

# New national and regional bryophyte records, 31

L T Ellis<sup>1</sup>, A Alegro<sup>2</sup>, H Bednarek-Ochyra<sup>3</sup>, R Ochyra<sup>3</sup>, A Bergamini<sup>4</sup>,  
A Cogoni<sup>5</sup>, P Erzberger<sup>6</sup>, P Górski<sup>7</sup>, N Gremmen<sup>8</sup>, H Hespanhol<sup>9</sup>, C Vieira<sup>9</sup>,  
L E Kurbatova<sup>10</sup>, M Lebouvier<sup>11</sup>, A Martinčič<sup>12</sup>, A K Asthana<sup>13</sup>, R Gupta<sup>13</sup>,  
V Nath<sup>13</sup>, R Natcheva<sup>14</sup>, A Ganeva<sup>14</sup>, T Özdemir<sup>15</sup>, N Batan<sup>15</sup>, V Plášek<sup>16</sup>,  
R D Porley<sup>17</sup>, M Randić<sup>18</sup>, J Sawicki<sup>19</sup>, W Schroder<sup>20</sup>, C Sérgio<sup>21</sup>,  
V R Smith<sup>22</sup>, P Sollman<sup>23</sup>, S Ștefănuț<sup>24</sup>, C R Stevenson<sup>25</sup>, G M Suárez<sup>26</sup>,  
B Surina<sup>27</sup>, G Uyar<sup>28</sup>, Z Modrič Surina<sup>29</sup>

<sup>1</sup>The Natural History Museum, UK, <sup>2</sup>University of Zagreb, Croatia, <sup>3</sup>Polish Academy of Sciences, Poland, <sup>4</sup>Swiss Federal Research Institute WSL, Switzerland, <sup>5</sup>Università degli Studi di Cagliari, Italy, <sup>6</sup>Berlin, Germany, <sup>7</sup>Poznań University of Life Sciences, Poland, <sup>8</sup>Diever, The Netherlands, <sup>9</sup>Universidade do Porto, Portugal, <sup>10</sup>Russian Academy of Sciences, Russia, <sup>11</sup>Université de Rennes 1, France, <sup>12</sup>Ljubljana, Slovenia, <sup>13</sup>CSIR-National Botanical Research Institute, India, <sup>14</sup>Bulgarian Academy of Sciences, Bulgaria, <sup>15</sup>Karadeniz Technical University, Turkey, <sup>16</sup>University of Ostrava, Czech Republic, <sup>17</sup>Cerca dos Pomares, Portugal, <sup>18</sup>Public Institution, Croatia, <sup>19</sup>University of Warmia and Mazury in Olsztyn, Poland, <sup>20</sup>Ludwigsstadt, Germany, <sup>21</sup>Universidade de Lisboa, Portugal, <sup>22</sup>University of Stellenbosch, South Africa, <sup>23</sup>St Anna Parochie, The Netherlands, <sup>24</sup>Institute of Biology Bucharest of Romanian Academy, Romania, <sup>25</sup>Norfolk, UK, <sup>26</sup>Facultad de Ciencias Naturales, Argentina, <sup>27</sup>University of Primorska, Slovenia, <sup>28</sup>Zonguldak Karaelmas University, <sup>29</sup>Turkey, Natural History Museum Rijeka, Croatia

## 1. *Andreaea nitida* Hook.f. & Wilson

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

**Îles Kerguelen:** Grande Terre, Peninsula Courbet, southern side of Val Studer: plateau at the south-eastern foot of Mont Crozier, 49°17'47.9"S, 70°02'35.6"E, 400 m a.s.l., forming large monospecific patches on wet stone at stream bank in the stand of *Azorella selago* Hook.f., 28 December 2006, *leg.* R. Ochyra (with C. Brumpt) 3745/06 (KRAM).

*Andreaea nitida* is one of the most distinctive and easily distinguished species of the genus, having a wide pan-temperate distribution in the Southern Hemisphere. In addition to southernmost parts of all continental masses in this hemisphere, it occurs on some islands in the vast Southern Ocean including Tristan da Cunha in the cool-temperate zone (Dixon, 1960 as *A. aquatica* R.Br.bis) and two subantarctic islands, namely, South Georgia in the Atlantic sector (Ellis *et al.*, 2011) and Macquarie Island in the Pacific sector (Seppelt, 2004). Herein, *A. nitida* is recorded for the first time from Îles Kerguelen, the oldest and largest archipelago in the subantarctic region, situated in the southern Indian Ocean sector of this biome. The species appears to be very rare in this area

and despite a special search, it was recorded only once in its typical habitat on wet, stony stream banks. The moss flora of Îles Kerguelen is the richest of all subantarctic islands and until recently, it consisted of about 125 species. However, recent exploration of the archipelago yielded a number of phytogeographically and taxonomically important new records of moss (Blockeel *et al.*, 2009a, b, 2010; Ochyra, 2010; Ellis *et al.*, 2010, 2011, 2012). Thus, considering the present record and all recent additions, the moss flora of this archipelago consists of approximately 135 species and it exceeds by about 15 species that of South Georgia which has the second richest moss flora in the subantarctic region.

## 2. *Barbilophozia binsteadii* (Kaal.) Loeske

**Contributor:** P. Górski

**Slovakia:** Western Carpathians, Western Tatra Mountains: upper, NW part of Jamnická dolina valley, below Žiarske sedlo pass, 49°11'33"N, 19°45'20"E, 1795 m a.s.l., 20 July 2006, *Polytrichum-Sphagnum* hummock, *leg.*, P. Górski s.n., *det.* P. Górski *conf.* J. Váňa (POZNB 894).

*Barbilophozia binsteadii* is a subarctic-alpine species. In Europe, it grows in the mountains of the northern part of the continent (Norway, Sweden, Finland, Estonia, and Northern Russia). Moreover, it has been recorded in Svalbard, subarctic America, Canada, Siberia, Novaya Zemlya, and the Russian Far East

Correspondence to: Leonard T Ellis, Department of Botany, The Natural History Museum, London. Email: l.ellis@nhm.ac.uk

(Söderström *et al.*, 2002). In the mountain ranges of central Europe, it occurs only in the Tatra Mountains, where it was first recorded in Poland by Szweykowski (1960a,b). Currently, *B. binsteadii* can be found in 10 localities in the Polish part of the Western and High Tatra Mountains (Szweykowski, 1960a, b; Cykowska, 2011; Górski, unpublished), in an altitude range between 1650 and 1920 m a.s.l. In the first locality recorded in Slovakia, *B. binsteadii* grows profusely in its typical habitat in the Tatra Mountains, as a component of a *Polytrichum-Sphagnum* hummock on a slope with a northern exposure. *B. binsteadii* is the third new species, together with *Nardia compressa* (Hook.) S.F.Gray and *Gymnomitrium adustum* Nees emend. Limpr., recently recorded in the Slovakian Tatra Mountains (Górski, 2010; Górski & Váňa, 2011).

3. *Bryoerythrophyllum recurvirostrum* (Hedw.) P.C.Chen

**Contributors:** L.E. Kurbatova and R. Ochyra

**King George Island:** Maxwell Bay, NW side of Marian Cove, Weaver Peninsula terminating North Spit, 62°12.341'S, 58°48.062'W, 11 m a.s.l.; on beach with boulders in the lichen and moss community, associated with *Distichium capillaceum* (Hedw.) Bruch & Schimp., *Sanionia georgicouncinata* (Müll.Hal.) Ochyra & Hedenäs, *Pohlia cruda* (Hedw.) Lindb. and *Platydictya jungermannioides* (Brid.) H.A.Crum, 3 March 2009, leg. L. E. Kurbatova L124-14 (KRAM, LE).

King George Island is the largest island in the South Shetland Islands in the maritime Antarctic and at the same time it has the richest moss flora in this biome. Ochyra (1998) completed a flora of the island's mosses and recorded 61 species but since then, it has increased by three distinct species. Two of these, *Schistidium lewis-smithii* Ochyra and *S. leptoneurum* Ochyra, were described as new to science (Ochyra, 2003, 2004) and the third, *Drepanocladus longifolius* (Mitt.) Paris was formerly known in Antarctica only from Signy Island in the South Orkney Islands, Livingston Island in the South Shetland Islands, and James Ross Island on the east coast of the Trinity Peninsula (Ochyra *et al.*, 2008a,b; Li *et al.*, 2009). Herein, one more species, *Bryoerythrophyllum recurvirostrum*, is added to the island's moss flora, which currently contains 65 species.

A single collection of *B. recurvirostrum* was found on the stony raised marine beach in a community dominated by mosses and lichens. The plants are entirely sterile, but otherwise they represent a typical expression of the species. They grow in small patches, 5–7 cm in diameter on stony soil together with *Distichium capillaceum*, *Sanionia georgicouncinata*, *Pohlia cruda* and *Platydictya jungermannioides*. It is worth noting that the latter is an exceedingly rare species on King George Island that has hitherto been known from only a single station (Ochyra, 1999).

So far, *Bryoerythrophyllum recurvirostrum* has been known from widely scattered localities in the maritime and continental Antarctic (Ochyra & Zander, 2002) and subantarctic South Georgia (Ochyra *et al.*, 2002), extending to Tierra del Fuego (Ochyra & Zander, 2002) and the Falkland Islands (Ochyra & Broughton, 2004). This is also the second record of the species from the South Shetland Islands, where, so far, it has been recorded from a single site on Livingston Island.

