

## Bryological Note

## New national and regional bryophyte records, 53

L. T. Ellis<sup>1</sup>, O. M. Afonina<sup>2</sup>, R. L. Andriamiarisoa<sup>3</sup>, H. Bednarek-Ochyra<sup>4</sup>, B. Cykowska-Marzencka<sup>4</sup>, M. Stryjak-Bogacka<sup>4</sup>, N. E. Bell<sup>5</sup>, M. Boiko<sup>6</sup>, D. A. Callaghan<sup>7</sup>, P. Campisi<sup>8</sup>, M. G. Dia<sup>8</sup>, M. L. Marino<sup>8</sup>, F. Proenzano<sup>8</sup>, J. Eckstein<sup>9</sup>, J. Enroth<sup>10</sup>, P. Erzberger<sup>11</sup>, T. Ezer<sup>12</sup>, M. L. Gagano<sup>13</sup>, E. Ginzburg<sup>14</sup>, P. Górski<sup>15</sup>, S. R. Gradstein<sup>16</sup>, C. Reeb<sup>16</sup>, C. Hannoire<sup>17</sup>, M. Infante<sup>17</sup>, I. Jukonienė<sup>18</sup>, E. V. Kushnevskaya<sup>19</sup>, M. Lebouvier<sup>20</sup>, J. Nagy<sup>21</sup>, A. Opmanis<sup>22</sup>, V. Plášek<sup>23</sup>, Z. Skoupá<sup>23</sup>, M. S. Sabovljević<sup>24</sup>, A. D. Sabovljević<sup>24</sup>, J. R. Shevock<sup>25</sup>, D. K. Singh<sup>26</sup>, S. Majumdar<sup>26</sup>, M. Skudnik<sup>27</sup>, A. Uselienė<sup>28</sup>, G. Venturella<sup>29</sup>, M. Węgrzyn<sup>30</sup>, P. Wietrzyk<sup>30</sup>, Y.-J. Yoon<sup>31</sup>, J. H. Kim<sup>31</sup>, E. Yücel<sup>32</sup>

<sup>1</sup>The Natural History Museum, London, UK, <sup>2</sup>Komarov Botanical Institute, Russian Academy of Sciences, Saint Petersburg, Russia, <sup>3</sup>Missouri Botanical Garden, Antananarivo, Madagascar, <sup>4</sup>W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków, Poland, <sup>5</sup>Royal Botanic Garden Edinburgh, Edinburgh, UK, <sup>6</sup>Department of Botany, Kherson State University, Kherson, Ukraine, <sup>7</sup>Bryophyte Surveys Ltd, Stroud, Gloucestershire, UK, <sup>8</sup>Department of Biological, Chemical and Pharmaceutical Sciences and Technologies Section of Botany and Plant Ecology, University of Palermo, Palermo, Italy, <sup>9</sup>Göttingen, Germany, <sup>10</sup>Department of Biosciences, University of Helsinki, Helsinki, Finland, <sup>11</sup>Berlin, Germany, <sup>12</sup>Biology Department, Niğde Ömer Halisdemir University, Niğde, Turkey, <sup>13</sup>Department of Earth and Marine Sciences, University of Palermo, Palermo, Italy, <sup>14</sup>Komarov Botanical Institute of the Russian Academy of Sciences, Saint Petersburg, Russia, <sup>15</sup>Department of Botany, Poznań University of Life Sciences, Poznań, Poland, <sup>16</sup>Institut de Systématique, Évolution, Biodiversité, Muséum National d'Histoire Naturelle, Sorbonne Universités, Paris, France, <sup>17</sup>Conservatoire Botanique National des Pyrénées et de Midi-Pyrénées, Bagnères-de-Bigorre, Hautes-Pyrénées, France, <sup>18</sup>Nature Research Centre, Vilnius, Lithuania, <sup>19</sup>Department of Plant Ecology and Geobotany, Saint Petersburg State University, Saint Petersburg, Russia, <sup>20</sup>CNRS UMR 6553, Université de Rennes 1, Rennes, France, <sup>21</sup>Department of Botany, Szent István University, Budapest, Hungary, <sup>22</sup>Latvian Nature Heritage Fund, Latvian Academy of Sciences, Riga, Latvia, <sup>23</sup>Botany Division, University of Ostrava, Ostrava, Czech Republic, <sup>24</sup>Institute of Botany and Botanical Garden, Faculty of Biology, University of Belgrade, Belgrade, Serbia, <sup>25</sup>California Academy of Sciences (CAS), San Francisco, CA, USA, <sup>26</sup>Botanical Survey of India, Kolkata, India, <sup>27</sup>Slovenian Forestry Institute, Ljubljana, Slovenia, <sup>28</sup>Viešvilė State Strict Nature Reserve, Eičiai, Tauragė distr., Lithuania, <sup>29</sup>Department of Agricultural and Forest Sciences, University of Palermo, Palermo, Italy, <sup>30</sup>Prof. Z. Czeppe Department of Polar Research and Documentation, Institute of Botany, Jagiellonian University, Kraków, Poland, <sup>31</sup>Korea Polar Research Institute, Incheon, Korea, <sup>32</sup>Department of Biology, Anadolu University, Eskişehir, Turkey

1. *Andreaea flexuosa* R.Br.bis

**Contributor:** H. Bednarek-Ochyra

**Chile:** Isla Grande de Tierra del Fuego: Alberto de Agostini National Park, Monte Buckland, towering over a narrow peninsula between Agostini Fjord and Fitton Bay, 500–700 m a.s.l., 54°22'S, 70°21'W, 23 February 1929, *leg.* H. Roivainen *s.n.* [Expedition Fennica 1928–29] (H, KRAM).

*Andreaea flexuosa* is principally an austral species, which is widely distributed but scattered in Australasia, southern Africa, Madagascar, southern South America and on some subantarctic islands in the Kerguelen Biogeographical Province. It also penetrates into the tropics where it occurs at high elevations in New Guinea and the Hawaiian Islands. The species extends as far north as Madeira in Macaronesia where, however, it is represented by a different subspecies (*Ochyra* in Ellis *et al.*, 2017a). In the Tierra del Fuego archipelago this species has hitherto been

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

recorded only once, when Müller (2009) cited a specimen collected by W. R. Buck in Antártica Chilena Province, but without details of the locality. However, according to the C. V. Starr Virtual Herbarium database in the New York Botanical Garden, it was recorded in 2004 on Isla Wollaston in Parque Nacional Cabo de Hornos at the southernmost tip of South America. Herein, the species is reported for the first time from Isla Grande de Tierra del Fuego where it was collected by the Finnish Expedition of 1928–1929 some 75 years earlier. It is actually the third record of *A. flexuosa* in South America, the first one being made in 1907 by the Swedish Expedition of 1907–1909 to the Falkland Islands (Ellis *et al.*, 2016c).

The moss flora of Tierra del Fuego is relatively rich by the standards of the southern hemisphere. During nearly two and half centuries of bryological exploration about 350 species of moss have been recorded from this archipelago (Greene, 1986; Matteri & Schiavone, 2002), but in the last quarter of century a number of phytogeographically interesting species have been added. These primarily include bipolar species, for example *Calliergon giganteum* (Schimp.) Kindb. (Kuc, 1995), *Platydictya jungermannioides* (Brid.) H.A.Crum (Ochyra, 1999), *Arctoa fulvella* (Dicks.) Bruch & Schimp. (Ochyra & Buck, 2003), *Encalypta procera* Bruch (Blockeel *et al.*, 2007a) and *Pterygoneurum ovatum* (Hedw.) Dixon (Blockeel *et al.*, 2008). Likewise, a good number of austral species have been newly discovered in Tierra del Fuego, for instance *Plagiothecium lamprostachys* (Hampe) A.Jaeger (Blockeel *et al.*, 2001, 2005), *Grimmia incrassicapsulis* B.G.Bell (Ochyra *et al.*, 2010) and *Andreaea gainii* Cardot and *Bucklandiella membranacea* (Mitt.) Bednarek-Ochyra & Ochyra (Ellis *et al.*, 2011a). Moreover, some species new to science were described from this area, including *Sematophyllum lebouvieri* Ochyra (Ochyra, 2010) and *Blindia buckii* B.K.Andreas, *B. rigida* B.K.Andreas and *B. serrata* B.K.Andreas (Andreas, 2013).

## 2. *Arnellia fennica* (Gottsche) Lindb.

**Contributors:** M. Infante and C. Hanoire

**France:** Hautes-Pyrénées, Aulon, Réserve Naturelle d'Aulon, under the Montarrouyet towers, 42.852687° N, 0.233631°E; 2165 m a.s.l., scree under a north-facing cliff of calcschistes, 19 September 2016, *leg.* C. Hanoire, *BBF s/n.*, *det.* M. Infante.

This is the first record of *Arnellia fennica* from the Pyrenean chain. The species was reported in France for the first, and hitherto only time by Skrzypczak (2001) in the Alps (Bessans, Haute-Savoie). The Pyrenean site represents a range extension of 600 km to the south-east from the site recorded by Skrzypczak. *Arnellia fennica* has a circumarctic distribution, with scarce relict occurrences in the Alps, Carpathians and the Balkans.

The specimen is quite scanty, consisting of just a few sterile branches. The closest accompanying species were *Encalypta alpina* Sm., *Distichium capillaceum* (Hedw.) Bruch & Schimp., *Ditrichum gracile* (Mitt.) Kuntze and *Scapania aspera* M.Bernet & Bernet, while *Campylophyllum halleri* (Hedw.) M.Fleisch., *Bryum elegans* Nees and *Mnium thomsonii* Schimp. were also found on the site. The site was on a north-facing slope that also hosts a population of *Dryas octopetala* L. (C. Bergès *com. pers.*).

## 3. *Atrichum tenellum* (Röhl.) Bruch & Schimp.

**Contributor:** M. Boiko

**Ukraine:** Steppe zone, Mykolaiv region, Ochakiv district, the village of Pokrovka, Regional Landscape Park 'Kinburns'ka Kosa', Black Sea coast, the Yagorlyts'ka Gulf, 46.48290°N, 31.65077°E, on wet sandy soil humus in steppe, 19 July 2016, *leg.* M. Zakharova *s.n.*, *det.* M.F.Boiko (KHER).

*Atrichum tenellum* is found on the plains and in mountainous areas in the Arctic, boreal, boreal-nemoral and nemoral zones of Europe, North Asia and North America. Its habitats include damp and sandy clay and sandy soils in meadows, fields, forests, on the edges of ditches and roads, peat bogs and along the banks of rivers and coasts. In the Ukraine it occurs in the Carpathian Mountains, in Polissia (boreal-nemoral zone) and Opillia (nemoral zone). It very rarely penetrates the forest-steppe region of the Ukraine (Donetsk forest-steppe), but is known there in the 'Provalskiyi steppe' reserve, in the Luhansk region of the Ukraine (Boiko, 2009).

The new discovery is the first for the Steppe zone of the Ukraine. The species occurred on sandy soil with the decomposed remains of plants in reducing psammophytic steppes near the forests of *Pinus sylvestris* L. and *Betula borysthena* Klokov on the shores of the Yagorlyts'ka Gulf of the Black Sea.

## 4. *Bazzania flaccida* (Dumort.) Grolle

**Contributor:** P. Górski

**Slovakia:** Western Carpathian Mountains, Western Tatra Mountains, Račkova dolina valley, Račkov Zadok, south-west of and above Vyšné Račkove pleso lake, on stone in alpine grassland, in a complex with a *Polytrichum-Sphagnum* hummock, 49.19888° N, 19.80265°E, MGRS-square 34UDV1250, 6 August 2012, *leg.* & *det.* P. Górski *s.n.* (POZNB 2375, KRAM).

Hitherto, the occurrence of *Bazzania flaccida* in Slovakia has been questionable (Duda & Váňa, 1992; Górski & Váňa, 2014). Despite sparse data in the literature indicating the presence of the plant in that country (Duda, 1955, 1958; Šmarda, 1961; Váňa & Duda, 1965), all revised herbarium material named *B. flaccida* from Slovakia actually referred to *B. tricrenata* (Wahlenb.) Lindb. (Duda & Váňa, 1989). The only collection originating from Slovakia that was

not previously revised (deposited in Poland in POZW) was material collected in 1956 by J. Szwejkowski (from the Dolina Kežmarskej Bielej vody valley in the High Tatra Mts; Szwejkowski, 1960). That material (POZW 1306, *leg.* J. Szwejkowski, 23 July 1956) undoubtedly belongs to *B. flaccida* (*rev.* P. Górski, 2017). The new locality described here, and the one from over 60 years ago which was revised recently, constitute the only proven records of *B. flaccida* from Slovakia. It is worth noting that the nearest localities of the plant are in the Polish Tatra Mountains (Szwejkowski, 1960), but no new locality has been found there since 1957, despite the many bryological studies in the Tatra Mountains. *Bazzania flaccida* seems to be a Regionally Threatened species, as it is in Italy, Luxembourg, Slovenia, Bulgaria and the Czech Republic (Hodgetts, 2015).

5. *Bucklandiella chlorocarpa* (Paris) Bednarek-Ochyra & Ochyra

**Contributor:** H. Bednarek-Ochyra

**New Zealand, North Island:** (1) without detailed locality data, *leg.* W. Colenso 2074 (BM-Hb. Wilson, PC-0708043 as *Dryptodon rupestris* Hook.f. & Wilson). Northland: (2) Papakauri, at Taheke Waterfall, 35°22'S, 174°15'E, ca 90 m a.s.l., 1874, *leg.* Sven Berggren 77 (AK, FH-Hb. Bartram). Taranaki: (3) Mount Egmont, Dawson Falls near Whakapapa Village, 39°19.525'S, 174°06.435'E, ca 900 m a.s.l., *leg.* D. A. Ratcliffe 1/83 (BM); (4) Taranaki, 1913, *leg.* J. Heywood 38x (BM-Hb. Dixon). Manawatu-Wanganui: (5) Ruapehu District, Kaiteki Co., Tongariro National Park, near Tawhai Falls, 39°10'23.0082''S, 175°30'52.4664''E, alt. ca 960 m a.s.l., 29 October 1971, *leg.* D. G. Catcheside 71.671 (AD). Wellington: (6) Ohakune, 39°25'S, 175°24'E, 610 m a.s.l., June 1925, damp river boulder, *leg.* R. Mundy 188 [Sainsbury No. 4463] (CHR 577797, WELT-Sainsbury M019763); (7) Mungaroa mountain north of Te Kau Kau Point, 41°33'15''S, 175°26'21''E, 370 m a.s.l., *leg.* J. Kirk 94 (BM-000962300 as *Racomitrium symphyodontum* (Müll.Hal.) Paris).

For a long time *Bucklandiella chlorocarpa* has remained a forgotten species, although the binomial *Racomitrium chlorocarpum* Mitt. had already appeared in the literature in the 1860s (Hooker, 1867), it was not validly published. The chequered taxonomic and nomenclatural history of this species was discussed in detail by Bednarek-Ochyra (2015a), who also provided its most important diagnostic traits. *Bucklandiella chlorocarpa* is a moss associated with aquatic or otherwise wet habitats and its ecological predilections are well expressed in a number of structural adaptations for thriving in streams and cascades with swiftly running water, such as the salient costae, polystratose distal laminal cells and fleshy, markedly thickened marginal borders that are

confluent at the leaf apex with the percurrent or excurrent costa. These features are typical for many rheophytic mosses (Vitt & Glime, 1984; Ochyra, 1985a, 1985b, 1986, 1987a, 1987b; Ochyra & Enroth, 1989; Sérgio *et al.*, 1995; Ochyra *et al.*, 1998; Ochyra & Vanderpoorten, 1999; Stech & Frahm, 2001; Shevock *et al.*, 2006, 2011; Blom *et al.*, 2011; Ochyra & Bednarek-Ochyra, 2011; Ochyra & Shevock, 2012). The same features are also exhibited by *B. lamprocarpa* (Müll.Hal.) Bednarek-Ochyra & Ochyra, which grows in the same habitats in South America (Bednarek-Ochyra & Ochyra, 1994; Bednarek-Ochyra *et al.*, 1996; Blockeel *et al.*, 2002; Bednarek-Ochyra, 2015b), South and East Africa (Bednarek-Ochyra & Ochyra, 2012a; Ochyra & van Rooy, 2013) and on some islands in the Southern Ocean (Ochyra *et al.*, 1988; Bednarek-Ochyra & Ochyra, 1998).

Along with several other species of *Bucklandiella* Roiv. (Fife, 1984; Bednarek-Ochyra & Ochyra, 1996, 2010, 2011; Bednarek-Ochyra *et al.*, 2014; Ellis *et al.*, 2014a), *B. chlorocarpa* is endemic to Tasmania and New Zealand. It is known from many localities in the South Island and Stewart Island of New Zealand (Ellis *et al.*, 2017b, 2017c), but so far no detailed records of this species are known from the North Island. Hooker (1867) mentioned a specimen collected by W. Colenso from this island, but without precise locality data. This had been reported earlier from the North Island by Wilson (1854) as *Racomitrium rupestre* (Hook.f. & Wilson) Wilson. All specimens of *B. chlorocarpa* known from the North Island are reported in this note. They indicate that the species is rare and scattered on this island but in all likelihood it is rather undercollected.

6. *Bucklandiella crispipila* (Taylor) Bednarek-Ochyra & Ochyra

**Contributor:** H. Bednarek-Ochyra

**Kenya:** (1) along Naro Moru track on western slope of Mount Kenya, on rock around forest line, 0°10'14''S, 37°12'38''E, ca 3000 m a.s.l., 20 January 1968, *leg.* D. Balázs 153 (BR, EGR, PC-Bizot), also H. Inoue, *Bryophyta Selecta Exsiccata* No. 447 (BR, JE, KRAM, PC as *Racomitrium durum* (Müll.Hal.) Paris); (2) Mount Kenya, Naro Moru route, 0°10'03''S, 37°13'54''E, 3500 m a.s.l., rupicolous, 20 January 1991, *leg.* Chuah-Petiot Nm516d (NY); (3) Mount Elgon National Park, Lower Elgon summit on the SE caldera rim, 1°05'59''N, 34°34'27''E, 4300 m a.s.l., on earth covered rock in tussock vegetation, 17 January 1992, *leg.* M. S. Chuah 9223/L (EGR, KRAM); (4) Mount Elgon National Park, SW ridge of Koitoboss summit with giant *Senecio barbatiipes* Hedberg and *Helichrysum* bush, 1°07'21''N, 34°36'08''E, 4050–4150 m a.s.l., rupicolous, 18 January 1992, *leg.* M. S. Chuah & E. M. Kungu 9225/A & 9225/AD (EGR, KRAM).

*Bucklandiella crispipila* is a relatively rare altimontane species in tropical Africa, which has so far been recorded from Mount Karisimbi in the Virunga Mountains in Rwanda and the Democratic Republic of Congo (Ochyra, 1993; Ellis *et al.*, 2017b), and on the Ugandan side of Mount Elgon (O'Shea *et al.*, 2003) in East Africa, as well as in Kwa Zulu-Natal in South Africa (Hodgetts *et al.*, 1999). Herein, the species is recorded from another East African country, Kenya. Here it was collected in the afro-alpine zone on Mount Kenya and Mount Elgon at elevations from 3000 to 4300 m.

