



New national and regional bryophyte records, 69

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1. *Anastrepta orcadensis* (Hook.) Schiffn.

Contributors. E. Fuertes and G. Oliván

Andorra. Pirineos Occidentales: Val d'Juclar, Estany de Juclar, plataforma de trampales y turberas, alt. 2000–2100 m a.s.l.. UTM 31CH80, 17 October 2001, *leg.* E. Fuertes & G. Oliván *s.n.* (MA, MACB).

Plants brown or reddish-brown, stems rigid, hardly branched, 2–5(–10) cm long; leaves erecto-patent, obliquely inserted, ovate-cordate, concave at base, usually as wide as or wider than long. Dioecious. Collected near several glacial lakes, Estany de Juclar, in the subalpine-alpine belt, forming lax tufts or as scattered shoots among other bryophytes such as *Calliargonella cuspidata* (Hedw.) Loeske, *Brachythecium glaciale* Schimp., *Bryum schleicheri* Schwägr. and *Diobelonella palustris* (Dicks.) Ochyra. *Anastrepta orcadensis* was growing on

wet and oligotrophic soils or turfy banks, in woodlands, ravines, on moist acid humus or siliceous rocks. It has a circumboreal distribution, which includes SW China, the Himalayas, Taiwan, Japan, north-west North America and Europe (Great Britain, Ireland, Scandinavia, Faroes, French Pyrenees, North Italy) (Smith 1990), Spain (Oliván and Fuertes in Blockeel, Oliván, et al. 2000) and Andorra (this report).

2. *Bazzania pearsonii* Steph.

Contributors. K. K. Rawat and R. R. Paul

India. Uttarakhand, Rudraprayag, Tungnath, 30°29'28.17"N, 79°13'02.44"E, alt. 3390 m a.s.l., on soil, 18 June 2019, *leg.* K. K. Rawat *s.n.* (LWG 321616D).

Bazzania pearsonii Steph. is reported for the first time from Uttarakhand in the Western Himalayas. It

was previously reported from the Eastern Himalaya (Arunachal Pradesh, Meghalaya, Sikkim and West Bengal) and Western Ghats (Kerala) of India (Singh 1996; Pócs et al. 2007; Mizutani 1967; Sharma and Srivastava 1993, Singh et al. 2016). Plants in the collection are described as follows: slender, brown, 12–25 mm long, simple to furcately branched, branches short, slightly incurved at the apex, flagelliform branches postical intercalary. Leaves contiguous to imbricate, obliquely inserted, asymmetrical, triangular, 0.80–1.10 × 0.64–0.72 mm, longer than wide, leaf apex with 2–3(–4) unequal lobes, lobes obtuse to acute, margin entire; marginal cells 12–20 × 12–20 µm, median cells 20–28 × 20–24 µm, basal cells 24–32 × 20–28 µm; cells slightly thick-walled with large trigones. Underleaves distinct, 0.3–0.48 × 0.40–0.48 mm, apex slightly incurved with 2–3 (4) unequal lobes, cells slightly thick-walled with large trigones. Reproductive structures not observed.

3. *Blindiadelphus campylopodus* (Kindb.) Fedosov & Ignatov

Contributor. M. Philippe

France. (1) Provence-Alpes-Côte d'Azur, Alpes-Maritimes département, Saint-Etienne-de-Tinée, ubac de Blainon, 44°13'11.98"N 6°55'54.51"E, alt. 1620 m a.s.l., Triassic cargneule stones on the ground, in a pine (*Pinus sylvestris* L.) forest, 17 July 2021, *leg.* M. Philippe *s.n.* (LY0780638), *vid.* Vincent Hugonnot; (2) Auvergne-Rhône-Alpes, Savoie département, Modane, Polset, 45°13'38.95"N 6°39'33.22"E, alt. 2000m a.s.l., Triassic cargneule stones on the ground, in a mixed forest with *Picea abies* (L.) H.Karst., *Pinus cembra* L., *Abies alba* Mill., 16 August 2021, *leg.* M. Philippe *s.n.* (LY0780637), *rev.* Jeannette Chavoutier.

This mostly subarctic-boreal-montane species was first mentioned as present in France by Gos and Ochyra (1994), based on the revision of two collections. The first, made by Culmann on the 19th July 1929 near Chamonix (Haute-Savoie), was initially attributed to *Seligeria erecta* H.Philib. (Culmann 1930). The second, made by Hébrard on the 12th July 1980 in Haute-Tinée (Alpes-Maritimes), was first identified as *Seligeria recurvata* (Hedw.) Bruch & Schimp. (Hébrard 2005). Despite targeted searching (V. Hugonnot, pers. com.) *Blindiadelphus campylopodus* had not been rediscovered in the French Alps. Here, the first observation was made near Hébrard's locality, while the second represents the first record of the species for the department of Savoie. In both locations, the species formed low monospecific turfs, growing on stones half-embedded in soil, in the light shade of a thin coniferous forest. The stone is a moisture retaining porous cargneule (a yellow-brown partly dedolomitised breccia). Carbonate stones on the forest floor seem to be a typical substrate for the species (Blockeel, 2014).

4. *Brachythecium tauriscorum* Molendo

Contributors. A. Hodgson and T. Kiebacher

France. (1) Hautes-Alpes, Queyras, Molines-en-Queyras, ca 1 km SW of Col Vieux, 44.692°N, 6.984°E, alt. ca 2700 m a.s.l., on soil in schist scree, 2 August 2014, *leg.* A. Hodgson 06/296 (priv. herb. A. Hodgson), *det.* T. Kiebacher; (2) Hautes-Alpes, Queyras, Saint-Véran, by Lac Blanchet Inferieur, 44.663°N, 6.948°E, alt. ca 2550 m a.s.l., on calcareous schist outcrop above alpine lake, 25 July 2017, *leg.* A. Hodgson 09/ 043 & 044 (priv. herb. A. Hodgson); (3) Hautes-Alpes, Queyras, Abriès, N end of Crête de Gilly, 44.7945°N 6.9625°E, soil bank on E side of ridge, alt. ca 2350 m a.s.l., 28 July 2017, *leg.* A. Hodgson 09/103 (priv. herb. A. Hodgson); (4) Hautes-Alpes, Queyras, St. Véran, ca 400 m SSW of Refuge de la Blanche, 44.66333°N, 6.93815°E, alt. 2569 m a.s.l., at base of large N-facing rock outcrops, greenschist, 14 July 2021, *leg.* T. Kiebacher 2927 (priv. herb. T. Kiebacher).

Brachythecium tauriscorum was recently established as the correct name for a widespread arctic-alpine taxon, previously referred to as *B. coruscum* I.Hagen and *B. groenlandicum* (C.E.O.Jensen) Schljakov (Hedenäs 2017). It was often interpreted as an alpine form of *B. glareosum* (Bruch ex Spruce) Schimp. or *B. albicans* (Hedw.) Schimp. and Grims (1999) considered it to be identical to *B. glareosum* var. *alpinum* (De Not.) Limpr. Having studied the types of both *B. tauriscorum* and *B. glareosum* var. *alpinum*, Meylan (1940) concluded that they clearly represent different taxa. Our determinations are based on his work. However, in view of the high variability of morphs that can be observed at high elevations in the Alps, a taxonomic revision is desirable. Molendo (1866) described *B. tauriscorum* from the Austrian Alps and several occurrences are reported from there as well as from the French, Italian and Swiss Alps (Hedenäs 2017; Legland and Garraud 2018; Chavoutier 2019; Swissbryophytes 2004–2021). Since only Austria and Switzerland are mentioned among these countries in the current Checklist and Country Status of European Bryophytes (Hodgetts and Lockhart 2020), it is worth reminding bryologists of the occurrence of *B. tauriscorum* in Italy and France. Here, the species is added to the bryoflora of the Queyras region, where *B. tauriscorum* occurs in moist, well-drained sites such as the bases of schist cliffs, cool soil banks and sheltered schist outcrops, all in areas where snow lies until late spring. The species occurs in both slightly acidic and slightly calcareous habitats.