4. *Bryum subapiculatum* Hampe

**Contributors:** W. Schröder and P. Erzberger

**Hungary:** Pest County, Danube inundation area, Dunakeszi town, on the gravelly bank of a Danube arm, associated with *Bryum dichotomum* Hedw. and *Barbula unguiculata* Hedw., 47°38'40"N, 19°7'E, ca 100 m a.s.l., 27 June 1997, leg. P. Erzberger (B Erzberger 3352a), det. W. Schröder, 5 November 2011; Bács-Kiskun County, Danube-Tisza interfluvium, Kiskun National Park, on alkaline soil near lake Búdös-szék near Szabadszállás village, associated with *Phascum cuspidatum* Hedw., *Barbula unguiculata*, 46°52'N, 19°10'E, ca 90 m a.s.l., 16 April 1998, leg. & det. P. Erzberger (B Erzberger 4313), conf. W. Schröder, 6 October 2011; Kiskun National Park, on alkaline soil near the lake Zab-szék near Fülöpszállás village, associated with *B. argenteum* Hedw., *B. dichotomum*, *Pseudocrossidium hornschurchianum* (Schultz) R.H.Zander, 46°50'30"N, 19°10'E, ca 90 m a.s.l., 17 April 1998, leg. & det. P. Erzberger (B Erzberger 4336), conf. W. Schröder, 16 October 2011.

*Bryum subapiculatum* (syn. *B. microerythrocarpum* Müll.Hal. & Kindb. ex Macoun) is new to Hungary according to the most recent checklist (Papp *et al.*, 2010).

5. *Bucklandiella striatipila* (Cardot) Bednarek-Ochyra & Ochyra

**Contributors:** H. Bednarek-Ochyra, R. Ochyra and N. Gremmen

**Gough Island:** Windy Ridge, 40°20'04"S, 9°54'59"W, 675 m a.s.l., in patch of *Racomitrium lanuginosum* (Hedw.) Brid. in *Empetrum* L. heath on high mountain slope, 16 September 2000, leg. N. Gremmen 2000-852A (KRAM); Tafelkop, south slope: 40°20'35"S, 9°53'37"W, 250 m a.s.l., 14 September 1999, leg. N. Gremmen 99-292 (KRAM); 40°20'33"S, 9°53'43"W, 500 m a.s.l., on exposed rock, 15 September 1999, leg. N. Gremmen 99-401 (KRAM); SE-facing slope, 40°20'37"S, 9°53'43"W, 500 m a.s.l., in wet montane heath, 15 September 1999, leg. N. Gremmen 99-426 (KRAM); 40°20'33"S, 9°53'54"W, 500 m a.s.l., on rocky outcrop, 23 September 1999, leg. N. Gremmen 99-547 (KRAM).

*Bucklandiella striatipila* is an amphiatlantic south-cool-temperate species, widely distributed in the *Nothofagus* zone along the western coast of southern

South America, from the Juan Fernandez Islands to Tierra de Fuego (Bednarek-Ochyra & Ochyra, 2010, 2011), and on most islands in the southern Atlantic and sectors of the Southern Ocean in the southern Indian Ocean. These include subantarctic South Georgia (Bell, 1974), Îles Crozet (Blockeel *et al.*, 2009b), and Îles Kerguelen (Ellis *et al.*, 2010), as well as Tristan da Cunha in the cool-temperate zone (Ellis *et al.*, 2011). Here, the species is reported for the first time from Gough Island, a volcanic island in the middle of the southern Atlantic Ocean. It is a remote and lonely place, situated about 400 km south-west of the Tristan da Cunha group, 2700 km from the Cape in South Africa and over 3200 km from the nearest point of South America. The island's moss flora is still underworked, but is characterized by a considerable percentage of South American cool-adapted mosses, for example *Ditrichum hyalinum* (Mitt.) Kuntze, *Dicranoloma hariatii* (Müll.Hal.) Paris, *Dicranella vaginata* (Hook.) Cardot., *Pseudosymblepharis krausei* (Lorentz) Ochyra & Matteri, *Codriophorus laevigatus* (Mitt.) Bednarek-Ochyra & Ochyra, *Bucklandiella heterostichoides* (Cardot) Bednarek-Ochyra & Ochyra, *Eustichia longirostris* (Brid.) Brid., *Philonotis vagans* (Hook.f. & Wilson) Mitt. and *Brachythecium subplicatum* (Hampe) A.Jaeger. These species apparently reached this island via long-distance dispersal thanks to prevailing Westerlies.

6. *Calypogeia sphagnicola* (Arnell & J.Perss.) Warnst. & Loeske

**Contributors:** Ž. Modrić Surina, M. Randić and A. Alegro

**Croatia:** Dinaric Alps, Liburnian karst, Obruč mountain range, Trstenik doline N of Trstenik peak, central part of Trstenik mire, 45°29'23.5"N, 14°27'17.6"E, 23 June 2010, *leg.* Ž. Modrić Surina, M. Randić & L. Gudac *s.n.* (NHMR 1739).

*Calypogeia sphagnicola*, a liverwort of the family *Calypogeiaceae*, widely distributed although rather rare in Europe, Iceland, Greenland, North America, Asia, Macaronesia, Faeroes, Africa, New Zealand, Oceania, and in southern South America (Paton, 1999; Dierßen, 2001; Hässel de Menéndez & Rubies, 2009), is here recorded for the first time for Croatia and the territory of former Yugoslavia (Pavletić 1968; Sabovljević, 2006; Sabovljević & Natcheva, 2006; Martinčić, 2011). This species usually grows on *Sphagnum* peat in moderately to considerably humid, highly acidic sites (with pH values below 4.0), and is considered to be an element of *Oxycocco-Sphagnetum* (Dierßen, 2001).

In Croatia, *Calypogeia sphagnicola* was found creeping on hummocks of *Sphagnum capillifolium* (Ehrh.) Hedw. and *S. magellanicum* Brid. in the central part of the Trstenik mire. This mire is

considered to be the only remnant of ombrotrophic vegetation in Croatia (Horvat, 1962; Topić *et al.*, 2006; Modrić, 2009; Modrić Surina, 2011), and is also the place where the vascular plants *Eriophorum vaginatum* L. (Ilijanić & Topić, 2002) and *Carex pulicaris* L. (Topić & Ilijanić, 2001) were recorded for the first time in Croatia.

Elsewhere in south-eastern Europe, *Calypogeia sphagnicola* is known from Bulgaria and Romania, but has not been noted for Croatia and other countries of former Yugoslavia (e.g. Slovenia, Bosnia and Herzegovina, Serbia, Montenegro, Macedonia; Pavletić, 1968; Sabovljević & Natcheva, 2006; Sabovljević, 2006; Martinčić, 2011).

7. *Chenia lorentzii* (Müll.Hal.) R.H.Zander

**Contributor:** G.M. Suárez

**Uruguay:** Montevideo, Barrio Peñarol, 34°49'23.82"S, 56°12'34.14"W, 37 m a.s.l., sobre suelo, en lugares sombreados, 22 January 2011, *leg.* G. Suárez 1013 (LIL).

**Argentina:** Tucumán, Departamento Trancas, 'Club hípico El Ojo', 26°36'S, 65°18'W, bosque chaqueño serrano, 10 November 2000, *leg.* G. Suárez & M. Schiavone 19 (LIL).

The genus *Chenia* R.H.Zander is not included in the bryophyte checklist for Uruguay (Matteri, 2004), a country that remains among the least bryologically explored places in South America. *Chenia lorentzii*, a neotropical species, was discovered during a recent revision of mosses collected in Montevideo. It was previously known from Argentina (Suárez *et al.*, 2005; Cano & Gallego, 2008) and Bolivia (Churchill *et al.*, 2009). This occurrence of *C. lorentzii* is a new record for the bryophyte flora of Uruguay, and the phytogeographical province of Pampa. The nearest other record for the species is in the phytogeographical province of Chaco (south of Bolivia and north-central of Argentina).

The plants from Uruguay fit well within the concept of this species and are easily recognized by the dentate upper leaf margins, large, epapillose upper laminal cells and red colouration in KOH.

As has been the case with other *Chenia* species (Hedderon & Zander, 2008), the Uruguayan collection was made in a locality clearly anthropogenic in origin, and the population lacked sporophytes or male plants.

8. *Conardia compacta* (Drumm. ex Müll.Hal.) H.Rob.

**Contributor:** T. Özdemir, N. Batan, and G. Uyar

**Turkey:** Eastern Anatolia, Iğdır, Zor mountain, 39°45'N, 43°53'E, 2400 m a.s.l., open field covered with bushes and annual and perennial small plants in the subalpine zone, on wet marlstones, 13 June 2010, *leg.* Özdemir-Batan 3580, *conf.* G. Uyar (Priv. Herb. Özdemir at the Department of Biology in Karadeniz Technical University).



This is the first report for *Conardia compacta* in Turkey (Uyar & Çetin, 2004; Kürschner & Erdağ, 2005). The species is recognized in the field by its thin, light green patches of slender shoots. At first glance, it slightly resembles *Amblystegium serpens* (Hedw.) Schimp., but unlike that species, has noticeable, often recurved, serrations, along the basal margins of its leaves, and has long, narrow median leaf cells. A well-developed costa separates *C. compacta* from *Isopterygiopsis* Z.Iwats., and its broad leaf bases, from *Rhynchostegiella tenella* (Dicks.) Limpr. Its identification is easy when the filamentous, cylindrical, papillose propagules are present on the abaxial surface near the apices of its leaves. It also characteristically has rhizoids on the basal part of at least some shoots.

