

New national and regional bryophyte records, 46

L. T. Ellis¹, A. K. Asthana², P. Srivastava², I. Omar², K. K. Rawat², V. Sahu², M. J. Cano³, D. P. Costa⁴, E. M. Dias^{5,8}, N. Dias dos Santos^{5,6}, J. B. Silva⁵, V. E. Fedosov⁷, M. N. Kozhin⁷, E. A. Ignatova⁷, S. R. Germano⁸, E. O. Golovina⁹, N. J. M. Gremmen¹⁰, R. Ion¹¹, S. Ștefănuț¹¹, M. von Konrat¹², M. S. Jimenez^{13,14}, G. M. Suárez^{13,15}, T. Kiebacher¹⁶, M. Lebouvier¹⁷, D. G. Long¹⁸, D. Maity¹⁹, R. Ochyra²⁰, I. Parnikoza²¹, V. Plášek²², L. Fialová²², Z. Skoupá²², S. Poponessi²³, M. Aleffi²³, M. S. Sabovljević²⁴, A. D. Sabovljević²⁴, P. Saha²⁵, M. N. Aziz²⁵, J. Sawicki^{26,22}, M. Suleiman²⁷, B.-Y. Sun²⁸, J. Váňa²⁹, T. Wójcik³⁰, Y.-J. Yoon³¹, J. Żarnowiec³², J. Larraín³³

¹The Natural History Museum, UK, ²CSIR-National Botanical Research Institute, India, ³Departamento de Biología Vegetal (Botánica), Universidad de Murcia, Spain, ⁴Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Brazil, ⁵Department of Botany, Federal University of Pernambuco, Brazil, ⁶Universidade Federal Rural do Rio de Janeiro, Instituto de Biologia, Brazil, ⁷M.V. Lomonosov Moscow State University, Russia, ⁸Departamento de Botany, Estadual University of Paraíba, Brazil, ⁹Komarov Botanical Institute RAS, Russia, ¹⁰Diever, The Netherlands, ¹¹Institute of Biology Bucharest of Romanian Academy, Romania, ¹²Science & Education, The Field Museum, Chicago, USA, ¹³Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina, ¹⁴Instituto de Botánica del Nordeste, Argentina, ¹⁵Facultad de Ciencias Naturales, Fundación Miguel Lillo, San Miguel de Tucumán, Argentina, ¹⁶Swiss Federal Research Institute WSL, Switzerland, ¹⁷CNRS UMR 6553, Université de Rennes, France, ¹⁸Royal Botanic Garden, Edinburgh, UK, ¹⁹Department of Botany, University of Calcutta, India, ²⁰Polish Academy of Sciences, Poland, ²¹Institute of Molecular Biology and Genetics, National Academy of Sciences, Ukraine, ²²University of Ostrava, Czech Republic, ²³University of Camerino, Italy, ²⁴Institute of Botany and Botanical Garden, University of Belgrade, Serbia, ²⁵Botanical Survey of India, Central National Herbarium, India, ²⁶University of Warmia and Mazury in Olsztyn, Poland, ²⁷Institute for Tropical Biology and Conservation, Universiti Malaysia, Malaysia, ²⁸Chonbuk National University, Korea, ²⁹Department of Botany, Charles University, Czech Republic, ³⁰Rzeszów University, Poland, ³¹Korea Polar Research Institute, KIOST, Korea, ³²Institute of Environmental Protection and Engineering, University of Bielsko-Biała, Poland, ³³Instituto de Biología, Pontificia Universidad Católica de Valparaíso, Chile

1. *Bartramia patens* Brid.

Contributors: R. Ochyra and M. Lebouvier

Îles Crozet, Île de la Possession: (1) Baie du Marin, steep cliff overlooking Crique du Navire, north-east of the Alfred Faure Station, 30 m a.s.l., 46°25'S, 51°50'E, on patches of bare moist soil in grassland dominated by *Poa cookii* (Hook.f.) Hook.f., 9 November 2006, leg. R. Ochyra 37/06 & 63/06 (KRAM); (2) on steep banks of a small intermittent stream 200 m south-east of Port Alfred Faure Station falling into the small cove south of Pointe Lieutard, 120 m a.s.l., 46°25'S 51°50'E, on bare soil, 11 November 2006, leg. R. Ochyra 137/06 (KRAM); (3) plateau 2 km

south of Port Alfred Station and 2 km south-east of Mont Branca, 185 m a.s.l., 46°44'59.6"S 51°41'35.4"E, on bare ground covered with scoria in dry and exposed situation in the fellfield, associated with *Bucklandiella membranacea* (Mitt.) Bednarek-Ochyra & Ochyra, *Ditrichum strictum* (Hook.f. & Wilson) Hampe, *Hymenoloma antarcticum* (Müll.Hal.) Ochyra, *Guembelia kidderi* (James) Ochyra & Żarnowiec and *Racomitrium lanuginosum* (Hedw.) Brid., 11 November 2006, leg. R. Ochyra 182/06 (KRAM).

Bartramia patens is one of a relatively large suite of austral temperate species whose occurrence in the sub-antarctic Îles Crozet would be expected, as it is a common member of the moss flora of coterminous archipelagoes in the African sector of the subantarctic,

Correspondence to: Leonard T. Ellis, Department of Life Sciences, The Natural History Museum, Cromwell Road, London SW7 5BD, UK.
Email: l.ellis@nhm.ac.uk

including the Prince Edward Islands (Ochyra & Hertel, 1990), Îles Kerguelen (Hébrard, 1970) and Heard Island (Selkirk *et al.*, 2008). The present discovery of the species on Île de la Possession, the largest island of the Îles Crozet archipelago, completes its range in the Kerguelen Biogeographical Province. The species appears to be a common epigeal moss in various types of habitats on the islands, and only some exemplary specimens are cited herein. *Bartramia patens* is an amphiatlantic temperate species with its maximum occurrence in the *Nothofagus* Blume zone in southern South America and the maritime Antarctic, where it extends to Charcot Island at 69°45'S (Ochyra *et al.*, 2008). The present discovery of *B. patens* is a remarkable addition to the moss flora of Îles Crozet, which is the least well studied of all the islands in this province. Until the early 1970s only about 40 species of moss were known from this archipelago, but in the last decade a number of species have been added to the bryoflora; for example, *Henediella marginata* (Hook.f. & Wilson) R.H.Zander (Blockeel *et al.*, 2006a as *H. antarctica* (Ångstr.) Ochyra & Matteri; Cano, 2008), *Anomobryum julaceum* (P.Gaertn., B.Meyer & Scherb.) Schimp. (Blockeel *et al.*, 2007a), *Pohlia nutans* (Hedw.) Lindb. (Blockeel *et al.*, 2007b), *Bucklandiella striatipila* (Cardot) Bednarek-Ochyra & Ochyra and *Hymenoloma immersa* Broth. (Blockeel *et al.*, 2009b), *Blindia magellanica* Schimp. *ex* Müll.Hal., *Ditrichum conicum* (Mont.) Mitt. and *Drepanocladus longifolius* (Mitt.) Paris (Blockeel *et al.*, 2010), *Willia calobolax* (Müll.Hal.) Lightowers (Ellis *et al.*, 2012d), and *Isopterygiopsis pulchella* (Hedw.) Z.Iwats. (Ellis *et al.*, 2015a). As a result the moss flora of Îles Crozet presently consists of about 70 species. This is still low in comparison with the moss floras of the adjacent archipelagoes of the Prince Edward Islands and Îles Kerguelen.

2. *Brotherella harveyana* (Mitt.) Dixon

Contributors: A. K. Asthana, P. Srivastava and I. Omar

India: Eastern Ghats, South India, Tamil Nadu, Salem, Yercaud, Rose Garden, 11°46.350'N 78°12.072'E, epiphytic, 4684 ft a.s.l., 13 April 2014, *leg.* A. K. Asthana & party *s.n.* (LWG 254981).