5. *Bucklandiella crispipila* (Taylor) Bedn.-Ochyra & Ochyra

Contributor. R. Ochyra

Papua New Guinea. (1) Western Highlands Province, north slopes of Mount Giluwe, above "cavern",

6°01'S, 143°54'E, alt. ca 3600–3700 m a.s.l., on exposed, non-calcareous stone in alpine tussock, 25 October 1968, *leg.* B. O. van Zanten 68.3321-F (KRAM B–256609), No. 68.3321-N (KRAM B–256610), 68.3321-P (KRAM B–256611); (2) Southern Highlands Province, below East summit, 6°03'S, 143°54'E, alt. ca 4000 m a.s.l., in exposed swampy place among alpine tussock, 26 October 1968, *leg.* B. O. van Zanten 68.3368-F (KRAM B–256614); (3) same province, below North summit, 6°02'S, 143°52'E, alt. ca 4100 m a.s.l., on shady base of non-calcareous rocks, 26 October 1968, *leg.* B. O. van Zanten 68.3358 (EGR, GRO, KRAM B–256612), No. 68.3372-E (GRO, KRAM B–256615), 68.3411-R (GRO, KRAM B–256616).

Bucklandiella crispipila, the largest segregate of the broadly conceived genus *Racomitrium* Brid. (Bednarek-Ochyra et al. 2014; Sawicki et al. 2015), has only once been reported from Papua New Guinea from Milne Bay Province (Blockeel et al. 2007). Herein, three additional sites on Mt. Giluwe are reported, situated on the border of the Southern and Western Highlands Provinces of the country. For a long time *B. crispipila* was considered to be a neotropical endemic, ranging from Mexico to SE Brazil (Frisvoll 1988; Bednarek-Ochyra et al. 1999). However, subsequent discovery of this species in Africa (Ochyra 1993; Ellis, Ah-Peng, et al. 2017; Ellis, Afonina, et al. 2017) changed its phytogeographical status to an amphiatlantic disjunct (Frahm 1982; Ochyra et al. 1992; Ellis et al. 2014). It shares this type of range with other congeners, including *B. lamprocarpa* (Müll.Hal.) Bedn.-Ochyra & Ochyra, *B. striatipila* (Cardot) Bedn.-Ochyra & Ochyra, *B. orhotrichacea* (Müll.Hal.) Bedn.-Ochyra & Ochyra, *B. membranacea* (Mitt.) Bedn.-Ochyra & Ochyra, *B. pachydictyon* (Cardot) Bedn.-Ochyra & Ochyra and *B. heterostichoides* (Cardot) Bedn.-Ochyra & Ochyra (Bednarek-Ochyra et al. 1996; Bednarek-Ochyra and Ochyra 1998, 2010, 2012a, 2012b, 2013; Blockeel, Bastos, et al. 2009; Ellis, Bednarek-Ochyra, et al. 2012; Ellis et al. 2013; Ellis, Aleffi, et al. 2016; Ochyra and van Rooy 2013; Bednarek-Ochyra 2014; Ochyra et al. 2015). Ultimately, following its discovery in Taiwan (Ellis et al. 2019) and Papua New Guinea, *B. crispipila* should be treated as a pantropical oreophyte.

6. *Dialytrichia saxicola* (Lamy) M.J.Cano

Contributors. C. Sérgio and R. D. Porley

Italy. Salerno, Amalfi Coast, Ravello, pr. de Villa Cimbrone, alt. 350 m a.s.l., on *Tilia* sp., 40°38'23.97"N 14°36'23.91"E, 26 March 2002, *leg.* C. Sérgio 12384 (LISU 205528).

While revising samples of *Dialytrichia saxicola* in LISU in preparation for IUCN *Threatened Species of Europe* assessments (Sérgio and Porley 2019) we found a collection from Italy that matched the typical

expression of this species. The population trend of this species was suspected to be increasing, favoured perhaps by eutrophication, and it was predicted that new areas of occurrence might be found (Sérgio and Porley 2019). It was therefore assessed as Least Concern, and considered native in Belgium, mainland France, Germany, The Netherlands, mainland Portugal, Madeira, mainland Spain and Great Britain (Hodgetts and Lockhart 2020).

Dialytrichia saxicola was first described from France as *Dialytrichia mucronata* (Brid.) Broth. var. *fragilifolia* Bizot & Cl.Roux, and subsequently raised to species rank as *Dialytrichia fragilifolia* (Bizot & Cl.Roux) F.Lara. It was later regarded as a variety of *Dialytrichia mucronata*, but taxonomic doubts remained pending further studies. More recently the name *Barbula saxicola* Lamy was shown to apply to this species and the transfer of *Barbula saxicola* to *Dialytrichia* necessitated the new combination *D. saxicola* (Lamy) M.J.Cano, since *saxicola* is the oldest available epithet applicable to *D. fragilifolia* (Cano 2007). This endemic European species is a Mediterranean-Atlantic moss growing in areas with a warm temperate climate, mainly as an epiphyte but also on rocks and artificial substrates such as concrete. This is the first report of *Dialytrichia saxicola* from Italy (see Aleffi et al. 2020).

7. *Donnellia commutata* (Müll.Hal.) W.R.Buck

Contributor. A. Schäfer-Verwimp

Costa Rica. Prov. de San José, Meseta Central, San José, Stadtpark Sabana, [ca 9°56'13"N, 84°06'14"W], alt. 1100 m a.s.l., epiphytisch an *Casuarina*, 29 December 1999, *leg.* Schäfer-Verwimp & Holz SV/H-0314/A, *det.* A. Schäfer-Verwimp (INB, JE).

Venezuela. Capital District, Caracas, Los Guayabitos, alt. 1340 m a.s.l., epiphytic in private garden, sparse, 25 January 1990, *leg./det.* Schäfer-Verwimp & Verwimp 12395/C (JE).

Donnellia commutata is a small species best recognised by the following combination of characters: (1) whitish peristome, (2) short setae (1.5–3.5 mm long), (3) basal row of not or only scarcely inflated alar cells and (4) plane leaf margins above, occasionally somewhat recurved at the base only. The differentiating characters of the similar species *Sematophyllum subpinnatum* (Brid.) E.Britton, *Meiothecium boryanum* (Müll.Hal.) Mitt., *Schraderella pungens* Müll.Hal. and *Schraderella standleyi* B.H.Allen in Central America are discussed in detail by Allen (2018).

Donnellia commutata is a widespread tropical American species ranging from Florida and Mexico to south-east and south Brazil. In Central America it is known from Belize, El Salvador, Honduras and Panama (Allen 2018), in the Greater Antilles from Cuba, Jamaica, Hispaniola (Haiti and Dominican Republic) and Puerto Rico (Buck 1998). In South America it is known from

Colombia, Bolivia, French Guiana and Brazil (distribution map in Buck 1994) but not thus far from Venezuela (Churchill et al. 2000; O'Shea 2010) or Costa Rica (Allen 2018). *Donnellia* Austin is a new generic record for Venezuela and the two finds of *D. commutata* close the gaps in its distributional range in central and northern South America. Its altitudinal range is from near sea level in Florida, Bolivia, French Guiana and Brazil to 1500 m in Bolivia and 2000 m in Colombia and Central America (Churchill et al. 2000, 2009; Allen 2018). In the West Indies it grows mostly at or below 1000 m (Buck 1998).

8. *Drepanocladus capillifolius* (Warnst.) Warnst.