In Europe, this species is rare, occurs on basic rocks and soil, and is not known to produce sporophytes. Nevertheless, it is common in North America, produces sporophytes frequently, and occurs on wood (Dierßen, 2001; Crum & Anderson, 1981). In Turkey, this hygrophytic species usually prefers damp, calcareous habitats in open places near the sides of creeks. As with European material, sporophytes are unknown in Turkish specimens. The nearest reports of *C. compacta* to this new Turkish record were from Upper Galilee and the Golan Heights in Israel, but Heyn & Herrstadt (2004) found the collection from the former locality to be a misidentification and that from the latter to be too old, poor and sterile to be certain of its identity. Until now, *C. compacta* had been recorded in Europe, North Africa, North East, as well as South Asia, North America including Greenland, and Central America (Düll, 1985; Hedenäs, 1989; Hill *et al.*, 2006; Ignatov *et al.*, 2006; Anderson *et al.*, 1990; Sabovljević *et al.*, 2008). The finding of this boreo-subtropical mountain species in Turkey notably extends its range towards the Middle East and fills an important gap in its known distribution (Frey & Kürschner, 1991; Kürschner, 2000, 2006; Akhani & Kürschner, 2004).

#### 9. *Coscinodon cribrosus* (Hedw.) Spruce

**Contributors:** H. Hespanhol, C. Vieira, and S. Sérgio

**Portugal:** Trás-os-Montes e Alto Douro (TM): Ponte de Abreiro, Bragança district, on a vertical granitic slope, 29TPF4378, 170 m a.s.l., 13 October 2011, *leg.* Helena Hespanhol & Cristiana Vieira *s.n.* (PO 5114, LISU 248078).

*Coscinodon cribrosus*, a boreo-temperate taxon, is distributed from northern Europe to Northeast Asia and North America. Although relatively widespread in Europe, it is considered as Critically Endangered in some countries such as Hungary (Erzberger, 2009) and Luxembourg (Werner, 2011). In the Iberian Peninsula, it is not considered threatened, mainly

owing to its scattered distribution in north-eastern and south-western Spain (Casas *et al.*, 1985; Sérgio *et al.*, 2007).

The first reference for this species in Portugal was from Caldas de Monchique, in Algarve Province (Dixon, 1912). Afterwards, it was found in the central region, in Beira Alta Province, near Viseu – collected by Sérgio in 1967 and near Pinhel – collected by Pierrot in 1972 (Casas *et al.*, 1985). It was thought to be a regionally extinct taxon in Portugal as it was no longer recorded after 1972, despite efforts to find it. Very recently, it was discovered in the northern valley of Tua river (tributary of the Douro River). This is the first report for TM Province, and extends its distribution to the north-western region of Iberia.

According to Smith (2004), this species is more commonly found in crevices of very acidic rocks, more rarely on rock faces. In this new locality, as in other Iberian records (Casas *et al.*, 1985), it was found in the most atypical ecological circumstances, on a dry vertical granite slope with seasonally dripping wet borders, growing with *Grimmia* spp. and *Timmiella barbuloidea* (Brid.) Mönk. The population was formed of fertile, dust-filled cushions, occupying an area of 2500 cm<sup>2</sup>.

#### 10. *Cratoneuropsis chilensis* (Lorentz) Ochyra

**Contributors:** R. Ochyra, H. Bednarek-Ochyra and V.R. Smith

**Heard Island:** Atlas Cove, 53°01'S, 73°22'E, 26 November 1929, *leg.* BANZARE B-150 (BM, as *Amblystegium serpens*); Azorella Peninsula, 53°00'S, 73°23'E, from pond, 27 October 2000, *leg.* P. Selkirk, M. Skotnicki & J. Whinam H666C (NSW-755106 as *A. serpens*).

*Cratoneuropsis chilensis* is a species closely related to the Australasian *C. relaxa* (Hook.f. & Wilson) Broth. and has been considered alternatively as its subspecies, *C. relaxa* subsp. *minor* (Wilson & Hook.f.) Ochyra. *Cratoneuropsis chilensis* is an extremely polymorphous species as evidenced by a long list of heterotypic synonyms for its name. The species is circum-Holantartic in distribution, and a map of its global range indicates that it also occurs on subantarctic Heard Island (Ochyra *et al.*, 2008b). As no details of this record have been made available, and the species has not otherwise been reported from this island, the relevant collections are cited here in order to substantiate it. It is worth noting that originally the material cited above was named and reported in the literature as *Amblystegium serpens* (Hedw.) Schimp. (Clifford, 1953; Selkirk *et al.*, 2008). This name was often applied to tiny and delicate phenotypes of *C. chilensis* which are very common in dry habitats on subantarctic islands. Actually, *A. serpens* does not occur in this biome and it remains principally a Holarctic species with some altimontane

outposts in the Neotropics (Hedenäs, 2003a) and bipolar stations in Australasia (Streimann & Klanzenga, 2002).

11. *Diaphanodon blandus* (Harv.) Renaud & Cardot.

**Contributors:** V. Nath, A.K. Asthana, and R. Gupta

**India:** Central India, Madhya Pradesh, Pachmarhi Biosphere Reserve, on way to Mahadev, growing on rocks, ca 975 m a.s.l., 29 November, 2006, *leg.* V. Sahu & V. Awasthi *s.n.* (LWG 227618).

The genus *Diaphanodon* Renaud & Cardot in the family Trachypodiaceae is represented by three valid species, two of which, *i.e.* *D. blandus* and *D. procumbens* (Müll.Hal.) Renaud & Cardot, occur in India (Chopra, 1975; Lal, 2005). The genus is largely confined to South East Asia (Gangulee, 1976).

*Diaphanodon blandus* has previously been reported from the western and eastern Himalaya, Gangetic plains, and South India. The species has now been found in Pachmarhi Biosphere Reserve in the central Indian bryo-geographical region, and extends its known range of distribution to central India.

Plants were densely matted, with prostrate primary stems, and procumbent, bipinnately branched secondary stems. Leaves were dimorphic, with stem leaves ovate-lanceolate, wide at the base and narrowing sharply above,  $\pm 1.40 \times 0.56$  mm. Branch leaves are smaller,  $\pm 1.00 \times 0.34$  mm. In both stem and branch leaves, the costa ended below the leaf tip, and the laminal cells were thick-walled with a single papilla in the middle. A sporophyte was not found.

12. *Grimmia nutans* Bruch

**Contributor:** R.D. Porley

**Portugal:** Beira Baixa, Monsanto, on dry siliceous boulders on trail to Castelo, 29T 0660921/4433474, 730 m a.s.l., with *G. montana* Bruch & Schimp. growing close by, 27 August 2011, *leg.* R.D. Porley *s.n.* (LISU and Priv. *Herb.* R.D. Porley).

Three or four small cushions of *G. nutans* were collected from soil-filled crevices on granitic rock in the shelter of colossal boulders. One well-developed sporophyte was present with an intact operculum. Both gametophyte and sporophyte showed the typical characters of the species (Maier, 2010). The Portuguese plants lacked the glaucous appearance said to distinguish the species at some of its other localities (Greven, 1994), presumably because they occurred in a relatively dry niche. The collection lay within a region experiencing an average annual rainfall of 700–800 mm.

*Grimmia nutans* is rare in Europe, hitherto known from Cyprus, Greece, France, and the Canary Islands (Spain). It is also known from the Atlas Mountains in Morocco and from the mountains surrounding Izmir

in Asian Turkey (type locality). In the Troodos Mountains, Cyprus, *G. nutans* is described as locally abundant (Greven, 1995) and near Lac des Escarcets in S.E. France it is said to be frequent (Hebrard, 2000); at its Portuguese station, it seems to occur in small quantity. All known localities are within the Mediterranean phytogeographic zone and lie far south of the Late Glacial Maximum. Monsanto, south-east of Serra da Estrela, is an inselberg (an isolated hill rising abruptly from the surrounding plain) and is within the UNESCO Naturtejo Meseta Meridional Geopark covering a vast territory of 4625 km<sup>2</sup>. Inselbergs are known to support unique plant communities (Porembski & Barthlott, 2000). Greven (1994) describes the Troodos Mountains in Cyprus as ‘ecologically an island on an island’; it supports many endemic plants. Gran Canaria, a volcanic island in the Atlantic Ocean, is also well known for its endemic plants.

13. *Leucoloma amoene-virens* Mitt.

**Contributors:** V. Nath, A.K. Asthana, and R. Gupta

**India:** Central India, Madhya Pradesh, Pachmarhi Biosphere Reserve, Down Fall, epiphytic, ca 884 m a.s.l., 28 November, 2006, *leg.* V. Sahu & V. Awasthi *s.n.* (LWG 229400).

*Leucoloma* Brid. in the family Dicranaceae presently includes some 71 species. Brotherus (1924) had reported 105 species in this genus from the tropical-temperate East African Islands, and Wijk *et al.* (1959–1969) cited 131 valid species occurring world wide. However, the strongest concentration of species in *Leucoloma* is seen in continental Africa (Gangulee, 1969–1972).

In India, Gangulee (1969–1972) had initially reported the presence of a single species, *i.e.* *L. amoene-virens* from the eastern Himalaya, South India, and Sri Lanka. He also recorded *L. taylorii* (Schwägr.) Mitt. from Nepal, Malay, and Burma. Later, Lal (2005) reported nine species of the genus from India and one from Nepal. All of these species were reported from South India, and one, *L. amoene-virens*, was also found in the eastern Himalaya). The present discovery of this species, from Down Fall in Pachmarhi Biosphere Reserve (Madhya Pradesh), constitutes a new record for central India.

The plants characteristically have erect, rarely branched, yellowish-green shoots that may be brown below, and reach up to 25 mm high. Stems are brown, sparsely covered with leaves below, but densely covered above. The leaves are lanceolate, narrowing from a broad sheathing base to a canaliculate apex,  $\pm 3 \times 0.32$  mm in size. A costa occupies most of the subula, and the cells forming the distal lamina are rhomboidal, incrassate and papillose, but towards the leaf base the cells become

elongated. The leaf base includes distinct, bulging alar groups of brownish-orange cells, and a leaf border is formed by a single row of transparent cells.

14. *Marsupella boeckii* (Austin) Kaal.