Gangulee (1978–1980) recognised 11 species of *Brotherella* Loeske *ex* M.Fleisch. occurring in India. Subsequently, Lal (2005) and Dandotiya *et al.* (2011) have reported 12. During recent investigations of the bryophytes of the Eastern Ghats, plants of *B. harveyana* were identified from the Rose Garden, Yercaud (Salem, Tamil Nadu). This is a new addition to the southern Indian bryoflora. The species was earlier only known from east Nepal and the Western Himalaya. *Pylaisiadelpha tenuirostris* (Bruch &

Schimp. *ex* Sull.) W.R.Buck has been treated as a synonym under this species by Jia & He (2010).

3. *Bryoerythrophyllum gymnostomum* (Broth.) P.C.Chen

Contributors: P. Saha, M. N. Aziz and D. Maity

India: West Bengal: Darjeeling, Lloyd Botanic Garden, epiphyte growing on stems together with *Hyophila involuta* (Hook.) A.Jaeger and *Brachymenium capitulatum* (Mitt.) Kindb. in the same colony, 27°04'46"N 88°26'29"E, 2000 m a.s.l., 8 September 2011, *leg.* Pamela Saha 64031 (CAL).

Bryoerythrophyllum P.C.Chen is a cosmopolitan genus with 28 species worldwide (Crosby *et al.*, 1999), and represented by four species in India (Aziz & Vohra, 2008). It occurs in the Eastern and Western Himalayas and in the Western Ghats.

Bryoerythrophyllum gymnostomum has been reported from only a few localities in the Eastern and Western Himalayas. Here, it is recorded for the first time from the Darjeeling district in the state of West Bengal. The species is characterised as follows: plants slender with triangular stem in transverse-section; leaves lanceolate with acute apices, margins recurved in the lower half or more, laminal cells multipapillose, costa percurrent; capsule without peristome.

4. *Bucklandiella membranacea* (Mitt.) Bednarek-Ochyra & Ochyra

Contributors: R. Ochyra and N. J. M. Gremmen

Heard Island: eastern part of the island, plateau inland of the west end of Skua Beach, 110 m a.s.l., 53°05'55"S 71°40'15"E, forming loose cushions on rocks in *Azorella–Usnea* fieldmark on exposed hillock on the plateau, 28 January 2001, *leg.* N. J. M. Gremmen H-1100 & H-1101 (KRAM).

Apart from *Bucklandiella crispula* (Hook.f. & Wilson) Bednarek-Ochyra & Ochyra, *B. rupestris* (Hook.f. & Wilson) Bednarek-Ochyra & Ochyra, *B. didyma* (Mont.) Bednarek-Ochyra & Ochyra and *B. lamprocarpa* (Müll.Hal.) Bednarek-Ochyra & Ochyra, *B. membranacea* is the fifth earliest species of the genus *Bucklandiella* Roiv. described from the temperate regions in the southern hemisphere, which is still accepted in modern muscology (Bednarek-Ochyra, 2015). It was described by Mitten (1876) from material collected in 1873 on Tristan da Cunha by H. N. Moseley, a naturalist with the British Challenger Expedition, which circumnavigated the earth in 1872–1876. *B. membranacea* is a distinct species, easily known by its unistratose leaf cells that are elongate throughout the lamina and differentiated at the basal margins forming a long border of pellucid and straight-walled cells, as well as a capillaceous leaf hair-point, 0.1–0.35 mm, which is entirely hyaline or yellowish to yellowish-brownish in the proximal portion and hyaline above.

Despite its distinctness, *B. membranacea* has fallen into oblivion since Cardot (1911) considered it to be conspecific with *Racomitrium symphyodontum* (Müll.Hal.) A.Jaeger, whereas Dixon (1926) placed it in synonymy with the then all-encompassing *R. crispulum* (Hook.f. & Wilson) Wilson. This concept was subsequently adopted by Clifford (1955). Ochyra & Hertel (1990) resurrected *B. membranacea* from obsolescence and reported it from subantarctic Marion Island in the Prince Edward Island archipelago. It was subsequently recorded from Tierra del Fuego, the Falkland Islands and the Archipelago Juan Fernández in the Pacific Ocean (Ellis *et al.*, 2011b), where it is rare and occurs at high elevations. Thus, *B. membranacea* is a typical amphiatlantic subantarctic species and it is one of a long array of species showing this distribution pattern in the southern hemisphere. Examples include *Ditrichum conicum* (Mont.) Mitt. and *D. ditrichoideum* (Cardot) Ochyra (Ochyra & Lewis Smith, 1998) and *Bucklandiella orthotrichacea* (Müll.Hal.) Bednarek-Ochyra & Ochyra (Bednarek-Ochyra & Ochyra, 2012a). *B. membranacea* appears to have its main centre of occurrence on subantarctic islands in the Kerguelen Biogeographical Province where it occurs in abundance. Apart from Marion Island, it is known from Îles Crozet (Ellis *et al.*, 2013c) and Îles Kerguelen (Ellis *et al.*, 2015c), and herein it is recorded from Heard Island.

This highly isolated speck of land is the most glaciated of all subantarctic islands and at present about three quarters of its surface is covered with ice. During the Last Glacial Maximum glaciers covered the whole island and probably extended beyond its present coastline (Hall, 2004). Thus, it is very likely that its cryptogamic flora, including mosses, could not have survived on this island and it was established via long distance dispersal after the Last Glacial Maximum (Van der Putten *et al.*, 2010), as is the case with other austral polar islands, for example subantarctic South Georgia (Van der Putten *et al.*, 2004) and the antarctic South Shetland Islands (Birkenmajer *et al.*, 1985). Heard Island has the poorest moss flora of all subantarctic islands. Selkirk *et al.* (2008) reported about 40 species from this island but since then no less than 15 species have been added to the island's bryoflora (e.g. Blockeel *et al.*, 2008a; Ellis *et al.*, 2010, 2011a, 2012a, 2012b, 2013a, 2013b, 2014a, 2015b). Among these new additions are six species of *Bucklandiella* which is the richest moss genus in the island's moss flora and some species are common constituents of the vegetation.

5. *Dicranella heteromalla* (Hedw.) Schimp.

Contributor: V. E. Fedosov

Russia: Krasnoyarsk Territory, Taimyr Autonomous Distr., Putorana Plateau western edge, S-facing slope

of watershed between Glubokoe and Lama Lakes, 69.30131°N 90.08388°E, ca 60 m a.s.l., spruce and dwarf-shrub dominated wood on creek terrace, abundant on mineral ground under upturned roots of fallen tree with *Schistostega pennata* (Hedw.) F.Weber & D.Mohr, *Pohlia cruda* (Hedw.) Lindb., *P. prolifera* (Kindb.), 3 August 2015, leg. V. Fedosov ## 15-0817, 15-0823 (MW).

The species is widespread in the Holarctic, southward to the southern limit of northern (Subarctic) taiga subzone. This is the first record of the species in the Asian Subarctic and the northernmost record worldwide except for one isolated locality on the Arctic coast of Norway (Hallingbäck *et al.*, 2006), where the Gulf Stream provides mild climatic conditions. The closest other known localities for *Dicranella heteromalla* in Siberia are in the Kuznetskij Alatau Mountains and Salair Ridge (ca 54°N, ca 1600 km south from present locality), its northernmost locality in the western foothills of the Ural Mountains is at about 59°N, while its northernmost locality in Russia is in the Kola Peninsula (ca 68°N), also affected by the Gulf Stream. The present locality for the species is the first in the cryolithic zone.

6. *Elmeriobryum philippinense* Broth.

Contributors: J. Larraín, M. Suleiman and M. von Konrat

Borneo: Sabah, Tambunan District, Crocker Range Park, Mount Alab Substation, around the 'rest house', on cement and road banks and water ditches by the vehicular road, 1750 m a.s.l., 5°44'14.4"N 116°20'27.3"E, 27 September 2014, leg. J. Larraín 38075, with M. Suleiman & M. von Konrat (CONC, F, BORH).