*Bucklandiella crispipila* is an Afro-American oreo-phyte having its main centre of distribution in the neotropics where it ranges along the American Cordillera from Mexico through the Central American isthmus to Bolivia and SE Brazil (Frisvoll, 1988; Bednarek-Ochyra *et al.*, 1999; Allen, 2002). The second centre of occurrence is in the eastern and southern mountains of Africa. The amphiatlantic distribution pattern is exhibited by no less than 77 species of hepatics (Ellis *et al.*, 2013a, 2013b, 2013c, 2014c; Gradstein, 2013, 2017; Pócs *et al.*, 2016) and well over 80 species of moss. Besides a large group of tropical lowland and montane species (e.g. Frahm, 1982; Ochyra *et al.*, 1992, 2002a; Ochyra & Ireland, 2004, 2016; Ellis *et al.*, 2012a, 2014a), this type of distribution is also shown by a relatively small group of south-temperate cool-adapted moss species (e.g. Ochyra & Lewis Smith, 1998; Ochyra *et al.*, 2002b, 2008a, 2014; Ochyra & Singh, 2008; Bednarek-Ochyra & Ochyra, 2012b, 2013; Ochyra & Bednarek-Ochyra, 2013).

#### 7. *Caduciella mariei* (Besch.) Enroth

**Contributors:** J. Enroth and J. R. Shevock

**Republic of São Tomé & Príncipe:** Islands in Gulf of Guinea, western equatorial Africa, Príncipe Island, Obô National Park de Príncipe, just above canyon of the Rio Papagaio at dam site about 2 km above community of Bela Vista, NAD 83: 01°36'16.4"N, 07°24'24.6"E, 105 m a.s.l., on hardwood trunk in mixed hardwood tropical forest, growing along river in filtered light, 30 April 2013, *leg.* James R. Shevock 42364 with T. Szuts (BOL, CAS, H, LISU, STPH).

*Caduciella* Enroth is a unispecific, paleotropical genus in the Neckeraceae (Enroth, 1991), closely related to the mainly Asian genera *Circulifolium* S.Olsson, Enroth & D.Quandt and *Himantocladium* (Mitt.) M.Fleisch. (Olsson *et al.*, 2010). According to the distribution map and specimens cited in Enroth (1991), *C. mariei* is distributed broadly from East Africa (Tanzania, Comoro Islands; see also O'Shea, 2006) to north-eastern India, south-western China and through the main parts of SE Asia to Queensland and the island groups of the Western Pacific.

This record from São Tomé & Príncipe suggests that *C. mariei* occurs more widely in sub-Saharan Africa

west of Tanzania. This wide, paleotropical distribution is intriguing as the sporophytes of *C. mariei* have not been found and the only means of propagation seem to be caducous leaves of the branch tips. Hence the current distribution might be relict, perhaps from the Mesozoic times, as discussed by Enroth (1991). This theory is supported also by the fact that *C. mariei* mostly occurs below 1000 m a.s.l., so dispersal by relatively recent 'mountain hopping' appears unlikely.

In the African context the small and frondose *C. mariei* most resembles *Pinnatella minuta* Mitt. in the Neckeraceae (cf. Enroth, 1994), but the former has closely appressed stipe leaves (spreading in *P. minuta*) and nearly always naked branch tips due to the caducous leaves.

#### 8. *Calycularia crispula* Mitt.

**Contributors:** C. Reeb, R. L. Andriamiarisoa and S. R. Gradstein

**Madagascar:** Angavokely rock at the top of the metallic stairs, Angavokely forest station, Analamanga region, Antananarivo province, 18°55'24.9"S, 47°44'21.7"E, 1603 m a.s.l., on compacted soil under an overhang with *Targionia hypophylla* L., 2 February 2011, *leg.* C. Reeb & R. Andriamarisoa CR11186 (PC—PC0716053, TAN).

According to Konstantinova & Mamontov (2010), *Calycularia crispula* has been recorded in Africa from Ethiopia, Kenya, Malawi, Tanzania and Zambia (based on the records of Jones [1985] and Perold [1993c]). The species is new to Madagascar, and despite several recent field trips to Madagascar with special focus on thalloid plants, this is the only collection of *C. crispula* thus far from the island. The site was very well preserved from disturbance, under a large and somewhat deep overhang at the top of Angavokely rock. This area has not been recently subjected to fire, as have so many other similar places in Madagascar.

The thallus of *C. crispula* may be easily confused with *Aneura* sp. or *Pellia* sp.; the latter genus is not known from Madagascar (Marline *et al.*, 2012). The presence of lamellate, green to purplish ventral scales with a globose apical cell on the ventral surface of the thallus, near the thallus apices (Konstantinova & Mamontov, 2010), clearly distinguishes this simple thalloid species from all others. The thallus has convoluted lobes with a distinct midrib on the dorsal face, and in cross-section is seen to taper gradually from the middle to a broad, unistratose wing. The Malagasy specimen is sterile. Good illustrations of the species are available in Davison & Smith (1992), Konstantinova & Mamontov (2010) and Daniels *et al.* (2014). A second species in the genus, *C. laxa* Lindb. & Arnell, with a less divided thallus, is only known from temperate regions of the northern hemisphere.

9. *Cephaloziella rubella* (Nees) Warnst.

**Contributors:** B. Cykowska-Marzencka, M. Stryjak-Bogacka, M. Węgrzyn and P. Wietrzyk

**Svalbard:** Spitsbergen, Nordenskiöld Land, Bolterdalen, Rieperbreen glacier marginal zone: (1) 78°7'30.19"N, 16°2'56.94"E, 280 m a.s.l., on immature soil on glacial moraine, 14 July 2015, *leg.* M. Węgrzyn *s.n.* (KRAM); (2) same locality, 78°7'30.25"N, 16°2'48.16"E, 275 m a.s.l., on immature soil on glacial moraine, 14 July 2015, *leg.* P. Wietrzyk *s.n.* (KRAM).

*Cephaloziella rubella* is one of 24 species of *Cephaloziella* (Spruce) Schiffn. in Europe and one of six species of the genus in Svalbard (Hodgetts, 2015). It is a northern suboceanic species widespread in Europe, and in the Nordic countries *C. rubella* is common in Denmark, Norway, Sweden and Finland, and is also known from Iceland, Greenland, the Canary Islands and the Azores (Damsholt, 2002). Outside Europe, the species has been confirmed in Asia from Siberia, China and Japan (Furuki & Mizutani, 1994; Damsholt, 2002; Xia *et al.*, 2014), and in North America transcontinentally, in the west from Alaska and in the east from Quebec to West Virginia and westwards to Michigan, Iowa and New Mexico (Schuster, 1980; Hong, 1986; Damsholt, 2002).

In Svalbard, the species was found during work on the phytosociology and succession of glacial moraine communities of the Nordenskiöld Land (Węgrzyn *et al.*, 2013; Węgrzyn & Wietrzyk, 2015; Wietrzyk *et al.*, 2017). *Cephaloziella rubella* had already been reported from Svalbard by Arnell (1900), Wulff (1902) and Summerhayes & Elton (1923), but later these records were questioned by Frisvoll & Elvebaak (1996), and the species was not included in the island's bryophyte checklist (Hodgetts, 2015).

With the discovery of *C. rubella* and the recently discovered *Odontoschisma sphagni* (Dicks.) Dumort. and *Barbilophozia floerkei* (Weber & Mohr) Loeske, the number of species of liverwort known from Svalbard has risen to 105 (Ellis *et al.*, 2014a, 2016b, 2016c; Hodgetts, 2015).

10. *Cinclidotus danubicus* Schiffn. & Baumgartner

**Contributors:** M. S. Sabovljević, M. Skudnik and A. D. Sabovljević

**Slovenia:** in the river Sava and its tributary Sava Bohinjka, upstream from Ljubljana; limestone rock outcrops in the river water; (1) North Ljubljana surroundings, 46.115057°N, 14.497483°E, 12 March 2016. *leg./det.* M. S. Sabovljević & A. D. Sabovljević *s.n.*; (2) near Vikriče, 46.126411°N, 14.438287°E, 3 August 2013 (and 13 March 2016), *leg./det.* M. S. Sabovljević & M. Skudnik *s.n.*; (3) near Bohinjka Bela, 45.346071°N, 14.069973°E, 19 July 2012, *leg./det.* M. S. Sabovljević &

A. D. Sabovljević *s.n.* (all vouchers BEOU bryophyte collections *s.n.*).

Although *Cinclidotus danubicus* was described from the Danube River, it seems to be uncommon, both here and in other large rivers similarly subject to eutrophication. Prevailing eutrophic conditions may be one of the reasons for its rarity, as the species prefers well aerated and oligotrophic fresh water. While searching for various rheophilic moss species in the Sava River in Slovenia, three populations were found on rock outcrops that were partly in water. In all cases, the moss was growing slightly above the water, but was well hydrated. It was accompanied by *Platyhypnidium riparioides* (Hedw.) Dixon, *Hygrohypnum luridum* (Hedw.) Jenn., and sometimes *Brachythecium rivulare* Schimp. All three Slovenian specimens were sterile.

*Cinclidotus danubicus* is here recorded for the first time in Slovenia, and was not listed as occurring there by Martinčič (2003), Sabovljević *et al.* (2008) or Ros *et al.* (2013). It is present in all countries neighbouring Slovenia i.e. Italy, Austria, Croatia and Hungary (Hodgetts, 2015), although it is Rare, decreasing or Data Deficient.

11. *Conostomum magellanicum* Sull.

**Contributors:** Y.-J. Yoon and J. H. Kim

**South Shetland Islands:** Antarctica. King George Island, Fildes Peninsula, near the Artigas station, 62°11'22.5"S, 58°55'42.5"W, 71 m a.s.l.; on soil, 24 January 2015, *leg.* Y.-J. Yoon *KG-1813* (KOPRI).

This is the first report of *Conostomum magellanicum* on the Fildes Peninsula, but it has previously been found on King George Island. The genus *Conostomum* Sw. ex F. Weber & D. Mohr consists of seven species, two of which, *C. pentastichum* (Brid.) Lindb. and *C. magellanicum*, occur in the northern maritime Antarctic. *Conostomum magellanicum* is a Fuegian-Antarctic species that occurs in the Magallanes Province of Chile, Tierra del Fuego, South Georgia, South Orkney Islands and the South Shetland Islands (Ochyra *et al.*, 2008b). This new record from the Fildes Peninsula is not surprising; nevertheless, it extends the known range of *C. magellanicum* in the Antarctic. This species is very rare in the Antarctic, and sporophytes have not been seen on any Antarctic material. *Conostomum magellanicum* is one of the most distinctive Antarctic mosses; it is distinguished from other species of the genus by its ovate to oblong-ovate leaves with a rounded-obtuse apex, very broad costae that usually end just below the leaf apex and flat leaf margins. It grows on soil along the margins of melt water runnels on the Fildes Peninsula.

12. *Dicranum leioneuron* Kindb.

**Contributor:** E. Ginzburg

**Russia:** Leningrad Region, Kurgalsky State Nature Sanctuary, 59°31'49.6"N, 28°06'49.1"E, on sandy soil

of lichen rich pine forest, 23 June 2016, *leg.* E. Ginzburg *s.n.* (LE).

*Dicranum leioneuron* is rather rare in European Russia and previously was chiefly known from more northern territories (Schlyakov & Konstantinova, 1982; Shubina & Zheleznova, 2002; Afonina *et al.*, 2008; Andrejeva *et al.*, 2012; Kozhin, 2012) and from the Novgorod Region (Ignatov & Ignatova, 2003). The closest record of *D. leioneuron* to that cited here is from the Levashovskij Forest Sanctuary in the southern part of Karelian Isthmus, St. Petersburg (Andrejeva *et al.*, 2012).

*Dicranum leioneuron* is closely related to *D. bonjeanii* De Not. and their differentiation is often obscure; flagelliferous branches can develop in both species (Hedenäs & Bisang, 2004). According to these two authors *D. leioneuron* has leaves in upper part  $\pm$  tubular, and entire or almost entire leaf margins, whereas *D. bonjeanii* has leaves in their upper part that are flat or channelled with leaf margins denticulate or at least obtusely denticulate. Bellolio-Trucco & Ireland (1990) also point out that *D. leioneuron* is distinct from *D. bonjeanii* in possessing involute rather than flat leaf margins. Our specimen had leaves  $\pm$  tubular in their upper part, leaf margins involute and almost entire to denticulate and flagelliferous branches. *Dicranum leioneuron* usually occurs in bogs and fens and is rarely found in more xeric habitats (Corley, 1991). This specimen was found in a xeric habitat on the sandy soil of a lichen rich pine forest.

### 13. *Entosthodon fascicularis* (Hedw.) Müll.Hal.

**Contributors:** P. Campisi, M. G. Dia, M. L. Marino and F. Provenzano

**Tunisia:** 2.8 km S of Ain Draham, ca 1 km NE of the sports training centre ('Kroumirie'), 660–670 m a.s.l. 36°45'16"N, 08°49'17"E, bog with *Sphagnum* L. and surrounding *Quercus* L. forest, associated with *Dicranella heteromalla* (Hedw.) Schimp. and *Fissidens taxifolius* Hedw., 04 April 2014, *leg.* F. M. Raimondo *s.n.*, *det.* P. Campisi & M. G. Dia (PAL).

In the course of identifying bryophytes collected during the 12th 'Iter Mediterraneum' organised by OPTIMA (The Organization for the Phyto-Taxonomic Investigation of the Mediterranean Area) in Tunisia in spring 2014, we found several species of phytogeographical interest. In a first contribution, Campisi *et al.* (2015) confirmed the presence of some species in Tunisia after more than half a century, while the first record of *Entosthodon fascicularis* in Tunisia is reported here.

*Entosthodon fascicularis* is a tiny green-yellow moss that grows in small colonies, usually on humid acidic soil in fields, on waste ground, banks and paths (Smith, 2004). It is a boreosubtropical-hemiboreal, oceanic-subcontinental species, widespread in Europe, where it is considered Threatened or Near

Threatened in several countries (Dierßen, 2001; Hodgetts, 2015). In the American continent, this species is known from western Canada, where it is also Threatened (Smith, 2004; Agence Parcs Canada, 2011). Furthermore, *E. fascicularis* has been reported in North Africa from Egypt, and also from Algeria and Morocco but only on the basis of old records (before 1962) (Ros *et al.*, 2013). The new report from Tunisia widens the distribution range of this species in the Mediterranean area.

### 14. *Entosthodon hungaricus* (Boros) Loeske

**Contributors:** E. Yücel and T. Ezer

**Turkey:** Eskişehir Province, Alpu District, Ağaşehir Village, Çatacık Forests, Asarlıktepe: 39°55'N, 31°08'E, growing on wet soil derived from gypsum, under *Pinus nigra* Arn. subsp. *pallasina* (Lamb.) Holmboe forest, 1650 m a.s.l., 18 April 1986, *leg.* and *det.* E. Yücel & T. Ezer *s.n.* (ANES 19639).

As a result of the identification of specimens collected in 1986 from Çatacık Forests in Central Anatolia (Eskişehir), *Entosthodon hungaricus*, a halophytic and gypsiferous species, is reported for the first time in Turkey.

*Entosthodon* Schwägr. (Funariaceae) is a genus of annual or biannual mosses, occurring worldwide on soils in temperate to tropical-montane climates (Wilding, 2015). The genus *Entosthodon* comprises around 100 species (Wilding & Hedderson, 2011). According to the bibliography of Turkish bryological and recent literature, there were previously nine taxa recognised in Turkey (Uyar & Çetin, 2004; Kürschner & Erdağ, 2005; Kürschner & Frey, 2011; Ros *et al.* 2013).

*Entosthodon hungaricus* was first described as *Funaria hungarica* Boros from Hungary in 1924 (Papp, 2002). Cano *et al.* (1999) synonymised *E. maroccanum* (Meyl.) Hebr. & Lo Guidice with *E. hungaricus* (Pisarenko *et al.*, 2001). Later, Ignatova & Ignatov (2005) revealed that *Physcomitrium martianovii* Broth. ex Abramov was also a synonym of *E. hungaricus*. Previously, the species had been reported only from central-eastern European localities in Austria, Germany, Hungary, Romania, Serbia, Slovakia and the Ukraine (Pisarenko *et al.*, 2001). Therefore, it was considered a European endemic and a typical species of the central European steppes, but later it was found in the Mediterranean area (Algeria, the Canary Islands, Greece, Israel, Malta, Morocco, Sicily, Spain) and Russia (Fedosov *et al.*, 2010; Ros *et al.*, 2013). *Entosthodon hungaricus* was most recently recorded from Montenegro (Sabovljević *et al.*, in Ellis *et al.*, 2016b). In addition, the species is included in the Red Data Book of European Bryophytes in the 'Rare' category owing to its ecological characteristics (ephemeral habit, gypsum and saline habitat type) (ECCB, 1995; Sabovljević *et al.*, in Ellis *et al.*, 2016b).

*Entosthodon hungaricus* is a continental-Mediterranean species, characterised by unbordered leaves, a straight and stout seta, conic to elongate-pyriform brown capsules widened at mouth, the lack of a peristome, and a rostrate operculum (Fedosov *et al.*, 2010). These features easily distinguish *E. hungaricus* from other Turkish species of *Entosthodon*.

The present record of *E. hungaricus* from Anatolia is a significant extension of range southwards. The specimens were collected from Central Anatolia, which characteristically has a continental climate with cold, snowy winters and hot, dry summers. It was collected on wet gypsiferous soil together with *Didymodon vinealis* (Brid.) R.H.Zander, *Barbula unguiculata* Hedw. and *Ceratodon purpureus* (Hedw.) Brid.

15. *Hypnum callichroum* Brid.

**Contributors:** O. M. Afonina and E. V. Kushnevskaya

**Russia:** Leningrad Province, Podporozh'e Distr., 61° 08'48"N, 33°56'30"E, floodplain of Vazhinka River, deciduous forest, on bark of aspen in large pure patch, 15 October 2016, *leg.* E. V. Kushnevskaya *s.n.* (LE).

This is the first record for *Hypnum callichroum* in Leningrad Province and the Russian Plain, outside the mountain regions. This species is very rare in Russia; there are a few records from Murmansk Province (Kola Peninsula) and the Caucasus (the Caucasian and Teberda Reserves). The records of *H. callichroum* from the Polar Ural, West and East Siberia and the Russian Far East (Ignatov & Afonina, 1992; Ignatov *et al.*, 2006a) were all based on misidentified specimens. Samples of *H. callichroum* from Russia kept in LE were mostly re-identified as *H. holmenii* Ando or *H. plicatulum* (Lindb.) A.Jaeger (Afonina, 2004). According to the literature, *H. callichroum* is known from North, West and Central Europe (Nyholm, 1965), North America (Greenland, Alberta, British Columbia, Alaska, Washington) (Schofield, 2014) and Asia (Mongolia, China, Japan) (Ando, 1997; Zhang & He, 2005; Tsegmed *et al.*, 2010). However, a selective study of specimens from Europe and North America kept in LE revealed misidentifications; therefore, a complete revision is needed to clarify the distribution of *H. callichroum*.

