



Original Scientific Paper

## New records and noteworthy data of plants, algae and fungi in SE Europe and adjacent regions, 1

Marko S. SABOVLJEVIĆ<sup>1\*</sup>, Gordana TOMOVIĆ<sup>1\*</sup>, Marjan NIKETIĆ<sup>2</sup>, Predrag LAZAREVIĆ<sup>1</sup>, Maja LAZAREVIĆ<sup>1</sup>, Jelena LATINOVIĆ<sup>3</sup>, Nedeljko LATINOVIĆ<sup>3</sup>, Eva KABAŠI<sup>1</sup>, Sanja Z. DJUROVIĆ<sup>4</sup>, Lado KUTNAR<sup>5</sup>, Mitja SKUDNIK<sup>5</sup>, Jovana PANTOVIĆ<sup>1</sup>, Ivana STEVANOSKI<sup>1</sup>, Snežana VUKOJIČIĆ<sup>1</sup> and Milan VELJIĆ<sup>1</sup>

1 Institute of Botany and Botanical Garden, Faculty of Biology, University of Belgrade, Takovska 43, 11 000 Belgrade, Serbia

2 Natural History Museum, Njegoševa 51, 11000 Belgrade, Serbia

3 Biotechnical Faculty, University of Montenegro, Mihaila Lalića 15, 81000 Podgorica, Montenegro

4 Faculty of Agriculture, University of Niš, Kosačićeva 4, 37 000 Kruševac, Serbia

5 Slovenian Forestry Institute, Večna pot 2, 1000 Ljubljana, Slovenia

\* column editors, to whom contributions should be sent ([botanicaserbica@bio.bg.ac.rs](mailto:botanicaserbica@bio.bg.ac.rs))

### ABSTRACT:

The present paper gives new records of the following taxa in SE Europe and adjacent regions, together with significant data pertaining to them: the pathogenic fungus *Arthrocladiella mougeotii*; the liverwort *Riccia frostii*; the mosses *Campylopus fragilis*, *C. introflexus* and *Tomentypnum nitens*; the fern *Allosorus persicus*; the monocots *Allium atropurpureum* and *Sisyrinchium montanum*; and the dicots *Calluna vulgaris* and *Santolina chamaecyparissus*.

### Keywords:

new record, *Allium atropurpureum*, *Allosorus persicus*, *Arthrocladiella mougeotii*, *Calluna vulgaris*, *Campylopus fragilis*, *Campylopus introflexus*, *Riccia frostii*, *Santolina chamaecyparissus*, *Sisyrinchium montanum*, *Tomentypnum nitens*

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***Allium atropurpureum* Waldst. & Kit., fam. Amaryllidaceae; (monocot, vascular plant)**

**Contributors:** Marjan NIKETIĆ and Gordana TOMOVIĆ

**Geographical focus:** Serbia

**New records and noteworthy data:** These are the first new records for Serbia proper. The last record dated from 1874. It was given by PANČIĆ (1874) for the environs of Belgrade (between Topčider Hill and Bele Vode, sub. *A. nigrum* L.). **Specimen data:** 1) NE Serbia, Negotin, near the village of Srbovo, Dupljanska River, locality Čajna, N 44.2480005°, E 22.5890782°, MGRS 34T FQ30, hygrophilous meadows in the zone of a *Quercus petraea* and *Acer campestre* forest, 37 m a.s.l., 18 May 2017; leg. Niketić M., Tomović G., det. Niketić M., Tomović G.; 2) NE Serbia, Negotin, between the villages of Mokranje and Veljkovo, at the foot of

Visočko Hill, N 44.1458447°, E 22.6069051°, MGRS 34T FP28, abandoned places near road and railroad, 90 m a.s.l., 19 May 2017; leg. Niketić M., Tomović G.; det. Niketić M., Tomović G.

**Vouchers:** Department of Plant Ecology and Geography, Herbarium of the Institute of Botany and Botanical Garden "Jevremovac", University of Belgrade (BEOU), vascular plant collection 48336, 48380; Natural History Museum in Belgrade, General Herbarium of the Balkan Peninsula (BEO) 100000, 100001.

