruce stand with *Hypnum jutlandicum* Holmen & Warncke and *Mnium hornum* Hedw., 50°32'51"N, 5°45'04"E, 280 m a.s.l., 05 August 2023, *leg.* A. Graulich (Herb. Graulich BE61/23).

The presence of *Leucobryum albidum* in western continental Europe was recently confirmed by Ottley et al. (2023). Currently, *Leucobryum albidum* is reported from a limited number of countries in western Europe, including Germany, Great Britain, Ireland and Italy (Ottley et al. 2023). Recent field observations suggest that *Leucobryum albidum* is widespread in eastern Belgium, although less common than *Leucobryum glaucum*. Further field investigations are necessary to better understand its frequency, ecology and distribution in Belgium and more broadly across Europe.

14. *Leucobryum juniperoideum* (Brid.) Müll.Hal.

Contributor. A. Graulich

Belgium. (1) Wallonia, Eupen, Helle valley, saprolignicolous on a rotten stump of oak with *Dicranodontium denudatum* (Brid.) E.Britton, 50°35'20"N, 6°6'42"E, 400 m a.s.l., 18 July 2023, *leg.* A. Graulich (Herb. Graulich BE27/23); (2) Wallonia, Stavelot, Eau Rouge valley,

saxicolous in a scree of quartzite boulders with *Campylopus flexuosus* (Hedw.) Brid., *Lepidozia reptans* (L.) Dumort and *Plagiothecium undulatum* (Hedw.) Schimp., 50°26'44"N, 5°58'74"E, 420 m a.s.l., 11 VIII 2023, leg. A. Graulich (Herb. Graulich BE63/23).

In the last century, *Leucobryum juniperoideum* was reported from several valleys in eastern Belgium (De Sloover and Lambinon 1966). However, an initial molecular study suggested that *Leucobryum juniperoideum* should be synonymised with *Leucobryum glaucum* (Hedw.) Ångstr. (Vanderpoorten et al. 2003). Consequently, *L. juniperoideum* was removed from the bryophyte checklist of Belgium (Sotiaux et al. 2007). Recently, a more extensive molecular and morphological study demonstrated that *L. juniperoideum* is indeed distinct from *L. glaucum* (Ottley et al. 2023). These recent observations of *L. juniperoideum* confirm its occurrence in eastern Belgium.

15. *Mitthyridium subluteum* (Müll.Hal.) H.Nowak

Contributor. L. T. Ellis

Sri Lanka. Matara and Sinharaja Districts, Sinharaja Forest Reserve, trail to waterfalls at eastern end of Reserve, 6°22'13"N, 80°28'46"E, 285–330 m a.s.l., on twigs, 19 May 2004, leg. Suranjan Fernando 04-624 (SING).

Hitherto, *Mitthyridium subluteum* has been regarded as a Malesian-Pacific species, with scattered occurrences stretching from Malaya and Sumatra eastward as far as Samoa (Nowak 1980). With this new record for Sri Lanka, it could now be considered to have an Indo-Pacific distribution. *Mitthyridium subluteum* possesses lanceolate leaves with a narrow chlorophyllose limb tapering from a relatively short, broad distinct hyaline basal region. Extending from the leaf base, the chlorophyllose limb has an undulating denticulate margin. Leaves in 'Suranjan Fernando 04-624' closely match those in type material of *M. subluteum* (Samoa, Graeffe s.n. isoelectotype (BM – BM000662456), except in the Sri Lankan material, the apex of the basal hyaline lamina (at its interface with the chlorophyllose lamina above) is unusually acute in many leaves. A more obtuse apex to the basal hyaline lamina is more typical in leaves of the species.

16. *Neckera villae-ricae* Besch.

Contributors. G. M. Suárez and D. J. Alvarez

Uruguay. (1) Rocha, Parque Nacional Fortaleza Santa Teresa, 34°00'7.87"S, 53°33'21.63"W, 33 m a.s.l., 10 January 2011, leg. G. Suárez 1123 (LIL); (2) Rivera, a 5 km de Valle Lunarejo, ruta 30, km 235, 31°08'24"S, 55°54'41.1"W, 187 m a.s.l., 26 February 2012, leg. G. Suárez 1228 (LIL), leg. G. Suárez 1234 (LIL).

