

REVISION OF BRYOPHYTE SPECIMENS FROM SERBIA DEPOSITED IN THE BRYOPHYTE COLLECTION OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST

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Abstract: More than a hundred specimens of problematic or taxonomically re-evaluated taxa were revised in the Bryophyte Herbarium of the Hungarian Natural History Museum, Budapest (BP). As a result, three species (*Orthotrichum alpestre*, *Tortella bambergi* s. str., *T. pseudofragilis*) can be added to the Serbian bryophyte flora and three species (*Grimmia donniana*, *Orthotrichum philibertii*, *Pohlia sphagnicola*) can be excluded so far. The presence of *Lophozia longiflora* s. str. is confirmed. The distribution of several taxa of conservation interest (e.g. *Ulota bruchii* or *Philonotis* taxa, severely threatened by climate change), and some other previously rather poorly known taxa in Serbia was clarified.

Key words: bryophyte collection of HNHM, regionally new species, rare species, threatened species

INTRODUCTION

The recent projects of an updated checklist and red list of Serbian hornworts and liverworts (PANTOVIĆ *et al.* 2020, SABOVLJEVIĆ *et al.* 2024a) and later on Serbian mosses (PANTOVIĆ *et al.* 2021, SABOVLJEVIĆ *et al.* 2024b) drew attention to the necessity to revisit the Bryophyte Herbarium of the Hungarian Natural History Museum, Budapest (BP). This collection harbours a high amount (5,364 specimens) of bryophyte material collected in the past two and a half decades in Serbia and holds the vouchers of 133 species (38 liverworts and 95 mosses) reported for the first time from the country (PAPP *et al.* 2019a). Between 2000 and 2018 fourteen large areas were visited during the expeditions organised by the

Hungarian Natural History Museum (Table 1, Fig. 1) mostly in cooperation with the Institute for Botany and Botanical Garden of the University of Belgrade. The results of these field works on bryophytes were published in 28 references (ELLIS *et al.* 2011*a, b*, 2012*a, b*, 2014, 2015, ERZBERGER and PAPP 2007, LAZAREVIĆ *et al.* 2016, PAPP and ERZBERGER 2005, 2007, 2009, PAPP and SABOVLJEVIĆ 2001, 2002, PAPP *et al.* 2004, 2006, 2009, 2012*a, b*, 2013, 2014*a, b, c*, 2016*a, b, c*, 2019*a, b, c*).

Table 1. List of the main investigated areas and the date of expeditions.

Area	Year
Petnica region	2000
Tara National Park	2000
Kopaonik National Park	2002, 2016
Golija-Studenica Biosphere Reserve	2003
Djerdap National Park	2004
Stara Planina Mts	2005
Suva Planina Mts	2006
Senta region	2010
Vrsačke Planine Mts	2010
Vlasina lake plateau	2010, 2011
Pešter plateau	2012
Ibar valley	2013
Ovčar, Kablar and Vujan Mts	2016
Danube branches at Kovilj	2018

We have learned a lot on the bryophyte flora of Serbia, but many bryologically uninvestigated sites remained to be visited, and many species distributions are blurred with very old and geographically unprecise reports.

In this paper we publish the results of our revisional work obtained up to now. It contains data on sporadic erroneous identifications and more complex revised sets based on new taxonomic approaches in some genera such as *Lophozia* s. l., *Tortella* or *Ulota*.

METHODS

Problematic or taxonomically re-evaluated taxa were checked and revised in the Bryophyte Herbarium of the Hungarian Natural History Museum, Budapest (BP). Taxonomy and nomenclature follow Hodgetts *et al.* (2020). Localities are given according to the original label of specimens, only misspellings were corrected. BRYO database held at the Institute for Botany and Botanical Garden of the University of Belgrade was used for the access and summary of distribution data and earlier records of species in Serbia (PANTOVIĆ and SABOVLJEVIĆ 2017*a*).