This species is predominantly distributed in the Vojvodina Province, while all records for the environs of Niš (PETROVIĆ 1882; PANČIĆ 1884; TATIĆ 1975; JANKOVIĆ & STEVANOVIĆ 1982) should be treated as erroneous. The only previous ev-

idence indicating the plant's presence in Serbia proper is a specimen collected by Josif Pančić in the vicinity of Belgrade (Žarkovo, leg. J. Pančić 1873, sub. *A. nigrum*, BEOU). The plant was originally identified as *A. nigrum* L., and this record was soon published with the approximate location (between Topčider Hill and Bele Vode, sub. *A. nigrum*) (PANČIĆ 1874). After Pančić, it was never found at that locality or in present-day Serbia proper, although PETROVIĆ (1882) erroneously mentioned its presence in the vicinity of Niš in Eastern Serbia (sub. *A. nigrum* var. *atropurpureum*) and the same record was confirmed by PANČIĆ (1884) (sub *A. atropurpureum*). However, according to NIKETIĆ (1999), these findings actually refer to *A. cyrilli* Ten.

The species inhabits abandoned places near roads and railroads, dry steppe meadows, cultivated fields and vineyards. At the locality near the village of Srbovo, the subpopulations are very sparse and consist of a few flowering individuals in poor condition due to anthropogenic impact. At the second locality, between the villages of Mokranje and Veljkovo, a few groups with a total of ca. 40 individuals grow as segetal plants, and the habitat of the species is endangered by the use of herbicides for weed destruction.

***Allosorus persicus* (Bory) Christenh., fam. Pteridaceae (fern, vascular plant)**

**Contributors:** Predrag LAZAREVIĆ and Maja LAZAREVIĆ

**Geographical focus:** Kosovo (Serbia)

**New record and noteworthy data:** This is the second record for Kosovo, i.e., Serbia.

**Specimen data:** "Monastery of the Holy Archangels" in the gorge of the river Prizrenska Bistrica, Prizren, Kosovo (Serbia), N 42.200590°, E 20.763544°, MGRS 34T DM87, 470 m a.s.l., 26 June 2017; leg. Lazarević P., Lazarević M.; det. Lazarević P., Lazarević M.; on remnants of the church walls.

**Voucher:** Herbarium of the Institute of Botany and Botanical Garden "Jevremovac", University of Belgrade (BEOU), vascular plant collection 17679.

According to the Euro+Med Plantbase (CHRISTENHUSZ & RAAB-STRAUBE 2013), *A. persicus* [syn. *Cheilanthes persica* (Bory) Mett. ex Kuhn] is distributed in Southern and Southeast Europe (Albania, Bosnia and Herzegovina, Bulgaria, Montenegro, Croatia, Greece, Italy, North Macedonia), Ukraine, Russia, Turkey and Transcaucasia. For the territory of Serbia, the first record of *A. persicus* was reported in Kosovo by KRIVOŠEJ *et al.* (2003). NIKETIĆ & TOMOVIĆ (2018) confirm this taxon to be present in Serbia, but only in Kosovo. The whole recorded population is restricted to old walls of the archaeological site in the Serbian medieval monastery Banjska near Kosovska Mitrovica. The new finding of *A. persicus* in the gorge of the river Prizrenska Bistrica is also situated on old church walls, in the "Monastery of the Holy Archangels" complex. In 2017 only a few individuals of the species were observed in the crevices of stone block remnants of the old church.

This new finding represents the second known locality reported for Kosovo, i.e., Serbia to date.

***Arthrocladiella mougeotii* (Léveillé) Vassilkov, fam. Erysiphaceae (fungus, plant pathogen)**

**Contributors:** Jelena LATINOVIĆ and Nedeljko LATINOVIĆ

**Geographical focus:** Montenegro

**New record and noteworthy data:** This is the first record of *Arthrocladiella mougeotii* in Montenegro.

**Specimen data:** Beri near Podgorica (Montenegro), N 42.442164°, E 19.177347°, 38 m a.s.l.; 21 October 2018; leg. Latinović N.; det. Latinović J.; on *Lycium barbarum* leaves.