Argentina. Entre Ríos, Departamento Uruguay, Colonia Elía: 32°41'60"S, 58°12'11.3"W, 13 February 2023, leg. D. J. Alvarez and P. G. Aceñolaza 303A (DTE, LIL, MFA); (2) 32°42'17.1"S, 58°11'49"W, 15

February 2023, leg. D. J. Alvarez and P. G. Aceñolaza 362A (DTE, LIL, MFA); (3) 32°42'17.2"S, 58°11'49.2"W, 15 Feb 2023, leg. D.J. Alvarez and P.G. Aceñolaza 368B (DTE, LIL, MFA). Corrientes, Departamento Ituzaingó, Estancia "La Mosca", (4) 27°30'46"S, 56°32'01"W, 25 February 2023, leg. D.J. Alvarez 398 (LIL).

Neckera villae-ricae is an epiphyte with a dendroid to irregularly pinnate habit (Sastre-De Jesús 1987). Plants are light green, glossy, and small to medium sized, 3–5 cm long. Stems are complanate-foliolate; in cross section with 3–5 rows of small thick-walled cells surrounding larger firm-walled cells, central strand none; axillary hairs with 1–2 short brown basal cells and 2 (–3) hyaline distal cells; paraphyllia absent; pseudoparaphyllia foliose or filamentose. Leaves are complanate, asymmetric, little altered when dry, oblong-lanceolate; costa absent or present and very short and double. It is autoicous, with perichaetial leaves oblong-subulate. Setae are short; capsules ovoid; exothecial cells quadrate to irregularly rectangular; peristome double, exostome teeth lanceolate, densely papillose, striate below; endostome densely papillose on both sides, segments narrowly perforate. Spores are papillose.

Neckera villae-ricae was previously reported from Argentina: Buenos Aires (Matteri 2003), Brazil: Paraná, Rio Grande do Sul and Sao Paulo, Paraguay: Alto Paraná, Itapúa and Paraguari (Sastre-De Jesus 1987) and Uruguay: Cerro Largo, Florida, Lavalleja, Tacuarembó and Treinta y Tres (Sastre-De Jesús 1987; Matteri 2004). Here, it is added to the bryoflora of Rocha and Rivera in Uruguay, and to Entre Ríos and Corrientes in Argentina. In Argentina *N. villa-ricae* was found growing on bark of *Vachellia caven* (Molina) Seigler & Ebinger (aromito) and *Scutia buxifolia* Reissek (coronillo). In Uruguay it was observed on small trees confined to the margins of streams, creeks and some steep, rocky areas.

17. *Neolepidozia cuneifolia* (Steph.) Fulford & J.Taylor

Contributors. A. Nadhifah, B. Adjie and J. M. Budke

Malaysia. (1) Johor, Mount Ophir, "in. decliv. Suprem.", Padang Batu versus, 1,100–1,395 m a.s.l., April 1930, leg. F. Verdoorn 78 (NY 04688986); (2) Pahang, in Forest Reserve, NW of Brinchang, Cameron Highlands, on humus in mossy forest, 2,000 m a.s.l., 14 October 1966, leg. H. Inoue s.n. (C0027878F); (3) Perak, Bukit Larut (Maxwell hill), E of Taiping town, above the tea garden, along the road between hairpin bends No. 67 and 80, relatively open submontane rainforest with high Fagaceae (*Quercus*) – Dipterocarpaceae (*Shorea*) canopy, 680–790 m a.s.l. (C0267709F); (4) Selangor, on road to Genting Highlands at ca. 6 miles mark, 1,000 m a.s.l., 2 June 1978, leg. M. G. Manuel 2443 (MO-3342349).

Solomon Islands. (1) Kolombangara, in rainforest on middle slopes of mountain on ridge N of Vanga River on NW side of island, UTMG 57M, TM, 210-220, 850-860, 7°57'S, 157°03'E, 15 August 1977, *leg.* D. H. Norris & L. Roberts 49761 (MO-3342346).

Neolepidozia cuneifolia has had a complex taxonomic history. This species was synonymised with *Neolepidozia wallichiana* (Gottsche) Fulford & J. Taylor (Inoue 1979; Grolle and Pippo 1984; Piippo 1984) because *N. wallichiana* was considered as a polymorphic species and widely distributed from the Himalayas to the Pacific regions (Piippo 1984; Engel and Merrill 2004). However, Engel and Merrill (2004) provided a detailed account distinguishing between *N. cuneifolia* and *N. wallichiana*. The distinctive features are found in the branch leaves, which in *N. cuneifolia* are asymmetrically lobed, at least one lobe with typically 4 cells at base, ligulate and subfalcate, disc up to 8 cells high, the disc cells somewhat irregular in shape and arrangement.