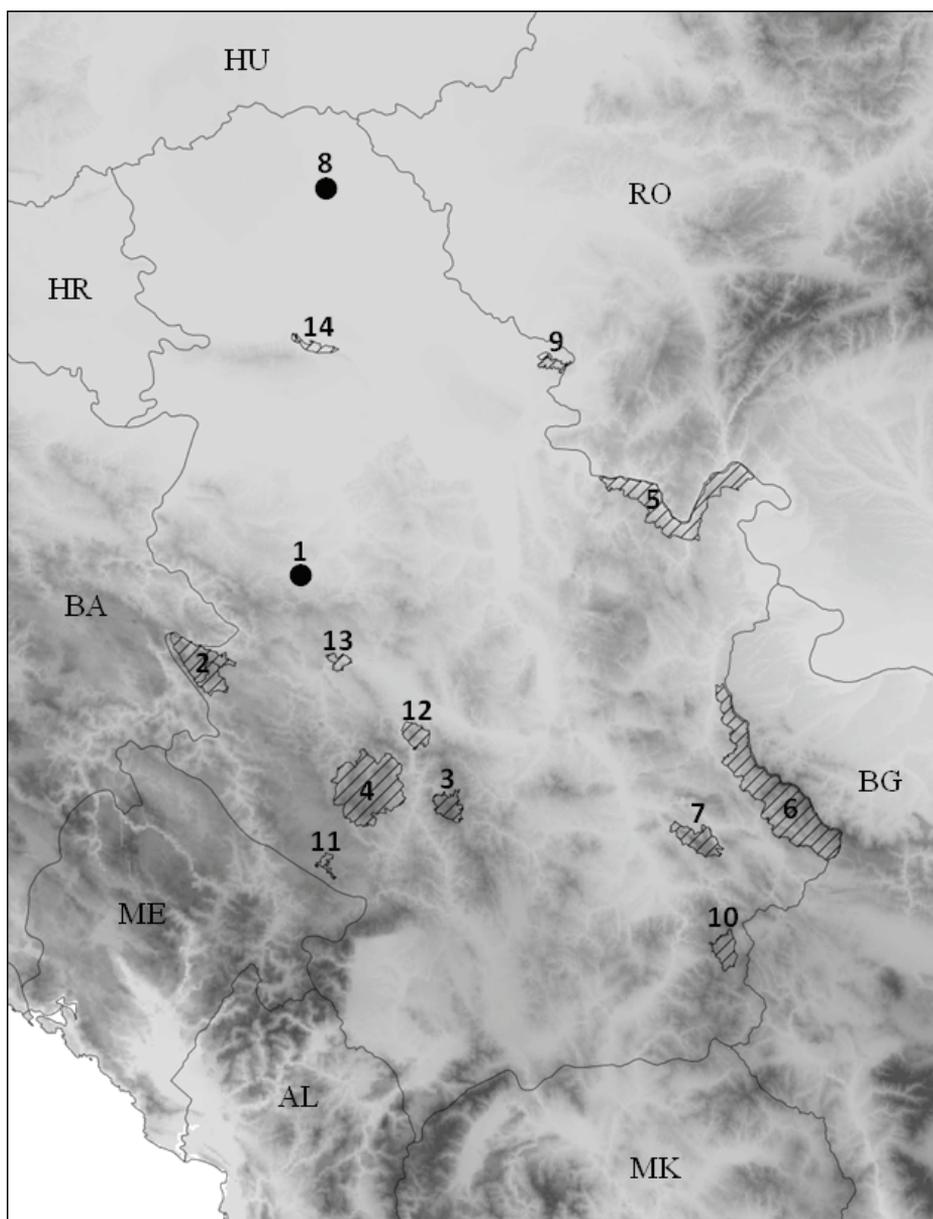


Fig. 1. Location of the main investigated areas (abbreviations: AL = Albania, BA = Bosnia-Herzegovina, BG = Bulgaria, HR = Croatia, HU = Hungary, ME = Montenegro, MK = Northern Macedonia, RO = Romania; 1 = Petnica region, 2 = Tara NP, 3 = Kopaonik NP, 4 = Golija-Studenica Biosphere Reserve, 5 = Djerdap NP, 6 = Stara Planina Mts, 7 = Suva Planina Mts, 8 = Senta region, 9 = Vrsачke Planine Mts, 10 = Vlasina lake plateau, 11 = Pešter plateau, 12 = Ibar valley, 13 = Ovčar, Kablar and Vujan Mts, 14 = Danube branches at Kovilj).

RESULTS

Exsertotheca crispa (Hedw.) S. Olsson, Enroth et D. Quandt

Suva Planina Mts, Gornja Studena village, from Bonjanine vode to Sokolov kamen peak, under Sokolov kamen, on shaded limestone rocks, 43° 12' 53.6" N, 22° 06' 45.1" E, 1,200 m a.s.l., 12.07.2006, leg. and det. Papp, B., rev. Papp, B. 12.2020, BP 178170, published in PAPP and ERZBERGER (2009) under the name *Neckera pumila* Hedw.

Comment: A small form of *Exsertotheca crispa* was misidentified. So far, *N. pumila* is known only from two sites in Western Serbia (VELJIĆ *et al.* 2006, 2008). It is also stated in GAJIĆ *et al.* (1991) for Serbia, but without precise location. Further studies and field investigations are needed for elucidation of its presence and conservation status in the country.

Grimmia trichophylla Grev.

Western Serbia, Tara National Park, at Sedaljka village, in *Quercetum* 7 km from Predov krst to Borje and Rastiste villages, on calcareous rock in forest, 460 m a.s.l., 08.07.2000, leg. and det. Papp, B., rev. Papp, B. 02.2021, BP 168208, published in PAPP and SABOVLJEVIĆ (2002) under the name *Grimmia donniana* Sm.

Comment: This was the only report of *Grimmia donniana*, and thus it should be excluded from the list of the Serbian bryophyte flora.

Grimmia pulvinata (Hedw.) Sm.

Western Serbia, Petnica region, at Valjevo city. On the rocks of the railway bed at Brangović village, 400–450 m a.s.l., 01.04.2000, leg. and det. Papp, B., rev. Papp, B. 01.2021, BP 167580, published in PAPP and SABOVLJEVIĆ (2001) under the name *Grimmia trichophylla* Grev.

Gymnostomum calcareum Nees et Hornsch.

Suva Planina Mts, Jelašnica village, Jelašnička klisura gorge, shaded limestone rocks, 43° 16' 35.5" N, 22° 04' 06.3" E, 317 m a.s.l., 13.07.2006, leg. and det. Papp, B., rev. Papp, B. 02.2023, BP 178220, published in PAPP and ERZBERGER (2009) under the name *Gyroweisia tenuis* (Hedw.) Schimp.

Comment: A small form of *Gymnostomum calcareum* was misidentified. There are other reports of *Gyroweisia tenuis* from Serbia, but these should be also carefully checked up to elucidate its presence and conservation status in the country. GUERRA *et al.* (2006) also mention that this species is also rarer in the

Iberian Peninsula than it seems on the basis of literature data, because it is frequently mistaken for *Gymnostomum* species.

Hamatocaulis vernicosus (Mitt.) Hedenäs

Kopaonik Mts, Jankove bare, *Sphagnetum* and *Piceetum*, on soil, 43° 19.114' N, 20° 46.546' E, 1,800 m a.s.l., 09.07.2002. leg. and det. Papp, B., rev. Papp, B. 2016, BP 170989, published as new to the Serbian bryophyte flora in PAPP *et al.* (2004) under the name *Drepanocladus lycopodioides* (Brid.) Warnst.

Comments: Based on this revision *D. lycopodioides* has no occurrence in Serbia. *Hamatocaulis vernicosus* was found again in 2016 in Jankove bare by Papp, B. and Pantović, J. It has other populations in Pešter plateau (PAPP *et al.* 2014a) and around Vlasina lake (PAPP *et al.* 2012a).

Lescuraea incurvata (Hedw.) E. Lawton

Stara Planina Mts, Babin Zub, on great rockwalls in *Fagetum*, boulder scree and crevices of large rocks, Permian red sandstone, on sandstone rocks, in rock crevices, 43° 22' 28.8" N, 22° 36' 59.1" E, 1,581 m a.s.l., 25.06.2005, leg. and det. Papp, B., conf. Németh, Cs. 2017, BP 173248, published in PAPP and ERZBERGER (2007). – Stara Planina Mts, between Babin Zub and Midžor peak, at the peak of Tupanar, temporary small pool in subalpine grassland, on sandstone rocks, rock crevices, 43° 24' 00.9" N, 22° 38' 55.5" E, 1,903–1,933 m a.s.l., 30.06.2005, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 173563, published in PAPP and ERZBERGER (2007). – Suva Planina Mts, Gornja Studena village, Bojanine vode, shaded limestone rocks, on limestone rock, 43° 13' 16.8" N, 22° 06' 42.4" E, 865–965 m a.s.l., 10.07.2006, leg. and det. Papp, B., conf. Papp, B. 01.2021, BP 178022, published in PAPP and ERZBERGER (2009). – Suva Planina Mts, Gornja Studena village, tourist path from Bojanine vode to Trem peak, *Fagetum*, on limestone rock, 43° 12' 38.2" N, 22° 07' 45.2" E, 1,072 m a.s.l., 11.07.2006, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 178070, published in PAPP and ERZBERGER (2009). – Western Serbia, Tara National Park, in *Piceeto-Abieto-Fagetum* at Jokića potok, Ljuti breg reserve area, on shaded calcareous rock, 960 m a.s.l., 06.07.2000, leg. and det. Papp, B., conf. Németh, Cs. 2017, BP 168271, published in PAPP and SABOVLJEVIĆ (2002).