Contributor. R. Ochyra

Australia. Tasmania, "Phytologic Museum of Melbourne. *Hypnum fontinaloides* Hpe Kings Island [actually King Island is located between the Australian mainland and Tasmania in the Bass Strait at 39°52'S, 143°59'E and it is considered botanically and administratively to be a part of Tasmania], A. Neate. Baron Ferd. von Mueller PH & M.D." (BM-Hampe, MEL 1036836).

Species of *Drepanocladus* (Müll.Hal.) G.Roth with excurrent costae have usually been recognised as *D. longifolius* (Mitt.) Paris in the Southern Hemisphere (Ochyra 1989; Ochyra and Matteri 2001). This species is primarily distributed in southern South America from where it deeply penetrates into the tropics in the northern Andes and SE Brazil (Hedenäs 2003), and to the northern maritime Antarctic (Ochyra, Bednarek-Ochyra et al. 2008; Li et al. 2009). In addition, it is rare and scattered on some subantarctic islands and extends to SE Australia (Ochyra et al. 2002; Ochyra, Lewis Smith et al. 2008). However, molecular studies have demonstrated that the Australian plants actually belong to the Holarctic *D. capillifolius* (Warnst.) Warnst. (Sařuga et al. 2018). As a result of this taxonomic conclusion, the phytogeographical status of *D. longifolius* changed from that of a pan-south-cool-temperate species to an amphiatlantic south-cool-temperate one, the latter distribution pattern being typical of many bryophyte species (e.g. Ochyra and Vána 1989; Ochyra and Lewis Smith 1998; Ochyra and Zander 2002; Blockeel, Bednarek-Ochyra, et al. 2009; Ochyra and Bednarek-Ochyra 2013). In contrast, *D. capillifolius* is a bipolar species, having a panholarctic range in the north, while in the south it is known from mainland Australia including the states of New South Wales, Victoria, South Australia and the Australian Capital Territory. Herein, the species is recorded from King Island which belongs to the state of Tasmania.

9. *Encalypta affinis* R.Hedw.

Contributor. R. Ochyra

Bulgaria. Pirin Mountains, Mt. Vihren, alt. 2914 m a.s.l., 41°46'04"N, 23°24'03"E, in rock crevices near the summit, 19 August 1960, *leg.* M. Kuc *s.n.*, *det.* Diana Horton, October 1999 (KRAM B–018445).

Encalypta affinis is a panholarctic arctic-alpine species having a strongly dissected geographical range, primarily in the northern regions of Eurasia and western North America. In Europe, it is widely distributed but scattered in Svalbard and Fennoscandia, but absent from Iceland and the British Isles, while in the continental zone it occurs in all mountain ranges from the Pyrenees in the west, through the Alps and Carpathians, to the Caucasus and Urals in the east. Likewise, it is very occasional in Greece (Blockeel 2010) and rare and localised in Slovenia, Bosnia and Herzegovina, Serbia and Montenegro in the Balkan Peninsula (Sabovljević et al. 2008; Hodgetts and Lockhart 2020). Herein, it is recorded for the first time from Bulgaria where it was once collected in the summit region of Mt. Vihren in the Pirin massif. The moss flora of Bulgaria is relatively rich compared with those of coterminous countries in SE Europe. In a recent checklist, some 531 moss species were reported (Natcheva and Ganeva 2005), but in a subsequent account of the mosses of SE Europe some 576 species have been recorded from this country (Blockeel, Bednarek-Ochyra, et al. 2006; Blockeel, Chlebicki, et al. 2006; Sabovljević et al. 2008). Since then, nine moss species have been added to the bryoflora of Bulgaria, including the present discovery (e.g. Ellis, Alegro, et al. 2012; Ellis, Alataş, et al. 2013; Ellis, Agcagil, et al. 2016; Ellis et al. 2021), so currently it consists of 585 species.

10. *Encalypta kangchenjungae* D.G.Long & P.Shrestha

Contributor. F. Müller

China. Southeast Tibet, Zogang 20 km ENE, 29°44'N, 98°03'E, alt. 4930 m a.s.l., 36° south exposed scree slope with *Juniperus pingii* W.C.Cheng ex Ferré and turf-fragments, 14 September 2004, *leg.* G. Mieke, Sonam Co & L. Opgenoorth 04-157-15, *det.* F. Müller (DR).

Encalypta kangchenjungae was recently described as new to science from different high altitude locations in Nepal, India and Bhutan (Long and Shrestha 2021). The species is unique in the genus in its campanulate-cucullate calyptra which is fringed at the base with triangular lobes with a split on one side up to half its length, or almost to the base of the rostrum. With this find in southeast Tibet the known range of the species can be significantly expanded to the east. Long and Shrestha (2021) characterise *E. kangchenjungae* as a very high altitude Himalayan species, known from 3780 to 4860 m a.s.l., restricted to strongly calcareous soil and rocky substrates, and often growing in the shade of shrubs such as *Juniperus* and *Potentilla* species. We know little of the geology of the new

Tibetan site, but it shares at least the high altitude (4930 m a.s.l.) and shade of *Juniperus* shrubs with the hitherto known locations.

11. *Fissidens ovatifolius* R.Ruthe

Contributor. D. Spitale

Cyprus. Argaki Lazaridhes river, Pafos Forest, 34° 55'39.3"N, 32°42'31.5"E, alt. 480 m a.s.l., 24 June 2021. Catchment of the Xeros river, within the boundaries of Mylikouri village in Nicosia district, *leg.* and *det.* Daniel Spitale *s.n.* (TR).

Fissidens ovatifolius was found on a vertical stone on a riverbank, in dense pine forest within a Natura 2000 area network. The river is characterised by an intermittent flow and is one of the four tributaries of the Xeros, which is one of the largest rivers in Cyprus. It is a relatively narrow stream, well shaded with about 70% tree canopy cover. At the collection site, the mean width is about 1.5 m and the mean depth 0.15 m, with a substrate of cobbles and boulders predominating. The distribution of *F. ovatifolius* includes Europe, North Africa and Macaronesia and it is considered to be rare (Dierßen 2001). According to Ros et al. (2013), the species is present in Greece, Crete (but not in Turkey), Egypt, Israel, Lebanon and Syria. It was found together with *Pellia endiviifolia* (Dicks.) Dumort., *Brachytheciastrum velutinum* (Hedw.) Ignatov & Huttunen, *Timmiella barbuloidea* (Brid.) Mönk. and *Eucladium verticillatum* (With.) Bruch & Schimp.

12. *Frullania platycalyx* Herzog

Contributors. A. Schäfer-Verwimp and G. Winter

Venezuela. Caracas, Jardim Botánico, alt. ca [950–]1000 m a.s.l., [ca 10°29'37"N, 66°53'55"W], Sekundärwald, über Wurzeln kriechend, c. per. + andr. (autoicous), 12 January 1990, *leg.* Schäfer-Verwimp & Verwimp 12045 (FR, JE).

Frullania platycalyx is characterised by its autoicous condition, a smooth, flattened 4(–5)-keeled perianth (two lateral, two ventral and one(–two) weak dorsal keels) and constantly laminate lobules. *Frullania platycalyx* was described from Misiones, northeastern Argentina, by Herzog (1952) and subsequently treated by Reiner (1988), who extended its range to the province of Buenos Aires. Later, it was reported from Brazil, from the southern states of Paraná, Santa Catarina and Rio Grande do Sul, by Schäfer-Verwimp (1996), while Cañiza et al. (2017) reported it from Paraguay. Range extensions within Brazil are given by Costa et al. (2006) for Rio de Janeiro ("aff. *platycalyx*"), Machado (2011) for Minas Gerais, Fetter (2012) for Mato Grosso, Oliveira et al. (2018) for Maranhão and Batista et al. (2018) for Ceará. Finally, Lima (2019) found it to be widespread in Brazil, listing numerous collections, and provided a distribution map for the

country. The new record from Venezuela is a considerable range extension to the north and represents its highest known altitude. Its altitudinal range in Brazil is from near sea level to 850 m (Schäfer-Verwimp 1996), and while no altitudinal data are available for Argentina and Paraguay, all cited collection localities seem to be clearly below 1000 m.