**Contributor:** S. Ștefănuț

**Romania:** Southern Carpathians, Făgăraș Mountains, Ciortea Mountain, Sibiu County, 45°34'41"N, 24°29'16"E, 2040 m a.s.l., on rocks, with *Gymnomitrium concinnatum* (Lightf.) Corda, 22 August 2009, leg. S. Ștefănuț s.n., det. S. Ștefănuț, conf. J. Váňa (BUCA B4088); 25 August 2011, leg. S. Ștefănuț s.n., det. S. Ștefănuț, conf. J. Váňa (BUCA B4317).

This specimen was collected from the alpine zone of Făgăraș Mountains, on the edge of the track from Scara Peak to Avrig Glacial Lake. The plants grew in pure turfs, or scattered among *Gymnomitrium concinnatum*, *Marsupella commutata* (Limpr.) Bernet, *Anthelia juratzkana* (Limpr.) Trevis. and *Andreaea nivalis* Hook.

This is the first confirmed report of *Marsupella boeckii* in Romania and the southern Carpathians since the first record more than 110 years ago, which came from Negoiu Mountain, Făgăraș Mountains, 2200 m a.s.l., 16 August 1897, leg. et det. K. Loitlesberger, as *M. lapponica* Limpr. ex Loitl., rev. J. Váňa 1978 (BP 5567) (Loitlesberger, 1898, Ștefănuț, 2008, Váňa et al., 2010).

The nearest other locality for this species is in the Tatra Mountains.

In Europe, *M. boeckii* has been reported from Britain, Estonia, Finland, Sweden, Norway, France, Germany, Switzerland, Italy, Malta, Austria, Slovakia, Poland, Romania, and the northern and eastern parts of European Russia (Söderström et al., 2002, 2007).

15. *Orthotrichum affine* var. *bohemicum* Plášek & Sawicki

**Contributors:** V. Plášek and J. Sawicki

**United States of America:** Idaho, Bear Lake Co., Paris Spring at head of Paris Canyon Creek, west of Town of Paris, base of *Pseudotsuga menziesii* (Mirb.) Franco, GPS coordinates (WGS 84): 42°12'N, 111°29'E, ca 2135 m a.s.l., 15 June 1976, leg. D.H. Vitt s.n. [Vitt, D.H., *Orthotrichaceae Boreali-Americanae Exsiccatae* fasc. 3, exsicc. no. 24 (1981)], det. V. Plášek (16 December 2011), (LE).

This variety was described recently from the Czech Republic by Plášek et al. (2011). The herbarium specimen cited above was found during a visit to the St. Petersburg's herbarium (LE) in December 2011. Upon close examination, the collection proved to be the first record of this variety for the continent of North America.

In many features, *Orthotrichum affine* var. *bohemicum* is similar to the type variety, but it can be easily distinguished by its 16 endostome segments (practically

as long as exostome teeth) and smaller spore size of 13–15 μm diam. (spores in the type variety are 14–26 μm diam.). *Orthotrichum pallens* Bruch ex Brid. seems superficially related to *O. affine* and its variety, but can be differentiated from them primarily by its possession of cryptopore type stomata and its shorter, blunter-ended leaves. In addition, *O. pallens* has endostome segments alternately longer and shorter, whereas in *O. affine* var. *bohemicum* all segments are equally long.

16. *Orthotrichum gymnostomum* Bruch ex Brid.

**Contributor:** C.R. Stevenson.

**Albania:** Drilon National Park, ca 4 km east of Pogradec. 40°54'00.48"N, 020°42'47.61"E, ca 700 m. a.s.l. Epiphytic on trunk of large *Tilia* in park, beside a spring fed stream, 17 September 2011, leg. C.R. Stevenson s.n. (BM000976507), det. T.L. Blockeel.

The site for this record was very close to the shores of Lake Ohrid, which along with the nearby stream, presumably helped to create a microclimate suitable for epiphytes. *Orthotrichum gymnostomum* is known from Romania, Slovenia (Sabovljević et al. 2008) and Bulgaria (Natcheva et al., 2007). Associated species included: *Homalothecium sericeum* (Hedw.) Schimp.; *Hypnum cupressiforme* Hedw.; *Orthotrichum affine* Schrad. ex Brid.; *O. anomalum* Hedw.; *Orthotrichum diaphanum* Brid.; *Orthotrichum schimperi* Hammar, *Orthotrichum striatum* Hedw. and *Orthotrichum tenellum* Bruch ex Brid.

*Orthotrichum gymnostomum* is a European Boreal-montane species (Hill & Preston, 2008) which is regionally threatened within Europe (Dierßen 2001).

17. *Orthotrichum schimperi* Hammar

**Contributor:** C.R. Stevenson.

**Albania:** Drilon National Park, ca 4 km east of Pogradec. 40°54'00.48"N, 020°42'47.61"E, ca 700 m. a.s.l. Epiphytic on trunk of large *Tilia* in park, beside a spring fed stream, 17 September 2011, leg. C.R. Stevenson s.n., det. T.L. Blockeel, conf. F. Lara (BM000976506).

The site is very close to the shores of Lake Ohrid, which along with the nearby stream, presumably helps create a microclimate suitable for epiphytes. *Orthotrichum schimperi* is known from several other Balkan countries – Bosnia-Herzegovina, Greece, Croatia, Romania, Slovenia, and Serbia (Sabovljević et al., 2008) so its occurrence in Albania is in no way unexpected. It is, according to Cortini Pedrotti (2001), common in Italy. Associated species included: *Homalothecium sericeum* (Hedw.) Schimp.; *Hypnum cupressiforme* Hedw.; *Orthotrichum affine* Schrad. ex Brid.; *O. anomalum* Hedw.; *Orthotrichum diaphanum* Brid.; *Orthotrichum gymnostomum* Bruch ex Brid.; *Orthotrichum striatum* Hedw. and *Orthotrichum tenellum* Bruch ex Brid.

18. *Pohlia flexuosa* Hook. var. *pseudomuyldersii* (Arts, Nordhorn-Richter & A.J.E.Sm.) A.J.E.Sm.



**Contributors:** P. Erzberger and W. Schröder

**Romania:** Bihor county (Județul Bihor), Bihor Mountains, valley of the river Crișul Negru, 3.5 km ENE of Poiana village, near the source of Crișul Negru on the NW slope of Cucurbeta Mare, 1.9 km from the summit, on soil near a forest trail in beech-spruce mixed forest, 46°27'20"N, 22°40'25"E, ca 1200 m a.s.l., 12 July 2011, *leg.* P. Erzberger, T. Pócs & M. Höhn, *det.* P. Erzberger, *conf.* W. Schröder (B Erzberger 14733).

*Pohlia flexuosa* Hook. (syn: *P. myldermansii* R.Wilczek & Demaret) is not listed in the checklist of Sabovljević *et al.* (2008) and therefore appears to be new to south-eastern Europe in general and to Romania in particular. Although Mohan (1991) published *P. myldermansii* as new to Romania from the Calimani Mountains, and had included the species in his checklist (Mohan, 1998), Dihoru (1994) excluded the species from the Romanian checklist. Apparently, the data of Mohan could not be confirmed (Plămadă, 1979, 1992; Ștefănuț, 2008).

In Europe, this rare species has been recorded from Ireland, Britain, Belgium, the Netherlands, Switzerland, Austria (Wigginton, 1994), Italy (Blockeel *et al.*, 2002) and Germany (Meinunger & Schröder, 2007). It can be recognized by the dense clusters of differently shaped, vermicular and clavate bulbils, occurring on the same plant. The var. *pseudomyldermansii* differs from the type variety in having knobbly and stalked clavate bulbils. Bulbils of the plants from Romania are identical in shape to those illustrated in Smith (2004: 607 Figure 200, 2–3). The var. *flexuosa* has been found in the lowlands in Belgium and the Netherlands, but not in Germany (contrary to the statement in Smith (2004), whereas var. *pseudomyldermansii* occurs in Germany (Meinunger & Schröder, 2007) and Austria (Grims, 1999; Köckinger *et al.*, 2008).

This record represents a substantial extension of the distributional range of the species (and the var. *pseudomyldermansii*) from the Alps towards the Carpathians.

19. *Racomitrium lanuginosum* (Hedw.) Brid.

**Contributors:** H. Bednarek-Ochyra, R. Ochyra, N. Gremmen, and V.R. Smith

**Prince Edward Island:** eastern part, between Hoedberg and Platkop, 46°38'36"S, 37°58'36"W, 186 m a.s.l., in *Jamesoniella colorata-Agrostis magellanica* mire, 3 April 2003, *leg.* N. Gremmen G03-138 (KRAM); inland from Kraterkoppie, 46°38'39"S, 37°57'44"W, 174 m a.s.l., sparsely on wet peaty soil, *leg.* N. Gremmen G03-028 (KRAM).

The bipolar species *Racomitrium lanuginosum* has a continuous circum-Holantarctic range in the Southern Hemisphere. It occurs in the temperate region at the southernmost tips of South America, Africa and SE

Australia, on almost all islands scattered in the vast Southern Ocean, and extends to the volcanic Deception Island in the maritime Antarctic (Ochyra *et al.*, 2008a, b). It was only recently reported from Île Amsterdam in the southern Indian Ocean sector (Blockeel *et al.*, 2009c), and here is recorded from Prince Edward Island in the Prince Edward Islands group. This small archipelago consists of only two volcanic islands. *Racomitrium lanuginosum* is very common and abundant on the larger, Marion Island and the long-term observations indicate that its frequency and abundance have markedly increased in the past quarter of a century (V.R. Smith, personal observations). Surprisingly, however, the species was unknown from the small Prince Edward Island which lies only 22 km away from Marion Island. However, it was recently found on this island as well, though it is still very rare and occasional. Thus, at present *R. lanuginosum* has been recorded from all islands in the Southern Ocean.