Neolepidozia cuneifolia has been thus far known from only a few localities in eastern Malesia and the Pacific region, including Ambon, Papua New Guinea, New Caledonia, Vanuatu, Tahiti, and Fiji (Engel and Merrill 2004; von Konrat et al. 2014). These records represent the first report of this species for Malaysia and Solomon Islands. This new report of *N. cuneifolia* is based on the collections housed in F, MO, and NY. These specimens were originally annotated as *Lepidozia wallichiana* and recognised as *N. cuneifolia* by subfalcate, asymmetrically lobed branch leaves with each lobe 2–4 (mostly 3) cells wide at base. These new records in Malaysia and Solomon Islands extend the distribution of *N. cuneifolia* and underscore the critical importance of herbaria as reservoirs of undescribed and undocumented diversity (Bebber et al. 2010).

18. *Notothylas javanica* (Sande Lac.) Gottsche

Contributors. M. F. Oliveira, G. F. Peñaloza-Bojacá, G. H. R. Mattos and A. S. Maciel-Silva

Brazil. Belo Horizonte, Minas Gerais, on soil between the paving stones in the ICEX parking lot at the Pampulha Campus of Universidade Federal de Minas Gerais, 19°52'06"S, 43°57'51"W, 809 m a.s.l., 19 February 2024, *leg.* M.F. Oliveira 604-606 (BHCB N° 217223-217225).

Notothylas javanica is a cosmopolitan hornwort commonly found in gardens and near residential areas. In Brazil, this species has been documented in the *Caatinga* (dry forest) and *Cerrado* (savanna) biomes, spanning the states of Ceará, Goiás, Mato Grosso do Sul, Maranhão, Pernambuco and Piauí (Gradstein and Costa 2003; Amélio and Peralta 2020). Most samples in Brazil occur in moderately disturbed habitats, including agricultural lands and shaded sandy areas adjacent to roadsides (Amélio and Peralta 2020). During the rainy season, we made a

noteworthy discovery of *Notothylas javanica* at the UFMG campus in Belo Horizonte, marking its inaugural observation in Minas Gerais and extending its documented range within Brazil. The collected plants are monoecious (Hasegawa 1979) and we found them displaying numerous sporophytes. Additionally, although this species is often associated with *Fissidens* spp. (Amélio and Peralta 2020), we observed them growing alongside the moss *Hyophila involuta* (Hook.) A. Jaeger at the collection site. Upon observing *N. javanica* samples in a parking lot, we hypothesised that spores from this plant might have been transported by vehicle wheels, leading to soil colonisation and establishment.

Notothylas javanica differs from other *Notothylas* species by its cleistocarpic capsule fully enclosed within the involucre and yellow spores with a vermiculate surface. Additionally, it lacks pseudoelaters and may have an absent or poorly developed columella (Hasegawa 1979). Recently, *N. javanica* was synonymised with *N. vitalii* Udar & Singh on the basis of overlapping gametophytic and sporophytic characters (Amélio and Peralta 2020).

19. *Orthotrichum rogeri* Brid.

Contributors. S. Rosadziński and M. Staniaszek-Kik

Poland. (1) Wielkopolska Region, Wielkopolskie Lakeland, Special Area of Conservation 'Ostoja koło Promna': Kapalica village, 52.456253°N, 17.294813°E, 103 m a.s.l., ATMOS grid square Cc-91, on the trunk of *Robinia pseudoacacia* L., a cluster of trees on fallow land along a dirt road, 22 May 2018, *leg.* S. Rosadziński *s.n.*, *det.* S. Rosadziński, A. Rusińska (POZG); (2) Wielkopolska Region, Wielkopolskie Lakeland, Wielkopolski National Park: in the forest section 28n near the village of Wiry, 52.312717°N, 16.842554°E, 96 m a.s.l., ATMOS grid square Db-18, on the trunk of *Acer platanoides* L. on the edge of the oak-hornbeam forest (*Galio sylvatici-Carpinetum*), 16 October 2023, *det.* S. Rosadziński, M. Staniaszek-Kik (without voucher).

