Botanica SERBICA

(2021) 45 (1): 119-127

DOI: https://doi.org/10.2298/BOTSERB2101119S
journal homepage: botanicaserbica.bio.bg.ac.rs

Original Scientific Report

New records and noteworthy data of plants, algae and fungi in SE Europe and adjacent regions, 3

Marko S. Sabovljević[1*], Gordana Tomović[1*], Petya Boycheva[2], Dobri Ivanov[2], Teodor T. Denchev[3], Cvetomir M. Denchev[3], Ivana Stevanoski[1], Aleksandra Marković[4], Sanja Z. Djurović[5], Uroš Buzurović[6], Galina Yaneva[2], Sorin Ștefănuț[7], Miruna-Maria Ștefănuț[8], Aleksandar Knežević[1], Predrag Petrović[9], Boris Assyov[3], Jovana Pantović[1], Marjan Niketić[6], Snežana Vukojičić[1], Roxana Ion[7] and Gabriela Tamas[7]

1 Institute of Botany and Botanical Garden, Faculty of Biology, University of Belgrade, Takovska 43, 11 000 Belgrade, Serbia
2 Department of Biology, Medical University of Varna, 84, Tsar Osvoboditel Blvd., 9000 Varna, Bulgaria
3 Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 2 Gagarin St., 1113 Sofia, Bulgaria
4 Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Njegoševa 12, 11000 Belgrade, Serbia
5 Faculty of Agriculture, University of Niš, Kosančićeva 4, 37 000 Kruševac, Serbia
6 Natural History Museum, Njegoševa 51, 11000 Belgrade, Serbia
7 Institute of Biology Bucharest of the Romanian Academy, 296 Splaiul Independentei, 060031 Bucharest, P.O. Box 56-53, Romania.
8 Faculty of Biology, University of Bucharest, 91-95 Splaiul Independenței, 050095 Bucharest, Romania.
9 Innovation Centre, Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11000 Belgrade, Serbia
* column editors, to whom contributions should be sent (botanicaserbica@bio.bg.ac.rs)

ABSTRACT:
This paper presents new records and noteworthy data on the following taxa in SE Europe and adjacent regions: parasitic fungus *Antherospora hortensis,* saprotrophic fungi *Loweomyces fractipes* and *Pholiota henningsii,* stonewort *Chara canescens,* mosses *Grimmia caespiticia* and *Rhodobryum ontariense,* fern *Woodsia alpina,* monocots *Aegilops triuncialis, Epipactis purpurata, Galanthus elwesii* and *Typha shuttleworthii* and dicot *Umbilicus luteus.*

Keywords:
new report, *Aegilops triuncialis, Antherospora hortensis, Chara canescens, Epipactis purpurata, Galanthus elwesii, Grimmia caespiticia, Loweomyces fractipes, Pholiota henningsii, Rhodobryum ontariense, Typha shuttleworthii, Umbilicus luteus, Woodsia alpina*

UDC: 581.95:582.28+582.263.3+582.32+582.37/.39+582.52+582.6/.9
Received: 20 November 2020
Revision accepted: 10 January 2021

***Aegilops triuncialis* L., fam. Poaceae; (monocot, vascular plant)**
Contributors: Petya Boycheva and Dobri Ivanov
Geographical focus: Bulgaria
New record and noteworthy data: This is the first record for the Northeastern Bulgaria floristic region.
Specimen data: Northeastern Bulgaria, Varna region, Novakovo village, N 43.3452460°; E 27.8413980°; 07 June 2020; leg./det. Boycheva P, Ivanov D.
Voucher: Herbarium of Sofia University St. Kliment Ohridski (SO) 108036.

The distribution of the species in Bulgaria includes the Tundja Hilly Plane, the Struma Valley (north), and the Predbalkan region (Assyov *et al.* 2012). The habitat along the north and south Black Sea coasts has been reported by Zaharieva *et al.* (2004), a habitat on the south of the Kamchia river by Spetsov *et al.* (2006) and an addi-

tional report near the city of Burgas. The newly recorded population near the village of Novakovo counts more than 50 specimens per 1 m^2. The habitat is of steppe vegetation with a predominance of plants belonging to the Fabaceae and Poaceae families.

***Antherospora hortensis* Piątek & M. Lutz, fam. Floromycetaceae (fungus, parasitic)**
Contributors: Teodor T. Denchev and Cvetomir M. Denchev
Geographical focus: Greece
New record and noteworthy data: The finding of *Antherospora hortensis* represents the first Balkan record of this smut fungus, which in other parts of Europe is only known from Germany and the UK.
Specimen data: on *Muscari armeniacum* H.J. Veitch (det. Stuart D. C.), Greece, Eastern Macedonia and Thrace, between the villages of Mandra and Soufli, alt. ca 100 m, 25 April 1961; leg. Rechinger K H., Iter Balcanico-mediterraneum 1961 (Iter graecum X.), no. *22171*; det. Denchev TT, Denchev CM.
Voucher: Herbarium of the Natural History Museum in Vienna, vascular plant collection (W) 1964-0016348. The anthers of this specimen are infected with *Antherospora hortensis*. This smut fungus was examined during a visit to W, in July 2017, within the framework of the SYNTHESYS Project.

Antherospora contains 12 species hosted by the members of the Hyacinthaceae family. Most commonly, their sori are produced in the anthers, but in some species the filaments and gynoecium can also be affected (Begerow & McTaggart 2018).

Antherospora hortensis is a recently described smut fungus on *Muscari armeniacum* Leichtlin ex Baker, known only from specimens collected in gardens in Germany and the UK (Piątek *et al.* 2013; Kruse 2014; Woods 2018). Here, *Antherospora hortensis* is reported for the first time from SE Europe, namely on the specimen collected in Greece. It is worth mentioning that this is the first record of this parasitic fungus developed on naturally grown *M. armeniacum*.