Lescuraea saviana (De Not.) E. Lawton

Kopaonik Mts, Vodopad Jelovarnik, *Fagetum*, limestone rock, 43° 16.202' N, 20° 51.433' E, 1,250 m a.s.l., 10.07.2002, leg. and det. Papp, B., conf. Papp, B. 07.2024, BP 171035, published in PAPP *et al.* (2004). – Kopaonik Mts, Jaram

under Karaman vrh, by the hotel Rtanj, *Piceetum*, bark of *Juniperus*, 43° 18.248' N, 20° 49.757' E, 1,810 m a.s.l., 13.07.2002, leg. and det. Papp, B., conf. Papp, B. 07.2024, BP 171036, published in PAPP *et al.* (2004). – Golija Biosphere Reserve, Šaronje village, Jankov kamen, on shaded rocks, 43° 20' 00.0" N, 20° 16' 28.7" E, 1,755 m a.s.l., 08.07.2003, leg. and det. Papp, B., rev. Papp, B. 12.2020, BP 171816, published in PAPP and ERZBERGER (2005) under the name *Pseudoleskea incurvata* (Hedw.) Loeske – Golija Biosphere Reserve, Šaronje village, surrounding of Odvrćenica (N of Mt Kula) *Piceo-Abieti-Fagetum*, volcanic bedrock, on the bark of *Fagus*, 43° 16' 52.3" N, 20° 19' 56.9" E, 1,680 m a.s.l., 07.07.2003, leg. and det. Papp, B., conf. Papp, B. 07.2024, BP 171793, and on rocks BP 171768, published in PAPP and ERZBERGER (2005). – Stara Planina Mts, Babin Zub, Zubaska reka stream, Permian red sandstone rocks in *Fagetum*, on the bark of *Fagus* tree, 43° 22' 28.8" N, 22° 36' 59.1" E, 1,536 m a.s.l., 26.06.2005, leg. and det. Papp, B., conf. Papp, B. 07.2024, BP 173352, published in PAPP and ERZBERGER (2007). – Western Serbia, Tara National Park, at Biljeske Stene, Zvezda reserve area, in *Piceeto-Abieto-Fagetum*, on shaded calcareous rock, 1,080 m a.s.l., 08.07.2000, leg. and det. Papp, B., rev. Papp, B. 12.2020, leg. and det. Papp, B., rev. Papp, B. 12.2020, BP 168359, published in PAPP and SABOVLJEVIĆ (2002) under the name *Lescuraea incurvata* (Hedw.) Lawt. – Southeastern Serbia, north of Vlasina lake, Sveta Trojica sa crkvicom at Dojcinovci village, on rock, 42° 46' 00.9" N, 22° 18' 35.0" E, 1,345 m a.s.l., 23.06.2010, leg. and det. Papp, B., conf. Papp, B. 07.2024, BP 184385, published in PAPP *et al.* (2012a). – Southeastern Serbia, at Mt Bukova glava near Vlasina Stojkovićevo, stream valley at Skela village, on siliceous rock, 42° 41' 59.8" N, 22° 23' 21.0" E, 1,300 m a.s.l., 22.06.2011, leg. and det. Papp, B., conf. Papp, B. 07.2024, BP 184580, published in PAPP *et al.* (2012a). – Southeastern Serbia, Vlasina Rid, in the valley of Cvetkova reka stream at Vlasina lake, Okruglica, on the bottom of *Fagus*, 42° 44' 43.1" N, 22° 18' 56.7" E, 1,280 m a.s.l., 23.06.2011, leg. and det. Papp, B., conf. Papp, B. 07.2024, BP 184681, published in PAPP *et al.* (2012a). – Suva Planina Mts, Gornja Studena village, under Trem peak, between Devojački grob and Trem, grassland, limestone rocks, 43° 11' 19.4" N, 22° 09' 33.6" E, 1,530 m a.s.l., 11.07.2006, leg. and det. Papp, B., rev. Papp, B. 12.2020, BP 178108, and on the bark of *Sorbus*, leg. and det. Papp, B., rev. Papp, B. 01.2021, BP 178117, published in PAPP and ERZBERGER (2009) under the name *Pseudoleskea incurvata* (Hedw.) Loeske. – Suva Planina Mts, Gornja Studena village, Trem peak, on limestone rock, 43° 11' 00.4" N, 22° 10' 16.9" E, 1,824 m a.s.l., 11.07.2006, leg. and det. Papp, B., rev. Papp, B. 01.2021, BP 178130, published in PAPP and ERZBERGER (2009) under the name *Pseudoleskea incurvata* (Hedw.) Loeske. – Suva Planina Mts, Gornja Studena village, from Bonjanine vode to Sokolov kamen peak, under Sokolov kamen, on shaded limestone rocks, 43° 12' 53.6" N, 22° 06' 45.1" E, 1,200 m a.s.l., 12.07.2006, leg. and det. Papp, B.,

rev. Papp, B. 12.2020, BP 178164, and on the bark of *Fagus* BP 178164, published in PAPP and ERZBERGER (2009) under the name *Pseudoleskea incurvata* (Hedw.) Loeske. – Suva Planina Mts, Gornja Studena village, Bojanine vode, shaded limestone rocks, on limestone rock, 43° 13' 16.8" N, 22° 06' 42.4" E, 865–965 m a.s.l., 10.07.2006, separated from BP 178022 under the name *Pseudoleskea incurvata* (Hedw.) Loeske, leg. and det. Papp, B., conf. Papp, B. 01.2021, BP 196117.

Comments: *Lescuraea saviana* is a rare species in the western parts of Europe, becoming frequent towards the south-east. In the Balkans *L. incurvata* and *L. saviana* appear mainly at an elevation above 1,000 m a.s.l. and they grow in the same habitat on shaded rocks, but *L. saviana* also occurs on the bark of trees. Small, undeveloped *L. saviana* specimens are frequently misidentified. Distinguishing characters of the two species can be found in NAGY and NÉMETH (2017). Based on these revisions *L. saviana* seems to be more frequent than *L. incurvata* in Serbia.

Lophozia guttulata (Lindb. et Arnell) A. Evans

Golija Biosphere Reserve, N of Odvračenica, branch of Crna reka downwards from Radulovac, in the source area and along the stream, on decaying wood, 43° 17' 33.0" N, 20° 20' 41.0" E, 1,690–1,735 m a.s.l., 11.07.2003, leg. Papp, B., det. Váňa, J., rev. Papp, B. 05.2023, BP 48767/H, published in PAPP and ERZBERGER (2005) under the name *Lophozia longiflora* (Nees) Schiffn.