16. *Jensenia spinosa* (Lindenb. & Gottsche) Grolle

**Contributors:** R. L. Andriamiarisoa, D. A. Callaghan and C. Reeb

**Madagascar:** (1) 6.5 km north of Pic Boby, Diavolana Circuit, Andringitra Massif, Andringitra National Park, Haute Miasatra Region, Fianarantsoa Province, 22°08'19.7"S, 46°52'7.1"E, 2140 m a.s.l., forming dense wefts on vertical damp peaty bank of small stream, deeply shaded by granite slab of footpath and over-hanging vegetation, including *Yvesia madagascariensis* A.Camus and *Erica* L. sp., in dry montane savanna, associated with the

widespread palaeotropical liverwort *Notoscyphus lutescens* (Lehm. & Lindenb.) Mitt., 23 May 2016, *leg.* R. Andriamiarisoa & D. A. Callaghan *ALR-1822* & *DAC1305161309*, *det.* D. A. Callaghan, *conf.* C. Reeb (E, TAN). (2) Rainbavy (queen) waterfall, Andringitra Massif, Andringitra National Park, Haute Miasatra Region, Fianarantsoa Province, 22° 08'43.52"S, 46°53'28.81"E, 1731 m a.s.l., under overhang at entrance to small cave, 21 May 2016, *leg.* P. Mananivoson & C. Reeb *CR16M73*, *det.* C. Reeb (PC, No. PC0716042, TAN).

*Jensenia spinosa*, the only representative of the genus in Africa (Grolle, 1993), occurs in Latin America and eastern to southern Africa, including Mauritius and Réunion (Forrest *et al.*, 2005; Wigginton, 2009). It is typical of high elevations in Africa (Grolle, 1993) and the discovery in highland Madagascar was to be expected. The collection (Andriamiarisoa & D. A. Callaghan *ALR-1822* & *DAC1305161309*) comprised sterile shoots mixed with female plants lacking sporophytes, the latter with cup-like involucre, as illustrated by Figure 3E of Perold (1993a) and Figure 317d of Chuah-Petiot (2003). The characteristic involucre is a key distinguishing feature from the only other dendroid member of the Pallaviciniaceae in Africa, *Symphyogyna podophylla* (Thunb.) Mont. & Nees, in which the archegonial group is protected by a deeply incised laciniate-ciliate scale (Grolle, 1993).

17. *Lewinskya erosa* (Lewinsky) F.Lara, Garilleti & Goffinet

**Contributors:** Z. Skoupá and V. Plášek

**China:** Gansu Province, south of the Province, Wenxian County, Qijiaba, Yigongduan, 32°54.982'N, 104°18.503'E, 2550 m a.s.l., 20 May 2007, *leg.* Y. Jia 09268 (PE#01414559), *det.* Y. Jia, *teste* Z. Skoupá & V. Plášek.

*Lewinskya erosa* was historically placed in *Orthotrichum* Hedw. as *O. erosum* Lewinsky. However, the polyphyly of *Orthotrichum* has been repeatedly suggested by inferences from molecular data (Goffinet *et al.*, 2007; Plášek *et al.*, 2009, 2011, Sawicki *et al.*, 2009, 2010, 2012, 2017). Plášek *et al.* (2015) divided the traditionally conceived genus *Orthotrichum* into four segregates, namely *Dorcadion*, *Nyholmia*, *Orthotrichum* and *Pulviger*. Because the generic name *Dorcadion* proved to be illegitimate, Lara *et al.* (2016) proposed the generic name *Lewinskya* F.Lara, Garilleti & Goffinet as a replacement.

*Lewinskya erosa* is considered endemic to China (Lewinsky, 1992). According to the data in the literature and from the revision of herbarium material, the species has been previously reported only from Shaanxi (Lewinsky, 1992), Sichuan (Lewinsky-Haapasaari, 1995) and Hubei Provinces (Skoupá

*et al.*, 2017), and herein the species is newly recorded from Gansu Province (Wenxian County).

*Lewinskya erosa* has a unique peristome within the genus and can be identified without problem even in the field. The exostome is formed by eight pairs of yellowish teeth which are recurved when dry, whilst the endostome consists of eight well-developed segments that are yellowish and triangular, with very irregular erose margins.

18. *Neckeromnion lepineanum* (Mont.) S.Olsson, Enroth, Huttunen & D.Quandt

**Contributors:** J. Enroth and J. R. Shevock

**Republic of São Tomé & Príncipe:** Islands in Gulf of Guinea, western equatorial Africa, (1) Príncipe Island, Obô National Park de Príncipe, watershed of the Rio Banzu, along the Rio Banzu less than 2 km from ruins of roça S. Carlos de Fundão, NAD 83: 01°36'03.0"N, 07°23'23.5"E, 190 m a.s.l., mixed hardwood forest with palms, on volcanic rock wall in river in filtered light, 15 November 2016, *leg.* James R. Shevock 49799 with C. Garcia, T. Daniel & O. Rocha (BOL, CAS, H). (2) Príncipe Island, Obô National Park de Príncipe, headwaters of the Rio Banzu, steep slopes above the Rio Banzu heading toward the Pico de Príncipe, NAD 83: 01°35'28.0"N, 07°23'12.0"E, 350 m a.s.l., mixed hardwood forest with palms, pendulous on hardwood trunk and branches in filtered light, 16 November 2016, *leg.* James R. Shevock 49809 with C. Garcia & O. Rocha (BOL, CAS, DR, E, EGR, F, H, KRAM, LISU, MO, NY, STPH, US).

This species was until recently (Olsson *et al.*, 2016) known as *Neckeropsis lepineana* (Mont.) M.Fleisch. It is tropical–subtropical and has a general palaeotropical distribution (Enroth, 1989). In sub-Saharan Africa it was known from 11 countries (including Cameroon and Gabon close to São Tomé & Príncipe) or island groups (Enroth, 1993; O'Shea, 2006). The reported altitudinal range of *N. lepineanum* is wide; for example in Papua New Guinea it is encountered between 60 and 2000 m a.s.l. (Enroth, 1989) and in China between 2000 and 2800 m a.s.l. (Wu, 2011). In Africa it occurs mostly below 1100 m a.s.l., but has been collected as high as at 2000 m a.s.l. on Mt Kilimanjaro (Enroth, 1993). It grows mostly as an epiphyte, but also on rocks.

In Africa *N. lepineanum* is the only species of its genus and is easy to identify due to its large size, mostly pendulous habit, and lingulate, regularly undulate leaves with a very weak costa. In China and Japan, however, it has a closely related species *N. calcicola* (Nog.) S.Olsson, Enroth, Huttunen & D.Quandt (Olsson *et al.*, 2016). According to Wu (2011) the latter has a longer costa than *N. lepineanum*, but that is a tendency rather than a difference. The two species are difficult to distinguish if sporophytes are absent, as they usually are. *Neckeromnion lepineanum*

has deeply immersed capsules, while those of *N. calcicola* are shortly exerted on a seta *ca* 1.5–2.0 mm long (Touw, 1962; Wu, 2011).

19. *Orthodontium gracile* (Wilson) Schwägr. *ex* Bruch & Schimp.

**Contributor:** N. E. Bell

**China:** Yunnan, Fugong County, Lumadeng Xiang, Yaping Cun, E slope of Gaoligong Shan (Nu Jiang catchment), Burma/Yunnan border ridge, below 'Amero Pass' on road at head of South Fork Yamu River, 27°03'14.6"N, 98°45'10.7"E, *ca* 3190 m a.s.l., steep valley slope with *Abies/Rhododendron*/bamboo forest; on trunk of *Abies* Mill., 13 August 2005, *leg.* D. G. Long 34722, *det.* N. E. Bell, 25 May 2017 (E). Yunnan, Fugong County, Lishadi Xiang, Yaduo Cun, E slope of Gaoligong Shan (Nu Jiang catchment), N bank of North Fork Yamu River, near big waterfall above Shibali Forestry Station, between river and waterfall, 27°10'29.7"N, 98°45'23.3"E, *ca* 2715 m a.s.l., mossy *Tsuga/Abies/Picea/Larix/Rhododendron* forest on river bank; on rotten *Tsuga* (Endl.) Carrière stump, 15 August 2005, *leg.* D. G. Long 34798, *det.* N. E. Bell, 25 May 2017 (E).

**India:** Sikkim, West District, Chhurong Chhu Valley between Tsoka and Jamlinghang, 27°26'N, 88°10'E, *ca* 3155 m a.s.l., *Abies densa/Rhododendron* forest; on trunk of *Abies*, 9 July 1992, *leg.* D. G. Long 22485, *det.* N. E. Bell, 25 May 2017 (E).

**Nepal:** Eastern Region, Kangchenjunga, Ghunsa Khola between Pheri and Ghunsa, 27°39'N, 87°56'E, *ca* 3400 m a.s.l., *Abies/Juniperus/Rhododendron* forest; on tree trunk, 7 September 1989, *leg.* D. G. Long 16704, *det.* N. E. Bell, 25 May 2017 (E). Eastern Region, Kangchenjunga, between Ghunsa and Tamo La, 27°38'N, 87°57'E, *c.* 3650 m, *Abies/Rhododendron* forest; on trunk of *Abies*, 15 September 1989, *leg.* D. G. Long 16942, *det.* N. E. Bell, 25 May 2017 (E).

Previous records of *Orthodontium* in the Sino-Himalaya are restricted to *Orthodontium lignicola* (Broth.) D.C.Zhang ( $\equiv$  *Orthodontopsis lignicola*) in the Hengduan Mountains (but see below) and *O. infractum* Dozy & Molk. in Sikkim (from a single collection named *O. emodi* Hampe & Müll.Hal. *nom. nud.*; see Koponen & Norris, 1985). Both species have relatively broad-linear leaves, while *O. lignicola* additionally has a clearly differentiated bistratose border of linear cells. *Orthodontium gracile*, however, has setaceous or sub-setaceous leaves and is further distinguished from all other species in the genus (such as the superficially similar *O. lineare*) by completely lacking stereids in the nerve. Capsules of *O. gracile* tend to be pale, wide-mouthed and not sulcate when old, often with a long, attenuate apophysis tapering into the seta, although as with features of peristome ornamentation these characters are not completely



reliable. Amongst David Long's extensive collections of bryophytes from the Sino-Himalaya are five specimens of *O. gracile*, previously known only from the Americas, north-west Europe (probably now only in the UK, where it is very rare and declining), Madeira and Africa. The Sino-Himalayan material differs from British and North American specimens in showing greater variability in the length of the rostrum; one Yunnanese specimen is  $\pm$ long-rostrate, while the Nepalese specimens have shorter rostra. Molecular data (Bell, in prep.) corroborate the identity of the two collections from Yunnan. I have seen the original material of *O. emodi* and it does indeed match *O. infractum*; thus the genus is represented in the region by three species.

20. *Orthodontium lignicola* (Broth.) D.C.Zhang

**Contributor:** N. E. Bell

**India:** Sikkim, North District, Phune, Lachung Chhu, 27°45'05"N, 88°43'41"E, ca 3390 m a.s.l., *Rhododendron* L. scrub on river bank; on rotten stump, 13 July 1996, leg. D. G. Long 26397, det. N. E. Bell, 18 March 2015 (E). Sikkim, West District, Rathong Chhu valley, E bank of Prek Chhu below Bakhim, 27°25'N, 88°11'E, ca 2315 m a.s.l., steep wet forested slope above river; on base of rotten tree trunk, 27 July 1992, leg. D. G. Long 22925, det. N. E. Bell, 18 March 2015 (E). Sikkim, West District, Chhurong valley between Jamlinghang and Bikbari, 27°29'N, 88°09'E, ca. 3720 m a.s.l., *Abies densa*/*Rhododendron*; on shady stump, 11 July 1992, leg. D. G. Long 22531, det. N. E. Bell, 18 March 2015 (E).

**Nepal:** Central Region, Rasuwa District, between Cholang Pati and Shin Gompa, 28°06'09"N, 85°22'25"E, ca 3550 m a.s.l., shady mature *Abies spectabilis* Mirb. forest; on *Abies* stump, 9 October 2001, leg. D. G. Long 30503, det. N. E. Bell, 17 March 2016 (E).

This species has been recognised in a separate genus as *Orthodontopsis lignicola* (Broth.) Ignatov & B.C.Tan, along with *Orthodontopsis bardunovii* Ignatov & B.C.Tan from southern Russia and Mongolia (see Ignatov *et al.*, 2006b). Preliminary results from molecular data, however (Bell, in prep.), challenge the generic concept of *Orthodontopsis* Ignatov & B.C.Tan and we prefer to treat the species within *Orthodontium* Schwägr. Until now known only from the Chinese Hengduan Mountains (Yunnan, Sichuan and Xizang), David Long's collections at E contain three specimens from Sikkim and one from Nepal. Clearly distinguished from all other species in the region by its 2–3 stratose leaf border of 1–3 rows of very narrow cells, specimens otherwise share the habit, general appearance and substrate preferences of other *Orthodontium* species.

It seems likely that both *O. lignicola* and *O. gracile* are not uncommon in high elevation *Abies*/

*Rhododendron* forest across the Sino-Himalayan region, especially as they are rather inconspicuous, superficially resemble species of other more common genera, and are likely to be missed by non-expert collectors. The status of *O. infractum* in the region remains ambiguous—I did not find any samples among David Long's collections, suggesting that it is considerably less common than the other two species. However, the original collection (Kurz 2434, H-BR) was from 7000 ft (ca 2100 m), lower than any of the collections of *O. lignicola* and *O. gracile*, so it is possible that it could be more common in mid-altitude forests.

21. *Orthotrichum callistomum* Bruch & Schimp.

**Contributors:** Z. Skoupá and V. Plášek

**China, Gansu Province:** southern part of the Province, Wenxian County, Qijiaba, Yigongduan, 32°54.982'N, 104°18.503'E, 2550 m a.s.l., 20 May 2007, leg. Y. Jia 09268 (PE#01414559 as *O. ibukiense* Toy.), det. Z. Skoupá, teste V. Plášek.

*Orthotrichum callistomum* was firstly collected and described from the Swiss Alps in Europe (Bruch *et al.*, 1850), where it is probably extinct, as it has not been re-found there since the beginning of the 20th Century (Lewinsky, 1992). The species is very interesting not only from a morphological point of view but also phytogeographically. It was historically reported from Taiwan and across south-west China to Nepal (Lewinsky, 1992; Redfearn *et al.*, 1996; Wu, 2000; Jia *et al.*, 2011; Xiong, 2014), and from the Caucasus (Akatova *et al.*, 2004) to Turkey (Lara *et al.*, 2010). The voucher specimen collected by Y. Jia in 2007 and identified as *O. ibukiense* is actually mixed with *Lewinskya erosa* (Lewinsky) Lara, Garilleti & Goffinet which is also a new record for Gansu Province (for detail see the note on *L. erosa* above).

*Orthotrichum callistomum* is an unmistakable species, mainly because of the unique morphology of the peristome. The endostome consists of eight broad segments, as tall as the teeth, forming an annular structure similar to a perforated dome.

22. *Orthotrichum crenulatum* Mitt.

**Contributor:** V. Plášek

**Uzbekistan:** Middle Asia, E of Tashkent town, Ak Tash, on the bark of a tree, 14 May 1990, leg. S. Davey s.n. (E), det. J. Lewinsky-Haapasaari, teste V. Plášek.

Only three taxa of the genus *Orthotrichum* Hedw. have previously been published from Uzbekistan (*cf.* Lazarenko, 1938; Ignatov *et al.*, 2006b). The specimen cited above is an epiphytic moss new to the bryoflora of the country.

In Uzbekistan, *Orthotrichum crenulatum* was firstly collected from tree bark by S. Davey in 1990 in Ak Tash village, situated east of the capital city.

Unfortunately, it was without a detailed description of its locality. The voucher specimen is richly fertile. It was identified by J. Lewinsky-Haapasaari who noted: '*Orthotrichum crenulatum* Mitt. (obtuse leaf) mixed with *O. pallens* Brid.'. Alas, detailed inspection of the specimen did not reveal the latter species.

In Asia, *O. crenulatum* has already been reported from Afghanistan, India, Tibet, Turkestan and Kazakhstan (Lewinsky, 1992), Pakistan (Schäfer-Verwimp & Gruber, 2002) and recently it was repeatedly collected in Tajikistan (Ellis *et al.*, 2011b) and Kyrgyzstan (Ellis *et al.*, 2014b). A recent survey of epiphytic bryophytes in China revealed the occurrence of the species in four provinces of China (Skoupá *et al.*, 2017).

23. *Orthotrichum cupulatum* Brid.

**Contributor:** V. Plášek

**Uzbekistan:** Middle Asia, 25 km S of Samarkand town, north slope of Zeravshan ridge, Aman-Kutan valley above the Young Pioneer camp, along the Termez road (M39), on a rock, GPS coordinates (WGS 84): 39°18'53.21"N, 66°57'10.51"E, 1370 m a.s.l., 10 June 1969, *leg.* C. C. Townsend 69/402 (E), *teste* V. Plášek.

In Uzbekistan, *Orthotrichum cupulatum* was first collected by C. C. Townsend in 1969 from rocks in the south-eastern part of the country in the Zeravshan Range. The herbarium specimen consists of plants in fine fruiting condition.

In Middle Asia the species has been reported from Kirgizstan, Tajikistan and Turkmenistan (Lazarenko, 1938; Mamatkulov, 1975; Rakhmatulina, 1990; Mamatkulov *et al.*, 1998). The discovery of *O. cupulatum* and *O. crenulatum* (see note above) expands the number of species of *Orthotrichum* Hedw. in Uzbekistan to five.

24. *Radula tabularis* Steph.

**Contributors:** D. K. Singh and S. Majumdar

**India:** Eastern Himalaya, Arunachal Pradesh, Anjaw district, on way to Yasong from Menzong, 27°53'07"N, 96°48'37"E, ca 1000 m a.s.l., 26 October 1985, *leg.* D. K. Singh (ASSAM 110A/1985).

The specimen was lignicolous, growing in association with *Acrolejeunea sandvicensis* (Gottsche) Steph., *Bazzania tricrenata* (Wahlenb.) Trevis., *Blepharostoma trichophyllum* (L.) Dumort. subsp. *trichophyllum*, *Cheilolejeunea turgida* (Mitt.) W.Ye & R.L.Zhu, *Mannia fragrans* (Balbis) Frye & Clark, *Microlejeunea punctiformis* (Taylor) Steph., *Plicanthus hirtellus* (F.Weber) R.M.Schust., *Porella caespitans* (Steph.) S.Hatt. var. *caespitans*, *Ptychanthus striatus* (Lehm. & Lindenb.) Nees, *Radula kojana* Steph., *R. lindenbergiana* Gottsche *ex* Hartm. and *Scapania ornithopoides* (With.) Waddell. The population consisted of both vegetative and mature sporophyte bearing plants.