***Chara canescens* Loiseleur, fam. Characeae (charophyte algae)**
Contributors: Ivana Stevanoski and Aleksandra Marković
Geographical focus: Serbia
New record and noteworthy data: The second record for Serbia, a rare and threatened species.
Specimen data: Bačka, between the villages of Bački Vinogradi, Horgoš and Kilapoš, in the Selevenjske Pustare Special Nature Reserve, N 46.13987°, E 19.91535°; a deep and steep watering hole where animals drink water, with sand substrate; 22 May 2020; leg. Pantović J, Stevanoski I, Bogosavljević J, Gajić M.; det. Marković A.
Vouchers: Institute of Chemistry, Technology and Metallurgy, University of Belgrade, charophyte collection, 54.

In 2014, *Chara canescens* was declared Extinct in the wild (EX) by Blaženčić (2014) since it had been found only once on the territory of Serbia (the Suva Česma salt spring near Prokuplje) and was not confirmed again for this site. However, in 2018 it was rediscovered in an excavation pond made in the process of clay digging in Plava banja near Kikinda. The pond is eutrophic and with extreme ion concentrations, used as a source of drinking water for cattle (Trbojević *et al.* 2019). The finding in the Kilapoš waterhole is hence the second record for Serbia. The waterhole was almost dry and the charophyte coverage sporadic. Only female plants were found, which is typical for this species since most of the populations in Europe do not contain any male shoots, but only parthenogenetic females (Schaible *et al.* 2011). Trbojević *et al.* (2019) also found only female plants.

Even though its area of distribution is wide, ranging from Europe to Australia, but mostly in the Northern Hemisphere, this species is considered rare in Europe and is included on the Red Lists of many European countries and regions (e.g. Blaženčić *et al.* 2006; Caisova & Gabka 2009; Korsch *et al.* 2013). According to the national legislation ("Službeni glasnik", No. 5/2010, 47/2011, 32/2016, 98/2016) *Chara canescens* is a strictly protected species in Serbia.

Chara canescens is a halophyte species which grows in brackish waters, preferably shallow. It can tolerate high light conditions and extreme ion anomalies (Blindow & Schubert 2003; Schubert *et al.* 2016; Calero & Rodrigo 2018; Trbojević *et al.* 2019).

***Epipactis purpurata* Sm., fam. Orchidaceae (monocot, vascular plants)**
Contributors: Sanja Z. Djurović and Uroš Buzurović
Geographical focus: Serbia
New record and noteworthy data: New sites in central Serbia are given for rare *E. purpurata* previously recorded only in the western parts of Serbia. The species is on the CITES list. It is a new species for the Radan Nature Park.
Specimen data: **1)** central Serbia, Mt. Radan, Sokolovica, N 43.0844442°, E 21.3753141°, MGRS 34T EN37, beech forest, 857 a.s.l., 31 July 2020; leg. Djurović S, Buzurović U, Veljić M.; det. Buzurović U, Djurović S.; conf. Djordjević V. **2)** central Serbia, Mt. Radan, Sokolovica, N 43.0711364°, E 21.3910473°, MGRS 34T EN36, beech forest, 969 a.s.l., 31 July 2020; leg. Djurović S, Buzurović U, Veljić M, det. Buzurović U, Djurović S.
Vouchers: 1) Herbarium of the University of Belgrade (BEOU), vascular plant collection 68652; Natural History Museum in Belgrade, General Herbarium of the Balkan Peninsula (BEO) 85001. **2)** photo documentation S. Djurović, U. Buzurović.

Epipactis purpurata is distributed in Europe from Great Britain and Denmark in the north to Italy and Greece in the south and from Spain in the west to Romania in the east. In Serbia it was previously recorded only in the western region (Djordjević *et al.* 2010, 2017; Tomović *et al.* 2020) growing exclusively in beech forests (Djordjević *et al.* 2016) with an estimated regional conservation status of Vulnerable (VU; Djordjević *et al.* 2017). It is included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 2020).

In July 2020 two new sites in the beech forest on Mt. Radan were discovered with five individuals closely grouped on each site.

***Galanthus elwesii* Hook. f., fam. Amaryllidaceae (monocot, vascular plant)**

Contributors: Petya Boycheva and Galina Yaneva

Geographical focus: Bulgaria

New record and noteworthy data: This is a species of conservation value. The newly reported sites are in habitat types on the territory protected by the European NATURA 2000 network Suha reka.

Specimen data: Northeastern Bulgaria, the Varna region, land around Krumovo village, N 43.3702950°, E 27.8160600°; 01 March 2020; leg./det. Boycheva P, Yaneva G.

Voucher: Herbarium of Sofia University St. Kliment Ohridski (SO) 108047.

The species is not new to the floristic region of Northeastern Bulgaria (Assyov *et al.* 2012; Zahariev 2015), but is a new locality in Northeast Bulgaria. The species is protected, included in *Annex III* of the Biodiversity Act and listed under the endangered category in the The Red Data Book of Bulgaria (Peev *et al.* 2011). *G. elwesii* is included in the CITES (2020) list.

***Grimmia caespiticia* (Brid.) Jur., fam. Grimmiaceae; (moss, bryophyte)**

Contributors: Sorin Ștefănuț and Miruna-Maria Ștefănuț

Geographical focus: Romania

New records and noteworthy data: New records for Romania in the last 50 years.