20. *Rhizomnium horikawae* (Nog.) T.J.Kop.

**Contributors:** V. Nath, A.K. Asthana and R. Gupta

**India:** Central India, Madhya Pradesh, Pachmarhi Biosphere Reserve, Little Fall, on wet rocks, ca 884 m a.s.l., 28 November 2006, *leg.* V. Sahu & V. Awasthi *s.n.* (LWG 229398).

*Rhizomnium horikawae* was known in India from the eastern and western Himalayas, and beyond India, from Nepal and Myanmar. The present record was collected from Little Fall in the Pachmarhi Biosphere Reserve (Madhya Pradesh), and is a new addition to the bryoflora of central India.

The plants were bright green, with shoots up to 28 mm long. Towards the base of the deep reddish-brown stems the broadly ovate leaves were distantly arranged, reaching  $\pm 1.4 \times 0.6$  mm, but towards the apices were densely crowded and larger,  $\pm 2 \times 0.83$  mm. Extending from the leaf base, the costa ended between two thirds of the leaf length from the apex to just below the apex. The leaf cells were thick-walled, quadrate-hexagonal to irregular, in the distal leaf reaching  $\pm 27.12 \times 20.8$   $\mu$ m and towards the leaf base  $\pm 100 \times 33.4$   $\mu$ m. Elongated cells in 3–5 rows formed a prominent leaf border.

21. *Sanionia uncinata* (Hedw.) Loeske

**Contributors:** A. Bergamini and A. Cogoni

**Sardinia:** Gennargentu Mountain Range, Province of Ogliastra: North-northeast of Bruncu Spina, community of Villagrande Strisaili, 32T 0526073/443065, ca 1610 m a.s.l., subalpine pasture, on humid soil beside a rivulet, 26 May 2011, *leg.* A. Bergamini *s.n.* (specimen in private herbarium); Fundu de Tonneri, community of Seui 32S 0533488/4416817, ca 950 m a.s.l., moist soil in riparian *Ostrya carpinifolia* Scop. forest, 24 May 2011, *leg.* A. Cogoni *s.n.* (CAG).

*Sanionia uncinata* is a widespread species in temperate to sub-polar regions in the northern as well as the southern hemisphere (Hedenäs, 2003b, 2010). It is known from most regions of Italy (Aleffi *et al.*, 2008) and has also been recorded in Corsica (Sotiaux *et al.*, 2007). In Sardinia, the second largest island in the Mediterranean Sea, the species has not previously been recorded. It is not mentioned in the checklist by Aleffi *et al.* (2008) nor in the list by Frahm *et al.* (2008). Michele Aleffi (pers. comm.) has also confirmed that it has not been found in Sardinia since the publication of these checklists. We thus report here the species as new for Sardinia. *S. uncinata* has been found independently by both contributors at two different locations in the Gennargentu mountain range that include the highest peaks in Sardinia (up to 1864 m a.s.l.).

The bryoflora of Sardinia was studied in some detail by Th. Herzog at the beginning of the twentieth century (Herzog, 1909) and he also published a short paper on the bryoflora of the Gennargentu mountain range (Herzog, 1926). Here, he was surprised by the many alpine bryophyte species he could find, given the rather limited height and area of high-altitude zones in the range. More than 80 years after Herzog, the exploration of the Gennargentu mountain range is still fragmentary as has been pointed out by Cogoni *et al.* (1999). The recent findings of *Sanionia uncinata* confirm this conclusion.

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

**Contributors:** R. Natcheva and A. Ganeva

**Bulgaria:** Lovech District: at the north-western slopes of peak Vezan, Central Balkan Range, Central Balkan Nature Park, by the tourist trail from shelter-house Vezan to shelter-house Planinski izvori, 24.391301°E, 42.763405°N, ca 1800 m a.s.l., on mineral soil in the cavity under an overhanging stone, 16 August 2011, *leg.* R. Natcheva *s.n.* (SOM-B 9414).

*Schistostega pennata* is here reported new to Bulgaria. This suboceanic boreo-temperate species was found near the upper tree limit, in an arboreal community composed of *Picea abies* (L.) H. Karst, *Pinus peuce* Griseb. and *Juniperus sibirica* Burgsd. On the Balkan Peninsula it is known only from Romania and Slovenia (Sabovljevič *et al.*, 2008). In Romania *S. pennata* is recorded from many localities (S. Ștefănuț, pers. comm.), but in Slovenia, although its habitat is not threatened (A. Martinčič, pers. comm.), the species is red-listed as Rare (Martinčič, 1992).

The new site for *S. pennata* in Bulgaria was first visited by S. Petrov (Petrov, 1966) who collected a number of rare bryophytes there. He had searched unsuccessfully for *S. pennata* for many years at different places in Bulgaria (S. Petrov, pers. comm.).

It is not clear, therefore, whether the current finding of *S. pennata* is a result of previous overlooking of a rare species or is an example of recent establishment.

23. *Streptocolea atrata* (Hornsch.) Ochyra & Zarnowiec

**Contributors:** R. Ochyra and P. Sollman

**Colombia:** Departamento Boyacá, Sierra Nevada del Cocuy, Alto Valle Lagunillas, Quebrada la Bocatoma, 6°22'N 172°19'W, 4300 m a.s.l., 'musgo epilítico', 28 September 1972, *leg.* P. A. Florschütz 4090 (KRAM, L).

*Streptocolea atrata* is a pan-Holarctic orophyte (Ochyra & Bednarek-Ochyra, 2004; Blockeel *et al.*, 2006), which like a number of northern moss species, penetrates into the tropics, occupying altimontane sites. Hitherto, the species was known at a few stations from only two countries in the neotropics, namely in Bolivia, where it was found at elevations between 4350 and 4750 m (Muñoz, 1999; Churchill *et al.*, 2000, as *Grimmia atrata* Hornsch.) and in south-eastern Brazil in Santa Catarina Province (Sehnem, 1976). Here, *S. atrata* is reported from Colombia, where it was collected in the Cordillera Oriental at an altitude of 4300 m. The ecological data available on the specimen label are scanty and would indicate that it was a rupestral moss. However, it was apparently collected from soil covering rocks, and the presence of silt suggests that it grew in a moist habitat. The discovery of this distinct species represents one more Holarctic moss occurring in montane outposts of Colombia, and according to Churchill *et al.* (1995) this phytogeographical element totals about 35 species, i.e. 4% of the moss flora of this Andean country.

24. *Thuidium meyenianum* (Hampe) Dozy. & Molk.

**Contributors:** V. Nath, A.K. Asthana, and R. Gupta

**India:** Central India, Madhya Pradesh, Pachmarhi Biosphere Reserve, on way to Jata Shankar, growing on rocks, ca 823 m a.s.l., 29 November, 2006, *leg.* V. Sahu & V. Awasthi *s.n.* (LWG 2276558 A).

*Thuidium* Schimp. is a widely distributed genus in India. There were two dozen species mentioned by Chopra (1975), 19 reported by Gangulee (1978), and 23 by Lal (2005).

Among the eight bryo-geographical regions of India, *T. meyenianum* has been reported from the western and eastern Himalayas, South India, and the Andaman and Nicobar Islands. The present record of the taxon from Pachmarhi Biosphere Reserve extends its distributional range to central India.

The plants were delicate, small, matted, and yellowish-green with pinnately branched, dense filamentous shoots, bearing paraphyllia. In cross-section the stem was oval to circular. The distant stem leaves were ovate-chordate, narrowing into the acumen, and reaching  $\pm 0.69 \times 0.3$  mm. Branch leaves were smaller



and densely arranged,  $\pm 0.15 \times 0.12$  mm, with a crenulated margin. Both stem and branch leaves had a single costa, ending below the leaf tip, and small, obscure, multipapillose leaf cells, reaching  $\pm 5$   $\mu$ m in diameter. Sporophytes were not found.

25. *Tortella densa* (Lorentz & Molendo) Crundwell & Nyholm

**Contributors:** A. Martinčič and B. Surina

**Croatia:** Liburnian karst, NW Adriatic above the Kvarner Bay, Mount Učka, southern slopes, in four micro-localities: cliffs of the Suhi vrh peak, 45°16'52.2"N, 14°12'35.7"E, 1265 m a.s.l., NE exposure, 13 August 2011, *leg.* B. Surina *s.n.* (NHMR 1740, LJU); boulders above the Mala Učka settlement, 45°16'38.2"N, 14°12'05.6"E, 1192 m a.s.l., ESE exposure, 17 August 2011, *leg.* B. Surina *s.n.* (NHMR 1741), 45°16'37.8"N, 14°12'06.3"E, 1189 m a.s.l., WSW exposure, 17 August 2011, *leg.* B. Surina *s.n.* (NHMR 1742); 45°16'35.3"N, 14°12'17.2"E, 1254 m a.s.l., W exposure, 17 August 2011, *leg.* B. Surina *s.n.* (NHMR 1743).

*Tortella densa* ( $\equiv$  *Tortella inclinata* (Hedw.f.) Limpr. var. *densa* (Lorentz & Molendo) Limpr.,  $\equiv$  *Barbula inclinata* (Hedw.f.) Schwägr. var. *densa* Lorentz & Molendo in Lorentz, Pottiaceae), a species with a disjunctive Holarctic distribution (Crundwell and Nyholm, 1962; Fedosov and Ignatova, 2009), and considered to be a temperate element in Europe (Smith, 2004), is recorded for the first time in Croatia (Pavletić, 1955; 1968; Sabovljević, 2006; Sabovljević *et al.*, 2008).