Elmeriobryum Broth. is a small genus in the Hypnaceae, incorporating three species: *E. guatemalense* J.R.Rohrer from Central America, *E. wilhelmense* (E.B.Bartram) W.R.Buck & B.C.Tan from Papua New Guinea, and *E. philippinense*, previously known only from the islands of Luzon (Philippines) and Taiwan (Buck & Tan, 2007). Here we report a population growing by the side of a paved road in the highest peaks of the Crocker Range Park in Malaysian Borneo. The species was forming a lush pure population growing directly on the cement and walls of the road's draining ridges, covering an area ca 50 m long. The fact that the species was not found anywhere else in the surrounding native forests, and the population was lush in a human disturbed habitat, together with the conspicuous look and size of the plants, suggests that it might have been recently introduced to Sabah.

7. *Encalypta mutica* I.Hagen

Contributor: V. E. Fedosov

Russia: Krasnoyarsk Territory, Taimyr Autonomous Distr., Putorana Plateau western edge, vicinity of

Imangda abandoned settlement, Kyuhta Ridge, 69.15651°N 89.63342°E, ca 220 m a.s.l., limestone outcrops, on turf-covered rocks and in *Dryas*-dominated calcareous rocky tundra with *Tortella tortuosa* (Hedw.) Limpr., *Trichostomum crispulum* Bruch, *Encalypta procera* Bruch, *Orthothecium strictum* Lorentz, 27 July 2015, leg. V. Fedosov ## 15-0641, 15-0686, 15-0705, 15-0708, 15-0720, 15-0738 (MW).

The species was described from Norway and for a long time had been considered an endemic of Fennoscandia. Subsequently it was found in the western part of North America (Horton & Murray, 1976), Svalbard (Horton, 1983), Greenland (Mogensen, 1988) and Estonia (Ingerpuu *et al.*, 1994). Horton (1983) noted that new localities for the species could be expected in western Beringia, and it was actually found on the Chukotka Peninsula and Vrangal Island, as well as in Polar Ural, Russia (Afonina & Czernyadjeva, 1998). Further study of the bryophyte flora of Siberia contributed new localities in the Anabar Plateau (Fedosov *et al.*, 2011) and Yakutia (Ignatov *et al.*, 2014). The present record, made between Polar Ural and Beringia completes the circumpolar pattern for the distribution of *E. mutica*, mostly associated with subarctic mountains. Superficial disjunctions in the distribution of *E. mutica* are due to its specific ecotopes, and because the north of Siberia has been poorly studied. Both Horton (1983) and Afonina & Czernyadjeva (1998) noticed that the species is extremely rare throughout its range, but in the east Siberian north it is locally abundant in places where calcareous rocks outcrop.

8. *Fabronia ciliaris* var. *wrightii* (Sull.) W.R. Buck

Contributors: J. B. Silva, E. M. Dias, S. R. Germano and N. Dias dos Santos

Brazil: Parque Nacional (PARNA) Vale do Catimbau, Buíque, Pernambuco, 08°34'03.8"S 37°14'50.9"W, 704 m a.s.l., on *Syagrus coronata* (Marc.) Becc. bark sheath, 22 June 2014, leg. J.B. Silva 304 (UFP).

Fabronia ciliaris var. *wrightii* is a Neotropical taxon restricted to Mexico and Brazil (W³ TROPICOS, 2015). In the Brazilian Flora (Peralta, 2015), it was only recorded from Rio de Janeiro (RJ) state, southern Brazil, and in the Atlantic Forest, although this variety had been found on rocky outcrops in the state of Paraíba (ca 1752 km from RJ) in Caatinga Domain (Silva & Germano, 2013). During a collecting expedition to Parque Nacional (PARNA) Vale do Catimbau we identified the variety *wrightii*. This find extends the distribution of the variety in Brazil, occurring within the Caatinga area about 200 km from the Paraíba, and provides the first record for Pernambuco state. Despite the hot, semi-arid climate

in Catimbau, in xeric environments, var. *wrightii* occurs exclusively on shaded tree trunks (Delgadillo & Cárdenas, 2011).

The most reliable gametophytic character to identify this variety seems to be the shape of the leaf, which in var. *wrightii* is lanceolate with a long apex (Buck & Crum, 1978). However, it has often been identified primarily on the basis of the variable dentition of the leaf margin (Buck, 1994). Marginal tooth- ing is an extremely plastic character, sometimes even within a single collection (Buck & Crum, 1978; Buck, 1994). For example, longer and more frequent teeth are characteristic of plants growing in well-lit habitats (Buck, 1983). Marginal teeth in var. *wrightii* are characteristically intermediate between the extremes seen in other varieties of the species. Teeth are longer in the type variety and smaller, or lacking in *F. ciliaris* var. *polycarpa* (Hook.) W.R. Buck (Buck, 1983).

9. *Fabronia pusilla* Raddi

Contributors: M. S. Sabovljević and A. D. Sabovljević

Bosnia and Herzegovina: Republic of Srpska, Trebinje, main city park, 42.709542°N 18.344016°E, on the bark of *Cupressus sempervirens* L., 29 July 2014. leg./det. Marko S. Sabovljević and Aneta D. Sabovljević (BEOU Bryo 06911).

During a bryophyte collection trip to the southeastern part of Bosnia and Herzegovina, we collected *Fabronia pusilla* with sporophytes from the bark of various trunks of *Cupressus sempervirens* in the city park of Trebinje. *F. pusilla* was not listed for Bosnia and Herzegovina in Pavletić (1955), Sabovljević *et al.* (2008) or Ros *et al.* (2013). With this new record the moss flora of Bosnia-Herzegovina totals 577 species (out of 680 species in the complete bryophyte flora), and it is expected that with further exploration, the bryophyte diversity will increase as expected by Sabovljević (2004). Although Bosnia-Herzegovina has a rich documented bryophyte flora, there are few recent records (e.g. Sabovljević *et al.*, 2001, 2011), and further investigations are needed, as well as action in bryophyte conservation.

10. *Fissidens gracilifolius* Brugg.-Nann. & Nyholm

Contributors: M. N. Kozhin and E. A. Ignatova

Russia: Murmansk Province, Terskij Distr., Chavanga River Bay of the White Sea, 800 m upstream from the river mouth, 66°6'52.53"N; 37°44'57.89"E, wet fractured biotite gneiss beside the river. About 20 plants, 19 August 2014, leg. M. Kozhin *s.n.* (MW).

Fissidens gracilifolius is new to the Murmansk Province. The species sporadically occurs on wet calcareous rocks in Europe (Hedenäs & Hallingbäck, 2014), while in the northern part of Russia it is a rare species (Ignatov *et al.*, 2006). New localities for

F. gracilifolius were recently revealed in Fennoscandia (Norway, Sweden and Finland) and Leningrad Province (Leushina *et al.*, 2011), but it is still unknown from the Republic of Karelia and Arkhangelsk Province.

11. *Gymnomitrium corallioides* Nees

Contributors: J. Váňa and D. G. Long

Argentina: Tierra del Fuego, Ushuaia District, Parque Nacional Tierra del Fuego, SW slope of Cordillera Guanaco above Lago Roca, 54°48'56"S 68°32'13"W, on dry rock ledges on damp open hillside, 579 m a.s.l., 13 February 2003, *leg.* D. G. Long 31783, *det.* J. Váňa (E).

Gymnomitrium corallioides is a circumpolar, arctic-alpine species, newly found to be bipolar (new for the southern hemisphere and Latin America). Müller (1951–1958) considered three Holarctic *Gymnomitrium* Corda species, *G. concinatum* (Lightf.) Corda, *G. obtusum* Lindb. and *G. crenulatum* Gottsche *ex* Carrington, to be bipolar taxa. Grolle (1966) investigated the reports of these three species from the southern hemisphere and found that all were based on erroneous determinations; nearly all these reports (except for one specimen which was *Hygrolembidium andinum* (Herzog) R.M.Schust.) belonged to species of the genus *Herzogobryum* Grolle.

Váňa (1976) reported *Gymnomitrium concinatum*, on the basis of a collection by H. Roivainen, from the Chilean part of Tierra del Fuego (Fjordo Finlandia). This represents the first confirmed record of a Holarctic species of *Gymnomitrium* in the southern hemisphere, and the first bipolar species in that genus. Chen *et al.* (1995) erroneously reported *G. corallioides* from Antarctica (Fildes Peninsula). The voucher specimen for this record was studied by J.V. and found to be *Syzygiella teres* (Carrington & Pearson) Váňa (*cf.* Bednarek-Ochyra *et al.*, 2000).