Specimen data: **1)** Southern Carpathians, Făgăraș Mts., Puha glaciar ring, Sibiu County, N 45.58819°, E 24.511638°, 2069 m a.s.l., 17 August 2016; leg. Ștefănuț S.; det. Ștefănuț S, Ștefănuț M-M.; **2)** Southern Carpathians, Făgăraș Mts., Vișțișoara glaciar ring, Brașov County, N 45.612194°, E 24.759°, 2200 m a.s.l., 21 August 2020; leg. Ștefănuț S.; det. Ștefănuț S, Ștefănuț M-M.

Voucher: Herbarium of the Institute of Biology Bucharest, Romanian Academy (BUCA), bryophyte collection, B12056, B12031, B12032.

Grimmia caespiticia was collected from the glacial ring area on the southern side of Vișțișoara Lake, along with other bryophytes such as *Marsupella funckii* (F. Weber & D. Mohr) Dumort., *Gymnomitrion concinnatum* (Lightf.) Corda and male plants of *Andreaea nivalis* Hook.

This is the second report of *G. caespiticia* in Romania (Ștefănuț & Goia 2012). The first report was made from Făgăraș Mts., Podragu Valley, 1900 m a.s.l., 14 August 1966; leg./det. Vajda L., as *Grimmia alpestris* (Schleich.) Nees var. *microstoma* Br.eur, BP *72021*; rev. Muñoz J., August 1994 (Muñoz 1998). The nearest localities of *G. caespiticia* are in Serbia (Pantović *et al.* 2021) and Bulgaria (Hodgetts & Lockhart 2020). The conservation status of *G. caespiticia* in Romania should thus be changed from Critically Endangered – CR B1ab(ii,iii)+2ab(ii,iii) to Endangered – EN B2ab(ii,iii,iv).

***Loweomyces fractipes* (Berk. & M.A. Curtis) Jülich, fam. Steccherinaceae (fungus, saprotrophic)**

Contributors: Aleksandar Knežević and Predrag Petrović

Geographical focus: Serbia

New record and noteworthy data: This is the first record of *Loweomyces fractipes* in Serbia.

Specimen data: Šumadija, Belgrade, Ada Ciganlija, N 44.782169°, E 20.378663°, on *Populus tremula* logs, in the protected area Fungi of Ada Ciganlija, 78 m a.s.l.; 25 October 2019; leg. Knežević A.; det. Petrović P.

Voucher: Natural History Museum, National Fungal Collection (BEO) 21129.

In October 2019, basidiocarps of *L. fractipes* were collected from only one site on Ada Ciganlija inhabiting dead hardwood residues. According to the Global Biodiversity Information Facility - GBIF database, *L. fractipes* [syn. *Polyporus fractipes* Berk. & M.A. Curtis or *Abortiporus fractipes* (Berk. & M.A. Curtis) Bondartsev] is distributed in North America, South America and Europe. Although this species is widely distributed, it is considered rare. *L. fractipes* was firstly reported from Belarus in 1958 and was subsequently confirmed in several European countries (Austria, Croatia, France, Georgia, Slovakia, Slovenia, Spain and Ukraine). In addition, the species was recorded in Asia for the first time in 2013 from a locality in South Korea by Muñoz *et al.* (2016). In Slovakia it is listed in the Red list of Fungi (Ripková & Hagara 2003). The only known locality on the territory of Serbia is Ada Ciganlija. Recorded basidiocarps are restricted to the protected area of Fungi of Ada Ciganlija according to national legislation ("Službeni glasnik RS", no. 501-150/13-C-20). This new finding represents the second known locality reported for Southeast Europe to date.

The new record of this species is important as it is located in the only protected area in Serbia which is strictly protected as a habitat of rare and endangered mush-

room species in accordance with the recommendations of the Bern Convention (Ivančević *et al.* 2012). Since 2013. the applied measures have prevented the removal of plant residues, especially hardwood debris, which is the habitat of this fungal species. This finding is encouraging since it shows that such protection measures are efficient in practice.

***Pholiota henningsii* (Bres.) P.D. Orton, fam. Strophariaceae (fungus, saprotrophic)**
Contributor: Boris Assyov
Geographical focus: Bulgaria
New records and noteworthy data: This is the first record of *Pholiota henningsii* on the Balkan Peninsula and in Bulgaria, as well as the southernmost and easternmost known occurrence of the species in Europe (as referred to Zervakis *et al.* 1998; Ivančević 2002; Tkalčec & Mešić 2003; Sesli & Denchev 2008; Denchev & Assyov 2010; Holec *et al.* 2014; Karadžić *et al.* 2017; Karadelev *et al.* 2018; Ćetković *et al.* 2020).
Specimen data: Stara Planina Mts., the Petrohan Pass, not far from Petrohan chalet, N 43.114864°, E23.132026°, among *Sphagnum* sp. and *Juncus effusus* L. in a peatland, 1463 m a.s.l.; 11 October 2020; leg./det. Assyov B.
Voucher: Bulgarian Academy of Sciences, Mycological Collection of the Institute of Biodiversity and Ecosystem Research (SOMF), 30339.

Pholiota henningsii is the rarest member of the genus, with distinctive morphology and a peculiar habitat preference and ecology (Holec 2001; Holec *et al.* 2014). It is known to be uncommon where it occurs, and is included on the Red lists of a number of European countries (Holec *et al.* 2014). The Bulgarian specimens are rather typical and show the characteristic features of the species as described and illustrated in recent European sources (Noordeloos 1999; Holec 2001; Gminder 2003; Roux 2006; Jacobsson 2008). The species is known to be related to and characteristic of *Sphagnum*-mires in Europe, where it inhabits relict sites and is often related to water bodies in those habitats (Holec *et al.* 2014). The Bulgarian collection conforms to this preference. In Stara Planina Mts. *P. henningsii* occurred in part of a large acidic poor fen with numerous mire-pools with *Eleocharis carniolica* W.D.J. Koch. and tree mosaic of *Pinus sylvestris* L. and *P. peuce* Griseb., the latter introduced and rather efficiently propagating in the area. Basidiomata of *P. henningsii* were found in a single spot, in close proximity to *Sphagnum* sp. and *Juncus effusus* and notably some of them even appeared completely submerged within the adjacent mire-pool.