13. *Grimmia torquata* Drumm.

Contributors: M. Kırmacı, G. Aslan and H. Özenoğlu
Turkey. Province İzmir, Beydağ, 38°02'14.28"N, 28°14'45.15"E, alt. 1330 m a.s.l., 13 March 2021, *leg.* M. Kırmacı, G. Aslan & H. Özenoğlu *s.n.* (GZD 1766).

Grimmia torquata was discovered in the northern part of the Aydın Mountains. The surrounding general vegetation consisted of *Castanea sativa* Mill. and *Quercus ithaburensis* Decne *subsp. macrolepis* (Kotschy) Hedge & Yalt. It was discovered on a shaded area of gneiss rock that was moist due to proximity to a small spring. Associated bryophytes were *Bartramia pomiformis* Hedw., *Grimmia elongata* Kaulf., *Orthotrichum rupestre* Schleich. ex Schwägr., *Didymodon acutus* (Brid.) K.Saito, *Ceratodon purpureus* (Hedw.) Brid. and *Cephaloziella hampeana* (Nees) Schiffn. *Grimmia torquata* differs from other taxa by its crisped and contorted leaves, multicellular gemmae occurring on the abaxial side of the leaf lamina in distal leaves and linear basal juxtacostal cells with extremely incrassate and sinuose walls. Sporophytes were not seen in our material and are unknown in the literature (Crum and Anderson 1981; Streiff 2005). In Turkey, *Grimmia* Hedw. is now represented by 32 taxa.

Grimmia torquata is found in many European and neighbouring countries and is Red Listed in some of them (Faroe Islands, Finland, Iceland, Norway, Svalbard, Sweden, Great Britain, Ireland (NT), Northern Ireland (NT), Andorra, Canary Islands, Corsica, France, Italy, Madeira, Portugal, Sardinia, Sicily (at risk), Spain, Austria, Belgium (TH), The Czech Republic (VU), Germany (EN), Luxembourg (VU), Poland, Slovakia (DD), Switzerland (NT), Bulgaria (VU), Greece, Montenegro (DD), Romania (EN), Serbia, Arctic Russia, Caucasus (in Europe), NW Russia, Sub-polar and North Urals) (Hodgetts 2015). It is listed as LC in the Red List of European mosses (Hodgetts et al. 2019).

14. *Heterocladium flaccidum* (Schimp.)

A.J.E.Sm.

Contributors. J. Kučera and E. Mikulášková

The Czech Republic. Krkonoše Mts., Horní Štěpanice, Benecko: valley of Jizerka, above left riverbank 685 m WNW of the road junction to Křížlice, 50°39'04"N, 15°30'40"E, alt. 470 m a.s.l., shaded phyllitic rock outcrops at base of soil-covered scree, growing by forest mostly

of *Fagus* L., 7 June 2021, *leg.* E. Mikulášková s.n. (Herb. E. Mikulášková, CBFS 23722).

The specific distinctness of *Heterocladium flaccidum* has only recently been supported by molecular data in a treatment by Hugonnot et al. (2020), triggered by new finds of the species in Tunisia and Georgia. Earlier authors mostly agreed on a varietal status for the taxon due to difficulties in morphologically separating *H. flaccidum* and depauperate morphs of *H. heteropterum* Schimp. (Hill et al. 2008). The distribution of *H. flaccidum* in Europe includes most Western European countries but in Central Europe it has been restricted to western Germany, Switzerland and Austria (Hodgetts and Lockhart 2020). We have not found any historical report of the taxon from the Czech Republic, although old reports exist from neighbouring historical Silesia, which are now probably referable to Poland (Milde 1869, as *Heterocladium heteropterum* var. *fallax* Milde, synonymised with *H. flaccidum* by Limpricht (1895)) and recent records exist from neighbouring Upper Austria (Schlüsslmayr 2005, 2011). Plants constituting the new Czech record were collected from moderately base-rich siliceous (phyllite) rocks in the foothills of the Krkonoše Mountains and were barcoded molecularly (GenBank accessions OK560459 – ITS, OK562590 – chloroplast *trnF-trnS*) due to uncertainty of morphological identification, although the material is rather typical and fully matching the existing descriptions. Associated species included *Brachytheciastrum velutinum* (Hedw.) Ignatov & Huttunen, *Orthothecium intricatum* (Hartm.) Schimp., *Seligeria donniana* (Sm.) Müll.Hal., *Plagiochila porelloides* (Nees) Lindenb. and *Mesoptychia collaris* (Nees) L.Söderstr. & Váňa.

15. *Jackiella javanica* Schiffn.

Contributors. L. Söderström, M. von Konrat and M. Tabua

Fiji. (1) Viti Levu, Monasavu, by the teletower, alt. 1210 m a.s.l. (17°47'28"S, 178°00'36"E), on the ground. 3 September 2011, *leg.* L. Söderström 2011/079 (SUVA, F, herb. Söderström); (2) Viti Levu, Namosi Road, alt. 350 m a.s.l. (18°03'24"S, 128°09'27"E), on rocks by a stream, 30 August 2011, *leg.* L. Söderström 2011/007 (F, SUVA, herb. Söderström); (3) Viti Levu, Slopes of Mt. Lomalagi, above Nadarivatu, alt. 3100–3600 ft., roadside, 30 June 1967, *leg.* R.M. Schuster 67-70204 (F, SUVA); (4) Vanua Levu, Waisali Rainforest Reserve, in gully of *Agathis* forest, alt. 350–400 m (16°38'19"S, 179°13'20"E), on soil of bank near junction of Buabua Track and Dakua Track, 12 July 2006, *leg.* M. von Konrat, J. J. Braggins, & A. Naikatini 6/20-9 (F) [FATOL254]; (5) Vanua Levu, near Waisali Rainforest Reserve, alt. 300 m a.s.l. (16°38'27"S, 179°13'17"E), roadside bank of Cross Island Road, 2 May 2012, *leg.* M. von Konrat 12342, M. Tabua, B. Shaw & A. Naikatini (F, SUVA);

(6) Kadavu, 3 km S of Vunisea, alt. 121 m a.s.l. (19°04'18"S, 178°08'20"E), on soil bank by a small stream, 6 September 2011, *leg.* L. Söderström 2011/156 (SUVA, herb. Söderström); (7) Kadavu, Namara Road, alt. 131 m a.s.l. (19°01'49"S, 178°11'28"E). On soil bank by the road. 7 September 2011, *leg.* L. Söderström 2011/174 (SUVA, herb. Söderström).

Widespread in SE Asia and the Pacific, but apparently never before published from Fiji (ELPT database; Söderström et al. 2011), although collected as early as 1967. However, specimen (4) above was used in a molecular phylogenetic study by Shaw et al. (2015) without any locality details. It is a mystery to us that this species, that can cover many square meters along road cuttings, was not reported from the archipelago earlier.

16. *Loeskeobryum cavifolium* (Sande Lac.) M.Fleisch. ex Broth.

Contributors. V. F. Fedosov and A. V. Shkurko

Russia. Sakhalin Province, (1) South Kuril Islands, Shikotan Island, vicinity of Ostrovnoy Cape (southern extremity of the Island), 43.7484°N, 146.5993°E, alt. ca 10 m a.s.l., hummocky bog, moist shaded niche of *Dicranum* dominated hummock, 20 August 2021, *leg.* Fedosov & Shkurko s.n. (MW); (2) Ploskaya Mt., extensive rock outcrops near the top, 43.8021°N, 146.6560°E, alt. ca 280 m a.s.l., on humus covering rock ledge, 23 August 2021, *leg.* Fedosov & Shkurko s.n. (MW); (3) Krabozavodsk village vicinity, 43.8456°N, 146.7392°E, alt. ca 200 m alt., calcareous rock outcrops, on humus covering rocks, together with *Meteorium buchananii* (Brid.) Broth., *Entodon concinnuus* (De Not.) Paris, *Calohypnum plumaeforme* (Wilson) Jan Kucera & Ignatov, *Hylocomiadelphus triquetrus* (Hedw.) Ochyra & Stebel, etc., 26 August 2021, *leg.* Fedosov & Shkurko s.n. (MW).