Comments: Previous reports of *Lophozia longiflora* were considered as *L. guttulata* in the latest checklist of liverworts of Serbia (PANTOVIĆ *et al.* 2020), as these were taken as synonyms. Thus, this record was considered as *L. guttulata* in the latest red list of liverworts of Serbia (SABOVLJEVIĆ *et al.* 2024a).

Lophozia longiflora (Nees) Schiffn.

Golija Biosphere Reserve, Šaronje village, surrounding of Odvračenica (N of Mt Kula) *Piceo-Abieti-Fagetum*, volcanic bedrock, on soil, 43° 16' 52.3" N, 20° 19' 56.9" E, 1,680 m a.s.l., 10.07.2002, leg. and det. Papp, B., conf. Papp, B. 05.2023, BP 48681/H, published in PAPP and ERZBERGER (2005). – Golija Biosphere Reserve, N of Odvračenica, branch of Crna reka downwards from Radulovac, in the source area and along the stream, on soil, 43° 17' 33.0" N, 20° 20' 41.0" E, 1690–1735 m a.s.l., 11.07.2003, leg. Papp, B., det. Váňa, J., conf. Papp, B. 05.2023, BP 48773/H, published in PAPP and ERZBERGER (2005).

Comments: Both of these morphologically similar species have records from the Golija Biosphere Reserve. *Lophozia guttulata* was found on decaying wood, while *L. longiflora* occurred on soil among acidic rocks, which matches with the habitat preference of the two species published by BAKALIN (2016).

Lophozia longiflora was not mentioned in the latest checklist of hornworts and liverworts of Serbia (PANTOVIĆ *et al.* 2020). This species should be included and considered as a separate entity from *L. guttulata*.

Plasteurhynchium striatulum (Spruce) M. Fleisch.

Kopaonik Mts, Jaram under Karaman vrh, by the hotel Rtanj, *Piceetum*, on soil, 43° 18.248' N, 20° 49.757' E, 1,810 m a.s.l., 13.07.2002, leg. and det. Papp, B., rev. Papp, B. 08.2024, BP 170999, published in PAPP *et al.* (2004) under the name *Eurhynchium meridionale* (B., S. et G.) De Not.

Comment: This specimen was an atypical form of *P. striatulum*, an almost pinnately branched plant with slightly plicate leaves, which at first glance makes it similar to *Isothecium myosuroides* Brid. However, the microscopic features, like apices of branch leaves were often twisted, their nerve ended in a spike and the angular cells were not incrassate, only thick-walled, matched with the characters of *P. striatulum*. Based on this revision, *Plasteurhynchium meridionale* (Schimp.) M. Fleisch. (syn: *Eurhynchium meridionale* (B., S. et G.) De Not.) should not be deleted from the Serbian bryophyte flora, since there are more old and/or unprecise reports by other authors (GAJIĆ *et al.* 1991, GRDOVIĆ and STEVANOVIĆ 2006, MARTINČIĆ 1968, PAVLETIĆ 1955, PODPERA 1922). Further studies and field investigations are needed for the elucidation of its presence and conservation status in the country.

Orthotrichum alpestre Bruch et Schimp.

Southeastern Serbia, Vlasina Rid, in the valley of Cvetkova reka stream at Vlasina lake, Okruglica, on *Fagus* bark, 42° 44' 43.1" N, 22° 18' 56.7" E, 1,280 m a.s.l., 23.06.2011, leg. and det. Papp, B., rev. Papp, B. 11.2020, BP 184684 published in PAPP *et al.* (2012a) under the name *Orthotrichum philibertii* Vent. – Suva Planina Mts, Gornja Studena village, tourist path from Bojanine vode to Trem peak, *Fagetum*, on the base of a *Fagus*, 43° 12' 38.2" N, 22° 07' 45.2" E, 1,072 m a.s.l., 11.07.2006, leg. and det. Papp, B., rev. Papp, B. 11.2020, BP 178605. – Western Serbia, Tara National Park, at Biljeske Stene, Zvezda reserve area, in *Piceeto-Abieto-Fagetum*, on bark of *Fagus* tree, 43.97265° N, 19.31667° E, 1,080 m a.s.l., 08.07.2000, leg. and det. Papp, B., rev. Papp, B. 11.2020, BP 168356, published as new to the Serbian bryophyte flora in PAPP and SABOVLJEVIĆ (2002) under the name *Orthotrichum philibertii* Vent.

Comments: These were all known *Orthotrichum philibertii* specimens from Serbia. Based on these revisions *Orthotrichum alpestre* can be added as new species to the Serbian bryophyte flora, while *Orthotrichum philibertii* can be excluded from the list of known moss taxa in Serbia.

Revision of *Philonotis* specimens*Philonotis calcarea* (Bruch et Schimp.) Schimp.

Kopaonik Mts, Brzecka reka in Metodje Reservat, towards a geyser, limestone rocks at a spring, 43° 18.710' N, 20° 51.001' E, 1,490 m a.s.l., 12.07.2002, leg. and det. Papp, B., conf. Papp, B. 06.2024, BP 170908, published in PAPP *et al.* (2004). – Southeastern Serbia, north of Vlasina lake, at Vlasina reka stream, in wetland at a spring, 42° 46' 29.3" N, 22° 18' 56.4" E, 1,195 m a.s.l., 19.06.2010, leg. and det. Papp, B., rev. Papp, B. 12.2020, BP 184154, published in PAPP *et al.* (2012a) under the name *Philonotis seriata* Mitt. – Southeastern Serbia, north of Vlasina lake, at Vlasina reka stream, in wetland at a spring, 42° 46' 29.3" N, 22° 18' 56.4" E, 1,195 m a.s.l., 19.06.2010, leg. and det. Papp, B., rev. Papp, B. 07.2022, BP 184155 published in PAPP *et al.* (2012a) under the name *Philonotis tomentella* Molendo. – Southern Serbia, Pešter plateau, from Sjenica town to Crvsko village, between Bare and Goševo, serpentine bedrock, wet meadow at the stream, 43° 08' 20.9" N, 19° 53' 22.4" E, 1,110 m a.s.l., 31.05.2012, leg. and det. Papp, B., rev. Papp, B. 12.2020, BP 186444 and BP 186445 published in PAPP *et al.* (2014a) under the name *Philonotis seriata* Mitt. – Stara Planina Mts, valley of Crnovrska reka stream at Zubska reka stream at Kozarnica village above Golema reka village, wet meadow, on soil, 43° 23' 42.9" N, 22° 36' 17.4" E, 1,003 m a.s.l., 27.06.2005, leg. and det. Papp, B., conf. Papp, B. 06.2024, BP 173444, published in PAPP and ERZBERGER (2007). – Stara Planina Mts, valley of Zubska reka stream, wet meadows, on soil, 43° 22' 42.7" N, 22° 37' 11.8" E, 1,361 m a.s.l., 26.06.2005, leg. and det. Papp, B., conf. Papp, B. 06.2024, BP 173364, published in PAPP and ERZBERGER (2007).