The occurrence of *P. henningsii* on the Balkan Peninsula is important from the biogeographical point of view as no findings were previously known southeast of the Alps (Holec *et al.* 2014) and it was hypothesized by the same authors that the species, whose distribution is obviously related to glacial refugial sites, might not have survived in the southern refugia. There can be little doubt that the Bulgarian locality is a site of relict occurrence rather than recent colonization by long-distance dispersal. Some pollen samplings from studied mires in the area of Petrohan Pass have been dated back to around 2000 years BP by means of the radiocarbon approach (Filipovitch 1981) and in general the age of the mire complex of Petrohan is placed in the Atlantic period (6000 years BP; Hájek *et al.* 2009), which could imply the refugial origin of the fungus in the area and the subsequent colonization of newly-formed mires after the end of the Last Glacial Period. Moreover, those fens are known to be poor remnants of more continuous past distribution in Bulgaria and harbor a high number of disjunctly occurring plant species (Hájek *et al.* 2009). Whether *P. henningsii* occurs in localities further south of Stara Planina Mts. is a question yet to be answered, but the species may be further sought in relict mires in Rhodopi, Rila and Pirin Mts., which are among the southernmost peat lands on the Balkan Peninsula (Tanneberger *et al.* 2017).

***Rhodobryum ontariense* (Kindb.) Paris, fam. Bryaceae; (bryophyte, acrocarpous moss)**
Contributors: Jovana Pantović and Ivana Stevanoski
Geographical focus: Serbia
New record and noteworthy data: First record for the Bačka region (North Bačka county).
Specimen data: Bačka, Special nature reserve Selevenjske Pustare, Selevenjska Šuma, N 46.1440545°, E 19.8872208°, on soil at the edge of forest-grassland transition; 26 May 2020; leg. Stevanoski I.; det. Pantović J.; rev. Sabovljević M.
Voucher: Herbarium of the Institute of Botany and Botanical Garden Jevremovac, University of Belgrade (BEOU), bryophyte collection, Bryo 07877.

Rhodobryum ontariense is a subcontinental montane moss which usually grows on dry calcareous soil in open woodlands (Düll 1984). It has a wide but rather fragmented world distribution (Sabovljević *et al.* 2011) with a more southern range pattern (Iwatsuki & Koponen 1972). Apart from its preference for lower latitudes (50° N or lower), the species *R. ontariense*, unlike the related species *R. roseum*, occurs at lower elevation and in more thermophyllous habitats. In Southeastern Europe it is known from Bulgaria, Croatia, Hungary, Romania, Serbia and Slovenia (Hodgetts & Lockhart 2020).

This moss was firstly reported for Serbia rather recently (Sabovljević & Cvetić 2001). Up to date, it was known from only two sites in the country - Deliblato sands in the Vojvodina province and the Sićevačka Gorge in Eastern Serbia (Sabovljević & Cvetić 2001; Papp & Erzberger 2009). The present finding from Selevenjske Pustare is the first record for the Bačka region.

Rhodobryum ontariense is considered a rare moss in Serbia, but listed under the LR (Lower Risk) category in the country's latest red list of the species (Sabovljević *et al*. 2004). However, it is red-listed in a few other European countries as well, for example as vulnerable in neighboring Romania (Ştefănuţ & Goia 2012). This new record represents an important step towards the understanding of its national and regional distribution and ecology, as well as the active protection of the species.

***Typha shuttleworthii* W. D. J. Koch & Sond., fam. Typhaceae; (monocot, vascular plants)**
Contributors: Marjan Niketić and Snežana Vukojičić
Geographical focus: Serbia
New records and noteworthy data: New sites are given here for the rare and strictly protected species of great conservation interest - *T. shuttlewortii*. These are the first records for Mt. Ozren and Mt. Jelova Gora, and the second record for the flora of Mt. Stara Planina.
Specimen data: 1) eastern Serbia, Mt. Stara Planina, the Jelovica river valley, between Lice and Ravnište, N 43.209527°, E 22.832182°, MGRS 34T FN48, peat-bog near the river, silicate, c. 810 m a.s.l.: 2 May 2015; leg./ det. Niketić M, Vukojičić S, Tomović G, Djurović S. *43746* (BEOU), *s/n*. (BEO); **2)** southwestern Serbia, Mt. Ozren, Čir peak, near Gronča revo village, N 43.250167°, E 19.807309°, MGRS 34T DN08, peat-bog next to the farm, silicate, 1465 m a.s.l.; 31 July 2020; leg./det. Niketić M, Tomović G. *68410* (BEOU), *s/n*. (BEO); **3)** western Serbia, Mt. Jelova Gora, 14 km from Užice, N 43.943571°, E 19.759808°, 925 m a.s.l.; Jul 2020; small patches of a few square meters in roadside ditches; leg./ det. Vukojičić S. *17712* (BEOU).
Vouchers: Herbarium of the Institute of Botany and Botanical Garden Jevremovac, University of Belgrade (BEOU), vascular plant collection 43746, 68410, 17712; Natural History Museum in Belgrade, General Herbarium of the Balkan Peninsula (BEO), s/n.