Several specimens of *T. densa* were found in crevices of vertical boulders and cliffs of limestone rock, among four stands of a chasmophytic community including the narrow endemic *Campanula tommasiniana* K.Koch. Other frequent and rather interesting phanerogams in stands, covering 20–40% of the relevé area, included *Sesleria tenuifolia* Schrad., *Athamanta turbith* Brot., *Leontopodium alpinum* Cass., *Globularia cordifolia* L., *Arabis scopoliana* Boiss., *Silene saxifraga* L., etc. In these stands, bryophytes were only poorly represented and covered around 1% (and up to 5%) of the relevé area. Besides *Tortella densa*, other mosses recorded included *Encalypta vulgaris* Hedw., *Homalothecium philippeanum* (Spruce) Schimp., *H. sericeum* (Hedw.) Schimp., *Hypnum cupressiforme* Hedw. var. *cupressiforme*, *Tortella tortuosa* (Hedw.) Limpr., *T. nitida* (Lindb.) Broth., and *Weissia* sp. Here, *Tortella densa* preferred open and sunny sites between 1180 and 1265 m a.s.l., and was exposed to the Bora wind regardless of its position.

In the Balkan Peninsula and elsewhere in SE Europe, *Tortella densa* is known only from Slovenia, Serbia, Romania and Greece (Sabovljević *et al.*, 2008). Fedosov and Ignatova (2009) erroneously

cited it for Croatia (Fedosov, pers. comm.). In neighbouring Slovenia, it occurs in south-eastern Calcareous Alps (Martinčič, 2003), pre-Alps and Dinaric Alps between 500–2100 m a.s.l.

## Acknowledgements

Ž. Modrić Surina, M. Randić, and A. Alegro are grateful to Professor Marko Sabovljević from Institute of Botany, Faculty of Biology, University of Belgrade (Serbia) for confirming the determination of *Calypogeia sphagnicola*. The study by T. Özdemir, N. Batan, and G. Uyar was supported by the Turkish Scientific and Technical Research Council (TUBITAK) with project code 108T566. S. Ștefănuț is grateful to J. Váňa for confirming the identity of *Marsupella boeckii* and acknowledges the support by project no. RO1567-IBB03/2012 through the Institute of Biology of the Romanian Academy Bucharest. C.R. Stevenson is grateful to Tom Blockeel for the identification of *Orthotrichum schimperii* and *O. gymnostomum*, and to Francisco Lara for confirming *O. schimperii*. G. M. Suárez thanks Richard Zander for comments and suggestions on his manuscript. His financial support was provided by CIUNT (Secretaria de Ciencia y Técnica, Universidad Nacional de Tucumán) and CONICET (Consejo Nacional de Investigaciones Científicas y Técnicas). A. Bergamini and A. Cogoni thank Alberto Spinelli for organizing the BRYOLICH excursion to Sardinia and Edi Urmi for help with locality information. The contribution of A. Martinčič and B. Surina was supported financially by Učka Nature Park. P. Gorski is grateful to Professor Jiří Váňa (Charles University, Prague, Czech Republic) for revision of herbarium specimens, and he acknowledges financial support from the Polish Ministry of Science and Higher Education through grant no. NN 304 028539. The contributions by H. Bednarek-Ochyra and R. Ochyra have been financially supported by the Polish Ministry of Science and Higher Education through grant nos. N N 303 796 940 (for H. Bednarek-Ochyra) and N N 303 469 338 (for R. Ochyra). They also thank the Curators at BM and NSW for the loan of the herbarium material. The field work of R. Ochyra and Marc Lebouvier on Îles Kerguelen was organized within programme 136 ECOBIO of the French Polar Institute (IPEV). The contribution by V. Plášek and J. Sawicki is part of a research project of the Institute of Environmental Technologies, reg. no. CZ.1.05/2.1.00/03.0100, supported by the 'Research and Development for Innovations' Operational Programme, and financed by the Structural Funds of the European Union and by the state budget of the Czech Republic. These authors would like to thank O. M. Afonina and L. E. Kurbatova for their kind permission to study herbarium materials in LE.

The contributions by L. E. Kurbatova were financially supported by grants from the Russian Foundation for Basic Research (Project 11-04-01247-a).

Taxonomic Additions and Changes: Nil.

## References

- Akhani, H. & Kürschner, H. 2004. An annotated and updated checklist of the Iranian bryoflora. *Cryptogamie, Bryologie*, 25: 315–47.
- Aleffi, M., Tacchi, R. & Cortini-Pedrotti, C. 2008. Check-list of the hornworts, liverworts and mosses of Italy. *Bocconea*, 22: 5–255.
- Anderson, L.E., Crum, H.A. & Buck, W.R. 1990. List of the mosses of North America, north of Mexico. *Bryologist*, 93: 448–99.
- Bednarek-Ochyra, H. & Ochyra, R. 2010. *Bucklandiella allanififei* (Grimmiaceae), a new moss species from New Zealand, with a note on South American *B. striatipila*. *Journal of Bryology*, 32: 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: 13–27.
- Bell, B.G. 1974. A synoptic flora of South Georgian mosses: V. *Willia* and *Racomitrium*. *British Antarctic Survey Bulletin*, 38: 73–101.
- Blockeel, T.L., Bakalin, V.A., Bednarek-Ochyra, H., Ochyra, R., Buck, W.R., Choi, S., Cykowska, B., Erdağ, A., Erzberger, P., Kirmaci, M., Kürschner, H., Lebouvier, M., Papp, B., Sabovljević, M., Schröder, W., Singh, S.M., Sun, B.-Y., Townsend, C.C., Váňa, J. & Yayintaş, Ö.T. 2009c. New national and regional bryophyte records, 20. *Journal of Bryology*, 31: 54–62.
- Blockeel, T.L., Bastos, C.J.P., Bednarek-Ochyra, H., Ochyra, R., Dulin, M.V., Fovet, I., García, C., Hedenäs, L., Hugonnot, V., Kirmaci, M., Koponen, T., Lebouvier, M., Martins, A., Müller, F., Sabovljević, M., Lakušić, D., Schäfer-Verwimp, A., Sérgio, C., Surina, B. & Yayintaş, Ö.T. 2009b. New national and regional bryophyte records, 22. *Journal of Bryology*, 31: 201–10.
- Blockeel, T.L., Bednarek-Ochyra, H., Cykowska, B., Ochyra, R., Düzenli, A., Ezer, T., Holyoak, D.T., Hugonnot, V., Kara, R., Larrain, J., Lebouvier, M., Preston, C.D., Schäfer-Verwimp, A., Smith, V.R., Spitale, D., Ştefănuţ, S. & Váňa, J. 2010. New national and regional bryophyte records, 23. *Journal of Bryology*, 32: 140–7.
- Blockeel, T.L., Bednarek-Ochyra, H., Ochyra, R., Cykowska, B., Esquivel, M.G., Lebouvier, M., Luis, L., Martins, S., Müller, F., Papp, B., Plášek, V., Pócs, T., Sabovljević, M., Sérgio, C., Sim-Sim, M., Stech, M., Váňa, J. & Yayintaş, Ö.T. 2009a. New national and regional bryophyte records, 21. *Journal of Bryology*, 31: 139–42.
- Blockeel, T.L., Bednarek-Ochyra, H., Ochyra, R., Hájková, P., Hájek, M., Kučera, J., Kürschner, H., Müller, F., Oliván, G., Parolly, G., Porley, R.D., Rams, S., Sêneca, A., Sérgio, C., Townsend, C.C., Tyshchenko, O. & Vieira, C. 2006. New national and regional bryophyte records, 13. *Journal of Bryology*, 28: 151–5.
- Blockeel, T.L., Bruggeman-Nannenga, M.A., Brusa, G., Hedenäs, L., Novotny, I., Ochyra, R., Sabovljević, M.S. & Townsend, C.C. 2002. New national and regional bryophyte records 6. *Journal of Bryology*, 24: 329–32.
- Brotherus, V.F. 1924. Musci. In: A. Engler & K. Prantl, eds. *Die Natürlichen Pflanzenfamilien*. 2nd edn. Band 10. Leipzig: W. Engelmann, pp. 209–11.
- Cano, M. & Gallego, T. 2008. The genus *Tortula* (Pottiaceae, Bryophyta) in South America. *Botanical Journal of the Linnean Society*, 156: 173–220.
- Casas, C., Brugués, M., Cros, R.M. & Sérgio, C. 1985. Cartografia de Briófitos. Península Ibérica i les Illes Balears, Canàries, Açores i Madeira. *Institut d'Estudis Catalans*, 1: 1–50.
- Chopra, R.S. 1975. *Taxonomy of Indian mosses (an introduction)*. New Delhi: Publications and Information Directorate (CSIR).
- Churchill, S.P., Griffin, D. III & Muñoz, J. 2000. A checklist of the mosses of the tropical Andean countries. *Ruizia*, 17: 1–203.
- Churchill, S.P., Linares, C.E.L. & Gonzáles, G.M. (illustrations). 1995. *Prodromus bryologiae novo-granatensis*. Introducción a la flora de musgos de Colombia. Parte 1 (Adelotheciaceae a Funariaceae). *Biblioteca José Jerónimo Triana*, 12: [1–12] + 1–453 + i–xxvi.
- Churchill, S., Sanjines, N. & Aldana, C. 2009. *Catálogo de las briofitas de Bolivia: diversidad distribución y ecología*. Santa Cruz, CA: Museo de Historia Natural Noel Kempff Mercado/St Louis, MO: Missouri Botanical Garden.
- Clifford, H.T. 1953. The mosses of Macquarie Island and Heard Island. *Australian National Antarctic Research Expedition Reports Series B, Botany*, 2: 1–12[–14].
- Cogoni, A., Aleffi, M. & Scrugli, A. 1999. Sardinia's bryological flora: the state of knowledge and chorological considerations. *Webbia*, 53: 381–92.
- Cortini Pedrotti, C. 2001. *Flora dei muschi d'Italia (1 parte)*. Roma: Antonio Delfino Editore.
- Crum, H.A. & Anderson, L.E. 1981. *Mosses of eastern North America, Vol. 2*. New York: Columbia University Press.
- Crundwell, A.C. & Nyholm, E. 1962. Notes on the genus *Tortella* I. *Tortella inclinata*, *T. densa*, *T. flavovirens* and *T. glareicola*. *Transactions of the British Bryological Society*, 4: 187–193.
- Cykowska, B. 2011. Bryophytes of *Sphagnum-Polytrichum* hummocks in the Polish Tatra Mountains. In: A. Stebel & R. Ochyra, eds. *Chorological studies on Polish Carpathian Bryophytes*. Poznań: Sorus, pp. 233–59.
- Dierßen, K. 2001. Distribution, ecological amplitude and phytosociological characterization of European bryophytes. *Bryophytum Bibliotheca*, 56: 1–289.
- Dihoru, G. 1994. Bryophyta – Musci in the Romanian flora. *Revue Roumaine de Biologie, Série Botanique*, 39: 91–107.
- Dixon, A. 1912. Results of a bryological visit to Portugal. *Revue Bryologique et Lichénologique*, 39: 33–50.
- Dixon, H.N. 1960. Mosses of Tristan da Cunha. In: E. Christophersen, ed. *Results of the Norwegian Scientific Expedition to Tristan da Cunha 1937–1938. No. 48*. Oslo: Kommissjon hos H. Aschehoug & Co. (W. Nygaard), pp. 1–49.
- Düll, R. 1985. Distribution of the European and Macaronesian mosses (Bryophytina) Part. II. *Bryologische Beiträge*, 5: 110–232.
- Ellis, L.T., Asthana, A.K., Sahu, V., Bednarek-Ochyra, H., Ochyra, R., Cano, M.J., Costa, D.P., Cykowska, B., Philippov, D.A., Dulin, M.V., Erzberger, P., Lebouvier, M., Mohamed, H., 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, T.K. & Zander, R.H. 2010. New national and regional bryophyte records, 25. *Journal of Bryology*, 32: 310–22.
- 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., Ştefănuţ, S., Suárez, G.M. & Váňa, J. 2011. New national and regional bryophyte records, 28. *Journal of Bryology*, 33: 237–47.
- Ellis, L.T., Bednarek-Ochyra, H., Cykowska, B., Ochyra, R., García, C., Sérgio, C., Lebouvier, M., Manolaki, P., Giannouris, E., Kadis, C., Marková, I., Papp, B., Szurdoki, E., Peralta, D.F., Plášek, V., Ristová, R., Sabovljević, M., Sim-Sim, M., Smith, V.R., Tsakiri, E., Váňa, J., Virchenko, V.M. & Barsukov, O.O. 2012. New national and regional bryophyte records, 30. *Journal of Bryology*, 34(1): 45–51.
- Erzberger, P. 2009. The genera *Grimmia* and *Coscinodon* (Grimmiaceae, Musci) in Hungary *Studia botanica hungarica*, 40: 37–124.
- Fedosov V.E. & Ignatova E.A. 2009. *Tortella densa* (Pottiaceae, Bryophyta) in Russia. *Arctoa*, 18: 189–94.
- Frahm, J.-P., Lüth, M. & van Melick, H. 2008. Kommentierte artenliste der moose von Sardinien. *Archive for Bryology*, 31: 1–13.
- Frey, W. & Kürschner, H. 1991. Conspectus bryophytorum Orientalum et Arabicorum. An annotated catalogue of the bryophytes of Southwest Asia. *Bryophytum Bibliotheca*, 39: 1–181.
- Gangulee, H.C. 1969–1972. *Mosses of Eastern India and adjacent regions Vol. I*. Calcutta: Sree Saraswaty Press.
- Gangulee, H.C. 1976. *Mosses of Eastern India and adjacent regions Fasc. 5*. Calcutta: Sree Saraswaty Press.
- Gangulee, H.C. 1978. *Mosses of Eastern India and adjacent regions. Fasc. 7*. Calcutta: Sree Saraswaty Press.
- Górski, P. 2010. *Nardia compressa* — a liverwort new to Slovakia found in the Tatra Mountains. *Cryptogamie, Bryologie*, 31(2): 199–203.