Philonotis seriata Mitt.

Golija Biosphere Reserve, N of Odvraćenica, branch of Crna reka downwards from Radulovac, in the source area and along the stream, on soil, 43° 17' 33.0" N, 20° 20' 41.0" E, 1, 690–1,735 m a.s.l., 11.07.2003, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 171995, published in PAPP and ERZBERGER (2005). – Kopaonik Mts, Jankove bare, *Sphagnetum* and *Piceetum*, on soil, 43° 19.114' N, 20° 46.546' E, 1,800 m a.s.l., 09.07.2002, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 171063, published in PAPP *et al.* (2004). – Kopaonik Mts, Jaram under Karaman vrh, by the hotel Rtanj, *Piceetum*, on soil, 43° 18.248' N, 20° 49.757' E, 1,810 m a.s.l., 13.07.2002, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 170864, published in PAPP *et al.* (2004). – Kopaonik Mts, Pančić vrh, grassland and meadows, spring mires, on soil, 43° 16.346' N, 20° 49.219' E, 1,990 m a.s.l., 12.07.2002, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 170862, published in PAPP *et al.* (2004). – Kopaonik Mts, Samokovka reka, near Jankove bare, granodi-

orit rocks, on soil, 43° 19.069' N, 20° 45.907' E, 1,810 m a.s.l., 09.07.2002, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 170861, published in PAPP *et al.* (2004). – Southeastern Serbia, Mt Čemernik at Okruglica, along Plavilo reka stream, 42° 44' 08.0" N, 22° 17' 25.7" E, 1,456 m a.s.l., 23.06.2011, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 184651, published in PAPP *et al.* (2012a). – Southeastern Serbia, Mt Čemernik at Okruglica, spring Izvor Orlovac under the peak, 42° 44' 10.1" N, 22° 16' 33.9" E, 1,630 m a.s.l., 20.06.2011, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 184475, published in PAPP *et al.* (2012a). – Southeastern Serbia, Mt Vrtop (Plana) at Okruglica (Vlasina lake), at spring Izvor Bankov on the eastern slope under the peak, 42° 47' 38.7" N, 22° 22' 37.6" E, 1,680 m a.s.l., 21.06.2011, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 184558, published in PAPP *et al.* (2012a). – Southeastern Serbia, Mt Vrtop (Plana) at Okruglica (Vlasina lake), wet meadow and rivulet on the southern slope under the peak, 42° 47' 14.6" N, 22° 21' 57.9" E, 1,680 m a.s.l., 21.06.2011, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 184565, published in PAPP *et al.* (2012a). – Stara Planina Mts, valley of Zubska reka stream, wet meadows, on soil, 43° 22' 42.7" N, 22° 37' 11.8" E, 1,361 m a.s.l., 26.06.2005, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 173366, published in PAPP and ERZBERGER (2007).

Philonotis tomentella Molendo

Southern Serbia, Pešter plateau, east of Karajukića bunari village, pasture along a stream, 43° 05' 04.1" N, 20° 06' 01.2" E, 1,160 m a.s.l., 30.05.2012, leg. and det. Papp, B., rev. Papp, B. 09.2024, BP 186417, published in PAPP *et al.* (2014a) under the name *Philonotis fontana* (Hedw.) Brid. – Southeastern Serbia, at Vlasina lake, Blato at Okruglica, Eriophoretum, 42° 40' 19.8" N, 22° 20' 40.3" E, 1,235 m a.s.l., 22.06.2010, leg. and det. Papp, B., rev. Papp, B. 09.2024, BP 198671, separated from PB 184343 under the name *Philonotis fontana* (Hedw.) Brid., published in PAPP *et al.* (2012a) under the name *P. fontana*.

Comments: Most of the *Philonotis fontana* specimens were well identified, however many revisions were made in the case of other species belonging to the *Philonotis* section of the genus. *P. calcarea* occurs in Kopaonik Mts, Pešter plateau, Stara Planina Mts and around Vlasina lake, while *P. seriata* has records from Golija Biosphere Reserve, Kopaonik Mts, Mt Čemernik, and Mt Vrtop around Vlasina lake and Stara Planina Mts. According to the revisions HNHM has specimens of *P. tomentella* from Vlasina lake and Pešter plateau.

Plagiopus oederianus (Sw.) H. A. Crum et L. E. Anderson

Western Serbia, Tara National Park, in *Piceeto-Abieto-Fagetum* at Jokića potok, Ljuti breg reserve area, on shaded calcareous rock, 960 m a.s.l., 06.07.2000,

leg. and det. Papp, B., rev. Papp, B. 06.2024, BP 168275 and on bark of *Fagus* tree, leg. and det. Papp, B., rev. Papp, B. 06.2024, BP 168284, published as new to the Serbian bryophyte flora in PAPP and SABOVLJEVIĆ (2002) under the name *Bartramia stricta* Brid. – Western Serbia, Tara National Park, at Zaovine, Vranjak, at locus classicus of *Picea omorica*, in *Piceeto-Abieto-Fagetum*, on shaded calcareous rock, 760 m a.s.l., leg. and det. Papp, B., rev. Papp, B. 07.07.2024, BP 168171, published as new to the Serbian bryophyte flora in PAPP and SABOVLJEVIĆ (2002) under the name *Bartramia stricta* Brid.

Comments: These were the only known specimens of *Bartramia stricta* from Serbia without Kosovo. The other known records come from Kosovo (PANTOVIĆ and SABOVLJEVIĆ 2017b).

Plagiomnium ellipticum (Brid.) T. Kop.

Stara Planina Mts, valley of Temstica reka stream above Temska village, on limestone tufa rocks at a waterfall, 43° 15' 56.9" N, 22° 33' 21.2" E, 401 m a.s.l., 01.07.2005, leg. and det. Papp, B., conf. Papp, B. 12.2020, BP 173597, published in PAPP and ERZBERGER (2007).

Plagiomnium rostratum (Schrad.) T. Kop.

Western Serbia, Petnica region, at Valjevo city. On shaded calcareous rocks in the surroundings of Petnica village, 200–250 m a.s.l., 30.03.2000, leg. and det. Papp, B., rev. Papp, B. 12.2020, BP 167537, published in PAPP and SABOVLJEVIĆ (2001) under the name *Plagiomnium ellipticum* (Brid.) T. Kop. – Western Serbia, Tara National Park, in *Piceeto-Abieto-Fagetum* at Jokića potok, Ljuti breg reserve area, on shaded calcareous rock, 960 m a.s.l., 06.07.2000, leg. and det. Papp, B., rev. Papp, B. 12.2020, BP 168280, published in PAPP and SABOVLJEVIĆ (2002) under the name *Plagiomnium ellipticum* (Brid.) T. Kop.