*Radula* Dumort. is represented in India by 27 species (Singh *et al.*, 2016). *Radula tabularis* has been reported in India from Himachal Pradesh in the Western Himalayas (Udar & Kumar, 1984; Singh & Singh, 2010; Singh *et al.*, 2016) and Tamil Nadu in the Western Ghats (Udar & Kumar, 1982; Daniels, 2010; Verma & Srivastava, 2011 as *R. indica* Steph. and *R. rara* Steph.; Singh *et al.*, 2016). Outside India, the species is known from Indonesia (Yamada, 1979; Menzel, 1988), Malaysia (Yamada, 1979, 1989; Chuah-Petiot, 2011), New Zealand (Yamada, 1979; Glenn, 1998), Sri Lanka (Long & Rubasinghe, 2014) and Africa (Yamada, 1979; Wigginton, 2009). It is reported here for the first time from Arunachal Pradesh in the Eastern Himalayas.

*Radula tabularis* can be easily distinguished from other species of the genus in the region by its brown, pinnately branched plants with stems up to eight cells thick, which are not internally differentiated into cortical and medullary zones. The leaves are densely imbricate, concave and falcate-ovate, their thin-walled cells have large, nodulose trigones. The lobes of the leaf are large and rectangular, up to 2/3 the length of the leaf with strongly inflated carinal regions. Gynoecia are terminal on the main shoot, with one or two sub-floral innovations.

25. *Schistidium amblyophyllum* (Müll.Hal.) Ochyra & Hertel

**Contributors:** H. Bednarek-Ochyra and M. Lebouvier

**Îles Crozet, Île de la Possession:** eastern coast, a small intermittent stream 250 m south of the Alfred Faure Station, entering the stream with the dam and the water intake for the base, 46°26'30"S, 51°51'40"E, 170 m a.s.l., in dry, deep fissures of black lava rocks, 11 November 2006, *leg.* R. Ochyra 131/06 (KRAM).

So far, only two species of *Schistidium* have been recorded from Îles Crozet, namely *S. falcatum* (Hook.f. & Wilson) B.Bremer (Ochyra & Bell, 1984) and *S. cupulare* (Müll.Hal.) Ochyra (Ellis *et al.*, 2013c). Herein, the third species of the genus, *S. amblyophyllum*, is added to the moss flora of this sub-antarctic archipelago. It is known from the two coterminous archipelagoes in the Kerguelen Biogeographical Province, namely the Prince Edward Islands (Ochyra & Hertel, 1990) and Îles Kerguelen where the syntype of *Grimmia amblyophylla* Müll.Hal., the basionym of *S. amblyophyllum*, was collected (Ochyra *et al.*, 2008b), so the species has been expected to occur in Îles Crozet. This discovery shows that *S. amblyophyllum* could have spread from the geologically older Îles Kerguelen and colonised much younger islands in this province. Although direct palaeobotanical evidence is not available for Îles Crozet (Van der Putten *et al.*, 2010), it is very

probable that the cryptogamic flora of this archipelago, including bryophytes, consists of postglacial immigrants, which could have reached this archipelago after the Last Glacial Maximum, as is the case with other subantarctic (Van der Putten *et al.*, 2004, 2009) and Antarctic islands (Birkenmajer *et al.*, 1985).

The present discovery of *Schistidium amblyophyllum* is a notable addition to the moss flora of the Îles Crozet archipelago, which is the least studied of all subantarctic island groups. As a result of intensive field studies carried out in recent decades, a good number of moss species were found on these islands (e.g. Blockeel *et al.*, 2006, 2007b; Ellis *et al.*, 2010, 2012b, 2013d, 2014b, 2014d, 2015, 2016a, 2016b, 2016c; Ochyra *et al.*, 2015b), and currently the moss flora of Îles Crozet consists of well over 70 species. *Schistidium amblyophyllum* is a widely distributed but scattered amphiatlantic south-cool-temperate species which, apart from the islands in the Kerguelen Biogeographical Province, is very frequent on subantarctic South Georgia (Bell, 1984 as *S. hyalinocuspdatum* (Müll.Hal.) B.G.Bell) and extends to the maritime Antarctic (Ochyra *et al.*, 2008b). Additionally, it is widespread in southern South America from where it penetrates into the tropics along the Andes and, moreover, is known from high elevations in the volcanic massifs in equatorial East Africa.

26. *Sciuro-hypnum curtum* (Lindb.) Ignatov

**Contributors:** J. Eckstein, J. Nagy and P. Erzberger

**Hungary:** (1) Pest County, Börzsöny Mts [8079.4] (Central European Mapping Scheme), east of the settlement Nagy Börzsöny, on shaded andesitic rocks at the end of the valley Pokol-völgy, 47°54'57.7"N, 18°55'00.5"E, ca 670 m a.s.l., associated bryophytes: *Grimmia hartmanii* Schimp., *Syntrichia ruralis* (Hedw.) F.Weber & D.Mohr., 04 December 2015, leg. József Nagy *s.n.* (B-Erzberger *s.n.*), det. L. Meinunger & W. Schröder. (2) Borsod-Abaúj-Zemplén County, Zemplén Mts [7594.1] east of the village Telkibánya, on the hill Gunya-hegy, near the forest lodge Gúnya-kúti erdősz-ház, on soil in spruce plantation, 48°28'32.2"N, 21°23'37.1"E, ca 350 m a.s.l., 14 April 2017, leg. & det. Jan Eckstein *s.n.* (50221, BP), conf. L. Meinunger & W. Schröder.

Ignatov & Milyutina (2007) demonstrated that most European records of *Sciuro-hypnum oedipodium* (Mitt.) Ignatov & Huttunen (*Brachythecium oedipodium* (Mitt.) A.Jaeger) refer to *S. curtum*. *Sciuro-hypnum oedipodium* is essentially a western North American taxon with isolated populations in the Caucasus (Ignatov & Milyutina, 2007). Although Hodgetts (2015) listed entries under both names, we tentatively assume that they all belong in *S. curtum*, which in Europe then appears to have a predominantly northern and eastern distribution, including parts of Central Europe. It has been reported from Austria,

Slovenia, Romania, the Ukraine and Slovakia among the countries surrounding Hungary.

*Sciuro-hypnum curtum* can easily be overlooked or mistaken for the frequent, widespread and very variable *Brachythecium rutabulum* (Hedw.) Schimp., with which it shares overall size and e.g. the type of the alar cell group, gradually differentiated from adjacent basal leaf cells, and narrow decurrencies. It differs from *B. rutabulum* by: stems and branches often arcuate with a tendency to produce rhizoids at their tip when in contact with the substrate, branches with  $\pm$  complanate leaves, the costa occasionally ending in a dorsal spine, often less distinctly denticulate leaf margins and a seta that is smooth throughout or rough only in its upper portion (Piippo, 1983). The leaf tips are sometimes twisted through 180°.

In Hungary, *S. curtum* has not hitherto been recorded (Papp *et al.*, 2010). It may be more widespread in the country, in particular in conifer plantations, but has probably been overlooked.

27. *Sciuro-hypnum glaciale* (Schimp.) Ignatov & Huttunen

**Contributor:** H. Bednarek-Ochyra

**Falkland Islands:** West Falkland, Mount Alice east of Port Stephens, 51.153234°S, 60.597510°W, 370 m a.s.l., in rock fissures on SE slope associated with *Bartramia patens* Brid., 1 July 2015, leg. D. E. Crabtree 364A (KRAM).

The occurrence of *Sciuro-hypnum glaciale* in the Falkland Islands has been expected, as there are no phytogeographical or other reasons why it could not occur in this archipelago, as is the case with the coterminous areas of Tierra de Fuego, Western Patagonia, subantarctic South Georgia and the northern maritime Antarctic (Ochyra *et al.*, 2008b). A single shoot of this species was discovered growing as an admixture in a tuft of *Bartramia patens* Brid. *Sciuro-hypnum glaciale* is a bipolar species that is widely distributed, but scattered in Eurasia and in south-western Greenland where it has a markedly dissected arctic-boreal-alpine range. It appears to have its main centre of occurrence in northern Europe, ranging from Iceland through Scotland and northern Fennoscandia to the Polar Urals, with isolated stations in the Pyrenees, Alps, Carpathians and Caucasus. In Asia, *S. glaciale* is rare and widely scattered, occurring in Chukotka in the north and in the mountains in southern Siberia, Central Asia and China. The present discovery is an expected addition to the moss flora of the Falkland Islands, which consists of about 150 species (Matteri, 2003). A number of valuable records in this archipelago were made in the last decade (e.g. Allen & Magill, 2003; Bednarek-Ochyra & Ochyra, 2003; Blockeel *et al.*, 2003; Ochyra & Broughton, 2004; Ireland *et al.*, 2005; Ochyra *et al.*, 2015a).

28. *Sphagnum austinii* Sull.

**Contributors:** I. Jukonienė and A. Uselienė

**Lithuania:** Šilutė region, Aukštumala Telmological Reserve, central part of Aukštumala peatland, near the hollow, in *Sphagnum magellanicum* Brid. lawn, 55°23'44.98"N, 21°21'46.61"E, 11 November 2011, leg. A. Uselienė, det. I. Jukonienė, B17597 (BILAS); Plungė region, about 8 km west of Rietavas, Aukštasis Tyras Telmological Reserve, at the north-eastern part of Aukštasis Tyras raised bog, in *Calluna vulgaris* (L.) Hull and *Eriophorum vaginatum* L. dominated area, on low hummocks, 55°43'36.02"N, 21°48'22.11"E, 5 October 2016, leg. et det. A. Uselienė, ver. I. Jukonienė, B17596 (BILAS).

C. A. Weber's monograph (Weber, 1902) on the Aukštumala (Augstumal) raised bog (western part of Lithuania), presented data on the distribution of *Sphagnum imbricatum* Russow in the mire. The species was recorded in the bog plateau and on the south-eastern edge of the bog, in most cases on *Calluna vulgaris* hummocks or between scattered *Eriophorum vaginatum*. At the south-eastern and north-western edges of the bog it was also found dominating the upper part of *Sphagnum* L. peat. The raised bog as described by C. A. Weber has recently been essentially changed due to anthropogenic activity. Its eastern part is used for peat mining, while the western part, which is still active raised bog, is protected as Telmological Reserve and Natura 2000 habitat. Based on C. A. Weber's records, the species *S. imbricatum* was included in the lists of the Lithuanian bryoflora, but due to the absence of herbarium material, was treated in a wide sense (*S. imbricatum* s. l.) (Jukonienė, 2003). The data by C. A. Weber indicated *S. imbricatum* to be growing on both recently protected and exploited parts of the bog. In 2011, species from the *S. imbricatum* complex were collected on the edge of the Telmological Reserve, close to a field already prepared for peat mining. The main characteristics of the material (three branches (two spreading and one pendant) in a fascicle, hyalocysts of stem leaves with apparent combfibrils) identified it as *S. austinii* s.s. (Flatberg, 1984; Andrus, 1987). The species was present, but not abundant, in a lawn of *S. magellanicum*. This is not the only locality for *S. austinii* in Lithuania. In 2016, it was also recorded from Aukštasis Tyras raised bog, about 47 km northeast of the bog in Aukštumala. The species was established in drier conditions as compared to the habitat of Aukštumala, and was distributed through an area of about 200 m<sup>2</sup> with *C. vulgaris* and *E. vaginatum* on low hummocks; the dominant species of moss were *S. magellanicum* and *S. rubellum* Wilson. In addition to this area, the species was also recorded about 400 m north-west on a hummock near a ditch bank.

*Sphagnum austinii* is a boreal, amphiatlantic and western Pacific species (Andrus, 1987), and is a common species of mires in Norway (Flatberg, 1986). It was also recorded from the bogs near the Baltic Sea from the Kaliningrad region (Maksimov, 2007), Latvia (Āboliņa et al., 2015) and Estonia (Vellak et al., 2015), and from bogs in Sweden (Hallingbäck et al., 2006) and Denmark (Mogensen & Goldberg, 2005). Both the records cited above are from western Lithuania.

29. *Symphyogyna podophylla* (Thunb.) Mont. & Nees

**Contributors:** R. L. Andriamiarisoa, D. A. Callaghan and C. Reeb

**Madagascar:** 0.8 km SW of Camp 1, Asaramanitra Circuit, Andringitra Massif, Andringitra National Park, Haute Miasatra Region, Fianarantsoa Province, 22°8'25.5"S, 46°53'14.0"E, 1710 m a.s.l., base of shaded, vertical soil bank in dry montane native forest, associated with *Cylindrocolea kiaeri* (Austin) Váňa, *Fissidens asplenioides* Hedw., *F. madecassus* Schimp. ex Müll.Hal. and *Telaranea nematodes* (Gottsche ex Austin) M.Howe, 24 May 2016, leg. R. Andriamiarisoa and D. A. Callaghan DAC2405161502, det. D. A. Callaghan, conf. C. Reeb (E).

Collections by C. Reeb include six vouchers of *S. podophylla* from three further locations in highland Madagascar: (1) Angavokely Forest Station, Analamanga Region, Antananarivo Province: 18°55'44.8"S, 47°45'04.8"E, 1507 m a.s.l., on granite boulders along a temporary stream in dense evergreen montane forest in small valley, 31 January 2011, leg. C. Reeb & R. Andriamiarisoa CR11159, det. C. Reeb (PC, No. PC0716046, TAN); (2) 18°55'40.4"S, 47°45'02.7"E, 1583 m a.s.l., on humid boulder in a rivulet running along a cliff adjoining dense evergreen montane forest, 31 January 2011, leg. C. Reeb & R. Andriamiarisoa CR11166, det. C. Reeb (PC, No. PC0716049, TAN); (3) 18°55'16"S, 47°44'30"E, 1510 m a.s.l., on sparsely vegetated humid granitic boulder at cave entrance, surrounded by native sub-humid forest, 2 February 2011, leg. C. Reeb & R. Andriamiarisoa CR11189, det. C. Reeb (PC, No. PC0716049, TAN). (4) Maromizaha Reserve, Alaotra-Mangoro Region, Tamatave Province: 18°58'53.8"S, 48°27'51"E, 921 m a.s.l., on boulders along stream in native sub-humid forest, 8 July 2012, leg. C. Reeb & A. Andriamanantena MTM12127b & MTM12131, det. C. Reeb (PC, Nos. PC0716045 & PC0716048, TAN). (5) Zahamena National Park, Alaotra-Mangoro Region, Tamatave Province: 17°38'13"S, 48°39'11"E, 1277 m a.s.l., on clay bank along stream in native sub-humid forest, 30 December 2013, leg. C. Reeb & A. Andriamanantena CR13Z41, det.

C. Reeb (PC, No. PC0716051, TAN); (6) 17°38'19"S, 48°36'46"E, 1156 m a.s.l., on lateritic soil bank near base camp in native sub-humid forest, 30 December 2013, *leg.* C. Reeb & A. Andriamananana *CR13Z61*, *det.* C. Reeb (PC, No. PC0716052, TAN).

*Symphogyna podophylla* is widely distributed in Africa and South America (Grolle, 1993; Schaumann *et al.*, 2003; Wigginton, 2009; Fischer, 2013) and provisionally listed for Madagascar by Marline *et al.* (2012) as '*Symphogyna* aff. *podophylla*' based on a collection from Vohimana Reserve, 18°55'43.6"S, 48°29'56.6"E, 15 April 2010, *leg.* Reeb, Andriamananana and Bidault. The current material (Andriamiarisoa & Callaghan *DAC2405161502*) comprises sterile shoots mixed with two female plants lacking sporophytes, the latter with the archegonial group protected by deeply incised lacinate-ciliate scales, a key feature distinguishing *Symphogyna* Nees & Mont. from *Jensenia* Lindb. (Grolle, 1993), as illustrated by Figure 2E in Perold (1993b) and Figure 437 in Fischer (2013).

30. *Syntrichia latifolia* (Bruch *ex* Hartm.) Huebener

**Contributors:** I. Jukonienė and A. Uselienė

**Lithuania:** Jurbarkas region, the eastern part of Girdžiai Botanical Reserve, bank of the River Mituva, in deciduous forest on old tree of *Populus alba* L., 28 May 2014, 55°9'38.7"N, 22°46'50.3"E *leg.* and *det.* A. Uselienė *B17036*, *ver.* I. Jukonienė, (BILAS).

*Syntrichia latifolia* is a temperate-hemiboreal species with a circumpolar distribution (Dierßen, 2001). In Europe, it is recorded more frequently from southern and central regions (Hodgetts, 2015). In the Baltic countries, the species is quite rare. It is distributed in southern Sweden (Hallingbäck *et al.*, 2008), but not recorded from Estonia (Vellak *et al.*, 2015) and in Latvia it is Endangered (Hodgetts, 2015). As *Tortula latifolia* Hartm., the species was reported from East Prussia, Tilset (recently Sovietsk) district by Dietzow (1938), but since that time it has not been recorded in Lithuania (Jukonienė, 2003). Its occurrence in the Kaliningrad region is doubtful (Hodgetts, 2015).

31. *Thamnobryum subserratum* (Hook.) Nog. & Z.Iwats.

**Contributors:** I. Jukonienė, A. Opmanis and A. Uselienė

**Lithuania:** Šilalė region, 3 km northeast of Kvėdarna, steep slope of the River Jūra, in deciduous forest, on stone, 55°34'9.34"N, 21°56'16.86"E, 9 May 2014, *leg.* and *det.* A. Opmanis *B17028* (BILAS); Jurbarkas region, Lemantiškiai, slope of the River Mituva, in deciduous forest, in ravine, on stone, 55°7'15.07"N, 22°41'2.57"E, 25 May 2013, *leg.* A. Uselienė *B17029*, *det.* I. Jukonienė, (BILAS).

These are the first records of *Thamnobryum* in Lithuania. The specimens cited above were collected

in similar habitats in both localities. *Thamnobryum subserratum* has only recently been reported from Europe: Latvia (Mastracci, 2003; Ābolina *et al.*, 2011), Austria (Köckinger *et al.*, 2008), Estonia (Vellak *et al.*, 2013) and Sweden (Ellis *et al.*, 2014b). *Thamnobryum alopecurum* (Hedw.) Gangulee, with similar ecological requirements, is distributed in most European regions (Hodgetts, 2015), but *T. subserratum* is distinguished by its elongate cells near the costa that form clear oblique rows and by one row of quadrate marginal cells at the base of leaf (Frahm, 2009).

32. *Tortula freibergii* Dix. & Loeske

**Contributors:** P. Campisi, M. G. Dia, G. Venturella and M. L. Gargano

**Tunisia:** Jendouba 13.5 km S of Aïn Draham, in Al Firnanah ('Kroumirie') 36°39'06"N, 08°41'53"E, ca 270 m a.s.l., on a shaded slope with *Targionia hypophylla* L. and *Funaria hygrometrica* Hedw. in a forest of *Quercus suber* L. and *Q. faginea* Lam. 3 April 2014, *leg.* F. M. Raimondo *s.n.*, *det.* P. Campisi & M. G. Dia (PAL).

By undertaking a study of bryophyte specimens collected during the 12th 'Iter Mediterraneum' of OPTIMA (Tunisia, 24 March–4 April 2014), the first results of which were recently published by Campisi *et al.* (2015), the moss *Tortula freibergii*, previously unknown for this country, was identified.