The first records of *Typha shuttleworthii* for the Serbian flora were reported for the area surrounding Sjenica, Novi Sad, Kragujevac and Mt. Kukavica (Randjelović 1999 and references therein). Tomović *et al*. (2009) cites this species for the surroundings of Bor, Svrljig and Bosilegrad. More recent findings include records from western and central Serbia: Mt. Tara, Mt Golija and Mt Radan (Tomović *et al*. 2020), as well as eastern Serbia - Mt. Stara Planina (Jenačković *et al*. 2020).

***Umbilicus luteus* (Huds.) Webb. & Berthel., fam. Crassulaceae; (dicot, vascular plants)**
Contributors: Marjan Niketić and Gordana Tomović
Geographical focus: Serbia
New record and noteworthy data: This is the second record for the Šumadija region and the northernmost locality of the species distribution area in Serbia.
Specimen data: Šumadija, Mt. Kosmaj, Veliki Kosmaj peak, between the monument and repeater, MGRS 34T DQ62, *Fagus sylvatica-Allium ursinum* forest, silicate, 10 May 2003, leg./det. Niketić M, Tomović G.
Vouchers: Natural History Museum in Belgrade, General Herbarium of the Balkan Peninsula (BEO), s/n.

In Serbia, *U. luteus* was known from Mt. Bukulja (Gajić 1972), the Ravanica river gorge (Nikolić *et al*. 1986) and several localities in southeast Serbia (Stevanović *et al*. 1999). This newly registered site in Mt. Kosmaj represents the northernmost locality of the species entire distribution area in Europe. A small and restricted group of *U. luteus* individuals were found near the monument of the Veliki Kosmaj peak in shady places on humus soil within the *Fagus sylvatica-Allium ursinum* forest.

***Woodsia alpina* (Bolton) Gray, fam. Polypodiaceae (fern, vascular plant)**
Contributors: Roxana Ion and Gabriela Tamas
Geographical focus: Romania
New record and noteworthy data: This is the first record for the Southern Carpathians and Ţarcu Mts.
Specimen data: Western group of the Southern Carpathians, Ţarcu Mts., N 45.31694°, E 22.62555°, 2030 m a.s.l., SSE slope; 16 September 2020; leg./det. Nicoară R., Tamas G.
Voucher: Herbarium of the Bucharest Institute of Biology-Romanian Academy (BUCA), vascular plant collection, BUCA 159464.

Part of the diverse and widely distributed Polypodiaceae family, the distinct characters of *Woodsia alpina* include leaflets with 1 to 3 pairs of lobes, scales and hairs on jointed stems, ciliated indusia and the presence of hydathodes. It has a circumpolar distribution, present in Canada and the U.S., Europe and parts of Asia including the Ural and Altai Mts. (KBD 2021).

Of the three species present in Romania, the relict *W. alpina* is one of the rarest. It was primarily recorded in the Eastern Carpathians, Maramureşului Mts. and restricted to only two sites (Coman 1939, 1946; Grinţescu 1952). The newly recorded population from Ţarcu Mts. is located 320 km from the previous known location and represents the southernmost record within the Carpathians. We found alpine *Woodsia* growing in the rocky crevices of a remote cliff face in a glacial cirque suspended around Mătania Ridge, one of the places that harbors the richest flora in the massif (Boşcaiu 1971). The areas comprising the *W. alpina* habitat have a low vegetation cover, only a small number of species occur there, of which the most noteworthy are *Asplenium viride* Huds., *A. trichomanes* L., *Cystopteris fragilis* (Lam.) Bernh. ex Desv., *Campanula serrata* (Schult.) Hendrych, and *Saxifraga paniculata* Mill. The population consists of 3-5 individuals (tufts) spread over a 25 m^2 area, most of the leaves with fertile fronds.

Although it is considered to be of Least Concern (LC) according to the IUCN Red List (Christenhusz *et al.* 2017), the species is rare and protected in most of the Carpathian countries (Kricsfalusy 1999; Fabiszewski & Piękoś-Mirkowa 2001; Feráková *et al.* 2001). In the Romanian Carpathians, the species is classified as Endangered (EN) (Dihoru & Negrean 2009), but after a new reassessment, we have updated the threat category to CR B2ab(ii,iii,iv); C2a(i); D1.

Acknowledgements – The study of TTD and CMD received support from the SYNTHESYS Project http://www.synthesys.info/, financed by the European Community Research Infrastructure Action under the FP7 "Capacities" Program at the Natural History Museum Vienna (Grant no. AT-TAF-6702). JP acknowledges the Rufford Foundation for supporting research within the Project ID 25015-1.

REFERENCES:

Assyov B, Petrova A, Dimitrov D & Vasilev R. 2012. *Conspectus of the Bulgarian vascular flora. Distribution maps and floristic elements. Ed. **4***. Bulgarian Biodiversity Foundation, Sofia.

Begerow D & McTaggart A. 2018. Pucciniomycotina. In: Begerow D, McTaggart A & Agerer A (eds.), *Syllabus of plant families – A. Engler's Syllabus der Pflanzenfamilien, Part **1/3**: Basidiomycota and Entorrhizomycota*, pp. 17–91, Schweizerbart Science Publishers, Stuttgart.

Blaženčić J. 2014. Overview of the stoneworts (Charales) of Serbia with the estimation of the threat status. *Botanica Serbica* **38**(1): 121–130.

Blaženčić J, Stevanović B, Blaženčić Ž & Stevanović V. 2006. Distribution and ecology of charophytes recorded in the West and Central Balkans. *Cryptogamie Algologie* **27**: 311–322.

Blindow I & Schubert H. 2003. *Chara canescens* Desv. et Loisel. in Loisel. 1810. In: Schubert H & Blindow I (eds.), *Charophytes of the Baltic Sea*, pp. 70–81, Koeltz, Königstein.

Boşcaiu N. 1971. *Flora şi vegetaţia Munţilor Ţarcu, Godeanu şi Cernei*. Academiei R.S.R., Bucureşti.