Orthotrichum rogeri is an epiphytic moss found mainly in central and western Europe (Lara and Lönnell 2021), but has also been reported from isolated sites in Asia (Lara et al. 2010; Skoupá et al. 2018). Over the last dozen years there has been a growing number of reports of new localities for *O. rogeri* in Europe, for example in Czechia (Biedermann et al. 2009, Kučera et al. 2012, 2016), Germany (Lüth 2010), England (Bosanquet 2015), and Slovenia (Ellis et al. 2023). *Orthotrichum rogeri* has been regarded as extinct in Poland (Żarnowiec et al. 2004; Ellis et al. 2011), because its only locality in the Karkonosze Mountains identified in the 19th century (Limpricht 1883) was not confirmed in contemporary research (Stebel 2010). In 2009 a new site for *O. rogeri* was found in one of the urban parks in Katowice-Muchowiec (Silesian Upland, southern Poland)

(Stebel 2010; Ellis et al. 2011). Unfortunately, soon after this in 2010, the tree colonised by this moss was cut down by city maintenance services, and thus the site ceased to exist (Stebel 2012).

New sites for *Orthotrichum rogeri* were found in Wielkopolska region, western Poland. The first locality was identified in 2018 on the trunk of *Robinia pseudoacacia* growing on fallow land. The second was found in 2023 within the boundaries of the Wielkopolski National Park, where *O. rogeri* grew on the bark of a young *Acer platanoides* on the edge of a degraded oak-hornbeam forest. In both cases the identified tufts were scarce.

20. *Orthotrichum scanicum* Grönvall

Contributors. M. Boiko and N. Zagorodniuk

Ukraine. Steppe Zone, Kherson oblast', Beryslav district, National Natural Park "Nyzhnodniprovskiy», Kozatskyi Island in the floodplain of the Dnipro River, 46.773670N, 33.280286E. Deciduous forest, thickets of old *Populus* trees, on the bark of the trunk *Populus nigra* L., 25 July 2019, leg. V. Klymenko s.n., det. N. Zagorodniuk (KHER).

This is the first finding of *Orthotrichum scanicum* in the Steppe zone of the Ukraine. In the Ukraine, the species was previously known from the deciduous forests of Precarpathia in the Chernivtsi region (Mel'nychuk 1965; Boiko 2008). *Orthotrichum scanicum* is a dioecious nemoral epiphytic moss, which grows in small, up to 0.8 cm high cushion turfs, or among vegetation with other species such as *Lewinskya affinis* (Brid.) F.Lara, Garilleti & Goffinet, *L. speciosa* (Nees) F.Lara, Garilleti & Goffinet, and *Amblystegium serpens* (Hedw.) Schimp. The species was considered a continental European endemic, but has recently been found in Greece, Morocco, Great Britain, Turkey, Georgia, Kazakhstan, China, etc. (Lara et al. 2009; Blockeel 2012; Skoupa et al. 2018; Wang and Jia 2020; Plášek et al. 2021).

21. *Polytrichastrum emodi* G.L.Sm.

Contributors. A. Verma, V. Sahu, K. K. Rawat and A. K. Asthana

India. Jammu and Kashmir: Srinagar, Khilanmarg, Apharwat mountain 34°01'53"N, 74°20'49"E, 3600 m a.s.l., on soil, 04 August 2021, leg. K.K. Rawat and R.R. Paul, 325867 (LWG). Arunachal Pradesh: Tawang, near P. T. Tso Lake 27°38'14.3"N, 91°51'35.6"E, 3982 m a.s.l., on soil, 15 June 2015, leg. K. K. Rawat 300180, 300186, 300200 (LWG).

Historically, five species of *Polytrichastrum* G.L.Sm., viz., *P. papillatum* G.L.Sm., *P. emodi* G.L.Sm., *P. alpinum* (Hedw.) G.L.Sm., *P. xanthopilum* (Wilson ex Mitt.) G.L.Sm. and *P. formosum* (Hedw.) G.L.Sm. have been recognised in India (Smith 1974; Smith 1976; Chopra and Kumar 1981; Lal 2005; Asthana et al. 2012). However, based on combined molecular and

morphological evidence, Bell and Hyvönen (2010) treated *Polytrichastrum xanthopilum* and *P. formosum* under *Polytrichum* (as *Polytrichum xanthopilum* Wilson ex Mitt. and *P. formosum* Hedw.). Plants of *Polytrichastrum emodi* have been identified from the Eastern Himalaya and from Jammu and Kashmir in the Western Himalaya, and are reported here for the first time for these regions. The plants from Jammu and Kashmir are dark brown with erect shoots growing in dense tufts. Their leaves are appressed when dry, 3–4.5 mm long, with acute apices and margins serrated above the sheathing base. The sheathing base is 0.8–1.1 mm wide, the lamellae covering the ventral surface of the leaf except at the margins, up to 7 cells high with apical cells pyriform. Sporophyte not seen. *Polytrichastrum emodi* is close to *P. papillatum*, but in *P. emodii* the end cells of lamellae are not papillose.