*Tortula freibergii* is a Mediterranean-temperate suboceanic species, threatened in Europe, where it has been reported from Great Britain, Portugal, Spain, France, Balearic Islands, Italy, Sicily and Malta (ECCB, 1995; Hodgetts, 2015) and is also now known from Greece (Blockeel, 2017). Outside this continent, it is known only from Algeria in North Africa (Ros *et al.*, 2013). It is a mesophytic, considerably thermophytic, species, with a degree of tolerance to human impact (mesohemerobous-euhemerobous), which grows both in sheltered and fairly exposed situations, acidic to subneutral rock outcrops and walls. It can live in moderately dry habitats, although in most sites within its range the species shows a clear connection with waterside habitats, even subject to periodic flooding (Crundwell & Nyholm, 1972; Dierßen, 2001; Locksley, 2007; Blockeel *et al.*, 2010; Hugonnot, 2010; Cano & Sáez, 2012; Mifsud, 2012).

The first finding of *T. freibergii* in Tunisia extends its distribution in North Africa where this species should be further investigated.

### Acknowledgements

This work was supported by the Natural History Museum, London (BM). The contributions by H. Bednarek-Ochyra have been financed through the statutory fund of the W. Szafer Institute of Botany of the Polish Academy of Sciences. She is also thankful to the curators at AD, AK, BM, BR, CHR, EGR,

FH, H, JE, NY, PC and WELT for organising the loan of specimens. The field work of M. Lebouvier on Îles Crozet was organised within the programme 136 ECOBIO of the French Polar Institute (IPEV). E. Ginzburg thanks Dr Alexey Potemkin for various help and support. The study was carried out within the framework of the institutional research project 01201255616 of the Komarov Botanical Institute of the Russian Academy of Sciences and partly supported by the Program of Basic Research of the Presidium of RAS 'Wildlife: Current Status and Problems of Development' (subprogramme: 'Biodiversity: state and dynamics'). Neil Bell thanks David Long for facilitating the study of his uniquely valuable bryophyte collections from the Sino-Himalayan region. The Royal Botanic Garden Edinburgh is supported by the Scottish Government's Rural and Environment Science and Analytical Services Division. During 2017 we are also grateful for the support of players of People's Postcode Lottery towards our scientific research. K. K. Rawat, V. Sahu and A. K. Asthana are grateful to the Director, CSIR-NBRI for kindly providing necessary facilities. One of us (KKR) acknowledges the financial support from SAC, ISRO, Ahmedabad, India under project GAP-3329 titled 'Alpine ecosystem dynamics and impact of climate change in Indian Himalaya (PRACRITI-II). The bryophyte survey by M. Infante and C. Hanoire was part of the programme *Support to the emergent Natural Reserves and Regional Natural Parks* by Région Occitanie (Ancienne Région Midi-Pyrénées) with support from the European Union. Rémi Lafitte (RNR Aulon) is thanked for his help during this survey, and Lars Söderström (Norwegian University of Science and Technology, Trondheim) kindly provided a reference specimen for identification. The work of Y.-J. Yoon and J. H. Kim was supported by the Korea Polar Research Institute (PE17090). O. M. Afonina and E. V. Kushnevskay are grateful to M. Higuchi for confirming the identification of the specimen of *Hypnum callichroum* from Leningrad Province. The research by O. M. Afonina was partly supported by RFBR (project no. 16-04-01156), the research of E. V. Kushnevskay by RSF (project no. 15-14-10023). The contribution of Roger Andriamiarisoa, Des Callaghan and Catherine Reeb was made under LABEX BCDIV RICCIA, supported by French state funds managed by ANR within the Investissements d'Avenir Program (reference ANR-11-IDEX-0004-02), with fieldwork authorised by The Malagasy General Directorate of Forests and Tananarivo University Department of Plant Biology (79/16/MEEMF/SG/DGF/DAPT/SCBT.re). Des Callaghan would like to thank Jiří Váňa for confirming the identification of *Cylindrocolea kiaeri*, Tamás

Pócs for the identification of *Notoscyphus lutescens* and Anders Hagborg for helping to provide background literature. Catherine Reeb would like to thank Rob Gradstein for helping to confirm the identification of *Jensenia spinosa* and *Symphogyna podophylla*.

The contributions of Vítězslav Plášek and Zuzana Skoupá were financially supported by EU structural funding Operational Programme Research and Development for Innovation, project No. CZ.1.05/2.1.00/19.0388 and by the Ministry of Education, Youth and Sports of the Czech Republic in the 'National Feasibility Program I', project LO1208 'TEWEP', MSK projects supporting Czech-Chinese cooperation, no. 00955/RRC/2015 and 01211/RRC/2016, and SYNTHESYS project GB-TAF-6565. The contribution of I. Jukonienė was in connection with the long-term programme of the Nature Research Centre 'Research and projections into the status and change of Lithuanian nature and biological resources, scientific justification of conservation, restoration and sustainable use'. J. Eckstein, J. Nagy and P. Erzberger wish to thank Ludwig Meinunger and Wiebke Schröder, Germany, for examining the specimens of *Sciuro-hypnum curtum*. The contribution by Beata Cykowska-Marzencka was financially supported by the statutory fund of the W. Szafer Institute of Botany of the Polish Academy of Sciences, and the contribution by Michał Węgrzyn was financially supported by the statutory fund of the Institute of Botany, Jagiellonian University. D. K. Singh and Shuvadeep Majumdar thank the Director, Botanical Survey of India, Kolkata for facilities and financial assistance to S.M. under the 'Flora of India' project, and the authorities of State Forest Department, Govt. of Arunachal Pradesh for facilitating the field work and logistic support.

Taxonomic Additions and Changes: Nil.

## References

- Ābolīna, A.A., Reriha, I.S., Opmanis, A.G., Suško, U.A. & Ignatova, E.A. 2011. New and rare moss records from Latvia. *Arctoa*, 20: 263–6.
- Ābolīna, A., Piterāns, A., Bамbe, B. 2015. *Lichens and bryophytes in Latvia: checklist [Latvijas ķērpji un sūnas: Taksonu saraksts]*. Salaspils: Latvijas Valsts mežzinātnes institūts "Silava".
- Afonina, O.M. 2004. The *Hypnum* sect. *Hamulosa* (Musci, Hypnaceae) in Russia. *Arctoa*, 13: 9–28.
- Afonina, O.M., Lavrinenko, O.V., Kholod, S.S. & Lavrinenko, I.A. 2008. New moss records from Nenets Autonomous District. 2. *Arctoa*, 17: 192–4. (In Russian).
- Agence Parcs Canada. 2011. Plan de gestion de l'entosthodon fasciculé (*Entosthodon fascicularis*) au Canada [Proposition]. Série des Plans de gestion de la Loi sur les espèces en péril. Ottawa: Agence Parcs Canada.
- Akatova, T.V., Kharzinov, Z.Kh., Ignatova, E.A. & Ignatov, M.S. 2004. On three rare species of *Orthotrichum* (Orthotrichaceae, Musci) in the Caucasus. *Arctoa*, 13: 41–9.
- Allen, B. 2002. Moss flora of Central America. Part 2. Encalyptaceae–Orthotrichaceae. *Monographs in Systematic Botany from the Missouri Botanical Garden*, 90: [1–3] + 1–699.

- Allen, B. & Magill, R.E. 2003. A revision of *Pilotrichella* (Lembophyllaceae, Musci). *Acta Academiae Paedagogicae Agriensis, Sectio Biologica, Nova Series*, 24: 43–83.
- Ando, H. 1997. A new subspecies of *Hypnum callichroum* from Japan, with a preliminary list of the species of *Hypnum* sect. *Hamulosa* and their distribution. *Journal of the Hattori Botanical Laboratory*, 82: 19–25.
- Andreas, B.K. 2013. A revision of *Blindia* (Seligeriaceae) from southern South America. *Bryologist*, 116(3): 263–80.
- Andrejeva, E.N., Mežaka, A. & Potemkin, A.D. 2012. New and rare species of bryophytes for the territory of St. Petersburg. *Novosti Sistematiki Nizšikh Rastenii*, 46: 227–34 (in Russian).
- Andrus, R.E. 1987. Nomenclatural changes in *Sphagnum imbricatum* sensu lato. *Bryologist*, 90: 217–20.
- Arnell, H.W. 1900. Beiträge zur Moosflora der Spitzbergischen Inselgruppe. *Öfversigt af Förhandlingar: Kongl. Svenska Vetenskaps-Akademien*, 57: 99–130.
- Bednarek-Ochyra, H. 2015a. Nomenclatural entanglements associated with *Racomitrium chlorocarpum* (Grimmiaceae). *Phytotaxa*, 188(3): 153–61.
- Bednarek-Ochyra, H. 2015b. *Bucklandiella lamprocarpa* (Musci, Grimmiaceae) in central and northern Andes. *Cryptogamie, Bryologie*, 36(1): 81–90.
- Bednarek-Ochyra, H. & Ochyra, R. 1994. *Racomitrium lamprocarpum* (Musci, Grimmiaceae) in southern South America. *Fragmenta Floristica et Geobotanica*, 39(2): 361–7.
- Bednarek-Ochyra, H. & Ochyra, R. 1996. *Racomitrium curiosissimum* (Musci, Grimmiaceae), an exquisite new species from New Zealand. *Fragmenta Floristica et Geobotanica*, 41(2): 973–84.
- Bednarek-Ochyra, H. & Ochyra, R. 1998. *Racomitrium lamprocarpum* (Müll.Hal.) Jaeg.—an addition to the moss flora of Îles Kerguelen and the Subantarctic. *Journal of Bryology*, 20(2): 525–8.
- Bednarek-Ochyra, H. & Ochyra, R. 2003. *Racomitrium patagonicum*, a new moss species from southern South America. *Journal of Bryology*, 25(3): 181–7.
- Bednarek-Ochyra, H. & Ochyra, R. 2010. *Bucklandiella allanfifei* (Grimmiaceae), a new moss species from New Zealand, with a note on South American *B. striatipila*. *Journal of Bryology*, 32(4): 245–55.
- Bednarek-Ochyra, H. & Ochyra, R. 2011. *Bucklandiella angustissima* sp. nov. (Grimmiaceae), a new austral amphipacific species with the smallest capsules and the shortest setae in the genus. *Cryptogamie, Bryologie*, 32(1): 13–27.
- Bednarek-Ochyra, H. & Ochyra, R. 2012a. The taxonomic status of *Racomitrium capense* (Bryophyta, Grimmiaceae) from South Africa. *Cryptogamie, Bryologie*, 33(2): 97–106.
- Bednarek-Ochyra, H. & Ochyra, R. 2012b. A consideration of *Bucklandiella* (Bryophyta, Grimmiaceae) in South America, with a taxonomic re-assessment of *Racomitrium looseri*. *Nova Hedwigia*, 95(1–2): 153–63.
- Bednarek-Ochyra, H. & Ochyra, R. 2013. Diversity of Grimmiaceae subfam. Racomitrioidae in sub-Saharan Africa, including an addition of *Bucklandiella striatipila* to the moss flora of the continent. *Cryptogamie, Bryologie*, 34(1): 3–12.
- Bednarek-Ochyra, H., Matteri, C.M. & Ochyra, R. 1996. A major range extension of *Racomitrium lamprocarpum* (Musci, Grimmiaceae) in South America. *Fragmenta Floristica et Geobotanica*, 41(2): 995–1000.
- Bednarek-Ochyra, H., Ochyra, R. & Buck, W.R. 1999. The genus *Racomitrium* (Grimmiaceae) in Brazil, with the first report of *R. subsecundum* in South America. *Brittonia*, 51(1): 93–105.
- Bednarek-Ochyra, H., Ochyra, R., Sawicki, J. & Szczecińska, M. 2014. *Bucklandiella seppeltii*, a new species of Grimmiaceae from Australasia and its phylogenetic position based on molecular data. *Turkish Journal of Botany*, 38(6): 1214–28.
- Bell, B.G. 1984. A synoptic flora of South Georgian mosses: *Grimmia* and *Schistidium*. *British Antarctic Survey Bulletin*, 63: 71–109.
- Bellolio-Trucco, G. & Ireland, R. 1990. A taxonomic study of the moss genus *Dicranum* (Dicranaceae) in Ontario and Quebec. *Canadian Journal of Botany*, 68: 867–909.
- Birkenmajer, K., Ochyra, R., Olsson, I.U. & Stuchlik, L. 1985. Mid-Holocene radiocarbon-dated peat at Admiralty Bay, King George Island (South Shetland Islands, West Antarctica). *Bulletin of the Polish Academy of Sciences, Earth Sciences*, 33(1–2): 7–13.
- Blockeel, T.L. 2017. Bryophytes of the Cyclades, Greece: the flora of the island of Andros. *Field Bryology*, 117: 36–45.
- Blockeel, T.L., Matcham, H.W., Ochyra, R., Bednarek-Ochyra, H., Schumacker, R. & Vanderpoorten, A. 2001. New national and regional bryophyte records, 4. *Journal of Bryology*, 23(2): 149–52.
- Blockeel, T.L., Duckett, J.G., Fernández, M.C., Hébrard, J.-P., Matcham, H.W., Porley, R.D., Ochyra, R., Bednarek-Ochyra, H., Soldán, Z. & Townsend, C.C. 2002. New national and regional bryophyte records, 5. *Journal of Bryology*, 24(1): 88–91.
- Blockeel, T.L., Abay, G., Çetin, B., Bednarek-Ochyra, H., Ochyra, R., Lewis Smith, R.I., Matteri, C.M., Farias, R.M., Novotný, I., Rao, P., Enroth, J., van Rooy, J., Schiavone, M.M. & Váňa, J. 2003. New national and regional bryophyte records, 7. *Journal of Bryology*, 25(3): 141–4.
- Blockeel, T.L., Bednarek-Ochyra, H., Ochyra, R., Garcia, C., Matcham, H.W., Sérgio, C., Sim-Sim, M., Stebel, A., Townsend, C.C. & Váňa, J. 2005. New national and regional bryophyte records, 11. *Journal of Bryology*, 27(2): 163–8.
- Blockeel, T.L., Chlebicki, A., Hájková, P., Hájek, M., Hradílek, Z., Kürschner, H., Ochyra, R., Parolly, G., Plášek, V., Quandt, D., Townsend, C.C. & Vanderpoorten, A. 2006. New national and regional bryophyte records, 12. *Journal of Bryology*, 28(1): 68–70.
- Blockeel, T.L., Bednarek-Ochyra, H., Ochyra, R., Düzenli, A., Erdağ, A., Erzberger, P., Ezer, T., Hespanhol, H., Kara, R., Matteri, C.M., Müller, F., Séneca, A., Sérgio, C. & Váňa, J. 2007a. New national and regional bryophyte records, 15. *Journal of Bryology*, 29(2): 139–42.
- Blockeel, T.L., Bednarek-Ochyra, H., Ochyra, R., Garilleti, R., Glime, J.M., Lara, F., Mazimpaka, V., Rusińska, A., Schäfer-Verwimp, A., Shabbara, H.M., Söderström, L., Stebel, A., Townsend, C.C., Váňa, J., Yayintaş, Ö.T. & Żarnowiec, J. 2007b. New national and regional bryophyte records, 17. *Journal of Bryology*, 29(4): 277–83.
- Blockeel, T.L., Bednarek-Ochyra, H., Ochyra, R., Duckett, J.G., Erzberger, P., Hedenäs, L., Hugonnot, V., Maier, E., Marková, I., Matcham, H.W., Plášek, V., Pócs, T., Seppelt, R.D., Szűcs, P., Thouvenot, L. & van Zanten, B.O. 2008. New national and regional bryophyte records, 18. *Journal of Bryology*, 30(2): 161–7.
- Blockeel, T., Campisi P. & Dia, M.G. 2010. Nuove stazioni italiane di *Tortula freibergii*. *Informtore Botanico Italiano*, 42(1): 323–6.
- Blom, H.H., Shevock, J.R., Long, D.G. & Ochyra, R. 2011. Two new rheophytic species of *Schistidium* from China. *Journal of Bryology*, 33(3): 179–88.
- Boiko, M.F. 2009. *Bryobionta of the steppe zone of Ukraine*. Kherson: Ailant. (In Ukrainian).
- Bruch, P., Schimper, W.P. & Gumbel, T. 1850. *Bryologia Europaea seu genera muscorum Europaeorum monographicae illustrata*. Vol. III. *Orthotrichum*. Supplementum II. Stuttgartiae: E. Schweizerbart, p. 77 + Tab. 224 [Fasc. Mon. Suppl. 2: 1, tab. iii].
- Campisi, P., Dia, M.G., Domina, G. & Raimondo, F.M. 2015. Bryophytes collected during the 12th 'Iter Mediterraneum' (Tunisia, 24 March–4 April, 2014). First contribution. *Bocconeana*, 27(1): 63–8.
- Cano, M.J. & Sáez, L. 2012. *Tortula freibergii* Dix. & Loeske. In: R. Garilleti & B. Albertos (Coord.) *Atlas y Libro Rojo de los briófitos amenazados de España*. Madrid: Organismo Autónomo Parques Nacionales Madrid, pp. 116–7 (Conser).
- Cano, M.J., Ros, R.M., Guerra, J. & González, J. 1999. The identity of *Entosthodon hungaricus* (Boros) Loeske and *E. maroccanus* (Méyl.) Hebr. & Lo Giudice (= *Physcomitrium maroccanum* Meyl.). *Journal of Bryology*, 21: 67–70.
- Chuah-Petiot, M.S. 2003. *Mosses, liverworts and hornworts of Kenya: an illustrated guide with descriptions and figures of over 300 species and keys for identification*. Nairobi: privately published.
- Chuah-Petiot, M.S. 2011. A checklist of Hepaticae and Anthocerotae of Malaysia. *Polish Botanical Journal*, 56(1): 1–44.
- Corley, M.F.V. 1991. The habitat range of *Dicranum leioneuron* Kindb. *Journal of Bryology*, 16: 485–6.
- Crundwell, A.C. & Nyholm, E. 1972. *Tortula freibergii* Dix. & Loeske in Sussex, new to the British Isles. *Journal of Bryology*, 7: 161–4.
- Damsholt, K. 2002. *Illustrated flora of Nordic liverworts and hornworts*. Lund: Nordic Bryological Society, Lund University.
- Daniels, A.E.D. 2010. Checklist of the bryophytes of Tamil Nadu, India. *Archive for Bryology*, 65: 1–117.