Caisova L & Gąbka M. 2009. Charophytes (Characeae, Charophyta) in the Czech Republic: taxonomy, autecology and distribution. *Fottea* **9**: 1–43.

Calero S & Rodrigo MA. 2018. The life cycle of a parthenogenetic population of *Chara canescens* from an interdunal Mediterranean pond. *Botany Letters* **165**: 55–65.

Christenhusz M, Bento Elias R, Dyer R, Ivanenko Y, Rouhan G, Rumsey F & Väre H. 2017. *Woodsia alpina*. The IUCN Red List of threatened species 2017. Published on the Internet: e.t83644345a85450338 [Accessed 06 November 2020].

CITES 2020. *Convention on International Trade in Endangered Species of Wild Fauna and Flora*. Accessed 27 August. Available at: https://www.cites.org/eng/disc/species.php [Accessed 09 November 2020].

Coman A. 1939. Contribuţiuni la cunoaşterea florei Muntelui Farcău. *Revista pădurilor* **12**: 1013–1014.

Coman A. 1946. Enumerarea plantelor vasculare din Maramureşul românesc, din Herbarul "A. Coman". *Buletinul Grădinii Botanice şi al Muzeului Botanic de la Universitatea din Cluj* **26**: 57–89.

Ćetković I, Tkalčec Z, Dragićević S, Alegro A, Šegota V, Jadan M, Matočec N, Kušan I, Zgrablić Ž & Mešić A. 2020. *Entoloma conferendum, Hygrocybe coccineocrenata,* and *Hypholoma ericaeum* new to Montenegro. *Mycotaxon* **135**: 637–647.

Denchev CM & Assyov B. 2010. Checklists of the larger basidiomycetes in Bulgaria. *Mycotaxon* **111**: 297–282 + on-line version. Mycotaxon Checklists Online http://www.mycotaxon.com/resources/checklists/denchev-v111-checklist.pdf

Dihoru G. & Negrean G. 2009. *Cartea Roşie a plantelor vasculare din România*. Academiei Române, Bucureşti.

Djordjević V, Lakušić D, Jovanović S & Stevanović V. 2017. Distribution and conservation status of some rare and threatened orchid taxa in the central Balkans and the southern part of the Pannonian Plain. *Wulfenia* **24**: 143–162.

Djordjević V, Tomović G & Lakušić D. 2010. *Epipactis purpurata* Sm. (Orchidaceae): a new species in the flora of Serbia. *Archives of Biological Sciences* **62**: 1175–1179.

Djordjević V, Tsiftsis S, Lakušić D & Stevanović V. 2016. Niche analysis of orchids of serpentine and non-serpentine areas: implications for conservation. *Plant Biosystems* **150**: 710–719.

Düll R. 1984. Distribution of the European and Macaronesian Mosses (Bryophytina) I. *Bryologische Beiträge* **4**: 1–113.

Fabiszewski J & Piękoś-Mirkowa H. 2001. *Woodsia alpina* (Bolton) S. F. Gray – Rozrzutka alpejska. In: Kaźmierczakowa R & Zarzycki K (eds.), *Polish red data book of plants. Pteridophytes and flowering plants*, pp. 57–58, W. Szafer Institute of Botany, Institute of Nature Conservation, Polish.

Feráková V, Maglocký Š & Marhold K. 2001. Red list of ferns and flowering plants of Slovakia. *Ochrana Prírody (Banská Bystrica)* **20** (Suppl.): 44–77.

Filipovitch LA. 1981. Late Postglacial development of forest vegetation on the high slopes of Stara Planina Mts. *Fitologija* **18**: 3–21.

Gajić M. 1972. Crassulaceae DC. In: Josifović M (ed.), *Flora SR Srbije* **4**, pp. 212–237, Srpska akademija nauka i umetnosti, Beograd.

Gminder A. 2003. *Pholiota* (Fries) Kummer. In: Krieglsteiner GJ (ed.), *Die Großpilze Baden-Württembergs* **4**, pp. 370–395, Verlag Eugen Ulmer GmbH & Co, Stuttgard.

Grinţescu G. 1952. Genul *Polypodiaceae*. In: Săvulescu T (ed.), *Flora R.P.R.* **1**, pp. 81–150, Academiei R.S.R., Bucureşti.

Hájek M, Hájková P, Apostolova I, Horsák M, Plášek V, Shaw B & Lazarova M. 2009. Disjunct occurrences of plant species in the refugial mires of Bulgaria. *Folia Geobotanica* **44**: 365–386.

Hodgetts NG & Lockhart N. 2020. *Checklist and country status of European bryophytes –update 2020. Irish Wildlife Manuals, No. 123*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

Holec J. 2001. *The genus Pholiota in central and western Europe. Libri Botanici* **20**. IHW-Verlag, Eching bei München.

Holec J, Kučera T, Moreau P-A, Corriol G. & Soldán Z. 2014. Habitat preferences of *Pholiota henningsii* (Fungi, Strophariaceae), rare species of relict mires. *Nova Hedwigia* **98**: 51–77.

Ivančević B. 2002. Zabeležene vrste makromiceta u Srbiji i Crnoj Gori do 1993 godine. *Svet Gljiva* **14**: 7–10.

Ivančević B, Matavulj MN, Vukojević J & Karaman M. 2012. Fungi in the legislation of the Republic of Serbia. *Matica Srpska Proceedings for Natural Sciences* **123**: 51–64.

Iwatsuki Z & Koponen T. 1972. On the taxonomy and distribution of *Rhodobryum roseum* and its related species (Bryophyta). *Acta Botanica Fennica* **96**: 1–22.