Comment: *Plagiomnium ellipticum* is a rare species occurring in springs and wetlands (SMITH 2004), known to be present in Serbia in few other wetland areas (MARTINČIČ 1980, PANTOVIĆ and SABOVLJEVIĆ 2013, PAPP and ERZBERGER 2005, 2007, PETKOVIĆ *et al.* 2000, SABOVLJEVIĆ 1998).

Pohlia nutans (Hedw.) Lindb.

Southeastern Serbia, Okruglica, at Vlasina lake, Bratasnica, Bratanov dol, 42° 41' 40.8" N, 22° 19' 09.3" E, 1,245 m a.s.l., 19.06.2010, leg. and det. Papp, B., rev. Papp, B. 06.2024, BP 184200, published in PAPP *et al.* (2012a) under the name *Pohlia sphagnicola* (Bruch et Schimp.) Broth. – Southeastern Serbia, at Vlasina lake, Vlasina Stojkovicewa, Malina jezerca at Murina dolina, floating island, 42°

42° 49.1" N, 22° 21' 38.0" E, 1,225 m a.s.l., 21.06.2010, leg. and det. Papp, B., rev. Papp, B. 06.2024, BP 184232, published in PAPP *et al.* (2012a) under the name *Pohlia sphagnicola* (Bruch et Schimp.) Broth. – Southeastern Serbia, at Vlasina lake, Vlasina Stojkovicewa, Malina jezerca at Murina dolina, siliceous rocks at the floating islands, 42° 42' 48.5" N, 22° 21' 35.1" E, 1,230 m a.s.l., 21.06.2010, leg. and det. Papp, B., rev. Papp, B. 06.2024, BP 184244, published in PAPP *et al.* (2012a) under the name *Pohlia sphagnicola* (Bruch et Schimp.) Broth. – Southeastern Serbia, Mt Čemernik at Okruglica, spring Izvor Orlovac under the peak, 42° 44' 10.1" N, 22° 16' 33.9" E, 1,630 m a.s.l., 20.06.2011, leg. and det. Papp, B., rev. Papp, B. 06.2024, BP 184476, published in PAPP *et al.* (2012a) under the name *Pohlia sphagnicola* (Bruch et Schimp.) Broth.

Comment: The setae of these specimens were long (4–5.5 cm) compared to typical *P. nutans* and the spores were 14–18.5 µm. The length of setae is within the interval given for *P. nutans* in GUERRA (2010). The sizes of spores are markedly smaller than it is given for *P. nutans* (20–25 µm) in FREY *et al.* (1995), but matches with the size (11.5–16.5 µm) given in GUERRA (2010). According to both sources *P. nutans* is paroicous, while *P. sphagnicola* is dioicous. All Serbian specimens were paroicous. These were all the known records of *Pohlia sphagnicola* from Serbia. Based on these revisions this species can be deleted from the Serbian bryophyte flora.

Preissia quadrata (Scop.) Nees

Western Serbia, Tara National Park, at Zaovine, Vranjak, at locus classicus of *Picea omorica*, in *Piceeto-Abieto-Fagetum*, on shaded calcareous rock, 760 m a.s.l., 07.07.2000, leg. and det. Papp, B., rev. Papp, B. 2010, BP 47942/H, published in PAPP and SABOVLJEVIĆ (2002) under the name *Marchantia paleacea* Bertol.

Comment: *Marchantia paleacea* is a rare species with occurrences mostly in the Mediterranean to sub-Mediterranean zone in Europe (SABOVLJEVIĆ *et al.* 2019). Other previous records in Serbia come from the southeasternmost part of the country where more adequate climate conditions are present for this species. Further studies and field investigations are needed for the elucidation of its presence and conservation status in the country.

Rhizomnium magnifolium (Horik.) T. J. Kop.

Kopaonik Mts, Jankove bare, *Sphagnetum* and *Piceetum*, on soil, 43° 19.114' N, 20° 46.546' E, 1,800 m a.s.l., 09.07.2002, leg. and det. Papp, B., rev. Papp, B. 12.2020, BP 170919, published in PAPP *et al.* (2004) under the name *Rhizomnium pseudopunctatum* (Bruch et Schimp.) T. J. Kop.

Comment: *Rhizomnium pseudopunctatum* is reported from few other places in Serbia incl. Kosovo. Further studies and field investigations are needed for the elucidation of its presence and conservation status in country.

Syntrichia montana Nees

Suva Planina Mts, Sićevačka klisura, opposite to Sićevo village, on the left side of Nišava reka stream, above Sv. Bogorodica monastery, on limestone grassland, 43° 19' 44.6" N, 22° 04' 32.1" E, 350 m a.s.l., 15.07.2006, leg. and det. Papp, B., rev. Papp, B. 12.2020, BP 178429, published in PAPP and ERZBERGER (2009) under the name *Syntrichia princeps* (De Not.) Mitt.

Comment: *Syntrichia princeps* is mostly reported from the peri-Mediterranean and with scattered occurrences from Western Europe (CAMPISI and COGONI 2019). In Serbia, it was reported various times, but further studies and field investigations are welcomed for the elucidation of its presence and conservation status in the country.

Revision of *Tortella* specimens

Tortella bambergi (Schimp.) Broth. s. str.

Western Serbia, Tara National Park, *Piceeto-Abieto-Fagetum* at Predov krst, on shaded calcareous rock, 1,060 m a.s.l., 06.07.2000, leg. and det. Papp, B., rev. Papp, B. 06.2024, BP 168128, published as new to the Serbian bryophyte flora in PAPP and SABOVLJEVIĆ (2002) under the name *Tortella densa* (Lor. et Mol.) Crundw. et Nyh. – Kablar Mt at Čačak, under the peak, on limestone rock, 43° 54' 59.5" N, 20° 11' 15.0" E, 800 m a.s.l., 21.06.2016, leg. and det. Papp, B., rev. Papp, B. 06.2024, BP 193927, published in PAPP *et al.* (2019c) under the name *Tortella fasciculata* (Culm.) Culm.

Tortella densa (Lorentz et Molendo) Crundw. et Nyholm

Kopaonik Mts, Žljeb by the hotel Srebrnac, grassland with calcareous rocks, exposed limestone rocks, 43° 18.792' N, 20° 50.188' E, 1,775 m a.s.l., 13.07.2002, leg. and det. Papp, B., conf. Papp, B. 06.2024, BP 170948, published in PAPP *et al.* (2004).

Tortella fasciculata (Culm.) Culm.