Marsupella sparsifolia (Lindb.) Dumort. (Australia, New Zealand, South Africa, subantarctic islands) and *M. sprucei* (Limpr.) Bernet (New Zealand, southern South America, subantarctic islands) are also bipolar species in the family Gymnomitriaceae. More recently, an additional bipolar species was added: Váňa *et al.* (2010) reported *Prasanthus suecicus* (Gottsche *ex* Lange) Lindb. from Prince Edward Island. Therefore, five species of Gymnomitriaceae are now known to have a bipolar distribution.

12. *Lejeunea patens* Lindb.

Contributors: S. Poponessi and M. Aleffi

Italy: Genna Silana (Gulf of Orosei and Gennargentu National Park) Sardinian Region. National Park EUAP0944, UTM 32 T 543.4444, growing on damp shaded rock in a gorge in a forest of holm oak, 800 m a.s.l., 20 June 1971, *leg.* R. Düll *s.n.* (July 1971, *rev.* F. Koppe; 5 July 2014 *conf.*

S. Poponessi and M. Aleffi) (CAME) (www.anarc-hive.it).

During a bryological survey, *Lejeunea patens* was collected by R. Düll who identified it as *L. cavifolia* (Ehrh.) Lindb. Fritz Koppe revised the species as *L. patens*. The determination was confirmed by S. Poponessi and M. Aleffi. Generally there is no difficulty in recognising *L. patens* due to the strongly convex free part of the antical lobe of the leaves, the narrow angle where the postical margin meets the strongly arcuate keel, and underleaves which are rather small compared with the adjacent lobules. The angles are usually much wider in *L. lamacerina* (Steph.) Schiffn. and *L. cavifolia*, but some forms of the latter closely resemble *L. patens*. However, as with *L. lamacerina*, the oil-bodies provide the most reliable differentiating characteristic (Paton, 1999).

This is the first record of *Lejeunea patens* in Italy according to the *Check-list of the hornworts, liverworts and mosses of Italy* (Aleffi *et al.*, 2008). It is a Mediterranean/mountain, hemiboreal Eurasia + Macaronesia species, which in the Mediterranean is only found in Spain, France, Madeira and Portugal; as well as in Turkey with a report based on collections published before 1962, and in the Balears with a doubtful report (Dierßen, 2001; Ros *et al.*, 2007).

Following revision of specimens from Italian herbaria, all other reports of *L. patens* for Italy correspond to *L. lamacerina* and *L. cavifolia* (Aleffi *et al.*, 2008). On the basis of the diagnostic differences between the two species, a review of other Italian specimens from herbaria would be appropriate in order to define the actual distribution of both species in the Italian territory.

13. *Leucobryum bowringii* Mitt.

Contributors: P. Saha, M. N. Aziz and D. Maity

India: West Bengal: Darjeeling, Kurseong, Latpanchar, Ahaldara, on soil, 26°55'16"N 88°23'31"E, 1529 m a.s.l., 08 June 2013, *leg.* Pamela Saha 64476 (CAL); Kalimpong, Rishyap, on rotten log together with *Thuidium cymbifolium* (Dozy & Molk.) Dozy & Molk. and *Campylopus* Brid. sp. in the same colony, 27°06'27"N 88°39'16"E, 2700 m a.s.l., 14 June 2013, *leg.* Pamela Saha 64644 (CAL); Kalimpong, Loleygaon, on rotten log, 27°01'17"N 88°33'38"E, 1650 m a.s.l., 15 June 2013, *leg.* Pamela Saha 64656 (CAL).

Leucobryum Hampe is widely distributed throughout the tropical Asia and is represented by 83 species in the world (Crosby *et al.*, 1999). In India the genus has seven valid species (Yamaguchi, 1993) distributed all over the country.

Leucobryum bowringii is characterised by: plants of medium length, stems with central strand in transverse-section; leaves flexuose or contorted when dry,

lustrous, long, linear-lanceolate, smooth on abaxial side except at tip, not auriculate.

The species is found in a few locations in the Eastern Himalayas and Western Ghats. It is frequent in the Darjeeling district between ca 1500 and 3000 m a.s.l. This is the first report of its occurrence from the Darjeeling district in the state of West Bengal.

14. *Metzgeria saccata* Mitt.

Contributors: D. P. Costa and N. Dias dos Santos

Brazil: São Paulo, Ubatuba, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, Pico do Corcovado, 23°26'54"S 45°11'34"W, ca 1200 m a.s.l., sobre tronco de arbusto, May 2011, leg. N. D. Santos 1205 p.p. (RB).

Kuwahara (1966) described the genus *Austrometzgeria* Kuwah. with two species, *A. saccata* and *A. francana* (Steph.) Kuwah., and considered the former restricted to New Zealand, Tasmania, and Australia. So (2002) treated *Metzgeria francana* as conspecific with *M. saccata*, adopting the genus *Metzgeria* Raddi established by Raddi (1818) and considering New Caledonia to be the northernmost limit for this taxon. Benitez & Gradstein (2011) reported this taxon for the first time for tropical America. It was recorded from southern Ecuador (Loja and Zamora Chinchipe), on tree trunks, in upper montane cloud forest and páramo vegetation, between 2900 and 3500 m, mixed with other liverworts.

Metzgeria saccata is reported here for the first time for Brazil, and is the second record for tropical America. Collections of *M. saccata* were made in Atlantic Forest, in montane cloud forest, ca 1200 m, São Paulo State, Brazil, during the 2011 expedition of the project "Projeto Temático Gradiente Funcional do Programa Biota FAPESP".

The Atlantic Forest region is famous for the richness of its endemic taxa, and is considered the most important centre of endemism for liverworts in Brazil (Gradstein & Costa, 2003). According to Santos & Costa (2010), the montane and upper montane formations of the Atlantic Forest of southeastern Brazil are also characterised by species disjuncts with the Andes and southern element. Probably the disjunction presented by *M. saccata* is a result of a vicariance event by continental drift.

Metzgeria saccata is characterised by its wide and strongly lobate-saccate thallus. The species is rare and found as an epiphyte on tree trunks, associated with *Harpalejeunea stricta* (Lindenb. & Gottsche) Steph. and *Anoplolejeunea conferta* (C.F.W.Meissn. ex Spreng.) A.Evans.

15. *Oligotrichum parallelum* (Mitt.) Kindb.

Contributors: Y.-J. Yoon and B.-Y. Sun

Republic of Korea: Jeju Prov. (Island), Mount Halla; on humus over rocks, 8 August 1960, leg. W. S. Hong 215877 (NICH).

There are 27 species of *Oligotrichum* DC. in the world (Redfearn *et al.*, 1996), and *O. aligerum* Mitt. was reported from Korea by Choe (1980). *Oligotrichum parallelum* is recorded here for the first time from Korea. This species is restricted to the northern hemisphere where it is not rare on humus or rocks at high elevations. Previously, the species has been found in Japan (Hokkaido, Honshu, and Shikoku), Kamchatka, far-east Russia, and North America (Yukon, Alaska, and California). This species is similar to *Atrichum* P.Beauv. in appearance, but lacks a differentiated leaf border (Noguchi, 1987). It is distinguished from other species of *Oligotrichum* by the large plants with blackish-green leaves, which possess 4–5 ventral lamellae and have serrate or crenulate margins. In 2013, the herbarium specimen cited above was found during a visit to the Hattori Botanical Laboratory in Japan (NICH).

16. *Orthotrichum affine* Brid. var. *bohemicum* Plášek & Sawicki

Contributors: V. Plášek, L. Fialová, Z. Skoupá and J. Sawicki

Slovakia: Muráňská Planina National Park, 8.5 km NW of Muráň town and 7 km S of Závadka nad Hronom village, valley of Hronec river, near Klátna, on the bark of tree (*Alnus glutinosa* (L.) Gaertn.), GPS coordinates (WGS 84): 48°47'1"N 19°56'04"E, ca 827 m a.s.l., 24 April 2015, leg. L. Fialová, det. V. Plášek (herb. OSTR, # B681).