- Daniels, A., Kariyappa, K. & Sreebha, R. 2014. On the occurrence of *Calycularia crispula* Mitt. (Calyculariaceae) in the Western Ghats, India. *Acta Botanica Hungarica*, 56: 293–7.
- Davison, P. & Smith, D. 1992. *Calycularia crispula* (Hepaticae) in the Aleutian Islands and Pacific Northwest of North America. *Bryologist*, 9: 266–9.
- Dierßen, K. 2001. Distribution, ecological amplitude and phytosociological characterization of European bryophytes. *Bryophytorum Bibliotheca*, 56, 1–289.
- Dietzow, L. 1938. *Die Moose Altpreußens und ihre Standorte*. Königsberg: Jahresbericht des Preussischen Botanischen Vereins.
- Duda, J. 1955. Jatrovky Liptovských holi a jiných častí Slovenska. [Liverworts of Liptov and other parts of Slovakia]. *Časopis Slezkého Muzea, Series A, Opava*, 4: 14–28.
- Duda, J. 1958. K rozšíření jatrovek v Československu. [To extend the liverwort flora of Czechoslovakia]. *Časopis Slezkého Muzea, Series A, Opava*, 7(1): 31–63.
- Duda, J. & Váňa, J. 1989. Rozšíření jatrovek v Československu—LVI. (Extension of liverwort flora in Czechoslovakia LVI). *Časopis Slezkého Muzea, Series A, Opava*, 38: 209–24.
- Duda, J. & Váňa, J. 1992. Rozšíření jatrovek v Československu—LXII. (Extension of liverwort flora in Czechoslovakia—LXII). *Časopis Slezkého Muzea, Series A, Opava*, 41: 113–25.
- Ellis, L.T., Asthana, A.K., Sahu, V., Bednarek-Ochyra, H., Ochyra, R., Cano, M.J., Costa, D.P., Cykowska, B., Ochyra, R., Philippov, D.A., Dulin, M.V., Erzberger, P., Lebouvier, M., Mohamed, H., Ochyra, R., Orgaz, D.J., Phephu, N., Van Rooy, J., Stebel, A., Suárez, G.M., Schiavone, M.M., Townsend, C.C., Váňa, J., Vončina, G., Yayintaş, Ö.T., Yong, K.T. & Zander, R.H. 2010. New national and regional bryophyte records, 25. *Journal of Bryology*, 32(4): 311–22.
- Ellis, L.T., Asthana, A.K., Sahu, V., Srivastava, A., Bednarek-Ochyra, H., Ochyra, R., Chlachula, J., Colotti, M.T., Schiavone, M.M., Hradilek, Z., Jimenez, M.S., Klama, H., Lebouvier, M., Natcheva, R., Pócs, T., Porley, R.D., Sérgio, C., Sim-Sim, M., Smith, V.R., Söderström, L., Štefánuš, S., Suárez, G.M. & Váňa, J. 2011a. New national and regional bryophyte records, 28. *Journal of Bryology*, 33(3): 237–47.
- Ellis, L.T., Akhoondi Darzikolaei, S., Shirzadian, S., Bakalin, V.A., Bednarek-Ochyra, H., Ochyra, R., Claro, D., Dulin, M.V., Eckel, P.M., Erzberger, P., Eziz, R., Sulayman, M., Garcia, C., Sérgio, C., Stow, S., Hedderson, T., Hedenäs, L., Kürschner, H., Li, W., Nebel, M., Nieuwkoop, J., Philippov, D.A., Plášek, V., Sawicki, J., Schäfer-Verwimp, A., Štefánuš, S. & Váňa, J. 2011b. New national and regional bryophyte records, 29. *Journal of Bryology*, 33(4): 316–23.
- Ellis, L.T., Alegro, A., Bansal, P., Nath, V., Cykowska, B., Bednarek-Ochyra, H., Ochyra, R., Dulin, M.V., Erzberger, P., Garcia, C., Sérgio, C., Claro, D., Stow, S., Hedderson, T.A., Hodgetts, N.G., Hugonnot, V., Kucéra, J., Lara, F., Pertierra, L., Lebouvier, M., Liepina, L., Mežaka, A., Strazdiņa, L., Madžule, L., Reriha, I., Mazooji, A., Natcheva, R., Phephu, N., Philippov, D.A., Plášek, V., Čihal, L., Pócs, T., Porley, R.D., Sabovljević, M., Salimpour, F., Behroozmand Motlagh, M., Sharifnia, F., Akhoondi Darzikolaei, S., Schäfer-Verwimp, A., Šegota, V., Shaw, A.J., Sim-Sim, M., Sollman, P., Spitale, D., Hölzer, A., Stebel, A., Váňa, J., van Rooy, J. & Vončina, G. 2012a. New national and regional bryophyte records, 32. *Journal of Bryology*, 34(3): 231–46.
- Ellis, L.T., Bednarek-Ochyra, H., Ochyra, R., Cykowska, B., Dulin, M.V., Ezer, T., Kara, R., Flores, J.R., Suárez, G.M., Garcia, C., Martins, A., Sérgio, C., Garilleti, R., Kirmaci, M., Agcagil, E., Kurbatova, L.E., Lebouvier, M., Papp, B., Szurdoki, E., Philippov, D.A., Plášek, V., Pócs, T., Sabovljević, M., Sawicki, J., Sim-Sim, M., Szűcs, P., Bidló, A., Váňa, J., Vigalondo, B., Lara, F., Draper, I., Virchenko, V.M. & Wolski, G.J. 2012b. New national and regional bryophyte records, 33. *Journal of Bryology*, 34(4): 281–91.
- Ellis, L.T., Asthana, A.K., Gupta, R., Nath, V., Sahu, V., Bednarek-Ochyra, H., Ochyra, R., Cykowska, B., Calvo Aranda, S., Fischer, E., Gabriel, R., Górski, P., Gremmen, N., Hesperhol, H., Kurbatova, L.E., Lewis Smith, R.L., Long, D.G., Bell, D., Mogro, F., Sérgio, C., Garcia, C.A., Stow, S., Martins, A., Smith, V.R., Váňa, J. & Vanderpoorten, A. 2013a. New national and regional bryophyte records, 34. *Journal of Bryology*, 35(1): 62–70.
- Ellis, L.T., Bednarek-Ochyra, H., Ochyra, R., Benjumea, M.J., Saïš, L.V., Caparrós, R., Lara, F., Mazimpaka, V., Dulin, M.V., Garilleti, R., Gremmen, N., Grundling, P.-L., Heras, P., Infante, M., Huttunen, S., Ignatov, M.S., Korvenpää, T., Lebouvier, M., Lewis Smith, R.L., Lin, S.-H., Yang, J.-D., Linstrom, A., Plášek, V., Rosselló, J.A., Sawicki, J., van Rooy, J. & Smith, V.R. 2013b. New national and regional bryophyte records, 35. *Journal of Bryology*, 35(2): 129–39.
- Ellis, L.T., Bakalin, V.A., Baisheva, E., Bednarek-Ochyra, H., Ochyra, R., Borovichev, E.A., Choi, S.S., Sun, B.-Y., Erzberger, P., Fedosov, V.E., Garilleti, R., Albertos, B., Górski, P., Hájková, P., Hodgetts, N.G., Ignatov, M., Koczur, A., Kurbatova, L.E., Lebouvier, M., Mežaka, A., Miravet, J., Pawlikowski, P., Porley, R.D., Rosselló, J.A., Sabovljević, M.S., Pantović, J., Sabovljević, A., Schröder, W., Štefánuš, S., Suárez, G.M., Schiavone, M., Yayintaş, Ö.T. & Váňa, J. 2013c. New national and regional bryophyte records, 36. *Journal of Bryology*, 35(3): 228–38.
- Ellis, L.T., Aranda, S.C., Asthana, A.K., Bansal, P., Nath, V., Sahu, V., Bayliss, J., Asthana, G., Srivastava, S., Yadav, S., Brugués, M., Cano, M.J., Dulin, M.V., Fudali, E., Fuertes, E., Gabriel, R., Pereira, F., Silva, J.A.F., Gradstein, S.R., Hájková, P., Hájek, M., Heras, P., Infante, M., Lebouvier, M., Marka, J., Newsham, K.K., Ochyra, R., Pantović, J., Sabovljević, M.S., Phephu, N., van Rooy, J., Philippov, D.A., Porley, R.D., Puche, F., Schäfer-Verwimp, A., Segarra-Moragues, J.G., Sérgio, C., Smith, V.R., Štefánuš, S., Váňa, J. & Wigginton, M.J. 2013d. New national and regional bryophyte records, 37. *Journal of Bryology*, 35(4): 290–305.
- Ellis, L.T., Bayliss, J., Bruggeman-Nannenga, M.A., Cykowska, B., Ochyra, R., Gremmen, N.J.M., Frahm, J.-P., Hedderson, T.A., Heras, P., Infante, M.V., Hugonnot, V., Mogro, F., Plášek, V., Čihal, L., Sawicki, J., Schäfer-Verwimp, A., Stebel, A., Štefánuš, S., Váňa, J., Yang, J.-D. & Lin, S.-H. 2014a. New national and regional bryophyte records, 38. *Journal of Bryology*, 35(1): 61–72.
- Ellis, L.T., Afonina, O.M., Asthana, A.K., Gupta, R., Sahu, V., Nath, V., Batan, N., Bednarek-Ochyra, H., Benítez, A., Erzberger, P., Fedosov, V.E., Górski, P., Gradstein, S.R., Gremmen, N., Hallingbäck, T., Hagström, M., Köckinger, H., Lebouvier, M., Meinunger, L., Németh, C., Nobis, M., Nowak, A., Özdemir, T., Pantović, J., Sabovljević, A., Sabovljević, M.S., Pawlikowski, P., Plášek, V., Čihal, L., Sawicki, J., Sérgio, C., Ministro, P., Garcia, C.A., Smith, V.R., Štefánuš, S., Stow, S., Suárez, G.M., Flores, J.R., Thouvenot, L., Váňa, J., van Rooy, J. & Zander, R.H. 2014b. New national and regional bryophyte records, 39. *Journal of Bryology*, 36(2): 134–51.
- Ellis, L.T., Aleffi, M., Asthana, A.K., Srivastava, A., Bakalin, V.A., Batan, N., Özdemir, T., Bednarek-Ochyra, H., Borovichev, E.A., Brugués, M., Cano, M.J., Choi, S.S., De Beer, D., Eckstein, J., Erzberger, P., Fedosov, V.E., Ganeva, A., Natcheva, R., Garcia, C.A., Sérgio, C., Garilleti, R., Albertos, B., Puche, F., Gücel, S., Higuchi, M., Hugonnot, V., Hylander, K., Kirmaci, M., Aslan, G., Koponen, T., Lara, F., Mazimpaka, V., van Melick, H., Müller, F., Özenoglu Kiremit, H., Papp, B., Szurdoki, E., Plášek, V., Čihal, L., van der Pluijm, A., Poponessi, S., Mariotti, M.G., Reyniers, J., Sabovljević, M.S., Sawicki, J., Smith, V.R., Stebel, A., Štefánuš, S., Sun, B.-Y., Váňa, J. & Venanzoni, R. 2014c. New national and regional bryophyte records, 40. *Journal of Bryology*, 36(3): 223–44.
- Ellis, L.T., Aleffi, M., Tacchi, R., Alegro, A., Alonso, M., Asthana, A.K., Sahu, V., Biasuso, A.B., Callaghan, D.A., Ezer, T., Kara, R., Seyli, T., Garilleti, R., Gil-López, M.J., Gwynne-Evans, D., Hedderson, T.A., Kiebacher, T., Larrain, J., Long, D., Lüth, M., Malcolm, B., Mamontov, Y.S., Newsham, K.K., Nobis, M., Nowak, A., Ochyra, R., Pawlikowski, P., Plášek, V., Čihal, L., Potemkin, A.D., Puche, F., Rios, D., Gallego, M.T., Guerra, J., Sawicki, J., Schäfer-Verwimp, A., Segarra-Moragues, J.G., Šegota, V., Sofronova, E.V., Štefánuš, S., Szűcs, P., Bidló, A., Papp, B., Szurdoki, E., Tan, B.C., Váňa, J., Vigalondo, B., Draper, I., Lara, F., Yoon, Y.-J., Sun, B.-Y. & Nishimura, N. 2014d. New national and regional bryophyte records, 41. *Journal of Bryology*, 36(4): 306–24.
- Ellis, L.T., Alegro, A., Šegota, V., Bakalin, V.A., Barone, R., Borovichev, E.A., Hugonnot, V., Lebouvier, M., Nobis, M., Nowak, A., Ochyra, R., Papp, B., Szurdoki, E., Piwowarczyk, R., Plášek, V., Čihal, L., Ren, Z.-J., Sabovljević, M.S., Sérgio, C., Garcia, C.A., Melo, I., Sawicki, J., Stebel, A., Štefánuš, S., Ion, R., Manole, A., Tziortzis, I., Xiong, Y. & Zhao, Z.-T. 2015. New national and regional bryophyte records, 44. *Journal of Bryology*, 37(3): 228–41.



- Ellis, L.T., Asthana, A.K., Srivastava, P., Omar, I., Rawat, K.K., Sahu, V., Cano, M.J., Costa, D.P., Dias, E.M., Dias dos Santos, N., Silva, J.B., Fedosov, V.E., Kozhin, M.N., Ignatova, E.A., Germano, S.R., Golovina, E.O., Gremmen, N.J.M., Ion, R., Ștefănuț, S., von Konrat, M., Jimenez, M.S., Suárez, G.M., Kiebacher, T., Lebouvier, M., Long, D.G., Maity, D., Ochyra, R., Parnikoza, I., Plášek, V., Fialová, L., Skoupá, Z., Poponessi, S., Aleffi, M., Sabovljević, M.S., Sabovljević, A.D., Saha, P., Aziz, M.N., Sawicki, J., Suleiman, M., Sun, B.-Y., Váňa, J., Wójcik, T., Yoon, Y.-J., Żarnowiec, J. & Larrain, J. 2016a. New national and regional bryophyte records, 46. *Journal of Bryology*, 38(1): 47–63.
- Ellis, L.T., Aleffi, M., Alegro, A., Segota, V., Asthana, A.K., Gupta, R., Singh, V.J., Bakalin, V.A., Bednarek-Ochyra, H., Cykowska-Marzencka, B., Benítez, A., Borovichev, E.A., Vilnet, A.A., Konstantinova, N.A., Buck, W.R., Cacciatore, C., Sérgio, C., Csiky, J., Deme, J., Kovács, D., Damsholt, K., Enroth, J., Erzberger, P., Fedosov, V.E., Fuertes, E., Gradstein, S.R., Gremmen, N.J.M., Hallingbäck, T., Jukoniene, I., Kiebacher, T., Larrain, J., Lebouvier, M., Lüth, M., Mamontov, Yu.S., Potemkin, A.D., Nemeth, Cs., Nieuwkoop, J.A.W., Nobis, M., Osorio, F., Parnikoza, I., Peralta, D.F., Carmo, D.M., Plášek, V., Skoupá, Z., Poponessi, S., Venanzoni, R., Puche, F., Purger, D., Reeb, C., Rios, R., Rodríguez-Quiel, E., Arrocha, C., Sabovljević, M.S., Nikolić, N., Sabovljević, A.D., dos Santos, E.L., Segarra-Moragues, J.G., Ștefănuț, S., Stonić, D., Virchenko, V.M., Węgrzyn, M. & Wietrzyk, P. 2016b. New national and regional bryophyte records, 48. *Journal of Bryology*, 38(3): 235–59.
- Ellis, L.T., Agcagil, E., Kirmaci, M., Aleffi, M., Bakalin, V.A., Bednarek-Ochyra, H., Cykowska-Marzencka, B., Stryjak-Bogacka, M., Bojaca, G.F.P., Fantacelle, L.B., Araújo, C.A.T., Maciel-Silva, A.S., Bruno Silva, J., Calleja, J.A., Cano, M.J., Castillo Diaz, J., Gabriel, R., Dias dos Santos, N., Enroth, J., Erzberger, P., Garilleti, R., Hájek, M., Hedenäs, L., Heras, P., Infante, M., Kiebacher, T., Koczur, A., Krawczyk, R., Kučera, J., Lebouvier, M., Lüth, M., Mazimpaka, V., Vigalondo, B., Lara, F., Nagy, J., Németh, Cs., Kovács, A., Nobis, M., Węgrzyn, M., Wietrzyk, P., Norhazrina, N., Vanderpoorten, A., Nowak, A., Poponessi, S., Gigante, D., Venanzoni, R., Plášek, V., Rangel Germano, S., Schäfer-Verwimp, A., Sérgio, C., Claro, D., Garcia, C.A., Shirzadian, S., Akhondi Darzikolaei, A., Stebel, A., Suleiman, M., Yong, K.-T., Virchenko, V.M., Vončina, G., Yoon, Y.-J., Choi, H.-G. & Kim, J.H. 2016c. New national and regional bryophyte records, 49. *Journal of Bryology*, 38(4): 327–47.
- Ellis, L.T., Ah-Peng, C., Aleffi, M., Baráth, K., Brugués, M., Ruiz, E., Buck, W.R., Czernyadjeva, I.V., Erzberger, P., Fantacelle, L.B., Peñaloza-Bojacá, G.F., Araújo, C.A.T., Oliveira, B.A., Maciel-Silva, A.S., Gremmen, N.J.M., Guo, S.-L., Hedderson, T.A., February, E., Wilding, N., Hugonnot, V., Kirmaci, M., Kürschner, H., Lebouvier, M., Mesterházy, A., Ochyra, R., Philippe, M., Plášek, V., Skoupá, Z., Poponessi, S., Gigante, D., Venanzoni, R., Rawat, K.K., Sahu, V., Asthana, A.K., Sabovljević, M.S., Sabovljević, A.D., Schäfer-Verwimp, A. & Wierzcholska, S. 2017a. New national and regional bryophyte records, 50. *Journal of Bryology*, 39(1): 99–114.
- Ellis, L.T., Aleffi, M., Bednarek-Ochyra, H., Bakalin, V.A., Boiko, M., Calleja, J.A., Fedosov, V.E., Ignatov, M.S., Ignatova, E.A., Garilleti, R., Hallingbäck, T., Lönnell, N., Hodgetts, N., Kiebacher, T., Larrain, J., Lebouvier, M., Lüth, M., Mazimpaka, V., Vigalondo, B., Lara, F., Natcheva, R., Nobis, M., Nowak, A., Orgaz, J.D., Guerra, J., Pantović, J., Nikolić, N., Sabovljević, M.S., Sabovljević, A.D., Pisarenko, O.Yu., Plášek, V., Skoupá, Z., Poponessi, S., Privitera, M., Puglisi, M., Skudnik, M. & Wang, Q.H. 2017b. New national and regional bryophyte records, 51. *Journal of Bryology*, 39(2): 177–90.
- Ellis, L.T., Alataş, M., Aleffi, M., Alegro, A., Šegota, V., Ozimec, S., Vukovic, N., Koletić, N., Prlić, D., Bontek, M., Asthana, A.K., Gupta, D., Sahu, V., Rawat, K.K., Bakalin, V.A., Klimova, K.G., Baráth, K., Beldiman, L.N., Csiky, J., Deme, J., Kovács, D., Cano, M.J., Guerra, J., Czernyadjeva, I.V., Dulin, M.V., Erzberger, P., Ezer, T., Fedosov, V.E., Fontinha, S., Sim-Sim, M., Garcia, C.A., Martins, A., Granzow-de la Cerda, I., Sáez, L., Hassel, K., Weibull, H., Hodgetts, N.G., Infante, M., Heras, P., Kiebacher, T., Kučera, J., Lebouvier, M., Ochyra, R., Ören, M., Papp, B., Park, S.J., Sun, B.-Y., Plášek, V., Poponessi, S., Venanzoni, R., Purger, D., Reis, F., Sinigla, M., Stebel, A., Ștefănuț, S., Uyar, G., Vončina, G., Wigginton, M.J., Yong, K.-T., Chan, M.S. & Yoon, Y.-J. 2017c. New national and regional bryophyte records, 52. *Journal of Bryology*, 39(3): 285–304.
- Enroth, J. 1989. Bryophyte flora of the Huon Peninsula, Papua New Guinea. XXVII. Neckeraceae (Musci). *Acta Botanica Fennica*, 137: 41–80.
- Enroth, J. 1991. Notes on the Neckeraceae (Musci). 10. The taxonomic relationships of *Pinnatella mariei*, with the description of *Caduciella* (Leptodontaceae). *Journal of Bryology*, 16: 611–8.
- Enroth, J. 1993. Notes on the Neckeraceae (Musci). 17. A taxonomic study on the genus *Neckeropsis* in Africa. *Journal of the Hattori Botanical Laboratory*, 73: 159–173.
- Enroth, J. 1994. A taxonomic monograph of the genus *Pinnatella* (Neckeraceae, Bryopsida). *Acta Botanica Fennica*, 151: 1–90.
- European Committee for the Conservation of Bryophytes (ECCB). 1995. *Red data book of European bryophytes*. Trondheim: ECCB.
- Fedosov, V.E., Ignatova, E.A., Ignatov, M.S. & Doroshina, G.Y.A. 2010. On the genus *Entosthodon* (Funariaceae, Musci) in the Caucasus. *Arctoa*, 19: 75–86.
- Fife, A. 1984. Records of new or otherwise interesting mosses in New Zealand, including a new species of *Racomitrium*. *New Zealand Journal of Botany*, 22: 1–6.
- Fischer, E. 2013. Liverworts and hornworts of Rwanda. *Abc Taxa*, 14: 1–551.
- Flatberg, K.I. 1984. A taxonomic revision of the *Sphagnum imbricatum* complex. *Kongelige Norske Videnskabers Selskab Skrifter*, 3: 1–80.
- Flatberg, K.I. 1986. Taxonomy, morphovariation, distribution and ecology of the *Sphagnum imbricatum* complex with the main reference to Norway. *Gunneria*, 54: 1–118.
- Forrest, L.L., Schuette, S.W., Crandall-Stotler, B.J. & Stotler, R.E. 2005. A molecular study of the simple thalloid liverwort *Jensenia* (Marchantiophyta, Pallaviciniaceae). *Bryologist*, 108: 204–11.
- Frahm, J.-P. 1982. Grossdisjunktionen von Arealen Südamerikanischer und Afrikanischer *Campylopus*-Arten. *Lindbergia*, 8: 45–52.
- Frahm, J.-P. 2009. Zur Unterscheidung von *Thamnobryum subseratum* (Hook. ex Harv.) Nog. & Z. Iwatz. und *Thamnobryum neckeroides* (Hook.) E. Lawton. *Archive for Bryology*, 39: 1–7.
- Frisvoll, A.A. 1988. A taxonomic revision of the *Racomitrium heterostichum* group (Bryophyta, Grimmiaceae) in N. and C. America, Europe and Asia. *Gunneria*, 59: 1–289.
- Frisvoll, A.A. & Elvebakk, A. 1996. Part 2. Bryophytes. In: A. Elvebakk & P. Prestrud, eds. A catalogue of Svalbard plants, fungi, algae and cyanobacteria. *Norsk Polarinstitutt Skrifter*, 198: 57–172.
- Furuki, T. & Mizutani, M. 1994. Checklist of Japanese Hepaticae and Anthocerotae, 1993. *Proceedings of the Bryological Society of Japan*, 6: 75–83.
- Glenny, D. 1998. A revised checklist of New Zealand liverworts and hornworts. *Tuhinga*, 10: 119–49.
- Goffinet, B., Buck, W.R. & Wall, M.A. 2007. *Orthotrichum freyanum* (Orthotrichaceae), a new epiphytic moss from Chile. *Nova Hedwigia*, 131: 1–11.
- Górski, P. & Váňa, J. 2014. A synopsis of liverworts occurring in the Tatra Mountains (Western Carpathians, Poland and Slovakia): checklist, distribution and new data. *Preslia*, 86(4): 381–485.
- Gradstein, S.R. 2013. Afro-American hepatics revisited. *Polish Botanical Journal*, 58(1): 149–77.
- Gradstein, S.R. 2017. Amphitropical disjunctive species in the complex thalloid liverworts (Marchantiidae). *Journal of Bryology*, 39(1): 66–78.
- Greene, D.M. 1986. *A conspectus of the mosses of Antarctica, South Georgia, the Falkland Islands and southern South America*. Cambridge: British Antarctic Survey.
- Grolle, R. 1993. Taxonomic results of the BRYOTROP expedition to Zaire and Rwanda. 9. Pallaviciniaceae, Haplomitriaceae. *Tropical Bryology*, 8: 75–82.
- Hallingbäck, T., Hedenäs, L. & Weibull, H. 2006. Ny checklist för Sveriges mossor [Checklist of bryophytes recorded for Sweden]. *Svensk botanisk Tidskrift*, 100(2): 96–148.
- Hallingbäck, T., Lönnell, N., Weibull, H., Hedenäs, L., von Knorring, P., Korotyńska, M., Reisborg, C. & Birgersson, M. 2008. Nationalnyckeln till Sveriges flora och fauna. Bladmossor: Kompaktmossor-kapmossor. Bryophyta: *Anoetangium-Orthodontium*.—Uppsala: ArtDatabanken, SLU.
- Hedenäs, L. & Bisang, I. 2004. Key to European *Dicranum* species. *Herzogia*, 17: 179–97.