Kopaonik Mts, Duboka potok, near Čelici village, volcanic rock, 1,150 m a.s.l., 10.07.2002, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 170954, published in PAPP *et al.* (2004) under the name *Tortella tortuosa* (Hedw.) Limpr. –

Djerdap National Park, from Ploče to Veliki Štrbac hill, on limestone rock, 44° 35' 42.0" N, 22° 16' 57.5" E, 745 m a.s.l., 11.07.2004, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 172629, published in PAPP *et al.* (2006) under the name *Tortella tortuosa* (Hedw.) Limpr. – Djerdap National Park, Tatarski vis hill, on limestone rock, 44° 32' 35.5" N, 21° 56' 22.0" E, 664 m a.s.l., 15.07.2004, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 172842 and on conglomerate rock BP 172852, published in PAPP *et al.* (2006) under the name *Tortella tortuosa* (Hedw.) Limpr. – Western Serbia. Petnica region, in Valjevo city. On rocky soil in an open area at Brangović village, 400–450 m a.s.l., 01.04.2000, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 167596, published in PAPP and SABOVLJEVIĆ (2001) under the name *Tortella tortuosa* (Hedw.) Limpr. – Southern Serbia, Pešter plateau, east of Karajukića bunari village, pasture along a stream, on limestone rock, 43° 05' 04.1" N, 20° 06' 01.2" E, 1,160 m a.s.l., 30.05.2012, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 186428, published in PAPP *et al.* (2014a) under the name *Tortella tortuosa* (Hedw.) Limpr. – Suva Planina Mts, Gornja Studena village, from Bojanine vode to Trem peak, Devojački grob, limestone grassland, 43° 12' 38.2" N, 22° 07' 45.2" E, 1,315 m a.s.l., 11.07.2006, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 197790, separated from BP 178092 under the name *Tortella tortuosa* (Hedw.) Limpr., published in PAPP and ERZBERGER (2009) under the name *T. tortuosa*.

Tortella inclinata (R. Hedw.) Limpr.

Southern Serbia, Pešter plateau, at Crvsko village, limestone rocks in pasture, 43° 06' 53.3" N, 19° 54' 07.2" E, 1,140 m a.s.l., 31.05.2012, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 197785, separated from BP 186524 under the name *Tortella tortuosa* (Hedw.) Limpr., published in PAPP *et al.* (2014a) under the name *Tortella tortuosa*.

Tortella pseudofragilis (Thér.) Köckinger et Hedenäs

Djerdap National Park, Tatarski vis hill, on limestone rock, 44° 32' 35.5" N, 21° 56' 22.0" E, 664 m a.s.l., 15.07.2004, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 197789, separated from BP 172842 under the name *Tortella tortuosa* (Hedw.) Limpr., published in PAPP *et al.* (2006) under the name *Tortella tortuosa*. – Stara Planina Mts, between Babin Zub and Midžor peak, at the peak of Tupanar, sub-alpine grassland with sandstone rock outcrops, on rocky grassland, 43° 23' 59.4" N, 22° 39' 21.0" E, 1,693 m a.s.l., 28.06.2005, leg. and det. Papp, B., rev. Papp, B. 09.2022, BP 173525, published in PAPP and ERZBERGER (2007) under the name *Tortella fragilis* (Drumm.) Limpr. – Suva Planina Mts, Gornja Studena village, Bojanine vode, shaded limestone rocks, on limestone rock, 43° 13' 16.8" N, 22° 06' 42.4" E, 865–965 m a.s.l., 10.07.2006, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 178040, pub-

lished in PAPP and ERZBERGER (2009) under the name *Tortella tortuosa* (Hedw.) Limpr. – Southern Serbia, Pešter plateau, south of Karajukića bunari at Altunin bunari village towards Suvi do, limestone rocks in the pasture at Boroštica, 43° 03' 44.2" N, 20° 07' 10.9" E, 1,175 m a.s.l., 30.05.2012, leg. and det. Papp, B., rev. Papp, B. 09.2022, BP 186403, published in PAPP *et al.* (2014a) under the name *Tortella fragilis* (Drumm.) Limpr. – Southern Serbia, Pešter plateau, east of Karajukića bunari village, pasture along a stream, on limestone rock, 43° 05' 04.1" N, 20° 06' 01.2" E, 1,160 m a.s.l., 30.05.2012, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 186426, published in PAPP *et al.* (2014a) under the name *Tortella fragilis* (Drumm.) Limpr. – Suva Planina Mts, Gornja Studena village, from Bojanine vode to Trem peak, Devojački grob, limestone grassland, 43° 12' 38.2" N, 22° 07' 45.2" E, 1,315 m a.s.l., 11.07.2006, leg. and det. Papp, B., rev. Papp, B. 11.2022, BP 197791, separated from BP 178092 under the name *Tortella tortuosa* (Hedw.) Limpr., published in PAPP and ERZBERGER (2009) under the name *Tortella tortuosa*.

Tortella tortuosa (Hedw.) Limpr. *s. l.*

Kopaonik Mts, towards Kozje stene in Mt Kukavica, *Juniperetum* and grassland on volcanic bedrock, rocky soil, 43° 19.437' N, 20° 44.944' E, 1,650 m a.s.l., 11.07.2002, leg. and det. Papp, B., rev. Papp, B. 06.2024, BP 170947, published in PAPP *et al.* (2004) under the name *Tortella densa* (Lor. et Mol.) Crundw. et Nyh.

Comments: All specimens of *Tortella fragilis* from Serbia deposited in the bryophyte collection of the HNHM have been revised. *Tortella bambergeri* (Schimp.) Broth. *sensu stricto* according to KÖCKINGER and HEDENÄS (2023) and *Tortella pseudofragilis* can be added to the bryophyte flora of Serbia. *Tortella fasciculata* was reported for the first time in 2019 from Serbia from the Ovčar, Kablar, and Vujan Mts (PAPP *et al.* 2019c). Here new data are given to the distribution of this species as well. Fifty-five specimens named as *Tortella tortuosa* in BP remained for further study on the basis of the new taxonomic concepts published in KÖCKINGER and HEDENÄS (2023).

Tortula muralis Hedw.

Djerdap National Park, Šomardski kamen hill, sandstone rocks, *Fagetum*, on sandstone rock, 44° 32' 42.3" N, 22° 57' 50.2" E, 755–800 m a.s.l., 15.07.2004, leg. and det. Papp, B., rev. Papp, B. 2008, BP 172887, published as new to the Serbian bryophyte flora in PAPP *et al.* (2006) under the name *Tortula vabliana* (Schultz) Mont.

Comment: There are other reports of *Tortula vabliana* from Serbia, but these should be also carefully checked up to elucidate its presence and conservation status in the country.

Revision of *Ulota* specimens*Ulota bruchii* Hornsch. ex Brid.