Twenty-one taxa of the genus *Orthotrichum* Hedw. (including *Nyholmiella* Holmen & E.Warncke) have previously been reported from Slovakia (Kubinská *et al.*, 2001). The specimen cited above was collected during a botanical trip to the National Park Muráňská Planina in 2015. It is an epiphytic moss new to the bryoflora of Slovakia. The fertile population was found growing on the bark of a black alder tree at the height of about 160 cm above the ground and with a ESE exposure. Examples of associated species include *O. pallens* Bruch ex Brid. and *Ulotia crista* (Hedw.) Brid.

It appears that the variety is geographically widespread. During the last 4 years it has been reported from the Czech Republic (Plášek *et al.*, 2011), USA (Ellis *et al.*, 2012b), Poland (Ellis *et al.*, 2012d), Sweden (Ellis *et al.*, 2013b), Ukraine (Ellis *et al.*, 2014b), and Belgium (Ellis *et al.*, 2014c). The locality cited above is also known as the only historical Slovak site for *Orthotrichum rogeri* Brid. However, its presence here, previously collected in 1938 by Šmarda (cf. Šmarda, 1948), could not be confirmed, even after a detailed field investigation in April 2015. *O. rogeri* seems to be extinct in Slovakia.

17. *Philonotis osculatiana* De Not.

Contributors: M. S. Jimenez and G. M. Suárez

Chile: Región Metropolitana. Macul, October 1925, *leg.* Claude-Joseph 3421 (US). **Perú:** Cuzco. About two thousand feet above the Urubamba River near Machu Picchu, *ca* 7000 ft. a.s.l., 5 July 1962, *leg.* Worthley *s.n.* (US).

During an ongoing revision of the genus *Philonotis* Brid. occurring in South America (Jimenez *et al.*, 2014; Jimenez & Suárez, 2015), some herbarium samples collected in Chile and Perú and deposited in US, were identified as *Philonotis osculatiana*, an acrocarpous moss not previously reported for these countries (Menzel, 1992; Müller, 2009). A comparison with the type specimen of *P. osculatiana* confirmed their identity (isotype: Colombia, ad fl. Napo, *Osculati s.n.*, PC! PC0133484).

Philonotis osculatiana was described by De Notaris (1859) on the basis of samples collected in the Napo region (Colombia) by *Osculati*. Later, Florschütz-de Waard & Florschütz (1979) and Churchill & Linares (1995) confirmed its presence in Magdalena (Colombia), but it was not recorded for any other country until now.

Philonotis osculatiana is a distinctive species, but can be easily confused with *P. fontanella* (Hampe) A.Jaeger by the habit of the plants, the yellowish-green colour, the strong and robust, percurrent, sometimes excurrent costa, and the distal position of the papillae on the laminal cells. However, it differs by the presence of triangular-lanceolate leaves with plane margins that are dentate to slightly-serrate at the leaf apex, laminal cells oblong-rectangular to sub-linear, papillose on the distal angles, and a costal transverse-section rounded with a rounded stereid band. This last character has a great taxonomic value, since it is the only species of the genus from South America that has this trait.

In Chile *P. osculatiana* was collected in the Metropolitan Region, at *ca* 700–1000 m (= 2300–3300 ft) a.s.l. while in Peru it was found about 600 m above the Urubamba River near Machu Picchu, *ca* 2100 m (= 7000 ft) a.s.l.

18. *Pohlia cruda* (Hedw.) Lindb.

Contributor: R. Ochyra

Ethiopia: Bale Province, Bale Mountains, (1) east of Kara Deema, 6°50'N 39°43'E, 4120 m a.s.l.; ericaceous belt, *Philippia* Klotzsch woodland and thicket, *Philippia keniensis* S.Moore relic group on NE-facing slope, in soil pockets between boulders (wind and fire shelter), 27 January 1990, *leg.* Georg and Sabine Miehe 1459 (KRAM); (2) Tullu Deemtu, 6°49'N 39°49'E, 4300 m a.s.l.; afroalpine *Helichrysum* Mill. heath affected by strong substrate movement on 30–38° SW-facing upper slope with negligible rodent influence, moss in sheltered location on humic ground, 21 February 1990, *leg.* Georg and Sabine Miehe 2695 (KRAM).

Pohlia cruda is a bipolar species with some intermediate occurrences in the Neotropics and the Hawaiian Islands, where it occurs at altimontane elevations (Ochyra *et al.*, 2008). In Africa the species has hitherto been known only from Morocco and Algeria (Ros *et al.*, 1999), Lesotho and South Africa (O'Shea, 2006), and from the Rwenzori Mountains of Uganda (Blockeel *et al.*, 2007b). In this note, *P. cruda* is recorded from two stations in the Bale Mountains of Ethiopia. The voucher specimens were initially named *P. afrocruda* (Müll.Hal.) Broth. (Miehe & Miehe, 1994; O'Shea, 2006) but re-examination of these plants revealed their perfect correspondence to typical phenotypes of *P. cruda*. Ethiopia is still understudied bryologically and the recent field work carried out in various parts of this country yielded a number of new additions to its bryoflora (e.g. Koponen, 1993; Wigginton, 2001; Blockeel *et al.*, 2001, 2004, 2009a; Ellis *et al.*, 2012c).

19. *Pohlia drummondii* (Müll.Hal.) A.L.Andrews

Contributors: R. Ochyra and I. Parnikoza

Antarctica, Argentine Islands: Galindez Island, 30 m inland from Crystal Bay, in the southern part of the extensive moss peat bank dominated by *Polytrichum strictum* Brid., on slope with NW exposure, 14 m a.s.l., 65°14.886'S 64°15.060'W, on skua nest in tufts of *P. strictum*, 28 January 2014, *leg.* I. Parnikoza *s.n.* (KRAM).

The Argentine Islands are a group of 13 islands and islets in the Wilhelm Archipelago situated 9 km south-west of Petermann Island and 7 km north-west of Cape Tuxen in the Graham Coast on the Antarctic Peninsula. In 1954, the Falkland Islands Dependencies Survey set up a hut on Galindez Island which became known officially as Base F and in 1977 it was renamed Faraday Station. In 1996, it was handed over to the Ukraine and renamed Vernadsky Research Base. The vegetation and flora of the Argentine Islands was surveyed by Lewis Smith and Corner (1973). Their collection of mosses consisted of 32 species (Ochyra *et al.*, 2008). One more species, *Leptobryum pyriforme* (Hedw.) Wilson, was discovered on Galindez Island in the Ukrainian period of research (Blockeel *et al.*, 2006b). Herein, the next species *Pohlia drummondii* is added to the bryoflora of this island group. This bipolar species is rare though widely scattered in the northern maritime Antarctic, primarily on the periantarctic archipelagoes of the South Sandwich Islands, South Orkney Islands, South Shetland Islands and Palmer Archipelago, with a single site on the Danco Coast on the Antarctic Peninsula. A highly isolated station for the species is known from Lahille Island in the Grandidier Channel off the Graham Coast and this is the southernmost locality for this species. Outside the Antarctic, *P. drummondii*

is known in the southern hemisphere from Patagonia (Matteri, 1985), subantarctic South Georgia (Clarke, 1973) and Marion Island (Blockeel *et al.*, 2008b) and once it was recorded from southeastern Australia (Shaw, 2006).

20. *Racomitrium patagonicum* Bednarek-Ochyra & Ochyra

Contributors: R. Ochyra and V. Plášek

Chile: XI Región Aysén del General Carlos Ibáñez del Campo, Provincia Capitán Prat, near the bridge on Río El Salto, ca 25 km south of Cochrane and 5 km south of Lago Esmeralda along Ruta 7, 266 m a.s.l., 47°19'969"S 72°39'440"W, on dry, exposed and strongly insolated stone on the left-hand side of the river bank above the cascade, 15 January 2015, *leg.* H. Bednarek-Ochyra, R. Ochyra & V. Plášek 483/15 (KRAM, SGO).