**Voucher:** Fungal collection of the Biotechnical Faculty, University of Montenegro, s/n.

In October of 2018, powdery mildew (*A. mougeotii*) colonies were observed on leaves of Goji berry (*Lycium barbarum* L.) in the environs of Podgorica in Montenegro. Leaf surfaces were covered with abundant greyish-white fungal mycelium. Microscopic examination of samples revealed the presence of the powdery mildew fungal pathogen in the anamorph stage. The teleomorph stage was not found. Based on symptoms, the host plant, fungal conidia and published data (KISS *et al.* 2018), the pathogen was identified as *Arthrocladiella mougeotii*.

In recent years, Goji berry was introduced to cultivation in Montenegro due to its medicinal properties, and several plantations were set up. Since powdery mildew leads to leaf chlorosis and necrosis, distortion of the leaves and defoliation, more attention should be paid to this plant disease. The new record of this species is important both in the context of documentation of plant pathogenic fungi in Montenegro, and from the practical point of view, stressing that producers of Goji berries should pay attention to the problem of controlling this fungal disease in order to improve the quantity and quality of berries produced in Montenegro. Some general control measures for controlling powdery mildew can be recommended, such as removal and destruction of infected plant parts and treatment with sulphur-based fungicides.

***Calluna vulgaris* (L.) Hull., fam. Ericaceae (dicot, vascular plant)**

**Contributors:** Eva KABAŠ and Sanja Z. DJUROVIĆ

**Geographical focus:** Serbia

**New records and noteworthy data:** New sites are here given for the rare and strictly protected *C. vulgaris*, previously known from only four areas in Serbia. The newly reported sites are in habitat types protected by EU directives. The taxon in question represents a new species in the Golija Nature Park and the Golija-Studenica Biosphere Reserve.

**Specimen data:** 1) Serbia – southwestern Serbia: Golija Mts., Erčege, Kraljev grob - Bojića brdo, 1257 m a.s.l., N 43.35537°, E 20.172741°, on quartz conglomerate and sandstone; 24 August 2018. leg. Vukojičić S., Lazarević P., Kabaš E., Djurović S.Z., Veljić M.; det. Vukojičić S.;

2) Serbia – southwestern Serbia: Golija Mts., Kondilo - Rimski most, 702 m a.s.l., N 43.459677°, E 20.222108°, on phyllite; 25 August 2018. leg. Vukojičić S., Lazarević P., Kabaš E., Djurović S.Z., Veljić M.; det. Vukojičić S.

**Voucher:** Herbarium of the Institute of Botany and Botanical Garden “Jevremovac”, University of Belgrade (BEOU), vascular plant collection 57788, 57774.

In Serbia, *Calluna vulgaris* was known from four localities up to now: the Gučevo Mts. (STOJANOVIĆ & STEVANOVIĆ 2008), Boranja Mts. (PANČIĆ, 1874; CVJETIĆANIN *et al.* 2014), Djerdap Gorge (CVJETIĆANIN 2003; CVJETIĆANIN & NOVAKOVIĆ 2006; CVJETIĆANIN & PEROVIĆ 2006; CVJETIĆANIN *et al.* 2013) and Kamena Gora Mts. (Crni Vrh) (JOVANOVIĆ 1972). Additionally, in 2018 two sub-populations of *C. vulgaris* were noticed for the first time at two localities in the Golija Mts. At the Bojića brdo locality, a *C. vulgaris* population was recorded on the edge of a spruce forest in an extensively used mountain meadow with less than 100 individuals growing in small groups or solitarily along a transect 100 m long. With less than 50 individuals, the second population was on the Kondilo Hill, with very restricted distribution in between the local dirt road and the edge of a beech forest.

According to national legislation on protected habitat types („Službeni glasnik RS“, no. 35/2010), *C. vulgaris* heaths are marked as a priority habitat type for protection, and the species itself is strictly protected. Also, in The Habitats Directive - Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora - Annex I, *Calluna* heaths are recognised as potential NATURA 2000 habitats, so these newly recorded *Calluna* habitats should be protected, especially from current changes in traditional land use and overgrowing with woody species.

***Campylopus fragilis* (Brid.) Bruch & Schimp., fam. Leucobryaceae (moss, bryophyte)**

**Contributors:** Marko S. SABOVLJEVIĆ and Lado KUTNAR

**Geographical focus:** Slovenia

**New record and noteworthy data:** This is the second record for Slovenia, more than 100 years after the first report (1893).