- Górski, P. & Váňa, J. 2011. *Gymnomitrium adustum* – a liverwort new to Slovakia and Poland found in the Tatra Mts (Western Carpathians). *Cryptogamie, Bryologie*, 32(3): 279–84.
- Greven, H.C. 1994. The identities of *Grimmia nutans* Bruch, *G. ungeri* Jur. and remarks about other Grimmiaceae on the island of Cyprus. *Journal of Bryology*, 18: 303–9.
- Greven, H.C. 1995. *Grimmia Hedw. (Grimmiaceae, Musci) in Europe*. Leiden: Backhuys Publishers.
- Grims, F. 1999. Die Laubmoose Österreichs. *Catalogus Florae Austriae*, II. Teil, Bryophyten (Moose), Heft 1, Musci (Laubmoose). *Biosystematics and Ecology Series*, 15: 1–418.
- Hässel de Menéndez, G.G. and Rubies M.F. 2009. Catalogue of Marchantiophyta and Anthocerotophyta of southern South America. *Nova Hedwigia, Beihefte*, 134: 1–672.
- Hebrard, J.P. 2000. *Grimmia nutans* Bruch in southern France. *Botanica Helvetica*, 110: 115–24.
- Hedderston, T. & Zander, R. 2008. *Chenia ruigtevleia* (Pottiaceae), a new moss species from the Western Cape Province of South Africa. *Bryologist*, 111(3): 496–500.
- Hedenäs, L. 1989. On the taxonomic position of *Conardia* Robins. *Journal of Bryology*, 15: 779–83.
- Hedenäs, L. 2003a. Amblystegiaceae (Musci). *Flora Neotropica Monograph*, 89: 1–107.
- Hedenäs, L. 2003b. The European species of the *Calliergon-Scorpidium-Drepanocladus* complex, including some related or similar species. *Meylania*, 28: 1–116.
- Hedenäs, L. 2010. Phylogeography and origin of European *Sanionia uncinata* (Amblystegiaceae, Bryophyta). *Systematics and Biodiversity*, 8: 177–91.
- Herzog, T. 1909. Über die vegetationsverhältnisse Sardinien. *Botanische Jahrbücher für Systematik*, 42: 341–436.
- Herzog, T. 1926. Die alpine bryoflora des Monte Gennargentu auf Sardinien. *Botanische Jahrbücher für Systematik*, 60: 570–9.
- Heyn, C.C. & Herrnstadt, H.I. 2004. *The bryophyte flora of Israel and adjacent regions*. Jerusalem: The Israel Academy of Science and Humanities.
- Hill, M.O., Bell, N., Bruggeman-Nannenga, M.A., Brugués, M., Cano, M.J., Enroth, J., Flatberg, K.I., Frahm, J.-P., Gallego, M.T., Garilleti, R., Guerra, J., Hedenäs, L., Holyoak, D.T., Hyvönen, J., Ignatov, M.S., Lara, F., Mazimpaka, V., Muñoz, J. & Söderström, L. 2006. An annotated checklist of the mosses of Europe and Macaronesia. *Journal of Bryology*, 28: 198–267.
- Hill, M.O. & Preston, C.D. 2008. The geographical relationships of British and Irish bryophytes. *Journal of Bryology*, 20(1): 127–226.
- Horvat, I. 1962. *Vegetacija planina zapadne Hrvatske*. Zagreb: HAZU, pp. 1–179.
- Ignatov, M.S., Afonina, O.M. & Ignatova, E.A. 2006. Checklist of mosses of Europe and North Asia. *Arctoa*, 15: 1–130.
- Ilijanić, L.J. & Topić, J. 2002. *Eriophorum vaginatum* L. (Cyperaceae), new and critically endangered plant species in Croatia. *Razprave IV. razreda SAZU*, 43: 217–25.
- Köckinger, H., Suanjak, M., Schriebl, A. & Schröck, C. 2008. *Die moose Kärntens*. Sonderreihe Natur Kärnten 4, Klagenfurt: Verlag des Naturwissenschaftlichen Vereins für Kärnten.
- Kürschner, H. 2000. Bryophyte flora of the Arabian Peninsula and Socotra. *Bryophytum Bibliotheca*, 55: 1–131.
- Kürschner, H. 2006. A key to the pleurocarpous mosses (Bryophytina p. p.) of the Near and Middle East. Towards a bryophyte flora of the Near and Middle East, 5. *Nova Hedwigia*, 83: 353–86.
- 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.
- Lal, J. 2005. *A Checklist of Indian Mosses*. Dehra Dun: Bishen Singh Mahendra Pal Singh.
- Li, S.-P., Ochyra, R., Wu, P.-C., Seppelt, R.D., Cai, M.-H., Wang, H.-Y. & Li, C.-S. 2009. *Drepanocladus longifolius* (Amblystegiaceae), an addition to the moss flora of King George Island, South Shetland Islands, with a review of Antarctic benthic mosses. *Polar Biology*, 32: 1415–25.
- Loitlesberger, K. 1898. Verzeichnis der gelegentlich einer Reise im Jahre 1897 in den rumänischen Karpathen gesammelten Kryptogamen. *Annalen des k. k. Naturhistorischen Hofmuseums*, 13: 189–96.
- Maier, E. 2010. The genus *Grimmia* Hedw. (Grimmiaceae, Bryophyta) – a morphological-anatomical study. *Boissiera*, 63: 1–377.
- Martinčič, A., 1992. Rdeci seznam ogroženih listnatih mahov (Musci) v Sloveniji. *Varstvo narave, Ljubljana*, 18: 7–166.
- Martinčič, A. 2003. Seznam listnatih mahov (*Bryopsida*) Slovenije. *Hacquetia*, 2: 91–166.
- Martinčič, A. 2011. Seznam jetrenjakov (Marchantiophyta) in rogovnjakov (Anthocerotophyta) Slovenije/Annotated Checklist of Slovenian liverworts (Marchantiophyta) and hornworts (Anthocerotophyta). *Scopolia*, 72: 1–38.
- Matteri, C. 2004. The mosses (Bryophyta) of Uruguay, their synonymy and distribution. *Cryptogamie, Bryologie*, 25(2): 147–67.
- Meinunger, L. & Schröder, W. 2007. *Verbreitungsatlas der Moose Deutschlands. Band 3*. Regensburg: Herausgegeben von O. Dürhammer für die Regensburgische Botanische Gesellschaft, pp. 21–2.
- Modrić, Ž. 2009. Vegetacijske i ekološke značajke creta na Trsteniku (Gorski kotar, Hrvatska). MSc thesis, University of Zagreb.
- Modrić Surina, Ž. 2011. Utjecaj ekoloških čimbenika na vegetacijske značajke cretova u Hrvatskoj. PhD thesis, University of Zagreb.
- Mohan, G. 1991. *Pohlia muyldermansii* Wilczek & Demaret – specie noua pentru brioflora Romaniei. *Acta Botanica Horti Bucurestiensis*, 1990–1991: 35–38.
- Mohan, G. 1998. Catalogul briofitelor din România. *Acta Botanica Horti Bucurestiensis*, 1998: 1–432.
- Muñoz, J. 1999. A revision of *Grimmia* (Musci, Grimmiaceae) in the Americas. 1: Latin America. *Annals of the Missouri Botanical Garden*, 86: 118–91.
- Natcheva, R., Tsakiri, E. & Dihoru, G. 2007. New bryophyte records in the Balkans: 1. *Phytologia Balcanica*, 13(1): 101–6.
- Ochyra, R. 1998. *The moss flora of King George Island, Antarctica*. Cracow: Polish Academy of Sciences, Szafer Institute of Botany.
- Ochyra, R. 1999. Antipodal mosses: IX. *Platydictya* (Hypnaceae). *Annales Botanici Fennici*, 36: 51–8.
- Ochyra, R. 2003. *Schistidium lewis-smithii* (Bryopsida, Grimmiaceae) – a new species from the maritime Antarctic, with a note on the Australian *S. flexifolium*. *Nova Hedwigia*, 77: 363–72.
- Ochyra, R. 2004. *Schistidium leptoneurum* species nova from the South Shetland Islands, Antarctica. *Cryptogamie, Bryologie*, 25: 125–30.
- 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: 223–32.
- Ochyra, R. & Bednarek-Ochyra, H. 2004. *Streptocolea atrata* (Bryopsida, Grimmiaceae), newly found in western North America, with a review of its global distribution. *Bryologist*, 107: 542–9.
- Ochyra, R., Bednarek-Ochyra, H. & Lewis Smith, R.I. 2002. New and rare moss species from subantarctic South Georgia. *Nova Hedwigia*, 74: 121–47.
- Ochyra, R., Bednarek-Ochyra, H. & Lewis Smith, R.I. 2008a. New and rare moss species from the Antarctic. *Nova Hedwigia*, 87: 457–77.
- Ochyra, R. & Broughton, D.A. 2002. New moss records from the Falkland Islands. *Journal of Bryology*, 26: 226–30.
- Ochyra, R., Lewis Smith, R.I. & Bednarek-Ochyra, H. 2008b. *The illustrated moss flora of Antarctica*. Cambridge: Cambridge University Press.
- Ochyra, R. & Zander, R.H. 2002. The genera *Didymodon* and *Bryoerythrophyllum* (Pottiaceae) in Antarctica. *Journal of Bryology*, 24: 33–44.
- Papp, B., Erzberger, P., Ódor, P., Hock, Zs., Szóvényi, P., Szurdoki, E. & Tóth, Z. 2010. Updated checklist and red list of Hungarian bryophytes. *Studia Botanica Hungarica*, 41: 31–59.
- Paton, J.A. 1999. *The liverwort flora of the British Isles*. Colchester: Harley Books, pp. 1–626.
- Pavletić, Z. 1955. *Prodromus flore briofita Jugoslavije*. Zagreb: JAZU.
- Pavletić, Z. 1968. *Flora mahovina Jugoslavije*. Zagreb: Institut za botaniku Sveučilišta u Zagrebu.
- Petrov, S. 1966. Nachträgliches material zur moosflora Bulgariens. *Izvestia na Botanicheskia Institut, BAN*, 16: 253–64 (in Bulgarian).
- Plămadă, E. 1979. O lucrare străină de realitățile briogeografice ale României. *Contribuții Botanice*, Cluj-Napoca 1979: 379–82.
- Plămadă, E. 1992. O metodă originală de abordare a briologiei românești și implicațiile ei universale. *Contribuții Botanice*, Cluj-Napoca 1991–1992: 223–35 + annex 422–87.