Racomitrium patagonicum is a southern South American endemic species, known from central and southern Chile, Western Patagonia in Argentina, and Tierra del Fuego, extending to the Falkland Islands (Bednarek-Ochyra & Ochyra, 2003). It has its main centre of occurrence in Chile where it ranges from the VII Maule Region to the XII Region of Magallanes and Chilean Antarctica. However, so far it has not been recorded from the XI Region of Aysén and this gap in its continuous range in Chile (Ireland *et al.*, 2005; Müller, 2009) is filled by the present discovery of *R. patagonicum* in Provincia Capitán Prat of this region.

21. *Rhodobryum ontariense* (Kindb.) Kindb.

Contributors: R. Ochyra and T. Wójcik

Poland: Western Carpathians, Pogórze Strzyżowskie foothills, Kołaczyce 8 km north of Jasło, on the southern slope of the valley of the Wisłoka River, north of the village, 300 m a.s.l., 49°49.027'N 21°26.112'E (ATMOS grid square Ff-90), in xerothermic grassland dominated by *Gentiana cruciata* L., *Centaurea scabiosa* L., *Origanum vulgare* L., *Agrimonia eupatoria* L. and *Euphorbia cyparissias* L., associated with *Homalothecium lutescens* (Hedw.) H. Rob., *Campyliadelphus chrysophyllus* (Brid.) R.S. Chopra, *Eurhynchiastrum pulchellum* (Hedw.) Ignatov & Huttunen, *Plagiomnium cuspidatum* (Hedw.) T.J. Kop. and *Thuidium delicatulum* (Hedw.) Schimp., 11 July 2014, *leg.* T. Wójcik *s.n.* (KRAM).

Rhodobryum ontariense has been a long neglected species, which was resurrected from obsolescence by Iwatsuki & Koponen (1972) who provided convincing evidence for its distinctness from the widely distributed *R. roseum* (Hedw.) Limpr. with which it was commonly merged. A revision of Polish collections of this genus as well as field studies resulted in the discovery of *R. ontariense* at several localities in the southern uplands of Poland and in the Polish Western Carpathians (Ochyra & Szmajda, 1983; Ochyra

et al., 1985). The species appears to be most widespread in the Wyżyna Krakowsko-Częstochowska upland, where it was recently discovered at additional sites (Fojcik, 2011) and to be rare in the Wyżyna Kielecko-Sandomierska. The second centre of its distribution is in the Pieniny Klippen Belt in the Western Carpathians. *R. ontariense* is associated with the calcareous substrates which are common in the aforementioned regions and usually it grows in xerothermic grassland, shrub and deciduous forest. Such sites are largely lacking in the Polish Western Carpathians. Hence, discovery of the species in the Pogórze Strzyżowskie foothills is remarkable since flysch rocks predominate in this region, but in the Wisłoka River valley schist outcrops rich in calcium carbonate occasionally occur. As a result fertile soils in such base-rich sites, in some exposed and strongly insolated parts of the river valleys, support small stands of xerothermic vegetation of the *Festuco-Brometea* class, which provide suitable habitats for *R. ontariense*.

22. *Riccia canaliculata* Hoffm.

Contributors: S. Ștefănuț and R. Ion

Romania: Covasna County: Reci, Mestecănișul de la Reci Reserve, 45°49'29.49"N 25°56'8.16"E, 532 m a.s.l., 25 June 2015, *leg. et det.* S. Ștefănuț (BUCA B4824).

Riccia canaliculata was collected in the Mestecănișul de la Reci Reserve. The population was found by a pond with abundant vegetation, the margin enclosed by a ring of *Alnus glutinosa* (L.) Gaertn. The central area was occupied by a compact group dominated by *Schoenoplectus lacustris* (L.) Palla along with *Alisma plantago-aquatica* L., *Carex vesicaria* L., *C. lasiocarpa* Ehrh., *Eleocharis palustris* (L.) Roem. & Schult., *Juncus effusus* L., *Lycopus europaeus* L., *Lythrum salicaria* L., *Myosotis scorpioides* L., *Polygonum amphibium* L., *Sparganium erectum* L., *Thelypteris palustris* Schott and *Typha latifolia* L. The open water was populated by *Callitriche palustris* L., *Lemna minor* L., *Ricciocarpos natans* (L.) Corda and *Utricularia vulgaris* L. This community was bordered by a dense stand of *Lysimachia vulgaris* L. and the glacial relict *L. thyrsiflora* L. with *Cicuta virosa* L., *Galium uliginosum* L., *Scutellaria galericulata* L., and *Symphytum officinale* L.

Riccia canaliculata was found on mud along with other liverworts such as *R. rhenana* Lorb. ex Müll. Frib., *R. fluitans* L., *Ricciocarpos natans*, and *Marchantia polymorpha* L. subsp. *ruderalis* Bischl. & Boisselier.

This is the first confirmation of *Riccia canaliculata* in Romania for more than 120 years. It was reported from Arad and near Cermei along Töz Brook, by L. Simonkai, as *Ricciella fluitans* (L.) A. Braun var. *canaliculata* (Hoffm.) Roth (Simonkai, 1893;

Ștefănuț, 2008), but we did not find herbarium samples in BUC, BUCA, BP, or W. So, it cannot be confirmed that Simonkai's report refers to *Riccia canaliculata*.

The conservation status of *Riccia canaliculata* is changed from DD (Ștefănuț & Goia, 2012) to CR B1ab(ii,iii) + 2ab(ii,iii), but we suspect that this species has a much larger distribution in Romania and probably is not so threatened.

The nearest other locality for this species is in Hungary. In Europe *R. canaliculata* has been reported from Finland, Norway, Sweden, Denmark, Great Britain, Corsica, France, Italy, Portugal, Sardinia, Spain, Austria, Belgium, Czech Republic, Germany, Netherlands, Switzerland, Slovakia, Poland, Crete, Greece, Hungary, Romania, Belarus, Lithuania, Ukraine, and Russia (Söderström *et al.*, 2002, 2007; Ros *et al.*, 2007; Hodgetts, 2015).

23. *Schistidium rivulariopsis* (R.S.Williams) Ochyra

Contributor: R. Ochyra

Africa, Kenya: eastern slope of Mount Elgon above Japata estate, 3300 m a.s.l., 1°09'N 34°38'E, in a small brook in the lower part of the alpine region, below Koitoboss, 2 March 1948, *leg.* Olov Hedberg 228b (PC, S).

In the large and morphologically diverse genus *Schistidium* Bruch & Schimp. there is a relatively small group of species that grow on stones and boulders in the beds of montane streams and rivers, often submerged in swiftly flowing water. This is a rare ecological feature in this genus and rheophytic species of *Schistidium* possess some morphological adaptations for thriving in such habitats. These include variously polystratose distal laminal cells, fleshy marginal borders and strong costae (Ochyra, 1985a, 1985b, 1987; Ochyra & Vanderpoorten, 1999; Bednarek-Ochyra & Ochyra, 2012b). All these features are exhibited by *S. rivulariopsis*, a very rare Andean species, known only from Ecuador and Colombia, which was only recently reinstated as a species in its own right (Ochyra & Bednarek-Ochyra, 2011). Herein, this species is recorded for the first time from Africa where it was found on the eastern slope of Mount Elgon in Kenya. This specimen was determined as *S. apocarpum* (Hedw.) Bruch & Schimp. var. *rivulare* (Brid.) Bruch & Schimp. and published by Potier de la Varde (1955). The two species show a striking similarity and Deguchi (1987) actually considered them to be conspecific. Nevertheless, *S. rivulariopsis* is at once distinct in having small and minutely roughened spores, 12–13 μm in diameter, a lack of stomata and entire leaf margins at the apex. The African material perfectly matches the Ecuadorian type material of *S. rivulariopsis*. The present discovery increases by one distinct species the number of Afro-American species of moss (e.g.

Frahm, 1982; Allen & Crosby, 1986; Ochyra *et al.*, 1992; Wilbraham & Matcham, 2010; Bednarek-Ochyra & Ochyra, 2013). The group currently consists of about 80 species, but probably, with progress in taxonomic and field studies, the final tally of species showing this distribution pattern will be higher.