Loeskeobryum cavifolium is newly reported for the Kuril Islands. This species was described from Japan, where it is reported from all four major islands (Noguchi 1994) and it is also known to occur in Korea and China (Jia et al. 2005). In Russia it was reported from the Kamchatka Peninsula (Möller 1927) and the southern part of Sakhalin Island (Sakurai 1935), but these records have not been confirmed following extensive bryological studies in both areas in the early 21st century. Therefore, Ignatov et al. (2020) suggested that the species may have disappeared from the previously known Russian localities. Here we confirm the presence of this species in Russia, although our records originate from an area where it has not been previously been found.

17. *Meesia minor* Brid.

Contributor. O. M. Afonina

Russia. Arctic Far East; (1) Wrangel Island: center part of island, Mamontovaya River, 71°08'N, 179°42'W,

nival willow-herb-moss tundra, on calcareous soil, 25 July 1985, *leg.* O. M. Afonina *s.n.* (LE B0023673). Chukotka Peninsula; (2) Lavrentiya Bay, Krauze Cape, 65° 50'N, 171°00'W, calcareous shrub-herb-moss tundra, 28 August 1975, *leg.* O. M. Afonina *s.n.* (LE B0023674); (2) Middle course of Getlyanen River, 65°10'N, 173° 15'W, sedge-sphagnum bog, 4 August 1976, *leg.* O. M. Afonina *s.n.* (LE B0022111); (3) Low course of Marich River, vicinity of Yanrakynnot Settlement, 64° 53'N, 172°30'W, willow-dryad-moss tundra, 9 September 1978, *leg.* B. A. Yurtsev *s.n.* (LE B0023672); (4) Low course of Chegitun River, 66°30'N, 171°10'W, calcareous dryad-moss tundra, 8 August 1991, *leg.* O. M. Afonina *s.n.* (LE B0023671).

Meesia minor was described by Bridel (1803), but its taxonomic status was uncertain for a long time. Some authors considered it as *Meesia uliginosa* var. *minor* (Brid.) F. Weber & D. Mohr, while lately it has usually been merged with *M. uliginosa* Hedw. Hedenäs (2020) published an article on the results of molecular and morphological investigations of cryptic species within *Meesia uliginosa* in Scandinavia, showing that three species exist: *M. uliginosa* Hedw., *M. minor* Brid and *M. minutissima* Hedenäs. In this context, a revision of the herbarium material of *Meesia uliginosa* from Chukotka stored in LE was carried out and five specimens corresponding to the description of *M. minor* were found. The main characteristics of *Meesia minor* distinguishing it from *M. uliginosa* are its yellow-brown exostome, 2/5–2/3 of length of the endostome with well-developed ornamentation, larger spores and shorter seta. In Scandinavia *M. minor* occurs in the mountains (Hedenäs, 2020), while in Chukotka specimens were collected also in mountainous tundra on calcareous soil. For Russia (USSR) this species was first recorded by Abramova (1969) as *Meesia uliginosa* var. *minor* from the Kola Peninsula (northwestern European Russia). Recently, this species was found in different regions of Russia including the European and Siberian Arctic, Altai, Yakutia, Magadan Province, Kamchatka, and the Bering and Sakhalin islands (Fedosov et al. 2020; Ellis et al. 2021). Outside Russia *M. minor* is known from Scandinavia, the European Alps and King George Island (Hedenäs 2020).

18. *Odontoschisma francisci* (Hook.) L.Söderstr. & Váňa

Contributor. S. Ștefănuț

Romania. Southern Carpathians, Iezer-Păpușa Mountains, Iezer glacier ring, Argeș County, 45°27'38"N, 24° 57'38"E, alt. 2138 m a.s.l., 22 September 2021, *leg.* S. Ștefănuț *s.n.*, *det.* S. Ștefănuț (BUCA B12190).

This is the first report of *Odontoschisma francisci* for Romania and the South-Eastern Carpathians (Ștefănuț and Goia 2012; Hodgetts and Lockhart 2020). It grows on peat, in subalpine *Sphagnum* bogs, below Iezerul

Mare Peak, along with other bryophytes such as *Diplophyllum taxifolium* (Wahlenb.) Dumort., *Marsupella emarginata* (Ehrh.) Dumort., *Mylia anomala* (Hook.) Gray, *Nardia scalaris* Gray, *Neo-orthocaulis attenuatus* (Mart.) L.Söderstr., De Roo & Hedd., *N. floerkei* (F. Weber & D. Mohr) L.Söderstr., De Roo & Hedd., *Scapania undulata* (L.) Dumort., *Aulacomnium palustre* (Hedw.) Schwägr. and *Philonotis seriata* Mitt. The next nearest locality of this species is in Slovakia (Hodgetts and Lockhart 2020). The conservation status of *O. francisci* in Romania is Critically Endangered – B1ab(ii,iii,iv) + 2ab(ii,iii,iv).

19. *Orthotrichum pamiricum* Plášek & Sawicki

Contributors. M. Alataş, H. Erata, N. Batan and, T. Ezer **Turkey.** Elazığ Province, Firat University campus area, alt. 1102 m a.s.l., 38°40'30"N, 39°11'18"E, on trunks of *Ulmus minor* Mill., 16 September 2021, *leg.* M. Alataş *s.n.* (MA 3642), *det.* T. Ezer, M. Alataş, N. Batan & H. Erata.

Orthotrichum pamiricum Plášek & Sawicki was recently described from the Pamir Mountains on the Tajik-Afghan border in Central Asia (Plášek et al. 2014) and was later recorded from NW Xinjiang Province in China (Ellis et al. 2016). The present record from Eastern Anatolia (Turkey) is an important westward extension of its range. It is characterised by mainly obtuse leaf apices, cryptoporous stomata and an exostome composed of 8 pairs of teeth (Plášek et al. 2014). Although this new record for Turkey is from an urban ecosystem under anthropogenic pressure, the campus areas of universities can be considered as areas where biological diversity is protected (Ezer et al. 2021). The genus *Orthotrichum* has previously been represented by 29 taxa in Turkey (Kürschner and Frey 2020), this new record increasing the number to 30.

Orthotrichum pamiricum is similar to *O. crenulatum* Mitt., *O. sprucei* Mont. and *O. pumilum* Sw. It differs from *O. crenulatum* by its unistratose leaf lamina and 16 papillate endostome segments. *Orthotrichum sprucei* has a mucronate leaf apex and smooth leaf cells, while *O. pamiricum* has an obtuse leaf apex and short 1–2 conical papillose leaf cells. *Orthotrichum pumilum* is distinguished from *O. pamiricum* by its acute leaf apex and smooth endostome segments (Goffinet 2002; Plášek et al. 2014; Ellis et al. 2016; Fedosov et al. 2017).

20. *Plagiochila dimorpha* Lindenb. & Gottsche

Contributor. M. Burghardt

Ecuador. Pichincha, Cantón Mejía. Parrish Uyumbicho, Refugio de Vida Silvestre Pasochoa, "Mayguayacu" trail, alt. 3093 m a.s.l., 78°30'31.06"W, 0°26'04.96"S (WGS 84), trunk epiphyte in secondary montane forest, 03

December 2018, *leg.* M. Burghardt 9648a, *det.* M. Burghardt (QCNE).