**Specimen data:** Velika Plešivica near Adlešiči, Bela Krajina (Slovenia), N 45.526667°, E 15.293889°, 265 m a.s.l.; 16 July 2010; leg. Kutnar L.; det. Sabovljević M.; on *Castanea sativa* wood.

**Voucher:** Herbarium of the Slovenian Forestry Institute s/n, BEOU bryophyte collection, Bryo s/n.

This species was first reported from Slovenia in 1893 near Gorica in Slovenia (HÖHNEL 1893). Based on this record, it was thereafter cited in PAVLETIĆ (1955), MARTINČIČ (1968), SABOVLJEVIĆ *et al.* (2008), ROS *et al.* (2013) and HODGETTS (2015). Thus, the records were refreshed, but on the basis of previous citations, not really new specimen

records. The senior contributor performed monitoring of forest vegetation on an 8×16-km plot and collected a sample of mosses on the wood (mainly dead, but also living) of *Castanea sativa* Mill. The vegetation plot was in a forest stand with dominant sweet chestnut (*Castanea sativa*) trees on dystric soils. This forest stand represents a succession phase on former agricultural land developing toward potential emergence of a European hornbeam forest (*Abio albae-Carpinetum betuli* var. geogr. *Epimedium alpinum*) or even an acidophilous European beech forest (*Castaneo-Fagetum sylvaticae* s. lat.).

MARTINČIČ (2016) considers this moss species to be endangered in Slovenia (IUCN: EN) and not DD, since the estimate is based on a very old single record. In Europe or EU28, it is not considered threatened (HODGETTS *et al.* 2019), although it is on the national red lists of Austria, Germany, Montenegro, the Netherlands, Poland, Romania and Slovakia (HODGETTS 2015).

The new record of this species is therefore interesting both in the context of recent documentation of the flora of Slovenia and from the conservation point of view.

***Campylopus introflexus* (Hedw.) Brid., fam. Leucobryaceae (moss, bryophyte)**

**Contributors:** Marko S. SABOVLJEVIĆ and Mitja SKUDNIK  
**Geographical focus:** Slovenia

**New record and noteworthy data:** This is the second record for Slovenia of the invasive moss species in question, a neophyte in Slovenia.

**Specimen data:** Golovec near Ljubljana (Slovenia), N 46.019431°, E 14.562075°, 10 August 2013; leg. Skudnik M., Sabovljević M. S.; det. Skudnik M., Sabovljević M. S.; on a pine trunk.

**Voucher:** Herbarium of the Institute of Botany and Botanical Garden “Jevremovac”, University of Belgrade (BEOU), bryophyte collection, Bryo 06936.

The moss *Campylopus introflexus* is an invasive species in Europe. The native range of *C. introflexus* is in the Southern Hemisphere (South America, southern parts of Africa and Australia, New Zealand; MIKULÁŠKOVÁ *et al.* 2012). It is spreading from Western Europe to Central Europe and beyond. The first reports in Europe date from the 1940s, and it is possible that it invaded Europe from several points independently. The record presented here is the second known from Slovenia. The first report was by ELLIS *et al.* (2014). This one was in fact recorded earlier but was not reported up to now. In view of the invasive potential of the moss and its ability to spread over natural vegetation, the present record is significant in connection with monitoring of this species in Slovenia. Cuttings of the pine *Pinus sylvestris* L. along with ones of *Quercus petraea* (Matt.) Liebl. and *Fagus sylvatica* L. were the sites of the record. *Dicranella heteromalla* (Hedw.) Schimp., *Hypnum cupressiforme* Hedw. and *Polytrichum formosum* Hedw. were nearby associated bryophytes.

***Riccia frostii* Austin, fam. Ricciaceae; (thalloid liverwort, bryophyte)****Contributors:** Jovana PANTOVIĆ and Ivana STEVANOSKI**Geographical focus:** Serbia**New record and noteworthy data:** This is the first record for the central part of Serbia (city of Belgrade).**Specimen data:** Belgrade, Ada Ciganlija N 44.795371°, E 20.424721°, 16 October 2019; leg. Pantović J., Stevanoski I., Ćosić M.; det. Pantović J.; conf. Papp B.; on a muddy bank of the Sava River.**Voucher:** Herbarium of the Institute of Botany and Botanical Garden “Jevremovac”, University of Belgrade (BEOU), bryophyte collection, Bryo 07873 and Bryo 07874.