Jacobsson S. 2008. *Pholiota* P. Kumm. In: Knudsen H & Vesterholt J (eds.), *Funga Nordica,* pp. 837–844, Nordsvamp, Kopenhagen.

Jenačković Gocić D, Bolbotinović Lj, Jušković M, Nikolić D & Randjelović V. 2020. Insight into the chorology of some endangered, rare and potentially invasive plant species in Serbia. *Biologica Nyssana* **11**: 71–84.

Karadelev M, Rusevska K, Kost G. & Mitic Kopanja D. 2018. Checklist of macrofungal species from the phylum Basidiomycota of the Republic of Macedonia. *Acta Musei Macedonici Scientiarum Naturalium* **21**: 23–112.

Karadžić D, Radulović Z, Milenković I & Vemić A. 2017. The most common *Pholiota* species in the forests of Serbia and Montenegro. *Šumarstvo* **1–2**: 1–24.

KBD 2021. *Kew backbone distributions. The international plant names index and world checklist of selected plant families 2021.* Available at: http://www.ipni.org and http://apps.kew.org/wcsp/ [Accessed 04 January 2021]

Kim NK, Park JY, Park MS, Lee H, Cho HJ, Eimes JA, Kim C & Lim YW. 2016. Five new wood decay fungi (Polyporales and Hymenochaetales) in Korea. *Mycobiology* **44**: 146–154.

Korsch H, Doege A, Raabe U & van de Weyer K. 2013. *Rote Liste der Armleuchteralgen (Charophyceae) Deutschlands, 3. Fassung, Stand: Dezember 2012*. Thüringische Botanische Gesellschaft e.V., Jena.

Kricsfalusy V. 1999. Flora and vegetation of the Ukrainian Upper Tisza basin: aspects of biodiversity conservation. In: Hamar J & Sarkany-Kiss A (eds.), *The Upper Tisza Valley*, pp. 273–292, Tisza Nymda.

Kruse J. 2014. Selection of rare Bavarian plant parasitic microfungi. *Mycologia Bavarica* **15**: 75–90.

Muñoz J. 1998. A taxonomic revision of *Grimmia* subgenus *Orthogrimmia* (Musci, Grimmiaceae). *Annals of the Missouri Botanical Garden* **85**: 367–403.

Nikolić V, Sigunov A & Diklić N. 1986. Dopuna flori SR Srbije novim podacima o rasprostranjenju biljnih vrsta. In: Sarić M & Diklić N (eds.), *Flora SR Srbije* **10***, Dodatak* (**2**), pp. 259–336, Srpska akademija nauka i umetnosti, Beograd.

Noordeloos ME. 1999. *Pholiota* (Fr.) Kumm. In: Bas C, Kuyper TW, Noordeloos ME & Vellinga EC (eds.), *Flora Agaricina Neerlandica* **4**, pp. 80–105, A.A. Balkema, Rotterdam – Brookfield.

Pantović J, Veljić M, Grdović S & Sabovljević MS. 2021. An annotated list of moss species of Serbia. *Phytotaxa* **479**: 207–249.

Papp B & Erzberger P. 2009. Contributions to the bryophyte flora of southeastern Serbia: Suva Planina Mts and its surroundings. *Studia Botanica Hungarica* **40**: 125–142.

Peev D, Petrova AS, Nachev M, Temniskova D, Denchev CM, Ganeva A, Gussev C & Vladimirov V (eds.) 2011. *Red Data Book of the Republic of Bulgaria, Vol.* **1** *Plants & Fungi*. BAS & MOEW Sofia.

Piatek M, Lutz M & Chater AO. 2013. Cryptic diversity in the *Antherospora vaillantii* complex on *Muscari species*. *IMA Fungus* **4**: 5–19.

Randjelović V. 1999. *Typha shuttleworthii* Koch & Sonder. In: Stevanović V (ed.), *Crvena knjiga flore Srbije* **1**, pp. 384–386, Ministarstvo za životnu sredinu Republike Srbije, Biološki fakultet Univerziteta u Beogradu, Zavod za zaštitu prirode Republike Srbije, Beograd.

Ripková S & Hagara L. 2003. New, rare and less known macromycetes in Slovakia I. *Czech Mycology* **55**: 187–200.

Roux P. 2006. *Mille et un champignons.* Édition Roux, Sainte-Sigolène.

Sabovljević M & Cvetić T. 2001. *Rhodobryum ontariense* (Kindb.) Kindb. new to Yugoslavia and some notes on the genus *Rhodobryum* (Schimp.) Limpr in the Federal Republic of Yugoslavia. *Ekologija* **36**: 145–153.

Sabovljević M, Cvetić T & Stevanović V. 2004. Bryophyte Red List of Serbia and Montenegro. *Biodiversity and Conservation* **13**: 1781–1790.

Sabovljević M, Cvetković J, Živković S, Vujičić M, & Sabovljević A. 2011. Genetic structure of the rare moss species *Rhodobryum ontariense* in Vojvodina (Serbia) as inferred by isozymes. *Archives of Biological Sciences* **63**: 151–155.

Schaible R, Bergmann I & Schubert H. 2011. Genetic structure of sympatric sexually and parthenogenetically reproducing population of *Chara canescens* (Charophyta). *ISRN Ecology* **2011**: Article ID 501838.

Schubert H, Blindow I & van de Weyer K. 2016. *Chara canescens*. In: Arbeitsgruppe Characeen Deutschlands (ed.), *Armleuchteralgen. Die Characeen Deutschlands*, pp. 261–270, Springer Verlag, Heidelberg.