Western Serbia, Tara National Park, *Piceeto-Abieto-Fagetum* at Predov krst, on bark of *Fagus* tree, 43° 56' 29" N, 19° 18' 28" E, 1,060 m a.s.l., 06.07.2000, leg. and det. Papp, B., conf. Caparrós, R. 05.2011, BP 168148, published as new to the Serbian bryophyte flora in PAPP and SABOVLJEVIĆ (2002).

Ulota crispula Bruch

Kopaonik Mts, Brzecka reka in Metodje Reservat, towards a geyser, bark of *Salix caprea* tree, 43° 18.710' N, 20° 51.001' E, 1,490 m a.s.l., 12.07.2002, leg. and det. Papp, B., rev. Caparrós, R. 06.2011, BP 170966, published in PAPP *et al.* (2004) under the name *Ulota bruchii* Hornsch. ex Brid. – Golija Biosphere Reserve, at Orlov kamen, between Bele Vode and Kumanica villages, *Fagetum*, volcanic rocks, streamside, on the bark of *Fagus* tree, 43° 27' 38.0" N, 20° 15' 42.8" E, 950 m a.s.l., 10.07.2003, leg. and det. Papp, B., rev. Caparrós, R. 03.2011, BP 171951, published in PAPP and ERZBERGER (2005) under the name *Ulota crispula* (Hedw.) Brid. – Western Serbia, Tara National Park, in *Piceeto-Abieto-Fagetum* at Jokića potok, Ljuti breg reserve area, on bark of *Fagus* tree, 960 m a.s.l., 06.07.2000, leg. and det. Papp, B., rev. Caparrós, R. 06.2011, BP 168279, published as new to the Serbian bryophyte flora in PAPP and SABOVLJEVIĆ (2002) under the name *Ulota bruchii* Hornsch. ex Brid. – Western Serbia, Tara National Park, at Sedaljka village, in *Quercetum* 7 km from Predov krst to Borje and Rastiste villages, on bark of *Quercus* tree, 43° 56' 40" N, 19° 21' 19" E, 460 m a.s.l., 08.07.2000, leg. and det. Papp, B., rev. Caparrós, R. 06.2011, BP 168225, published in PAPP and SABOVLJEVIĆ (2002) under the name *Ulota crispula* (Hedw.) Brid. – Western Serbia, Tara National Park, *Piceeto-Abieto-Fagetum* at Predov krst, on bark of *Fagus* tree, 43° 56' 29" N, 19° 18' 28" E, 1,060 m a.s.l., 06.07.2000, leg. and det. Papp, B., rev. Caparrós, R. 05.2011, BP 195663, separated from BP 168148 under the name *Ulota crispula* (Hedw.) Brid. var. *norvegica* (Groenv.) A. J. E. Sm. et M. O. Hill, published as new to the Serbian bryophyte flora in PAPP and SABOVLJEVIĆ (2002) under the name *Ulota bruchii* Hornsch. ex Brid.

Ulota intermedia Schimp.

Western Serbia, Tara National Park, at Tepih Livada, Crveni potok reserve area, on bark of *Fagus* tree, 1,050 m a.s.l., 07.07.2000, leg. and det. Papp, B., rev. Caparrós, R. 05.2011, BP 168240, published as new to the Serbian bryophyte flora in PAPP and SABOVLJEVIĆ (2002) under the name *Ulota bruchii* Hornsch. ex

Brid. – Western Serbia, Tara National Park, in *Piceeto-Abieto-Fagetum* at Jokića potok, Ljuti breg reserve area, on bark of *Fagus* tree, 960 m a.s.l., 06.07.2000, leg. and det. Papp, B., rev. Caparrós, R. 06.2011, BP 195383, separated from BP 168279 under the name *Ulotia crispa* (Hedw.) Brid. var. *norvegica* (Groenv.) A. J. E. Sm. et M. O. Hill, published as new to the Serbian bryophyte flora in PAPP and SABOVLJEVIĆ (2002) under the name *Ulotia bruchii* Hornsch. ex Brid.

Comments: The study of CAPARRÓS *et al.* (2016) segregates the *Ulotia crispa* complex into three species; *U. crispa* (Hedw.) Brid. s. str., *U. crispula* Bruch, *U. intermedia* Schimp. The *Ulotia* material collected in Tara National Park is the richest one in the bryophyte collection of the HNHM. Based on these revisions *Ulotia bruchii* seems to be rare, while *U. crispula* seems to be the most frequent *Ulotia* species in the investigated territories.

CONCLUSIONS

More than a hundred specimens held in the Bryophyte Herbarium of the Hungarian Natural History Museum, Budapest (BP) were checked or revised. As a result, three species (namely *Orthotrichum alpestre*, *Tortella baumgartneri* s. str., *T. pseudofragilis*) can be added to the bryophyte flora of Serbia, while three other species (*Grimmia donniana*, *Orthotrichum philibertii*, *Pohlia sphagnicola*) can be deleted from the bryophyte checklist of Serbia. The presence of *Lophozia longiflora* s. str. is confirmed. Distribution of several taxa of conservation interest was clarified, e.g. rarities like *Ulotia bruchii* or wetland species like *Philonotis* taxa which are threatened due to climate change. Further study should be carried out based on new taxonomic treatments for example in the case of *Tortella tortuosa* specimens.

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Összefoglaló: Szerbia aktuális májmoha- és lombosmoha-listájának és vörös listájának elkészítése során elengedhetlenné vált a Magyar Természettudományi Múzeum Mohagyűjteményében (BP) található nagy mennyiségű Szerbiában gyűjtött anyag átnézése, ellenőrzése, revíziója, különösen olyan fajok vagy nemzetségek esetében, ahol mostanában új taxonómiai eredmények születtek. Ez a gyűjtemény 5364 olyan mohapéldányt tartalmaz, amelyek az utóbbi két és fél évtizedben kerültek begyűjtésre és 133 Szerbiában újként kimutatott faj (38 májmoha, 95 lombos moha) bizonyító példányai is itt kerültek elhelyezésre. A több, mint száz mohapéldány ellenőrzése eredményeként három új fajt (*Orthotrichum alpestre*, *Tortella bambergi* s. str., *T. pseudofragilis*) sikerült Szerbia mohafiórájához adnunk és három fajt pedig töröltünk az ország listájából (*Grimmia donniana*, *Orthotrichum philibertii*, *Pohlia sphagnicola*). Bizonyítást nyert a *Lophozia longiflora* s. str. előfordulása. Ezenkívül számos faj elterjedését sikerült jobban megismerni, köztük olyan, például a klímaváltozás kapcsán veszélyeztetett fajokét, mint a Balkánon ritka *Ulotia bruchii* vagy a vizes élőhelyeken élő *Philonotis* fajok.

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