Despite intensified research on the bryophyte flora of Serbia during the past few decades, many species still lack distributional data and are known from only a few localities in the country (PANTOVIĆ & SABOVLJEVIĆ 2017). This is especially the case for complex, hard to identify bryophyte groups and for ephemeral species that have not been in the focus of investigation.

So far, the only known locality of *R. frostii* in Serbia comes from an almost 50-year-old record from the environs of Senta in the Vojvodina Province (GUELMINO *et al.* 1973, PANTOVIĆ *et al.* 2020). Hence, the present finding from the area of Belgrade represents not only the first confirmed new record of the species, but also the first record south of the Sava and Danube Rivers outside of the Vojvodina Province.

According to the new European Red List of Mosses, Liverworts and Hornworts (HODGETTS *et al.* 2019), *R. frostii* is considered to be a species of least concern (LC). However, it is regionally rare and protected in some neighbouring countries, e.g., Romania, where it is assigned to the category of CR (ȘTEFĂNUȚ & GOIA 2012) and Hungary (NT) (ERZBERGER *et al.* 2015).

*Riccia frostii* grows on alluvial, muddy soil on the margins of reservoirs and banks of large rivers. It develops during favourable years in autumn, after a warm and dry summer, when the water is low (CASAS *et al.* 2009; ERZBERGER *et al.* 2015). Its rosettes are usually characterised by a pinkish colour, but if they are absent, the presence of spores can confirm the identification.

***Santolina chamaecyparissus* L., fam. Asteraceae; (dicot, vascular plant)****Contributors:** Marjan NIKETIĆ and Gordana TOMOVIĆ**Geographical focus:** Serbia**New record and noteworthy data:** This is the first record in Serbia out of cultivation. This western and central Mediterranean perennial plant is in the initial phase of naturalisation in Serbia.**Specimen data:** Bor, Brestovačka Banja spa – Zlot, Banjska River, 1 km upstream from the Brestovačka Banja spa, N 44.060705°, E 22.035141°, MGRS 34T EP87, abandoned arable land near the riverbank, 29 April 2015; leg. Niketić M., Tomović G.; det. Niketić M., Tomović G.**Vouchers:** Department of Plant Ecology and Geography, Herbarium of the Institute of Botany and Botanical Garden “Jevremovac”, University of Belgrade (BEOU), vascular plant collection 43157; Natural History Museum in Belgrade, General Herbarium of the Balkan Peninsula (BEO) 100002.

This species was treated as a taxon cultivated in gardens and parks in Serbia (GAJIĆ 1975) and Albania (BARINA 2017), while in the flora of Croatia (NIKOLIĆ 2000) and Montenegro (PULEVIĆ 2005) it is considered to be allochthonous – an alien with unknown status (GREUTER 2006+).

A small and restricted group of *Santolina chamaecyparissus* individuals was found in abandoned arable land near the banks of the Banjska River. According to NIKETIĆ & TOMOVIĆ (2018), this western and central Mediterranean perennial plant should be treated as allochthonous in the initial phase of naturalisation in Serbia.

***Sisyrinchium montanum* Greene, fam. Iridaceae; (monocot, vascular plant)****Contributor:** Snežana VUKOJIČIĆ**Geographical focus:** Serbia**New record and noteworthy data:** This is the first record for western Serbia out of cultivation.**Specimen data:** Mt. Jelova Gora, 14 km from Užice, N 43.942061°, E 19.761129°, 925 m a.s.l.; 2 August 2019; leg./det. Vukojičić S.**Voucher:** Herbarium of the Institute of Botany and Botanical Garden “Jevremovac”, University of Belgrade (BEOU), vascular plant collection 17678.

In Serbia, *Sisyrinchium montanum* has the status of a naturalised species (to a great extent domesticated) (NIKETIĆ & TOMOVIĆ 2018). Until now this species out of cultivation was recorded only in two areas in southeastern Serbia: in Vlasina, where it was found in damp meadows (RANDJELOVIĆ & ZLATKOVIĆ 2010); and in the environs of the town of Bosilegrad (Krajište region), in hydrophilous tall herb fringe communities of plains and on montane to alpine levels (MILOSAVLJEVIĆ *et al.* 2008).