- Hodgetts, N.G. 2015.** Checklist and country status of European bryophytes—towards a new Red List for Europe. *Irish Wildlife Manuals*, No. 84. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.
- Hodgetts, N.G., Matcham, H.W. & Duckett, J.G. 1999.** Bryophytes collected in Lesotho, the Natal Drakensberg and the Orange Free State, southern Africa. *Journal of Bryology*, 21(2): 133–55.
- Hong, W.S. 1986.** The family Cephalozellaceae in North America west of the 100th meridian. *Bryologist*, 89(2): 155–62.
- Hooker, J.D. 1867.** *Handbook of the New Zealand flora: a systematic description of the native plants of New Zealand and the Chatham, Kermadec's, Lord Auckland's Campbell's and Macquarrie's Islands, Part 2.* London: Reeve & Co., pp. xlii + 393–798.
- Hugonnot, V. 2010.** *Tortula freibergii* Dixon & Loeske (Pottiaceae) en Touraine à Amboise (Indre-et-Loire, France). *Bulletin de la Société Botanique du Centre-Ouest* (nouvelle série), 41: 529–32.
- Ignatov, M.S. & Afonina, O.M. 1992.** Check-list of mosses of the former USSR. *Arctoa*, 1: 1–85.
- Ignatov, M.S. & Ignatova, E.A. 2003.** *Flora mhov srednej chasti evropejskoj Rossii. T. 1 [Moss flora of the middle European Russia. Vols. 1].* Moscow: KMK. (In Russian).
- Ignatov, M.S. & Milyutina, I.A. 2007.** On *Sciuro-hypnum oedipodium* and *S. curtum* (Brachytheciaceae, Bryophyta). *Arctoa*, 16: 47–61.
- Ignatov, M.S., Afonina, O.M. & Ignatova, E.A. 2006a.** Checklist of mosses of East Europe and North Asia. *Arctoa*, 15: 1–130.
- Ignatov, M.S., Ignatova, E.A., Tsegmed, Ts. & Tan, B.C. 2006b.** The genus *Orthodontopsis* Ignatov & B.C.Tan (Bryaceae, Bryophyta) in Russia, Mongolia and China. *Arctoa*, 15: 163–8.
- Ignatova, E.A. & Ignatov, M.S. 2005.** On the identity of *Physcomitrium martianovii* (Funariaceae, Bryophyta). *Arctoa*, 14: 67–70.
- Ireland, R.R., Bellolio, B., Bednarek-Ochyra, H. & Ochyra, R. 2005.** Fertile plants of *Racomitrium patagonicum* (Bryopsida, Grimmiaceae). *Journal of the Hattori Botanical Laboratory*, 98: 205–11.
- Jia, Y., He, S. & Guo, S.-L. 2011.** Orthotrichaceae. In: P.-Ch. Wu, M.R. Crosby & S. He, eds. *Moss flora of China*. English version. Volume 5. *Eropodiaceae–Climaciaceae*. Beijing—New York: Science Press and St. Louis: Missouri Botanical Garden Press, pp. 22–117.
- Jones, E.W. 1985.** African hepatics XXXV. Some new or little-known species and some noteworthy records. *Journal of Bryology*, 13: 497–508.
- Jukoniėnė, I. 2003.** *Lietuvos kiminai ir žaliosios samanės (Mosses of Lithuania)*. Vilnius: Botanikos instituto leidykla.
- Köckinger, H., Suanjak, M., Schriebel, A. & Schröck, C. 2008.** *Die Moose Kärntens*. Klagenfurt: Verlag des Naturwissenschaftlichen Vereins für Kärnten.
- Konstantinova, N. & Mamontov, Y. 2010.** A revision of the genus *Calycularia* Mitt. (Calyculariaceae, Marchantiophyta). *Arctoa*, 19: 117–30.
- Koponen, T. & Norris, D.H. 1985.** Bryophyte flora of the Huon Peninsula, Papua New Guinea. XI. *Brachymenium*, *Epipterygium*, *Leptobryum*, *Mielichhoferia*, *Orthodontium*, and *Pohlia* (Bryaceae) and *Leptostomataceae* (Musci). *Acta Botanica Fennica*, 131: 97–127.
- Kozhin, M.N. 2012.** New bryophytes for the Kandalaksha State Nature Reserve. International bryological conference dedicated to 100 year anniversary of R.N. Schljakov. Apatity, Murmansk Province, 24–26th June 2012: Abstracts. Apatity.
- Kuc, M. 1995.** *Calliargon giganteum* (Musci, Amblystegiaceae) in Tierra del Fuego—first record in the Southern Hemisphere. *Fragmenta Floristica et Geobotanica*, 40(1): 229–32.
- Kürschner, H. & Erdağ, A. 2005.** Bryophytes of Turkey: an annotated reference list of the species with synonyms from the recent literature and an annotated list of Turkish bryological literature. *Turkish Journal of Botany*, 29: 95–154.
- Kürschner, H. & Frey, W. 2011.** Liverworts, mosses and hornworts of Southwest Asia (Marchantiophyta, Bryophyta, Anthocerotophyta). *Nova Hedwigia*, Beiheft, 139: 1–240.
- Lara, F., Mazimpaka, V., Medina, R., Caparrós, R. & Garilieti, R. 2010.** The northeastern Turkey, an unnoticed but very important area for the Orthotrichaceae (Bryophyta). *Nova Hedwigia*, 138: 165–80.
- Lara, F., Garilieti, R., Goffinet, B., Draper, I., Medina, R., Vigalondo, B. & Mazimpaka, V. 2016.** *Lewinskya*, a new genus to accommodate the phaneroporous and monoicous taxa of *Orthotrichum* (Bryophyta, Orthotrichaceae). *Cryptogamie, Bryologie*, 37: 361–82.
- Lazarenko, A.S. 1938.** Materials on bryoflora of Middle Asia. *Žurnal Instytuto. Botaniky Vseukrajins'koji Akademiji. Nauk*, 26–67: 191–216.
- Lewinsky, J. 1992.** The genus *Orthotrichum* Hedw. (Orthotrichaceae, Musci) in southeast Asia. A taxonomic revision. *Journal of the Hattori Botanical Laboratory*, 72: 1–88.
- Lewinsky-Haapasaari, J. 1995.** *Orthotrichum notabile* Lewinsky-Haapasaari, a new moss species from Sichuan, China. *Linbergia*, 20: 102–5.
- Locksley, A.R. 2007.** *Tortula freibergii* along the Bridgewater Canal. *Field Bryology*, 93: 8–10.
- Long, D.G. & Rubasinghe, S.C.K. 2014.** Liverworts and hornworts of Sri Lanka: a revised checklist. *Ceylon Journal of Science (Biological Sciences)*, 43(1): 1–36.
- Maksimov, A.I. 2007.** *Sphagnum imbricatum* complex (Sphagnaceae, Bryophyta) in Russia. *Arctoa*, 16: 25–34.
- Mamatkulov, U.K. 1975.** *Mosses of Darvaz Range*. Dushanbe: Donish, 100 pp.
- Mamatkulov, U.K., Baitulin, I.O. & Nesterova, S.G. 1998.** *Bryophytes of Middle Asia and Kazakhstan*. Almaty: Institut Botaniki i Fitointroduktsky MN-AN RK.
- Marline, L., Andriamiarisoa, R.L., Bardat, J., Chuah-Petiot, M., Hedderson, T.A.J., Reeb, C., Strasberg, D., Wilding, N. & Ah-Peng, C. 2012.** Checklist of the bryophytes of Madagascar. *Cryptogamie, Bryologie*, 33: 199–255.
- Martincič, A. 2003.** Seznam listnatih mahov (Bryopsida) Slovenije. [List of leaf mosses (Bryopsida) of Slovenia]. *Hacquetia*, 2: 91–166.
- Mastracci, M. 2003.** *Thamnobryum neckeroides* (Bryopsida: Neckeraceae): lectotypification, synonymies, diagnostic characters, habitat and distribution. *Journal of Bryology*, 25(2): 115–20.
- Matteri, C.M. 2003.** Los musgos (Bryophyta) de Argentina. *Tropical Bryology*, 24: 33–100.
- Matteri, C.M. & Schiavone, M.M. 2002.** Catálogo de los musgos (Bryophyta) de la Región Fueguina en Argentina y Chile. *Revista del Museo Argentino de Ciencias Naturales, Nueva Serie*, 4: 111–38.
- Menzel, M. 1988.** Annotated catalogue of the Hepaticae and Anthocerotae of Borneo. *Journal of the Hattori Botanical Laboratory*, 65: 145–206.
- Mifsud, S.D. 2012.** An update on the moss flora of the Maltese Islands. *Cryptogamie, Bryologie*, 33(4): 405–18.
- Mogensen, G.S. & Goldberg, I. 2005.** Danske og Latinske navne for Tørvemosser, Sortmosser og Bladmøsser, der forekommer i Danmark. Ver. 4. 29.12.2005 [Danish and Latin names for Sphagna, Andreaeas and mosses that occur in Denmark]. Vers. 4. 29.12.2005. [accessed 27 May 2017]. Available at <http://www.bryologkredsen.dk/pdf/danmos4.pdf>
- Müller, F. 2009.** An updated checklist of the mosses of Chile. *Archive for Bryology*, 58: 1–124.
- Nyholm, E. 1965.** *Illustrated moss flora of Fennoscandia*. II. Musci. Fasc. 5. Lund: Gleerup, pp. 408–647.
- Ochyra, R. 1985a.** *Koponenia*, a new pleurocarpous moss genus from Bolivia. *Journal of Bryology*, 13(4): 479–86.
- Ochyra, R. 1985b.** *Hypnobartlettia fontana* gen. et sp. nov. (Musci: Hypnobartlettiaceae fam. nov.), a unique moss from New Zealand. *Lindbergia*, 11(1): 2–8.
- Ochyra, R. 1986.** On the taxonomic position of *Sciaromium lacustre* Herz. & Rich. in Rich. *Journal of Bryology*, 14(1): 109–15.
- Ochyra, R. 1987a.** On the taxonomy and family placement of the moss genus *Limbella* (C. Muell.) Broth. *Journal of Bryology*, 14(3): 465–85.
- Ochyra, R. 1987b.** A revision of the moss genus *Sciaromium* (Mitt.) Mitt. II. The section *Limbidium* Dusén, with a description of *Vittia* gen. nov. (Vittiaceae fam. nov.). *Journal of the Hattori Botanical Laboratory*, 62: 387–415.
- Ochyra, R. 1993.** Taxonomic results of the BRYOTROP Expedition to Zaire and Rwanda. 20. Grimmiaceae, Funariaceae, Bartramiaceae (*Philonotis*), Amblystegiaceae, Plagiotheciaceae. *Tropical Bryology*, 8: 181–7.
- Ochyra, R. 1999.** Antipodal mosses: IX. *Platydictya* (Hypnaceae). *Annales Botanici Fennici*, 36: 51–8.
- Ochyra, R. 2010.** Antipodal mosses: XVI. The first record of the genus *Sematophyllum* (Sematophyllaceae) in the Subantarctic, with a description of *S. lebouvieri* sp. nov. *Cryptogamie, Bryologie*, 31(3): 223–32.