22. *Racomitrium nivale* (Köckinger, Bedn.-Ochrya & Ochrya) Köckinger

Contributor. T. Kiebacher

Italy. South Tyrol, Brenner, Pflersch, at the summit of Mt. Schneespitze, 46.97424°N, 11.25665°E, 3163 m a.s.l., rocks at summit area, siliceous rock, acidic, 15 August 2021, leg. T. Kiebacher 3552 (priv. herb. T. Kiebacher).

Racomitrium nivale currently represents one of the few bryophytes endemic to the European Alps. The species was described in 2007 and for 10 years the two localities in the Eastern Alps mentioned in the description were the only known occurrences (Köckinger et al. 2007). Then, the independent discovery of the species at two sites in Switzerland about 400 km W of the type locality (Kiebacher et al. 2019), and two subsequent records in Switzerland (Kiebacher unpublished), indicated that the species is more widespread in the Alps and maybe not uncommon in suitable habitats. The species colonises acidic rock habitats at high elevations (around 3000 m a.s.l.). However, these habitats are mostly not easily accessible and often not very attractive for floristic surveys because of low species diversity, and consequently are not often examined by bryologists. At the Italian locality presented here the species could be found relatively easily, but only a few plants were observed among cushions of *Grimmia incurva* Schwägr., which was the most abundant species at the summit. Observations in Switzerland and Italy together with Köckinger's from the Eastern Alps indicate that the species specifically colonises sites characterised by relatively prolonged snow cover. It is suggested that *Racomitrium nivale* is among the species that are particularly threatened by climate warming, because of decreasing snow cover in the Alps (Schöner et al. 2019; Matiu et al. 2021) and because it occurs in the nival zone, where opportunities to migrate upwards are limited.

23. *Riccia crozalsii* Levier

Contributors. B. Papp, R. Natcheva and G. Kunev

Bulgaria: (1) Eastern Rhodopi Mts: E of village Kazak, in dry serpentine grassland, 41.412055°N, 25.884361°E, 405 m a.s.l., 15 June 2019, *leg.* & *det.* B. Papp (BP 54024/H); (2) Eastern Rhodopi Mts: near village Sentse, in serpentine grassland at a rivulet, 41.460083°N, 25.469417°E, 535 m a.s.l., 16 June 2019, *leg.* & *det.* B. Papp (BP 54025/H); (3) Eastern Rhodopi Mts: along the road between villages Dobromirski and Dedets, in dry grassland on periodically wet open sandy soil, on sandstone bedrock, with sporophytes, 41.381901°N, 25.227407°E, 458 m a.s.l., 26 October 2023 *leg.* G. Kunev, R. Natcheva, *det.* R. Natcheva (SOM 11467-B); (4) Eastern Rhodopi Mts: at the side of the road between villages Mogilyane and Kayaloba, on soil in seasonally wet depression along temporary stream, sandstone bedrock, with sporophytes, 41.367240°N, 25.221644°E, 355 m a.s.l., 16 October 2023 *leg.* G. Kunev, *det.* G. Kunev, R. Natcheva (SOM 11514-B); (5) Struma River valley: E of village Starchevo, near the crossroad to loc. Rupite, on seasonally wet sandy soil at the side of a canal in dry grassland, on metamorphosed basic and ultrabasic bedrock, growing together with *Bryum alpinum* With., sterile, 41.471648°N, 23.253035°E, 123 m a.s.l., 4 October 2022, *leg.* G. Kunev, R. Natcheva, *det.* R. Natcheva (SOM 11226-B).