The newly recorded population on Mt. Jelova Gora numbers up to 100 individuals and is located in a beech forest clearing, next to the pathway leading to a spring called “Nedova voda”. According to national legislation, the given species is strictly protected, which is why this new habitat is of great conservation importance.

***Tomentypnum nitens* (Hedw.) Loeske, fam. Brachytheciaceae (moss, bryophyte)****Contributor:** Milan VELJIĆ**Geographical focus:** Serbia**New records and noteworthy data:** This is a nationally threatened species of great conservation interest, and these are the first records in the region of western Serbia and the Raški okrug county.

**Specimen data:** Serbia – southwestern Serbia: Golija Mts., Buban, Rudno, N 43.396733°, E 20.43263° and N 43.396605°, E 20.432763°, 15 July 2019; leg. Veljić M.; det. Veljić M.; in a peat-bog with *Sphagnum* spp. and *Eriophorum* sp.

**Voucher:** Herbarium of the Institute of Botany and Botanical Garden “Jevremovac”, University of Belgrade (BEOU), Bryophyte collection, Bryo 07858 and 07862a.

This wetland species was recorded twice in the Buban peat-bog area in the Golija Mts. It is a nationally endangered (IUCN: EN) species (SABOVLJEVIĆ *et al.* 2004) and therefore of great conservation interest. This new locality is a rare recent document of a new population of the given species in Serbia. Previous records in Serbia are from Vlasina (KATIĆ 1907; KOŠANIN 1910; PAVLETIĆ 1955; POPOVIĆ 1966; MARTINČIĆ 1968; PAPP *et al.* 2012); Kopaonik and Majdanpečka Domena (POPOVIĆ 1966); and with no precise locality given (GAJIĆ *et al.* 1991). The citation of SABOVLJEVIĆ (2003) is erroneous (pers. comm. Sabovljević).

The species is considered near threatened (IUCN: NT) in Europe and also in the EU28 directive (HODGETTS *et al.* 2019), but it is threatened in many countries: IUCN: CR in Luxembourg; IUCN: EN in Bulgaria and Hungary; and IUCN: VU in Great Britain, Northern Ireland, Spain and Iceland. In the Czech Republic and Slovenia, it has the status of IUCN: NT. It is threatened in the Netherlands (EB), Belgium (Mn), Austria (3), Germany (2) and Poland (V).

The present record is the first one in the region of southwestern Serbia and a new record in the Raški okrug county, where a previous one is stated for Mt. Kopaonik (but is actually from the region of central Serbia).

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REZIME



Botanica  
SERBICA

## Novi i značajni podaci o biljkama, algama i gljivama iz JI Evrope i susednih regiona, 1

Marko S. SABOVLJEVIĆ, Gordana TOMOVIĆ, Marjan NIKETIĆ, Predrag LAZAREVIĆ, Maja LAZAREVIĆ, Jelena LATINOVIĆ, Nedeljko LATINOVIĆ, Eva KABAŠ, Sanja Z. DJUROVIĆ, Lado KUTNAR, Mitja SKUDNIK, Jovana PANTOVIĆ, Ivana STEVANOSKI, Snežana VUKOJIČIĆ i Milan VELJIĆ

Prikazani su novi i značajni podaci sa područja JI Evrope i susednih regiona o patogenoj gljivi *Arthrocladiella mougeotii*, jetrenjači *Riccia frostii*, mahovinama *Campylopus fragilis*, *C. introflexusi* *Tomentypnum nitens*, paprati *Allosorus persicus*, monokotilama *Allium atropurpureum* i *Sisyrinchium montanum*, i dikotilama *Calluna vulgaris* i *Santolina chamaecyparissus*.

**Ključne reči:** novi prilog, *Allium atropurpureum*, *Allosorus persicus*, *Arthrocladiella mougeotii*, *Calluna vulgaris*, *Campylopus fragilis*, *Campylopus introflexus*, *Riccia frostii*, *Santolina chamaecyparissus*, *Sisyrinchium montanum*, *Tomentypnum nitens*