- Ochyra, R. & Bednarek-Ochyra, H. 2011. *Schistidium deguchianum* (Grimmiaceae), a new Andean species from Peru. *Journal of Bryology*, 33(3): 189–94.
- Ochyra, R. & Bednarek-Ochyra, H. 2013. On the identity of *Ditrichum validinervium* (Bryophyta, Ditrichaceae). *Cryptogamie, Bryologie*, 34(3): 299–306.
- Ochyra, R. & Bell, B.G. 1984. A record of *Schistidium falcatum* (Bryophyta: Musci) from the Antarctic. *British Antarctic Survey Bulletin*, 64: 77–9.
- Ochyra, R. & Broughton, D.A. 2004. New moss records from the Falkland Islands. *Journal of Bryology*, 26(3): 226–30.
- Ochyra, R. & Buck, W.R. 2003. *Arctoa fulvella* in the Tierra del Fuego and a review of bipolar moss species. *Bryologist*, 106(4): 532–8.
- Ochyra, R. & Enroth, J. 1989. *Neckeropsis touwii* (Musci, Neckeraceae), new species from Papua New Guinea, with an evaluation of sect. *Pseudoparaphysanthus* of *Neckeropsis*. *Annales Botanici Fennici*, 26(2): 127–32.
- Ochyra, R. & Hertel, H. 1990. Contribution to the moss flora of Marion Island. *Polish Botanical Studies*, 1: 19–34.
- Ochyra, R. & Ireland, R.R. 2004. *Isopterygium tenerum*, newly recognized for Africa. *Bryologist*, 107(3): 363–7.
- Ochyra, R. & Ireland, R.R. 2016. *Isopterygium tenerifolium* (Hypnaceae, Bryophyta)—one more Afro-American disjunct. *Herzogia*, 29(1): 72–8.
- Ochyra, R. & Lewis Smith, R.I. 1998. Antarctic species in the genus *Ditrichum* (Ditrichaceae, Bryopsida), with a description of *D. gemmiferum* sp. nov. *Annales Botanici Fennici*, 35(1): 33–53.
- Ochyra, R. & Shevock, J.R. 2012. A fruiting plant of *Handeliobryum sikkimense* (Bryopsida, Thamnobryaceae) from Yunnan, China. *Nova Hedwigia*, 94: 307–21.
- Ochyra, R. & Singh, S.M. 2008. Three remarkable moss records from Dronning Maud Land, continental Antarctica. *Nova Hedwigia*, 86: 497–506.
- Ochyra, R. & Vanderpoorten, A. 1999. *Platyhypnidium mutatum*, a mysterious new moss from Germany. *Journal of Bryology*, 21(3): 183–9.
- Ochyra, R. & van Rooy, J. 2013. Distribution of *Bucklandiella lamprocarpa* (Grimmiaceae, Musci) in South Africa. *Cryptogamie, Bryologie*, 34(3): 359–66.
- Ochyra, R., Sérgio, C. & Schumacker, R. 1988. *Racomitrium lamprocarpum* (C. Muell.) Jaeg., an austral moss disjunct in Portugal, with taxonomic and phytogeographic notes. *Bulletin du Jardin Botanique National de Belgique*, 58: 225–58.
- Ochyra, R., Bednarek-Ochyra, H., Pócs, T. & Crosby, M.R. 1992. The moss *Adelothecium bogotense* in continental Africa, with a review of its world range. *Bryologist*, 95: 287–95.
- Ochyra, R., Schmidt, C. & Bültmann, H. 1998. *Gradsteinia torrenticola*, a new aquatic moss species from Tenerife. *Journal of Bryology*, 20: 403–9.
- Ochyra, R., Wesche, K., Miehe, G. & Miehe, S. 2002a. New records of pleurocarpous mosses for Africa and Uganda. *Journal of Bryology*, 24(3): 256–9.
- Ochyra, R., Bednarek-Ochyra, H. & Lewis Smith, R.I. 2002b. New and rare moss species from subantarctic South Georgia. *Nova Hedwigia*, 74(1–2): 121–47.
- Ochyra, R., Bednarek-Ochyra, H. & Lewis Smith, R.I. 2008a. New and rare moss species from the Antarctic. *Nova Hedwigia*, 87(3–4): 457–77.
- Ochyra, R., Lewis Smith, R.I. & Bednarek-Ochyra, H. 2008b. *The illustrated moss flora of Antarctica*. Cambridge: Cambridge University Press.
- Ochyra, R., Weber, W.A. & Bednarek-Ochyra, H. 2010. Discovery of *Grimmia incrasscapsulis* (Grimmiaceae, Bryophyta) in Papua New Guinea. *Nova Hedwigia*, 91: 389–98.
- Ochyra, R., Zander, R.H. & Lebouvier, M. 2014. Antipodal mosses: XVIII. *Syntrichia christophei*, a new species from subantarctic Îles Kerguelen. *Cryptogamie, Bryologie*, 35(1): 37–46.
- Ochyra, R., Crabtree, D. & Tangney, R. 2015a. Studies on mosses in the Falkland Islands: I. *Bucklandiella* and *Codriophorus* (Grimmiaceae). *Cryptogamie, Bryologie*, 36(3): 289–310.
- Ochyra, R., Sollman, P.H. & Lebouvier, M. 2015b. *Hymenostylium recurvirostrum* (Pottiaceae, Bryophyta), a genus and species newly discovered in the southern polar regions. *Herzogia*, 28(2): 599–606.
- Olsson, S., Buchbender, V., Enroth, J., Hedenäs, L., Huttunen, S. & Quandt, D. 2010. Phylogenetic relationships in the ‘*Pinnatella*’ clade of the moss family Neckeraceae (Bryophyta). *Organisms, Diversity & Evolution*, 10(2): 107–22.
- Olsson, S., Enroth, J., Huttunen, S. & Quandt, D. 2016. Phylogeny of *Neckeropsis* and *Himantocladium* (Neckeraceae, Bryophytina). *Bryophyte Diversity & Evolution*, 38(2): 53–70.
- O’Shea, B.J. 2006. Checklist of the mosses of sub-Saharan Africa (version 5, 12/06). *Tropical Bryology Research Reports*, 6: 1–252. (Available at [http://www.nhm.ac.uk/hosted\\_sites/bbstbg/resources\\_lit\\_africa.html](http://www.nhm.ac.uk/hosted_sites/bbstbg/resources_lit_africa.html))
- O’Shea, B.J., Wigginton, M.J., Bruggeman-Nannenga, M.A., Hedenäs, L., Matcham, H.W., Frahm, J.-P., Porley, R.D., Ellis, L.T., Watling, M.C., Bates, J.E. & Vána, J. 2003. Bryophytes of Uganda, 6. New and additional records, 3. *Tropical Bryology*, 24: 161–8.
- Papp, B. 2002. New records of bryophytes from a saline area of Greece. *Studia Botanica Hungarica*, 33: 21–4.
- Papp, B., Erzberger, P., Ódor, P., Hock, Zs., Szövényi, P., Szurdoki, E. & Tóth, Z. 2010. Updated checklist and Red List of Hungarian bryophytes. *Studia Botanica Hungarica*, 41: 31–59.
- Perold, S.M. 1993a. The hepatic, *Jensenia spinosa* (= *Pallavicinia stephanii*: Pallaviciniaceae), in southern Africa. *Bothalia*, 23: 223–9.
- Perold, S.M. 1993b. The hepatics, *Symphogygyna podophylla* and *Pallavicinia lyellii* (Pallaviciniaceae) in southern Africa. *Bothalia*, 23: 15–23.
- Perold, S. 1993c. Notes on African plants: Allisoniaceae. *Bothalia*, 23: 79–83.
- Piippo, S. 1983. On the taxonomy, nomenclature and distribution of *Brachythecium starkei* (Brachytheciaceae, Musci) and related taxa. *Annales Botanici Fennici*, 20: 339–49.
- Pisarenko, O., Ignatova, E.A. & Ignatov, M.S. 2001. *Entosthodon hungaricus* (Boros) Loeske (Funariaceae, Musci) in Altai territory, South Siberia. *Arctoa*, 10: 97–102.
- Plášek, V., Sawicki, J., Trávníčková, V. & Pasečná, M. 2009. *Orthotrichum moravicum* (Orthotrichaceae), a new species from the Czech Republic. *Bryologist*, 112: 329–36.
- Plášek, V., Sawicki, J., Marková, I. & Wierzcholska, S. 2011. *Orthotrichum affine* var. *bohemicum* (Orthotrichaceae), a new variety of epiphytic moss from the Czech Republic. *Acta Societatis Botanicorum Poloniae*, 80: 335–40.
- Plášek, V., Sawicki, J., Ochyra, R., Szczecińska, M. & Kulik, T. 2015. New taxonomical arrangement of the traditionally conceived genera *Orthotrichum* and *Ulotia* (Orthotrichaceae, Bryophyta). *Acta Musei Silesiae, Scientiae Naturales*, 64: 169–74.
- Pócs, T., Bednarek-Ochyra, H. & Ochyra, R. 2016. *Lepidozia cupressina* (Marchantiopsida, Lepidoziaceae) in sub-Saharan Africa, with a note on the taxonomic status of *L. chordulifera*. *Cryptogamie, Bryologie*, 37: 125–47.
- Rakhmatulina, E.K. 1990. Mosses of herbarium of Institute of Biology of Academy of Science of Kyrgyz SSR. *Izvestiya Akademii Nauk Kyrgyzskoj SSR, ser. Khimiko-technologicheskije i biologicheskie nauki*, 4: 48–56.
- Redfearn, P.L., Tan, B.C. & He, S. 1996. A newly updated and annotated checklist of Chinese mosses. *Journal of the Hattori Botanical Laboratory*, 79: 163–357.
- Ros, R.M., Mazimpaka, V., Abou-Salama, U., Aleffi, M., Blockeel, T.L., Brugués, M., Cros, R.M., Dia, M.G., Dirkse, G., Draper, I., El-Saadawi, W., Erdağ, A., Ganeva, A., Gabriel, R.M.A., Gonzáles-Mancebo, J.M., Granger, C., Herrnstadt, I., Hugonnot, V., Khalil, K., Kürschner, H., Losada-Lima, A., Luis, L., Mifsud, S.D., Privitera, M., Puglisi, M., Sabovljević, M., Sérgio, C., Shabbara, H.M., Sim-Sim, M., Sotiaux, A., Tacchi, A., Vanderpoorten, A. & Werner, O. 2013. Mosses of the Mediterranean, an annotated checklist. *Cryptogamie, Bryologie*, 34: 99–283.
- Sabovljević, M., Natcheva, R., Dihoru, G., Tsakiri, E., Dragicević, S., Erdağ, A. & Papp, B. 2008. Check-list of the mosses of SE Europe. *Phytologia Balcanica*, 14: 207–44.
- Sawicki, J., Plášek, V. & Szczecińska, M. 2009. Preliminary studies on the phylogeny of the genus *Orthotrichum* inferred from nuclear ITS sequences. *Annales Botanici Fennici*, 46: 507–15.
- Sawicki, J., Plášek, V. & Szczecińska, M. 2010. Molecular studies resolve *Nyholmiella* (Orthotrichaceae) as a separate genus. *Journal of Systematics and Evolution*, 48: 183–94.
- Sawicki, J., Plášek, V. & Szczecińska, M. 2012. Molecular data do not support the current division of *Orthotrichum* (Bryophyta) species with immersed stomata. *Journal of Systematics and Evolution*, 50: 12–24.
- Sawicki, J., Plášek, V., Ochyra, R., Szczecińska, M., Ślipiko, M., Myszczyński, K. & Kulik, T. 2017. Mitogenomic analyses support the recent division of the genus *Orthotrichum* (Orthotrichaceae, Bryophyta). *Scientific Reports* 7; doi:10.1038/s41598-017-04833-z.
- Schäfer-Verwimp, A. & Gruber, J.P. 2002. *Orthotrichum* (Orthotrichaceae, Bryopsida) in Pakistan. *Tropical Bryology*, 21: 1–9.

- Schaumann, F., Frey, W., de Menéndez, G.H. & Pfeiffer, T. 2003. Geomolecular divergence in the Gondwanan dendroid *Symphogyna* complex (Pallaviciniaceae, Hepaticophytina, Bryophyta): studies in austral temperate rain forest bryophytes 22. *Flora - Morphology, Distribution, Functional Ecology of Plants*, 198: 404–12.
- Schlyakov, R.N. & Konstantinova, N.A. 1982. *Konspekt flory mohobraznyh Murmanskoy oblasti [Conspectus of bryophyte flora of Murmansk Province]*. Apatity: Polyarno-Alpijsky Bot. Sad (In Russian).
- Schofield, W.B. 2014. *Hypnum* Hedwig. In: Flora of North America Editorial Committee, eds. *Flora of North America north of Mexico*. Vol. 28: *Bryophyta*, part 2. New York: Oxford University Press, pp. 532–49.
- Schuster, R.M. 1980. *The Hepaticae and Anthocerotae of North America, east of the hundredth meridian*, vol. 4. New York and London: Columbia University Press.
- Sérgio, C., Muñoz, J. & Ochyra, R. 1995. *Racomitrium hespericum*, a new species from the Iberian Peninsula. *Bryologist*, 98: 112–7.
- Shevock, J.R., Ochyra, R. & Buck, W.R. 2006. Observations on the ecology and distribution of *Hydrocryphaea wardii*, a southeast Asian monospecific genus, reported new for China from Yunnan Province. *Journal of the Hattori Botanical Laboratory*, 100: 407–18.
- Shevock, J.R., Ochyra, R., He, S. & Long, D.G. 2011. *Yunnanobryon*, a new rheophytic moss genus from southwest China. *Bryologist*, 114: 194–203.
- Shubina, T.P. & Zheleznova, G.V. 2002. *Listostebelnye mhi ravninnoj chasti srednej tajgi evropejskogo Severo-Vostoka. [Mosses of the plain landscapes of the middle taiga of the European north-east]*. Ekaterinburg: UrO RAN (In Russian).
- Singh, D.K., Singh, S.K. & Singh, D. 2016. *Liverworts and hornworts of India—an annotated checklist*. Bhubaneswar: Botanical Survey of India.
- Singh, S.K. & Singh, D.K. 2010. A catalogue of the liverworts and hornworts of Himachal Pradesh, India. *Archive for Bryology*, 62: 1–13.
- Skoupá, Z., Ochyra, R., Guo, S.-L., Sulayman, M. & Plášek, V. 2017. Distributional novelties for *Lewinskya*, *Nyholmia* and *Orthotrichum* (Orthotrichaceae) in China. *Herzogia*, 30: 58–73.
- Skrzypczak, R. 2001. *Haplomitrium hookeri* (Sm.) Nees et *Arnellia fennica* (Gott.) Lindb. présents en France (Haute-Maurienne, Savoie). Contribution à la flore de Haute-Maurienne. *Bulletin de la Société Botanique du Centre-Ouest* (nouvelle série), 32: 259–76.
- Šmarda, J. 1961. Příspěvky k rozšíření jatrovek v Československu VI. [Contributions to the distribution of liverworts in Czechoslovakia VI]. *Biologické práce* (Bratislava), VII/1: 5–45.
- Smith, A.J.E. 2004. *The moss flora of Britain and Ireland*. 2nd edn. Cambridge: Cambridge University Press.
- Stech, M. & Frahm, J.-P. 2001. *Palustriella pluristratosa* spec. nov. (Amblystegiaceae, Bryopsida), a new aquatic moss species with pluristratose lamina from Switzerland. *Botanica Helvetica*, 111: 139–50.
- Summerhayes, V.S. & Elton, C.S. 1923. Contributions to the ecology of Spitsbergen and Bear Island. *Journal of Ecology*, 11: 214–86.
- Szweykowski, J. 1960. Materiały do flory wątrobowców Tatr. [Materials for the liverwort flora of the Tatras]. *Prace Komisji Biologicznej Poznańskiego Towarzystwa Przyjaciół Nauk*, 21: 3–92.
- Touw, A. 1962. Revision of the moss-genus *Neckeropsis* (Neckeraceae). 1. Asiatic and Pacific species. *Blumea*, 11: 373–425.
- Tsegmed, Ts., Ignatov, M.S. & Ignatova, E.A. 2010. *Moss flora of Mongolia*. Moscow: Izdatel'stvo Sel'khozakademii, pp. 1–634.
- Udar, R. & Kumar, D. 1982. The genus *Radula* Dumort. in India I. *Journal of the Indian Botanical Society*, 61: 177–82.
- Udar, R. & Kumar, D. 1984. The Genus *Radula* in Western Himalayas. *Biological Memoirs*, 9: 73–86.
- Uyar, G. & Çetin, B. 2004. A new check-list of the mosses of Turkey. *Journal of Bryology*, 26 (3): 203–20.
- Váňa, J. & Duda, J. 1965. Revize jatrovek, uveřejněných ve fyto-sociologické studii V. Krajiny z roku 1933. [Revision of the liverworts, published in phytosociological study of V. Lands of 1933]. *Časopis Slezkého Muzea, Series A, Opava*, 14: 171–75.
- Van der Putten, N., Stieperaere, H., Verbruggen, C. & Ochyra, R. 2004. Holocene palaeoecology and climate history of South Georgia (sub-Antarctica) based on a macrofossil record of bryophytes and seeds. *Holocene*, 14: 382–92.
- Van der Putten, N., Verbruggen, C., Ochyra, R., Spassov, S., de Beaulieu, J.-L., De Dapper, M., Hus, J. & Thouveny, N. 2009. Peat bank growth, Holocene palaeoecology and climate history of South Georgia (sub-Antarctica), based on a botanical macrofossil record. *Quaternary Science Reviews*, 28: 65–79.
- Van der Putten, N., Verbruggen, C., Ochyra, R., Verleyen, E. & Frenot, Y. 2010. Subantarctic flowering plants: pre-glacial survivors or post-glacial immigrants? *Journal of Biogeography*, 37: 582–92.
- Vellak, K., Kannukene, L., Leis, M. & Ingerpuu, N. 2013. New Estonian records: mosses. *Folia Cryptogamica Estonica*, 50: 121–2.
- Vellak, K., Ingerpuu, N., Leis, M. & Ehrlich, L. 2015. Annotated checklist of Estonian bryophytes. *Folia Cryptogamica Estonica*, 52: 109–27.
- Verma, P.K. & Srivastava, S.C. 2011. Endemism in liverworts of Western Ghats and their present status. *Archive for Bryology*, 99: 1–23.
- Vitt, D.H. & Glime, J.M. 1984. The structural adaptations of aquatic Musci. *Lindbergia*, 10: 95–110.
- Weber, C.A. 1902. *Ueber die Vegetation und Entstehung des Hochmoors von Augstumal im Memeldelta. [On the vegetation and origin of the high moor of Augstumal in the Memeldelta]*. Berlin: Paul Parey.
- Węgrzyn, M. & Wietrzyk, P. 2015. Phytosociology of snowbed and exposed ridge vegetation of Svalbard. *Polar Biology*, 38(11): 1905–17.
- Węgrzyn, M., Lisowska, M. & Nicia, P. 2013. The value of the terricolous lichen *Cetrariella delisei* in the biomonitoring of heavy-metal levels in Svalbard. *Polish Polar Research*, 34(4): 375–82.
- Wietrzyk, P., Węgrzyn, M. & Lisowska, M. 2017. Lichen diversity on glacier moraines in Svalbard. *Cryptogamie, Mycologie*, 38 (1): 67–80.
- Wigginton, M.J. 2009. Checklist and distribution of the liverworts and hornworts of sub-Saharan Africa, including the East African islands. *Tropical Bryology Research Reports*, 8: 1–116.
- Wilding, N. 2015. *Systematics, biogeography and morphological evolution in Entosthodon Schwägr. (Bryopsida, Funariaceae) with a revision of the genus in Africa*. Cape Town: University of Cape Town.
- Wilding, N. & Hedderson, T.A. 2011. *Entosthodon jamesonii* and *E. lindgii*: two species new for Africa from the Indian Ocean Islands. *Journal of Bryology*, 33 (4): 326–27.
- Wilson, W. 1854. Musci. In: J.D. Hooker, eds. *The botany of the Antarctic voyage of H. M. Discovery ships Erebus and Terror in the years 1839–1843, under the command of Captain Sir James Clark Ross, Kt., R.N., F.R.S. & L.S., etc. II. Flora Novae-Zelandiae. Part. II. Flowerless plants*. London: Lovell Reeve, pp. 57–125 + pls. lxxxiii–xcii.
- Wu, P.-C., ed. 2000. *Bryoflora of Hengduan Mts. (Southwest China)*. Beijing: Science Press.
- Wu, P.-C. 2011. Neckeraceae. In: P. Wu, & M.R. Crosby, eds. *Moss flora of China*, English Version. Vol. 5. Erpodiaceae–Climaciaceae. Beijing: Science Press, & St. Louis: Missouri Botanical Garden Press, pp. 319–68.
- Wulff, T. 1902. *Botanische Beobachtungen aus Spitzbergen*. Lund: Akademische Abhandlung.
- Xia, X., Xiong, Y.-X., Yang, B., Sun, Z.-W. & Cao, W. 2014. Preliminary study on *Cephaloziella* (Cephaloziellaceae, Marchantiophyta) in Guizhou. *Plant Science Journal*, 32(3): 236–9.
- Xiong, Y.-X. 2014. *Bryophyte flora of Guizhou China*. Vol. 2. Guiyang: Guizhou Publishing Group, Guizhou Science and Technology Publishing House Guiyang.
- Yamada, K. 1979. A revision of Asian taxa of *Radula*, Hepaticae. *Journal of the Hattori Botanical Laboratory*, 45: 201–322.
- Yamada, K. 1989. The bryophytes of Sabah (North Borneo) with special reference to the BRYOTROP transect of Mount Kinabalu. VIII. *Radula* (Radulaceae, Hepaticopsida). *Willdenowia*, 19(1): 219–36.
- Zhang, M.-X. & He, S. 2005. Hypnaceae. In: P.-c. Wu, M.R. Crosby, & S. He, eds. *Moss Flora of China*. English Version. Vol. 8. Sematophyllaceae–Polytrichaceae. Beijing, New York: Science Press & St. Louis: Missouri Botanic Barden, pp. 80–260.