Riccia crozalsii is a Mediterranean-Atlantic element (Hill and Preston 1998) with wide distribution in the Atlantic coast, the Mediterranean part of Europe, and sporadically in Central Europe. It is red listed in many European countries (Hodgetts and Lockhart 2020): The Netherlands (RE), Spain and Hungary (CR), Ireland, Italy, and Luxemburg (EN), Switzerland (VU), Great Britain and Germany (DD). The species was known from most countries of Southeast Europe, with the exception of Bulgaria, Serbia and Romania (Papp et al. 2019; Hodgetts and Lockhart 2020). Due to its seasonal appearance and short life cycle, it is likely overlooked and under-collected.

The species was found in dry grasslands in the southern part of Bulgaria, developed under pronounced Mediterranean climatic influence. Such grasslands are usually managed by grazing. The composition of vascular plants is diverse, including mostly ephemeral annuals, and is typical for EUNIS habitat R1D31 *Helleno-Balkan short grass and therophyte communities* (EEA 2021). These sparsely vegetated grasslands develop over open serpentine or sandy acidic substrates. In the rainy season, diverse bryophyte assemblages develop, consisting of several other thalloid sub-Mediterranean liverworts (Düll 1983; Hill and Preston 1998), like *Oxymitra incrassata* (Brot.) Sérgio and Sim-Sim, *Riccia ciliata* Hoffm., *R. ciliifera* Link ex Lindenb., *R. michelii* Raddi, and *R. nigrella* DC.). In all localities, *R. crozalsii* appeared in

clean colonies formed by loose rosettes or scattered thalli. It was easily distinguishable by having small (4–5 mm long, 0.5–1 mm wide), glaucous thalli with cilia at the margin in the upper part.

24. *Scleropodium touretii* (Brid.) L.F.Koch

Contributors. J. Csiky and A. Sipos

Hungary. (1) Baranya County, Mecsek Mts [9974.2] (Central European Mapping Scheme). On the outskirts of Pécs, in the south-facing Süle-völgy (Jakab-hegy), along a tourist path, in an oak-hornbeam forest, 235–290 m a.s.l., 46.078196°N, 18.164549°E, 16 December 2023., *leg.* J. Csiky, *det.* J. Csiky (JPU); 46.07874°N, 18.1645°E, 21 December 2023., *leg.*; (2) J. Csiky, A. Sipos, *det.* A. Sipos, J. Csiky (JPU). Associated bryophytes: *Atrichum undulatum* (Hedw.) P.Beauv., *Brachythecium rutabulum* (Hedw.) Schimp., *B. salebrosum* (F.Weber & D.Mohr) Schimp., *Brachytheciastrum velutinum* (Hedw.) Ignatov & Huttunen, *Calliergonella cuspidata* (Hedw.) Loeske, *Cirriphyllum crassinervium* (Wilson) Loeske & M.Fleisch., *Dicranella heteromalla* (Hedw.) Schimp., *Fissidens bryoides* Hedw., *Hypnum cupressiforme* Hedw., *Metzgeria furcata* (L.) Corda, *Microeurhynchium pumilum* (Wilson) Ignatov & Vanderp., *Oxyrrhynchium hians* (Hedw.) Loeske, *Plagiothecium cavifolium* (Brid.) Z.Iwats., *Pohlia melanodon* (Brid.) A.J.Shaw, *Ptychostomum capillare* (Hedw.) Holyoak & N.Pedersen, *P. moravicum* (Podp.) Ros & Mazimpaka.

Scleropodium touretii is the more common of the two Atlantic-Mediterranean species of *Scleropodium* found in Europe (Hodgetts and Lockhart 2020). Although it is absent from most neighbouring countries of Hungary, such as Austria, Slovakia, Ukraine and Slovenia, it is present in most Balkan countries, including Romania, Serbia and Croatia. While classified as a least concern (LC) species in Serbia (Sabovljevic et al. 2004), it is considered an endangered (EN) taxon in Romania (Ştefănuţ and Goia 2012). In Europe, this species is commonly found in ± open, rocky habitats along roadsides and is tolerant of trampling (Atherton et al. 2010, van Zuijlen et al. 2023). In Hungary, this species was found as new to the country along a tourist path in a shady, mesic, sub-Mediterranean oak forest (with *Asplenium adinatum-nigrum* L., *Helleborus odoratus* Willd., *Luzula forsteri* DC., *Ruscus aculeatus* L., *Tilia tomentosa* Moench), 1–20 metres from a seasonal stream. It is located 1–10 metres above the stream bed and present in five larger and a few smaller isolated patches totalling 7 m² within 600 metres. It forms mat-like colonies on mostly bare, clayey, rocky surfaces, where litter does not accumulate. The most commonly associated species in the valley is *Brachythecium velutinum*. This site is part of the European Natura 2000 network. The southern side of the Jakab-hegy is the only known location in Hungary for other

threatened bryophytes, such as *Campylopus fragilis* (Brid.) Bruch & Schimp. and *Grimmia montana* Bruch & Schimp. (Ellis et al. 2015).