24. *Schistidium sordidum* I.Hagen

Contributor: T. Kiebacher

Italy: Veneto, Belluno, Cortina d'Ampezzo, Dolomites, at the base of the northern summit slope of the Lagazuoi mountain, 100 m W Forcella Lagazuoi, 46°31'48.1"N 12°00'44.0"E, 2594 m a.s.l., at the bottom of a rock face, on wet dolomite rock, 28 June 2015, *leg.* T. Kiebacher *s.n.* (priv. herb. T. Kiebacher).

Schistidium sordidum is morphologically and ecologically a very distinctive species. Molecular studies revealed that it was probably the most basal species of the genus (Milyutina *et al.*, 2010). The leaves of *S. sordidum* are strongly concave, its apices broadly rounded and they lack a hair-point and can thereby easily be recognised, even in the field. Its habitat is characterised by wet calcareous rocks on preferably north exposed slopes at high altitudes. Frequently, it grows as a pioneer without any accompanying species (Kiebacher & Köckinger, 2015).

Schistidium sordidum was described in 1901 from Mount Finshö in the central part of southern Norway (Hagen, 1901) and for a long time the species was known only from Norway (Hofmann, 2004). One reason for that might be that until the revision of Blom (1998) the species was widely misunderstood and it was placed within disparate taxa (Amann *et al.*, 1918; Mönkemeyer, 1927; Nyholm, 1954–1969; Bremer, 1980; see also Kiebacher & Köckinger, 2015).

Currently the species is reported from Norway, Sweden, Finland, Svalbard (Blom, 1998), Russia (Blom, 1998, Ignatova *et al.*, 2009), France (Skrzypczak, 2009), Germany (Meinunger & Schröder, 2007), Austria (Blom, 1998; Hofmann, 2004; Köckinger *et al.*, 2008; Amann *et al.*, 2013; Schröck *et al.*, 2013), and Switzerland (Hofmann, 2004; Bergamini, 2006; Kiebacher & Köckinger, 2015). In the Alps the first record was made by H. Köckinger in 1997 in Austria (Hofmann, 2004). Since then several records followed in Austria as well as in other countries of the Alps (Germany and Switzerland).

The Italian population was quite small, consisting of approximately a dozen tufts. But sites with similar ecological conditions are frequent in this central part of the Southern Alps. The species is very likely to occur at several other localities in the Dolomites, also in the adjacent provinces.

25. *Schistidium tenuinerve* Ignatova & H.H.Blom

Contributors: E. A. Ignatova and M. N. Kozhin

Russia: Murmansk Province, Terskij Distr., Kandalaksha Bay of the White Sea, eastern part of Porya Guba Bay, seaside of Nikolskaya Bay, 66°44'40.37"N 33°49'0.76"E, ca 5 m a.s.l., on a big stone among grassland, 25 October 2011, *leg.* M. Kozhin (MW ##M-M-899, KAND ##1850(80)).

This is the first record for *Schistidium tenuinerve* in Europe. The species occurs mainly in north Asia with a sporadic distribution in the Anabar Plateau (Krasnoyarsk Territory), southern Siberia (Irkutsk Province and Altai), and in several localities in Kamchatka and the Commander Islands (Ignatova *et al.*, 2009; Fedosov *et al.*, 2012). In Asia *S. tenuinerve* grows in the alpine belt of mountains and in the treeless areas of rocky plateaux, at altitudes of 380–2000 m a.s.l., on dry rock surfaces and on fine soil in rock crevices. The new collection in Europe was made on granulite (gneiss that has experienced high-temperature and moderate pressure metamorphism) boulders of the coast of the White Sea (3–5 m a.s.l.). Its habitat reflects the conditions on the White Sea coast. It was found in meadows with sparse junipers, surrounded by northern spruce taiga forests and crowberry heathlands. A similar pattern of distribution is shown by *Schistidium sibiricum* Ignatova & H.H.Blom, *Pylaisia selwynii* Kindb. and *Myuroclada longiramea* (Müll.Hal.) M.Li, Y.F.Wang, Ignatov & Huttunen, which also have their main distribution areas in Asia with some disjunct localities in northern Europe.

26. *Schistostega pennata* (Hedw.) F.Weber & D.Mohr

Contributor: V. E. Fedosov

Russia: Krasnoyarsk Territory, Taimyr Autonomous Distr., Putorana Plateau western edge, S-facing slope of watershed between Glubokoe and Lama Lakes, 69.30131°N 90.08388°E, ca 60 m. a.s.l., spruce & dwarf-shrub dominated wood on creek terrace, abundant on mineral ground under upturned roots of fallen tree with *Dicranella heteromalla* (Hedw.) Schimp., *Pohlia cruda* (Hedw.) Lindb., *P. prolifera* (Kindb.) Arnell, 3 August 2015, *leg.* V. Fedosov ## 15-0821, 15-0824, 15-0847, 15-0862 (MW).

Schistostega pennata is a widely distributed species in temperate and southern parts of the boreal zone. It avoids areas with a calcareous bedrock composition and xeric areas; it is also absent from the Arctic. This present locality for the species is the first in the Russian Subarctic and the northernmost record worldwide except Scandinavia. In the latter region, the species penetrates to the northern coast at ca 71°N (Hallingbäck *et al.*, 2006), but the Gulf Stream provides rather mild climatic conditions here. The closest known other localities for the species are in the west Siberian North (in the vicinity of Kogalym Town, ca 62°N). In Yakutia the species was found in

two localities, with the northern one at 64.38°N in the middle taiga subzone (Ivanova & Ignatova, 2008). On the western foothills of the Putorana Plateau, the rather high precipitation and summer temperature provide suitable conditions for the growth of spruce forests and some generally more southern bryophytes, including *Dicranella heteromalla* (see above).

27. *Sciuro-hypnum oedipodium* (Mitt.) Ignatov & Huttunen *s.s.*

Contributors: M. N. Kozhin, E. A. Ignatova and E. O. Golovina

Russia: Murmansk Province, Terskij Distr., Kandalaksha Bay of the White Sea, Por'ya Guba Bay: (1) Ozerchanka Isle, depression between small rocky ridge, on a 3° slope S–E exposure with boulder-pebble deposits, 66°40'37.74"N 33°53'1.86"E, heathland with crowberry and forbs, with abundance of *Arctostaphylos uva-ursi* (L.) Spreng., *Rubus saxatilis* L., *Solidago lapponica* With., *Geranium sylvaticum* L., *Hieracium* sp., on poor dry peat, 4 August 2012, *leg.* E. Golovina (MW ##80, KAND ##1850(80)). (2) Lesnoy Island, 66°41'32.96"N 33°52'31.98"E, paludified heathland with heather, crowberry, and cloudberry, with *Rhododendron tomentosum* (Stokes) Harmaja, *Andromeda polifolia* L. among a depression between rocks, on the slope 1–4° NNW exposure, 11 July 2013, *leg.* E. Golovina (MW ## 5, KAND ## 1062 (5)).

Sciuro-hypnum oedipodium is newly recorded for northern Europe. It is widespread in western North America (British Columbia, Yukon, Alaska, Arizona, Colorado, Idaho, Montana, New Mexico, Utah, Washington, and Wyoming) and rare in Eurasia, where it is known from a few places in the Caucasus and in one locality in Chukotka (Ignatov & Milyutina, 2007b; Ignatova *et al.*, 2008; Draper & Hedenäs 2009; Ignatov, 2014). In North America, it grows on decaying vegetable matter and mineral soil in mountain forests at low to high elevations (40–3700 m) (Ignatov, 2014). The habitats of the species in the Caucasus are pine forests, crooked birch forests, prostrate rosebay shrubs and grasslands in the upper forest and subalpine belts at 2050–2750 m (Ignatov & Milyutina, 2007a; Akatova, 2008; Ignatova *et al.*, 2008); in Kamchatka it was found in a hot spring area (Ignatov & Milyutina, 2007a).