- 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(4): 335–40.
- Porembski, S. & Barthlott, W. eds. 2000. *Inselbergs: biotic diversity of isolated rock outcrops in tropical and temperate regions*. Berlin: Springer-Verlag.
- Sabovljević, M. 2006. Checklist of mosses of Croatia. *Archives of Biological Sciences, Belgrade*, 58: 45–53.
- Sabovljević, M. & Natcheva, R. 2006. Check-list of the liverworts and hornworts of Southeast Europe. *Phytologia Balcanica*, 12(2): 169–80.
- Sabovljević, M., Natcheva, R., Dihoru, G., Tsakiri, E., Dragičević, S., Erdağ, A. & Papp, B. 2008. Check-list of the mosses of SE Europe. *Phytologia Balcanica*, 14(2): 207–44.
- Sehnm, A. 1976. Musgos sub-brasileiros IV. *Pesquisas Botanica*, 30: 1–79.
- Selkirk, P.M., Whinam, J.P., Downing, A.J. & Skotnicki, M.L. 2008. Mosses of sub-Antarctic Heard Island: an updated list and discussion of their distribution. *Polar Record*, 44(229): 155–64.
- Seppelt, R.D. 2004. *The moss flora of Macquarie Island*. Kingston: Australian Antarctic Division.
- Sérgio, C., Brugués, M., Cros, R.M., Casas, C. & Garcia, C. 2007. The 2006 red list and an updated checklist of bryophytes of the Iberian Peninsula (Portugal, Spain and Andorra). *Lindbergia*, 31: 109–26.
- Smith, A.J.E. 2004. *The moss flora of Britain and Ireland*. 2nd edn. Cambridge: Cambridge University Press.
- Söderström, L., Urmi, E. & Váňa, J. 2002. Distribution of Hepaticae and Anthocerotae in Europe and Macaronesia. *Lindbergia*, 27: 3–47.
- Söderström, L., Urmi, E. & Váňa, J. 2007. The distribution of Hepaticae and Anthocerotae in Europe and Macaronesia — Update 1–427. *Cryptogamie, Bryologie*, 28: 299–350.
- Sotiaux, A., Pioli, A., Royaud, A., Schumacker, R. & Vanderpoorten, A. 2007. A checklist of the bryophytes of Corsica (France): new records and a review of the literature. *Journal of Bryology*, 29: 41–53.
- Ștefănuț, S. 2008. *The hornwort and liverwort atlas of Romania*. București: Ars Docendi — Universitatea din București.
- Streimann, H. & Klanzenga, N. 2002. *Catalogue of Australian mosses*. Flora of Australia Supplementary Series, 17. Canberra: Australian Biological Resources Study. pp. 1–259.
- Suárez, G., Colotti, T. & Schiavone, M. 2005. *Dolotortula mnifolia* (Sull.) Zand. (Pottiaceae, Musci) en Argentina. *Lilloa*, 42(1–2): 81–4.
- Szweykowski, J. 1960a. Materiały do flory wątrobowców Tatr. *Prace Komisji Biologicznej Poznańskiego Towarzystwa Przyjaciół Nauk, Poznań*, 21(3): 3–92.
- Szweykowski, J. 1960b. *Orthocaulis binsteadii* (Kaalaas) Buch – a new liverwort for Central Europe. *Fragmenta Floristica et Geobotanica*, 6(3): 399–405.
- Topić, J. & Ilijanić, L.J. 2001. *Carex pulicaris* L. (Cyperaceae), a new species in Croatian flora. *Natura Croatica*, 10: 423–6.
- Topić, J., Ilijanić, L.J. & Tvrtković, N. 2006. Gorski tresetni cret. In: T. Nikolić, ed. 2006. *Staništa*. Zagreb: Državni zavod za zaštitu prirode. pp. 1–4.
- Uyar, G. & Çetin, B. 2004. A new check-list of the mosses of Turkey. *Journal of Bryology*, 26: 203–20.
- Váňa, J., Söderström, L., Hagborg, A., von Konrat, M. & Engel, J.J., 2010. Early land plants today: taxonomy, systematics and nomenclature of Gymnomitriaceae. *Phytotaxa*, 11: 1–80.
- Werner, J. 2011. Les bryophytes du Luxembourg – Liste annotée et atlas. *Ferrantia*, 65: 1–144.
- Wigginton, M.J. 1994. *Pohlia myldermansii*. In: M.O. Hill, C.D. Preston & A.J.E. Smith, eds. *Atlas of the bryophytes of Britain and Ireland*. Vol. 3. *Mosses (Diplolepideae)*. Colchester: Harley Books. p. 70.
- Wijk van der, R., Margadant, W.D. & Florschütz, P.A. 1959–1969. *Index Muscorum*, Vols. 1–5. Utrecht: International Bureau for Plant Taxonomy and Nomenclature.