25. *Serpoleskea confervoides* (Brid.) Schimp.

Contributors. R. D. Cedrés-Perdomo, C. Polaino-Martín and R. Gabriel

Portugal. Macaronesia, Azores Islands: (1) Terceira, Praia da Vitória, Porto Martins, Gruta da Madre de Deus, 60 m a.s.l., 38°40'54.8"N, 27°4'5.6"W, 15 April 2019, leg. C. Polaino-Martín s.n., det. R.D. Cedrés-Perdomo, R. Gabriel; (2) Terceira, Praia da Vitória, Biscoitos, Gruta do Chocolate, 250 m a.s.l., 38°46'50.4"N, 27°15'7.6"W, 25 March 2019, leg. C. Polaino-Martín s.n., det. R.D. Cedrés-Perdomo, R. Gabriel; (3) Terceira, Praia da Vitória, Biscoitos, Gruta Branca Opala, 255 m a.s.l., 38°46'45.8"N, 27°15'6.1"W, 17 January 2019, leg. C. Polaino-Martín s.n., det. R.D. Cedrés-Perdomo, R. Gabriel; (4) Terceira, Angra do Heroísmo, Porto Judeu, Algar do Carvão, 583 m a.s.l., 38°43'39.2"N, 27°12'54.8"W, 18 March 2019, leg. C. Polaino-Martín s.n., det. R.D. Cedrés-Perdomo, R. Gabriel.

Serpoleskea (Limpr.) Loeske is a monotypic genus in the family Amblystegiaceae. The Amblystegiaceae comprises 20 to 30 genera worldwide, with the number of species estimated at 100 to 150 (Hedenäs and Vanderpoorten 2007). *Serpoleskea confervoides* is widely distributed in Europe and North America (GBIF 2023), growing on moist, shaded and calcareous rocks in montane areas (Casas et al. 2020). This species was first reported for the Azores Islands in 1989 by Juana González-Mancebo (González-Mancebo et al. 1991) on São Miguel Island (Gruta do Pico da Cruz) and Pico Island (Furnas do Soldão and Furna do Henrique Maciel). It has also been found growing epiphytically in Pico Island's forests (Gabriel et al. 2024). In this note, *S. confervoides* is cited for the first time for Terceira Island, occurring within the cave system (Cedrés-Perdomo et al. 2024). The moss was found in four different caves ranging from 60 to 580 m. a.s.l. on Terceira Island: Gruta da Madre de Deus, Gruta Branca Opala, Gruta Chocolate and Algar do Carvão. Some of the most frequently associated species were *Jubula hutchinsiae* (Hook.) Dumort., *Cyclodictyon laetevirens* (Hook. & Taylor) Mitt., *Tetrastichium fontanum* (Mitt.) Cardot and *Heterocladium flaccidum* (Schimp.) A.J.E.Sm. With this new record, *S. confervoides* has now been found, with a highly restricted distribution, on three of the nine islands in the Azores. Caves represent a refuge for this species, harbouring the largest populations in the archipelago.

26. *Syrrhopodon albovaginatus* Schwägr.

Contributor. L. T. Ellis

Sri Lanka. Matara and Sinharaja Districts, Sinharaja Forest Reserve, trail to waterfalls at eastern end of Reserve, 6°22'13"N, 80°28'46"E, 285–330 m a.s.l., on

decayed log, 19 May 2004, leg. Suranjan Fernando 04-622 (SING).

Syrrhopodon albovaginatus has a widespread Indo-Pacific distribution (Ellis 2016) but is new to Sri Lanka, and this constitutes its first verifiable record west of the Andaman Islands. Its linear leaves are unique within *Syrrhopodon* in having oblique to transverse rows of acute, distally leaning teeth at short intervals along the chlorophyllose lamina.

27. *Tortella bambergeri* (Schimp.) Broth.