Sesli E & Denchev CM. 2008. Checklists of the myxomycetes, larger ascomycetes, and larger basidiomycetes in Turkey. *Mycotaxon* **106**: 65–67 + on-line version, 6th edn (2014). Mycotaxon Checklists Online http://www.mycotaxon.com/resources/checklists/sesli-v106-checklist.pdf

Spetsov P, Plamenov D & Kiryakova V. 2006. Distribution and characterization of *Aegilops* and *Triticum* species from the Bulgarian Black Sea coast. *Central European Journal of Biology* **1**: 399–411.

Ştefănuţ S & Goia I. 2012. Checklist and Red List of bryophytes of Romania. *Nova Hedwigia* **95**: 59–104.

Stevanović V, Lakušić D, Niketić M, Vukojičić, S & Ranđelović V. 1999. Distribution of the vascular plants in Yugoslavia, Bosnia and Herzegovina and F. Y R. Macedonia. In: Jalas J, Suominen J, Lampinen R & Kurtto A (eds.), *Atlas Florae Europaeae. Distribution of vascular plants in Europe 12. Resedaceae to Platanaceae*, The Committee for Mapping the Flora of Europe & Societas Biologica Fennica Vanamo, Helsinki.

Tanneberger F, Tegetmeyer C, Busse S, Barthelmes A, Shumka S, Mariné AM, Jenderedjian K, Steiner GM, Essl F, Etzold J, Mendes C, Kozulin A, Frankard P, Milanović A, Ganeva A, Apostolova I, Alegro A, Delipetrou P, Navrátilová J, Risager M, Leivits A, Fosaa AM, Tuominen S, Muller F, Bakuradze T, Sommer M, Christanis K, Szurdoki E, Oskarsson H, Brink SH, Connolly J, Bragazza L, Martinelli G, Aleksāns O, Priede A, Sungaila D, Melovski L, Belous T, Saveljić D, De Vries F, Moen A, Dembek W, Mateus J, Hanganu J, Sirin A, Markina A, Napreenko M, Lazarević P, Stanová VŠ, Skoberne P, Pérez PH, Pontevedra-Pombal X, Lonnstad J, Küchler M, Wüst-Galley C, Kirca S, Mykytiuk O, Lindsay R & Joosten H. 2017. The peatland map of Europe. *Mires and Peat* **19** (22): 1–17.

Tkalčec Z & Mešić A. 2003. Preliminary checklist of Agaricales from Croatia V: Families Crepidotaceae, Russulaceae and Strophariaceae. *Mycotaxon* **88**: 279–314.

Tomović G, Sabovljević MS, Djokić I, Petrović P, Djordjević V, Lazarević P, Mašić E, Barudanović S, Ştefănuţ S, Niketić M & Butorac B. 2020. New records and noteworthy data of plants, algae and fungi in SE Europe and adjacent regions, 2. *Botanica Serbica* **44**(2): 251–259.

Tomović G, Zlatković B, Niketić M, Perić R, Lazarević P, Duraki Š, Stanković M, Lakušić D, Anačkov G, Knežević J, Szabados K, Krivošej Z, Prodanović D, Vukojičić S, Stojanović V, Lazarević M & Stevanović V. 2009. Threat status revision of some taxa from "The Red Data Book of Flora of Serbia 1". *Botanica Serbica* **33**(1): 33–43.

Trbojević I, Subakov-Simić G, Blaženčić J & Predojević D. 2019. Rediscovery of *Chara canescens* Loiseleur in Serbia. *Botanica Serbica* **43**(1): 97–102.

Woods RG, Chater AO, Smith PA, Stringer RN & Evans DA. 2018. *Smut and allied fungi of Wales. A guide, Red Data list and census catalogue.* A.O. Chater, Aberystwyth.

Zahariev D. 2015. *Flora of Northeastern Bulgaria. Vol. 4. Flora of the Frangen Plateau*. Chimera, Shumen.

Zaharieva M, Prosperi JM, Monneveu P. 2004. Ecological distribution and species diversity of *Aegilops* L. genus in Bulgaria. *Biodiversity and Conservation* **13**: 2319–2337.

Zervakis G, Dimou D & Balis C. 1998. A check-list of the Greek macrofungi including hosts and biogeographic distribution: I. Basidiomycotina. *Mycotaxon* **66**: 273–336.

REZIME

Botanica SERBICA

Novi i značajni podaci o biljkama, algama i gljivama iz JI Evrope i susednih regiona, 3

Marko S. Sabovljević, Gordana Tomović, Petya Boycheva, Dobri Ivanov, Teodor T. Denchev, Cvetomir M. Denchev, Ivana Stevanoski, Aleksandra Marković, Sanja Z. Djurović, Uroš Buzurović, Galina Yaneva, Sorin Ştefănuţ, Miruna-Maria Ştefănuţ, Aleksandar Knežević, Predrag Petrović, Boris Assyov, Jovana Pantović, Marjan Niketić, Snežana Vukojičić, Roxana Ion i Gabriela Tamas

Prikazani su novi i značajni podaci sa područja JI Evrope i susednih regiona o parazitskoj gljivi *Antherospora hortensis,* saprofitskim gljivama *Loweomyces fractipes* i *Pholiota henningsii,* hari *Chara canescens,* mahovinama *Grimmia caespiticia* i *Rhodobryum ontariense,* paprati *Woodsia alpina,* monokotilama *Aegilops triuncialis, Epipactis purpurata, Galanthus elwesii* i *Typha shuttleworthii* i dikotili *Umbilicus luteus.*

Ključne reči: novi nalaz, *Aegilops triuncialis, Antherospora hortensis, Chara canescens, Epipactis purpurata, Galanthus elwesii, Grimmia caespiticia, Loweomyces fractipes, Pholiota henningsii, Rhodobryum ontariense, Typha shuttleworthii, Umbilicus luteus, Woodsia alpina*