Plagiochila dimorpha is a rare Neotropical species, known from fewer than a dozen collections from Mexico (from where it was described by Gottsche et al. 1847) and Bolivia, and inhabiting upper montane forests between 3000 and 3500 m a.s.l. (Heinrichs 2002). It is here reported for the first time from the Northern Andes. The Ecuadorian collection is very sparse and consists of a few plants that grew intermingled with *Macromitrium* sp. *Plagiochila dimorpha* could be confused with *P. ecuadorica* (Inoue) L.Söderstr. and *P. macrostachya* Lindenb. owing to its subopposite foliation. It differs from the former by the shape and papilosity of the caducous leaflets (ovate and variously toothed to bilobed with smooth cuticle vs. lanceolate and entire with papillose cuticle), and from the latter by the common presence of a terminal branch system with caducous leaflets and vegetative lateral-terminal branching (Heinrichs 2002).

21. *Plagiochila neckeroidea* Mitt.

Contributors. A. M. de Souza, D. F. Peralta and E. B. Valente

Brazil. Bahia state, Serra da Jibóia, Santa Terezinha, 12°45'00''S, 39°42'00''W, 16 December 2003, *leg.* E. B. Valente 287, *det.* A. M. Souza (HUEFS [ac.85866]). Espírito Santo state, Reserva Biológica Augusto Ruschi – Nova Lombardia, Santa Teresa, 19°54'27''S, 40°33'11''W, 25 July 2002, *leg.* J. Rossini 14 (MBML [ac.17281], SP [ac.414982]).

The distribution of *Plagiochila neckeroidea*, previously restricted to the African continent, is expanded to Brazil, where it occurs in Espírito Santo and Bahia. In these locations it is epiphytic on tree trunks in ombrophilous forest at an elevation of 780–1043 m. *Plagiochila neckeroidea* is characterised by pseudodichotomous branching, oblong, oblong-ovate to triangular wide-spreading leaves with narrow to sub truncate apex, 2–3 lobe-like triangular teeth, ventral base short decurrent, dorsal base entire and perianth mouth laciniate. This species resembles *P. disticha*, but the latter is more robust, and presents a curved moderately ventral decurrence, ± crestlike, distinctly toothed with elongated ciliate teeth up to 10 cells long, with lacinate to ciliate underleaves. According to Jones (1962) the species has a pendant habit, but there was no information relevant to this on the labels of the Brazilian samples.

22. *Plagiochila papillifolia* Steph.

Contributors. A. M. de Souza, T. A. Feletti, D. F. Peralta and E. B. Valente

Brazil. (1) Espírito Santo state, Parque Nacional do Caparaó, Santa Marta, Ibitirama, Mata Ombrófila

Densa, 20°29'41''S, 41°44'03''W, alt. 1060 m a.s.l., 26 July 2019, *leg.* T. A. Feletti 57 (CAP [ac. 5090]); (2) Rio Grande do Sul state, Parque Nacional Aparados da Serra, Canion Itaimbezinho, Cambará do Sul, Mata Ombrófila Densa, 29°05'45''S, 50°3'7''W, 1030 m a.s.l., 16 April 2010, *leg.* D. F. Peralta 10835 (SP [ac.422677]); (3) São Paulo state, Serra do Itapeti, Mogi das Cruzes, Pedreira, 23°17'45''S, 46°8'26''W, alt. 1000 m a.s.l., 23 February 2013, *leg.* R. Ristow 2651 (SP [ac.436518]).

During analyses of *Plagiochila* samples from Brazil, an interesting species was found that has not previously been recorded in the country. *Plagiochila papillifolia* is characterised by oblong to oblong-ovate leaves, 2.0–2.5 times longer than wide, with very large ciliate teeth and 2 lobe-like teeth at the apex, absence of vitta and a verruculose cell surface. The Brazilian specimens represent a small form, with well-developed papillae on leaves on the upper parts of shoots. This species is closely related to *P. punctata*, but the latter has many lateral-intercalary flagelliferous branches having a feather-like aspect, ovate, obovate, to suborbicular leaves, 1.0–1.6(–2.0) times longer than wide, an ill-defined vitta and a smooth to indistinctly papillose cell surface. *Plagiochila papillifolia* is widespread in the Neotropics, cited from the Andes of Bolivia, Costa Rica, Peru, Ecuador and Colombia, and is also found in the Azores. In Brazil, this species is recorded for the first time from the São Paulo, Espírito Santo and Rio Grande do Sul states, occurring at elevations of 1000–1060 m and growing as rupicolous, corticolous and epixilous plants.

23. *Plagiochila steyermarkii* H. Rob.

Contributors. A. M. de Souza, D. F. Peralta and E. B. Valente

Brazil: Amazonas state, Parque Nacional Pico da Neblina, São Gabriel da Cachoeira, no Pico da Neblina, August 2011, *leg.* M. Pombo 9-1130 (SP [ac. 483547]).

Plagiochila steyermarkii is a very distinct species, easily recognised by its reddish, filiform stems that resemble strands of hair and its deeply bilobed leaves, which according to Robinson (1969, p. 94), “represent an extreme development within the genus”. The lobes in this species are incised to more than ½ of the leaf length and are highly divergent. The first material was collected by Julian Steyermark in Auyantepui, in the Guiana Highlands of Venezuela. Now it is recorded as occurring in Brazil, on Pico da Neblina in Roraima state, as terricolous plants at an elevation of approximately 2,700 m.

24. *Ptychostomum torquescens* (Bruch & Schimp.) Ros & Mazimpaka

Contributors. M. Boiko and N. Zagorodniuk

Ukraine. Northern Black Sea Coast, Kherson region, Novotroitsk district, Zaozerne village, Azovo-Syvasky NPP, Sivash Bay shore Churyuk Island: (1) Kashlyk tract, 46°11'06"N, 34°26'15"E, dry turf desert steppe, 25 May 2021, *leg.* D. Shyrjaeva *s.n.* *det.* N. Zagorodniuk (KHER); (2) 46°06'40"N, 34°15'41"E, halophilic steppe, 25 May 2021, *leg. et det.* N. Zagorodniuk *s.n.* (KHER); (3) Kalanchak district, Horli village, Karaday peninsula, Karaday landscape reserve, 46°11'07"N, 33°20'94"E, desert steppe, 26 May 2021, *leg.* J. Dengler, I. Moysiyeenko *s.n.*, *det.* N. Zagorodniuk, M. Boiko (KHER).

Ptychostomum torquescens is widespread in Europe, America, Africa and Asia, and also known from Tasmania and New Zealand (Bachurina and Melnichuk 1989; Wolfram and Dengler 1999; Holyoak 2004, etc.). In Europe it is widespread in the Mediterranean region, although there are only isolated records from the rest of its range, possibly due to the thermophilicity of the species (Wolfram and Dengler 1999). It grows in diverse unshaded habitats, including on stony, compacted and sandy soil, in places covered with hardened fine soil, on limestone rocks, dry grassy slopes, gravel in quarries and on coal mine dumps (Mashtaler 2005; Boiko 2009; Lobachevskaya 2012; Hofmann and Schroder 2017). In Ukraine, *P. torquescens* was previously known only from Crimea (Partyka 2005; Zagorodniuk and Boiko 2006; Boiko 2008), Donetsk Forest-Steppe (Mashtaler, 2005) and Maly Polissya (Lobachevskaya, 2012). We have discovered new localities on the Northern Black Sea coast, in the dry-steppe and halophilous plant communities of Prysyvashshya. Associated moss species included *Syntrichia ruralis* (Hedw.) F. Weber & D. Mohr, *Ceratodon purpureus* (Hedw.) Brid. and *Barbula unguiculata* Hedw. Plants in the voucher material were synoecious with well-developed antheridia and archegonia. Sporophytes were not detected.

25. *Riccia canaliculata* Hoffm.