Contributor. A. Graulich

Belgium, Wallonia: (1) Namur, Marche-les-Dames, on exposed dolomitic spur with *Homalothecium sericeum* (Hedw.) Schimp., 50°28'47"N, 4°56'19"E, 150 m a.s.l., 13 February 2024, leg. A. Graulich s.n., conf. H. Köckinger, (Herb. Graulich BE29/24); (2) Namur, Marche-les-Dames, on dolomitic pebbles in a wooded slope with *Ctenidium molluscum* (Hedw.) Mitt., *Eurhynchium striatum* (Hedw.) Schimp. and *Fissidens dubius* P.Beauv., 50°28'48"N, 4°56'15"E, 110 m a.s.l., 27 February 2024, leg. A. Graulich s.n. (Herb. Graulich BE55/24); (3) Huy, Solières valley, on calcareous pebbles in a wooded slope with *Neckera complanata* (Hedw.) Huebener, *Ctenidium molluscum*, *Eurhynchium striatum*, *Neckera crispa* Hedw. and *Fissidens dubius*, 50°30'36"N, 5°11'43"E, 130 m a.s.l., 23 February 2024, leg. A. Graulich s.n. (Herb. Graulich BE45/24).

In recent decades, the name *Tortella bambergeri* has been misapplied to designate both *Tortella fasciculata* (Culm.) Culm. and *Tortella pseudofragilis* (Thér.) Köckinger & Hedenäs (Köckinger and Hedenäs, 2017). According to a recent morphological and molecular study, *Tortella bambergeri* belongs to the *Tortella tortuosa* complex. In this complex, *Tortella bambergeri* is characterised by a specific stem structure. In addition to the presence of a central strand, the other stem structures are indistinctly differentiated (Köckinger and Hedenäs 2023). In Belgium, *Tortella bambergeri* has been found growing on dolomitic and limestone pebbles in wooded slopes as well as on exposed dolomitic rocks. The species is likely widespread in the calcareous areas of Wallonia. However, further field investigations are needed to determine its frequency in Belgium.

28. *Tortella commutata* Köckinger & Hedenäs

Contributor. A. Graulich

Belgium, Wallonia, Namur, Rochers de Néviau, on exposed dolomitic spur with *Orthotrichum anomalum* Hedw. and *Tortella nitida* (Lindb.) Broth., 50°25'38"N, 4°52'22"E, 130 m a.s.l., 02 March 2024, leg. A. Graulich s.n. (Herb. Graulich BE65/24).

In the recent morphological and molecular study of Köckinger and Hedenäs (2023), the *Tortella tortuosa* complex was split into eight species. Belonging to this complex, *Tortella commutata* Köckinger & Hedenäs differs from the similar *T. tortuosa* s.str. in

having smaller leaves, a shortly-pointed leaf apex, shorter mucro, a brownish stem with thin-walled cylinder cells and the ability to develop a central strand. *Tortella commutata* is described as a variable species with a wide ecological amplitude. Nevertheless, in central Europe, it appears to prefer sunny and dry calcareous locations (Köckinger and Hedenäs 2023). This thermophilous specimen exhibits the characteristics of *Tortella commutata* var. *valida* Köckinger & Hedenäs: large laminal cells with coarse papillae and the presence of a central strand only in thick stems (Köckinger and Hedenäs 2023).

29. *Tortella tortuosa* (Hedw.) Limpr.

Contributor. A. Graulich

Belgium. Wallonia: (1) Namur, Marche-les-Dames, on dolomitic outcrop in a wooded slope with *Ctenidium molluscum* (Hedw.) Mitt., 50°28'47"N, 4°56'17"E, 120 m a.s.l., 27 February 2024, leg. A. Graulich s.n. (Herb. Graulich BE59/24); (2) Huy, Solières valley, on calcareous outcrop in a wooded slope with *Brachythecium glareosum* (Spruce) Schimp. and *Fissidens dubius* P.Beauv., 50°30'36"N, 5°11'43"E, 130 m a.s.l., 24 February 2024, leg. A. Graulich s.n. (Herb. Graulich BE47/24).

A recent integrated morphological and molecular study (Köckinger and Hedenäs 2023) demonstrated that the *Tortella tortuosa* complex comprises eight species. Among these, *T. tortuosa* s. str. is still considered to be the most common species in Northern and Western Europe, as well as in the lowlands of central Europe (Köckinger and Hedenäs 2023). Although further field investigations are needed to confirm its ubiquity in calcareous areas of Belgium, *Tortella tortuosa* is likely to be widespread and common in southern Belgium.

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