The new localities for the species in Murmansk Province are on small islands in the White Sea, in a rare and peculiar habitat, *i.e.* treeless boggy crowberry heathland with a variety of vascular plants, lichens and mosses. The species grew in small amounts on moist peat in the sparse presence of *Hylocomium splendens* (Hedw.) Schimp., *Pleurozium schreberi* (Willd. ex Brid.) Mitt., *Sanionia uncinata* (Hedw.) Loeske,

Dicranum brevifolium (Lindb.) Lindb., *D. scoparium* Hedw., *D. majus* Sm., *Aulacomnium palustre* (Hedw.) Schwägr. and *Polytrichum commune* Hedw.

28. *Splachnum sphaericum* Hedw.

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

India: Arunachal Pradesh; Tawang – Se La Pass; 27°30'47.1"N, 91°51'31.6"E, 4137 m, a.s.l., on Yak dung, 17 June 2015, *leg.* K. K. Rawat *s.n.* (LWG 300254).

Splachnum sphaericum is an interesting moss, owing to its unique habitat on dung, known from North America, Greenland, Europe, Siberia, China, and Nepal (Iwatsuki & Steere, 1975; Smith, 2004; Ignatov *et al.*, 2006), it is reported here from Arunachal Pradesh, which is a new record for India.

The plants formed green, erect, tufts on Yak dung. They had closely imbricate, obovate rotundate, acuminate leaves with entire margins, and were fertile, with erect capsules on reddish-brown setae, 3–5 mm long. Spores were rounded, light yellowish-brown and 8 µm in diameter.

29. *Syntrichia norvegica* F. Weber

Contributors: A. K. Asthana, P. Srivastava and I. Omar

India: Eastern Ghats, South India, Karnataka, Chamrajanagar, Malai Mahadeshwara Wild Life Sanctuary, Kollegal, 11°58.348'N, 077°37.152'E, on soil covered rocks, 1025 ft a.s.l., 16 April 2014, *leg.* A. K. Asthana & party *s.n.* (LWG 256186).

Lal (2005) and Daniel (2010) reported two species of *Syntrichia* Brid. as occurring in India, while Aziz & Vohra (2008) recognised eight Indian species. *Syntrichia norvegica* had been recorded from Kashmir. This taxon also occurs in Japan, North America, Europe, Caucasus, Greenland, North Asia, Siberia, and Madeira. During a recent investigation of the bryoflora of the Eastern Ghats, *S. norvegica* was identified from Malai Mahadeshwara Wild Life Sanctuary, Karnataka, thus extending its range of distribution to South India.

The plants were robust, erect, and yellowish-brown, with leaves arranged in several rows. The leaves possessed a reddish-brown costa, *ca* 60 µm wide at the base, and excurrent in an arista; quadrate laminal cells were adorned with 2–4 'c'-shaped papillae.

30. *Syrrhodon scalariformis* Dixon

Contributor: L. T. Ellis

Malaysia, Sarawak: Bengoh, south of Kuching, *s.coll. s.n.* (Hb. Mitten – NY 02045688).

An anonymous collection in the herbarium of William Mitten (NY) was annotated by W.D. Reese in 1998 as having been misidentified as the New World species *Syrrhodon flexifolius* Mitt. However, no specific alternative identity was proposed in the annotation. The specimen is here identified as the

rare montane forest species *S. scalaris*, which was originally described from Sarawak in northern Borneo (Dixon, 1935). Mohamed & Reese (1986) placed *S. scalaris* in synonymy with *S. spiculosus* Hook. & Grev., but it has subsequently been recognised as a distinct species and comprehensively illustrated by Eddy (1990, Figure 211) and Ellis (2007, Figure 5). The specimen of *S. scalariformis* cited above was likely collected in the 19th century, and was apparently discovered in 'Bengoh' in the extreme west of Sarawak. It represents an isolated record, remote from the only other known localities for the species, which are clustered at the eastern end of Sarawak, i.e. Mount Dulit (Dixon, 1935), and Gunong Mulu National Park (Ellis, 2007). Apparently endemic to Sarawak, *S. scalariformis*, although rare, appears to be significantly more widespread than was hitherto appreciated, and likely to be found elsewhere in Borneo.

31. *Timmia austriaca* Hedw.

Contributor: M. J. Cano

Andorra: Canillo, Port d'Envalira, Clots de la Menera, 42°31'N 01°43'W, 2585 m a.s.l., in granite rock crevices near snowfields, 27 July 2012, *leg.* C. Aedo & J. Pedrol 19284 (MUB 41877).

Timmia austriaca is an Arctic-montane species found in Greenland, North America, Eurasia (Alps, Greece, Italy, Pyrenees, Scandinavia, United Kingdom), Iceland and Asia (Russia) (Brassard, 2007). In the Iberian Peninsula, this species forms turfs on stony soils and in calcareous rock crevices, from the lowlands to high mountains in the northeastern part of Spain (Casas *et al.*, 2006; Álvaro, 2010). The collection here reported was identified from a set of bryophytes from Andorra collected in 2012. No species of *Timmia* Hedw. had been previously recorded in this country (Casas, 2005; Álvaro, 2010). Although *T. austriaca* has been reported as a calcicolous species in the Iberian Peninsula, the material from Andorra was found growing in crevices of granite rock at 2585 m. It is therefore the highest known Iberian station for the species.

32. *Timmia bavarica* Hessel.

Contributor: M. J. Cano

Andorra: Ordino, Segudet, 42°33'N 01°32'W, 1480 m a.s.l., slopes near to a road, 8 August 2014, *leg.* M.J. Cano 8653 (MUB 48135); Canillo, parroquia de Canillo, 42°33'N 01°36'W, 1540 m a.s.l., on rock in *Pinus* forest, 27 July 2005, *leg.* C. Aedo 12193 (MUB 18584).

Timmia bavarica is an Arctic-montane species found on all the major mountains in the northern hemisphere (Rocky Mountains, Himalayas, Alps, Pyrenees, Caucasus, Urals) with some disjunct populations in mountain areas of North Africa, Mexico, and Hawaii (Ellis *et al.*, 2011a). According to Álvaro (2010), in the Iberian Peninsula this species occurs in

montane areas of diverse Spanish provinces, however it had not been recorded in Andorra until now. During a field trip to Andorra, in connection with the “*Flora Briofítica Ibérica*” project, a specimen of *T. bavarica* with sporophytes was collected. In addition, a second collection of this species was found deposited in MUB. These collections represent the first record of the species in this country.

33. *Warnstorfia trichophylla* (Warnst.) Tuom. & T.J.Kop.

Contributors: J. Żarnowiec and R. Ochyra

U.S.A., Oregon: Coos County, North Spit of Coos Bay, T25S, R13W, Sec. 7, 3 m a.s.l., aquatic, very common in a shallow pond with *Salix* L, *Carex* L. and *Eleocharis* R.Br., 13 July 1993, leg. Richard H. Halse 4642 (KRAM). **Michigan:** Cheboygan County. Douglas Lake Region, Maple River below Maple River Dam, edge of pool, 30 June 1950, leg. R. F. De Berg s.n. (AK-44467 & AK-44544).

Warnstorfia trichophylla has long remained an inadequately known species until Tuomikoski (1949) clarified its taxonomic status and presented its distribution in Fennoscandia. It was subsequently recorded for the first time in North America in Alaska (Persson & Shacklette, 1959; Persson, 1962), and Ireland *et al.* (1980) reported it from the Yukon Territory and the Northwest Territories. In the second edition of a checklist of the Canadian mosses, it was also reported from British Columbia and Manitoba (Ireland *et al.*, 1987). Hedenäs (2014) stated that many records of this species from North America actually referred to *Drepanocladus longifolius* (Mitt.) Paris and only confirmed the occurrence of *W. trichophylla* for Alaska, Nunavut, and Manitoba. The distribution of this species is apparently still poorly known in North America and the present discoveries in Oregon and Michigan suggest that it could also be found elsewhere on this continent. The plants from Oregon and Michigan match perfectly the concept of *W. trichophylla* and they are characterised by radially branched shoots, distinctly serrate leaf margins and penicillate apices of the stem and branches.

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