Contributors. G. Gospodinov and R. Natcheva

Bulgaria. Western Rhodopi Mts., Pazardzhik province: S shore of dam Batak, small fen in a spring area, on soil, sterile, 41.942711N, 24.178324E, 1103 m a.s.l., 31 August 2021, *leg.* and *det.* G. Gospodinov & R. Natcheva *s.n.* (SOM). Revised voucher: '*Riccia fluitans* fo. *terrestris* C. Jens. M. Rhodope occidentalis: ad sol. argillos. in uliginosus, l. d. Batasko blato', 1100 m a.s.l., 14 November 1955, *leg.* and *det.* Slavcho Petrov *s.n.* (SOM 168-B).

Riccia canaliculata is here reported as new to Bulgaria, based on new material as well as a revised herbarium voucher from the same locality. The species was collected for the first time at Batak swamp and identified as *Riccia fluitans* fo. *terrestris* by Dr Slavcho Petrov. The herbarium material at SOM includes five

duplicates with individual numbers SOM 166-B – 170-B. The plants in each envelope are abundant and had been growing in dense patches. They are sterile, without well distinguished reticulation, narrowing at the apex and with ventral scales present. Until 1955 Batak swamp was a large wetland complex consisting of open water bodies surrounded by boggy areas, including some *Sphagnum*-dominated parts, gradually transitioning into wet meadows and drier pastures (Iordanoff 1931). The transformation of the swamp following the construction of a dam in 1956–1957 dramatically changed the ecology of the site and most of the swamp vegetation disappeared. Nevertheless, some small fragments survived by the spring areas along the southern shore and the rivulets flowing into the dam. This was where *R. canaliculata* occurred. After a visit to the same locality, a small, dense, sterile patch of the species was found. It grew at the base of a tussock of *Juncus conglomeratus* L. just above the line of the highest water level of the dam. Other vascular plants at the site included *Juncus effusus* L., *Lythrum salicaria* L., *Lysimachia vulgaris* L., *Myosotis palustris* With., *Lycopus europeus* L., *Mentha aquatica* L., *Scutellaria galericulata* L., *Veronica scutellata* L. and *Alisma plantago-aquatica* L. The plant had a haploid chromosome number of $n = 8$.

26. *Riccia cavernosa* Hoffm.

Contributors. Ž. Lobnik Cimerman and S. Strgulc Krajšek

Slovenia. Štajerska, Maribor, SE of Zrkovci, abandoned field next to the river Drava, 46°32'31.9"N 15°42'50.0"E, 45 m a.s.l., exposed moist sandy soil, 15 October 2021, *leg.* Ž. Lobnik Cimerman, *det.* Ž. Lobnik Cimerman and S. Strgulc Krajšek (LJU).

Riccia cavernosa Hoffm. is a terrestrial representative of subgenus *Ricciella* (A. Braun) Boulay. Morphologically it is very similar to *R. crystallina* L., and ripe spores are essential for reliable identification (Paton 1999). It is widespread in Europe. According to Hodgetts and Lockhart (2020), it has not been recorded in many countries of the Balkan Peninsula. It is listed on national Red lists of many Central and Southern European countries, including three that neighbour Slovenia: Austria, Hungary and Italy (Hodgetts and Lockhart 2020). We found numerous rosettes in an abandoned field, overgrown with some pioneering seed plants, in a rural area by the River Drava in north-eastern Slovenia. The habitat was an exposed riparian site on soil overlying non-carbonate rock. *Anthoceros agrestis* Paton, a species only recently discovered in Slovenia (Strgulc Krajšek et al. 2021), also occurred in the vicinity. The bryophyte flora of arable sites in Slovenia is not well-known and we plan to conduct further fieldwork in this habitat to further our knowledge of *Riccia* L. We suggest that

R. cavernosa is included in the next Slovene Red List of bryophytes as data deficient (DD-new), as we do not have sufficient information to determine its true conservation status.

27. *Scapania ornithopodioides* (With.) Waddell

Contributors. K. K. Rawat and R. R. Paul

India. Uttarakhand, Rudraprayag, Tungnath, near HAPPRC centre, 30°29'15.72"N, 79°12'30.27"E, alt. 3270 m a.s.l. on soil covered rocks, 17 June 2019, *leg.* K. K. Rawat *s.n.* (LWG 321596A).

Scapania ornithopodioides is reported for the first time from Uttarakhand in the Western Himalaya. It was previously recorded in the Eastern Himalaya (Arunachal Pradesh, Assam, Sikkim and West Bengal (Mitten 1861) as *Scapania planifolia* (Hook.) Dumort. (Hattori 1966; Singh et al. 2008; Singh et al. 2016). The voucher specimen has the following characters: plants yellow to brown, up to 20–45 mm long and 3–4 mm wide; stem elliptical in cross section, 20–23 cells across, with a 2–3-layered cortex of slightly thick-walled cells; leaves distant at base and contiguous above, spreading laterally, 1.2–2.0 × 1.0–1.8 mm, longer than wide, conspicuously bilobed, lobes unequal, keels 1/10 of length of ventral lobe; dorsal lobe ovate, extending beyond the stem, ovate with long decurrent base, rounded apex and spinose dentate margin, cells thin-walled with large trigones; ventral lobe ovate, apex rounded to sharply pointed, base not decurrent, dentition spinose near apex, ciliate near ventral base, marginal cells 20–28 × 8–20 µm, median cells 20–30 × 20–28 µm; cuticle smooth, oil bodies not seen. Reproductive structures were not seen.

28. *Schistidium frahmianum* Ochyra & Afonina

Contributor. I. V. Czernyadjeva

Europe, Russia, Arctic European Part, Barents Sea, Novaya Zemlya Archipelago, South Island, Moller Bay, vicinity of Malye Karmakuly Station, 72°23'37.3"N, 52°45'20.4"E, alt. 39 m a. s. l., bank of the stream, on stone, 21 August 2020, *leg.* S. V. Sidorenko & I. V. Czernyadjeva # 7-20 (LE).

Schistidium frahmianum was recently described from Chukotka (Ochyra and Afonina 2010). The species is known from several localities in Chukotka and western Alaska, and also from one locality in Yakutia, in the northern part of the Verkhoyansky Mountain Range (Ignatova and Blom 2017). This find of *S. frahmianum* on the Novaya Zemlya Archipelago in the Barents Sea is the most westerly and the first record for Europe. *Schistidium frahmianum* is characterised by a strong costa excurrent as a yellowish, chlorophyllose, smooth awn. It is similar to *S. agassizii* Sull. &

Lesq., but differs in having stronger, 4–6-stratose costae that are rounded in transverse section and excurrent in a short or rather long awn. In contrast, *S. agassizii* has 2–3-stratose costae that end well below the leaf apex.

29. *Sphagnum flexuosum* Dozy & Molk.

Contributors. S. Dragičević, A. Alegro and V. Šegota
Montenegro. Sinjajevina Mt, south-western slopes, Municipality of Kolašin, Semolj: (1) peat bogs, 42°54'32"N, 19°16'36"E, alt. 1583 m a.s.l.; (2) Nastića meadows, peat bogs, 42°54'18"N, 19°16'56"E, alt. 1588 m a.s.l.; (3) along the way to Nastića meadows, peat bogs around creek, 42°54'22"N, 19°16'46"E, alt. 1587 m a.s.l., 6 September 2018, *leg. et det.* S. Dragičević, A. Alegro, V. Šegota *s.n.* (NHMM 14619, 14802, 14803; ZA 62698, 62699, 62700, 62701, 62702, 62703, 62704, 62705); (4) Hajla Mt, Municipality of Rožaje: Bandžov village, spring of the Ibar River, on the edge of a path in a woodland area, on mound of the soil and in a canal, 42°47'9"N, 20°07'51"E, alt. 1445 m a.s.l., 7 September 2018, *leg. et det.* S. Dragičević, A. Alegro, V. Šegota *s.n.* (ZA 62706); (5) western slopes of Hajla Mt, mountain path for Gornji Bukelj village (Grope), mountain peat bog, 42°45'43"N, 20°09'37"E, alt. 1752m a.s.l., 8 September 2018, *leg.* S. Dragičević, A. Alegro, V. Šegota *s.n.*, *det.* A. Alegro, V. Šegota, S. Dragičević, A. Martinčić (NHMM 14812; ZA 62707, 62708, 62709, 62710, 62711, 62712); (6) Bjelasica Mt, Municipality of Kolašin, around Pešića Lake, peat bogs, 42°51'14.98"N, 19°41'15.03"E, alt. 1841 m a.s.l.; (7) 42°51'10.32"N, 19°41'12.22"E, alt. 1857 m a.s.l., 18 August 2019, *leg.* S. Dragičević *s.n.*, *det.* A. Alegro, V. Šegota, S. Dragičević (NHMM 14879, 14881); (8) Municipality of Berane, Pešića rupe, peat bogs by creek, 42°51'38.90"N, 19°41'41.50"E, alt. 1807m a.s.l., 18 August 2019, *leg.* S. Dragičević *s.n.*; *det.* A. Alegro, V. Šegota, S. Dragičević (NHMM 14813, 14814); (9) Durmitor Mt, Municipality of Žabljak, Barno jezero, peat bogs, 43°09'21.75"N, 19°05'30.99"E, alt. 1493 m a.s.l., 14 October 2017, *leg.* S. Dragičević *s.n.*, *det.* A. Martinčić (NHMM 14620).

Sphagnum flexuosum has been listed for the Montenegrin bryoflora based on incorrect synonymisation of the name of the species recorded in Barno Lake on Durmitor Mountain (Birks and Walters 1972/73, Dragičević and Veljić 2006). Consequently, Sabovljević et al. (2008) and Ros et al. (2013) cited this data, but after revision the species was excluded from the Montenegrin flora (Hodgetts, 2015; Hodgetts and Lockhart, 2020). We found *Sphagnum flexuosum* on four Montenegrin mountains (Sinjajevina, Hajla, Bjelasica and Durmitor), in two NATURA 2000 habitats: 7140 Transition mires and quaking bogs, and 9410 Acidophilous *Picea* forests of the montane to alpine level (*Vaccinio-*

Piceetea). The species was growing with *S. subsecundum* Nees, *S. girgensohnii* Russow, *S. fallax* (H.Klinggr.) H.Klinggr., *S. squarrosus* Crome, *S. capillifolium* (Ehrh.) Hedw. and other mosses including *Aulacomnium palustre* (Hedw.) Schwägr., *Dicranum bonjeanii* De Not., *Campylium stellatum* (Hedw.) C.E.O.Jensen, *Calliergonella cuspidata* (Hedw.) Loeske, *Ptychostomum pseudotriquetrum* (Hedw.) J.R.Spence & H.P.Ramsay ex D.T.Holyoak & N.Pederson, *P. schleicheri* (DC.) J.R.Spence ex D.Bell & Holyoak and *Drepanocladus aduncus* (Hedw.) Warnst. *Sphagnum* peatlands are rare habitats in Montenegro, located in mountains in the north of the country and always occurring above 1000 m a.s.l. They occupied larger areas in the past, but have disappeared or been reduced due to various natural and anthropogenic factors. Peatland habitats with *Sphagnum flexuosum* on Bjelasica and Durmitor Mountains are within national parks, while Hajla Mountain and Sinjajevina Mountain are not protected by national legislation. With this new contribution, the Montenegrin bryoflora includes 20 species of *Sphagnum*.

30. *Tortella fasciculata* (Culm.) Culm.

Contributors. R. M. Ros, H. Köckinger, J. Muñoz and O. Werner

Morocco. High Atlas, Toubkal, climb from Armt to Nelther's refuge, 31°07'N, 7°55'W, alt. 2000–2400 m a.s.l., 19 June 1998, on granitic rocks and in granitic rock fissures, in the oromediterranean vegetation belt, growing with *Bryum argenteum* Hedw., *Buckia vaucheri* (Lesq.) D.Ríos, M.T.Gallego & J.Guerra, *Didymodon insulanus* (De Not.) M.O.Hill, *Encalypta vulgaris* Hedw., *Grimmia ovalis* (Hedw.) Lindb., *G. tergestina* Tomm. ex Bruch & Schimp., *Lewinskya rupestris* (Schleich. ex Schwägr.) F.Lara, Garilleti & Goffinet, *Pseudoleskeella tectorum* (Funck ex Brid.) Kindb. ex Broth., *Ptychostomum torquescens* (Bruch & Schimp.) Ros & Mazimpaka, *Reboulia hemisphaerica* (L.) Raddi, *Schistidium flaccidum* (De Not.) Ochyra, *S. helveticum* (Schkuhr) Deguchi, *Syntrichia calcicola* J.J.Amann and *Targionia hypophylla* L., leg. R. M. Ros, M. J. Cano & J. Muñoz s.n., det. R. M. Ros, rev. H. Köckinger (MUB 8399, 8426, 8436).

Following the resurrection by Köckinger and Hedenäs (2017) of this species for the *Tortella* (Müll.Hal.) Limpr. samples previously named as *T. bambergeri* auct. and its clear morphological distinction from *T. tortuosa* (Hedw.) Limpr. and *T. pseudofragilis* (Thér.) Köckinger & Hedenäs, this suboceanic-submediterranean species is increasingly being reported from many European countries. Its present confirmed distribution extends over Austria, Belgium, Croatia, France, Germany, Great Britain, Hungary, Ireland, Norway, Spain, Sweden and Switzerland (Köckinger and Hedenäs 2017; Erzberger and

Papp 2018; Alegro et al. 2019; Ottley and Blockeel 2019; Schröck 2019), Albania (Papp et al. 2018), Madeira (Dirkse et al. 2018), Montenegro (Papp et al. 2019a), Serbia (Papp et al. 2019b), The Netherlands (Hodgetts and Lockhard 2020), Turkey (Ellis et al. 2020) and Andorra (Ellis et al. 2021). The original records of *T. bambergeri* auct. have not yet been distinguished as *T. fasciculata* or *T. pseudofragilis* in Bulgaria, the Canary Islands, Bulgaria, Greece, Italy, Luxembourg, Romania, Slovenia, the European Caucasus, the South Urals (Hodgetts and Lockhard 2020) or The Czech Republic (De Zuttere 2005). This new record for the African continent closes a distribution gap in the Mediterranean region. The Moroccan sample was first identified as *T. tortuosa* and published by Ros et al. (2000), but re-examination confirmed the presence of a central strand in the stem and a papillose abaxial epidermis of the costa in the apical part of the leaf, these characters differentiating *T. fasciculata* from all other *Tortella* species.

31. *Trichosteleum boschii* (Dozy & Molk.)

A.Jaeger

Contributors. M. Evangelista and E. B. Valente

Brazil. Mato Grosso state, aprox. 110 km to General Carneiro, in direction to Cuiabá, Mata Ciliar, 15° 40'00"S, 53°42'00"W, 12 July 1991, leg. P. G. Windisch & W. Oliveira 6367 (HUEFS [ac. 53331]).

Trichosteleum boschii is characterised by oblong-lanceolate to ovate-lanceolate leaves, concave or plane, with a long acuminate apex and margins reflexed and serrulate near the apex; laminal cells linear to linear-rhomboid, thin-walled at the insertion; alar cells inflated, oblong; unipapillose in upper 2/3 of leaf. It differs from other Brazilian species of *Sematophyllum* mainly by the shape the leaves and the form of their apices. According to Ramsay et al. (2004), *T. boschii* is cited from India, Hong Kong, Fiji and Australia. In Brazil, this species is recorded for the first time from the Mato Grosso state, growing on wood.

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