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Report on the new and insufficiently studied taxa in the flora of Serbia

Bojan Zlatković¹*, Stefan Bogosavljević², Nenad Smiljković³, Vladimir Randelović¹

¹University of Niš, Faculty of Sciences and Mathematics, Department of Biology and Ecology, Višegradska 33, 18000 Niš, Serbia

²The Pharmaceutical Chamber of Serbia, Dečanska 8a, Belgrade, Serbia

³Serbian Herpetological Society "Milutin Radovanovic", Despota Stefana 142, Belgrade, Serbia

*E-mail: bojanzlat@yahoo.com

Abstract:

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Several important floristic records were established during our recent floristic investigations of southeastern Serbia and Province Kosovo-Metohija. *Minuartia mediterranea* (Caryophyllaceae) and *Arabis glabra* subsp. *pseudoturritis* (Brassicaceae) are reported for the first time from the territory of Serbia, while presence of neglected species *Symphytum bulbosum* (Boraginaceae) and *Valerianella microcarpa* (Valerianaceae) is reevaluated, as they were reported from new localities.

Key words: vascular flora, new and neglected taxa, distribution, Serbia, Balkans.

Apstrakt:

Zlatković, B., Bogosavljević, S., Smiljković, N., Randelović, V.: Izveštaj o novim i manje poznatim taksonima za floru Srbije. *Biologica Nyssana*, 5 (1), Septemebor 2014: 63-69.

Tokom florističkih istraživanja jugoistočne Srbije i Kosova i Metohije, zabeležen je veći broj značajnih podataka za floru Srbije. *Minuartia mediterranea* (Caryophyllaceae) i *Arabis glabra* subsp. *pseudoturritis* (Brassicaceae) su po prvi put ustanovljeni na teritoriji Srbije. Rasprostranjenje *Symphytum bulbosum* (Boraginaceae) i *Valerianella microcarpa* (Valerianaceae) dopunjeno je novim lokalitetima, čime je potvrđeno prisustvo ovih, u flori Srbije, zanemarenih taksona.

Ključne reči: vaskularna flora, novi i manje poznati taksoni, distribucija, Srbija, Balkan

Introduction

The territory of Serbia, in common with the other regions of Balkan Peninsula, is characterized by relatively high floristic richness compared to the rest of Europe (Turriil, 1929, Stevanović et al. 1995; 1999). Flora of Serbia has been studied

since Grisebach (1843) and Pančić (1874, 1884), and this long period of continuous research has significantly increased the number of reported floristic data from this country. The largest amount of data from the recent period is included in the 8-volume publication *Flora of SR Serbia* (Josifović, ed., 1970-1976), summarizing the

overall knowledge collected by the date of publication of each volume. However, as a large amount of new floristic data was reported for the region during the last decades, additional papers were published either simultaneously or after the publication date of the volume dealing with those taxa (Diklić 1977; Nikolić et al. 1986). Even though the Flora of Serbia presently comprises accounts on more than 3600 species and subspecies, including data in two more recent volumes (Stevanović 1992, 2012), the number of newly reported taxa still fluctuates in the positive direction.

During the most recent period of floristic research of Serbia (and particularly its southern provinces) many taxa new or poorly known for this area have been registered and reassessed on the topic of their distribution, ecology and conservation (Zlatković et al. 2009; 2011). The aim of this paper is to report findings of two recently discovered plant taxa in the flora of Serbia, and to emphasize presence of two other neglected species recently established at new localities in Serbia. Resuming their distribution at the local scale would be useful as an addition to the forthcoming volumes of "The Flora of Serbia (I-X)" (Josifović, ed., 1970-1977; Sarić & Diklić 1986), offering newly obtained floristic data.

Material and methods

Distribution of the studied taxa within the territory of Serbia was determined and mapped in UTM grid system (10 x 10 Sq. km., UTM Zone 34T). In addition to the field survey, herbarium collections and literature sources were also checked for supplementation of distribution data. Recent volumes of Atlas Florae Europae (Jalas & Suominen 1986; Jalas et al. 1999) and comparative Chorology of the Central European Flora for selected taxa (Meusel et al. 1965; 1978; Meusel & Jäger 1992) were used in order to discuss and compare recent and previously published data on distribution. In order to align plant distribution with geology substrate, adequate sections of Geology Map of Yugoslavia (K 34-56, 34-57, 34-68) were used at scale 1:100,000 (Babović & Cvetković 1968; Karajovanović & Hristov 1972; Terzin et al. 1970).

Descriptions of taxa match those in the selected volumes of the Flora of Europe (Halliday 1993; Jones 1964; Pawlowski 1972; Ernet et al. 1976). The main taxonomic characters of enumerated taxa were briefly compared with other similar representatives of their genera from Serbian flora. In order to provide

explanation of the ecological conditions in relation to the new parts of their range, short notes on ecological conditions of their habitats are added. Nomenclature and synonyms are aligned with the Euro+Med (<http://ww2.bgbm.org/EuroPlusMed/>) databases and adequate volumes of the Flora of Europe (Ernet et al. 1976). Voucher specimens are deposited in the Herbarium of the Institute of Botany and Botanical Garden "Jevremovac", University of Belgrade (BEOU), with acquisition numbers given in the brackets.

Results and discussion

Minuartia mediterranea (Link) K. Malý

General distribution: Algeria, Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Egypt, France [incl. Corse], Greece [incl. Crete & Aegean Islands], Spain [incl. Balearic Islands], Israel, Jordan, Italy [incl. Sardinia & Sicily], Libya, Lebanon, Portugal, Syria, Malta, Macedonia, Montenegro, Morocco, Slovenia, Tunisia, Turkey.

New distribution data: Prizrenska Bistrica gorge (Rečane), xeric pastures (*Thero-Brachypodietea*) on shallow soil, limestone, 430 m, 26-05-1997, DM77, coll./det. B. Zlatković (BEOU 16853); Prizrenska Bistrica gorge (St. Arhangei Monastery), rocky ground and screes, limestone, 390 m, 26-05-1997, DM87, coll./det. B. Zlatković (**Fig. 1**).

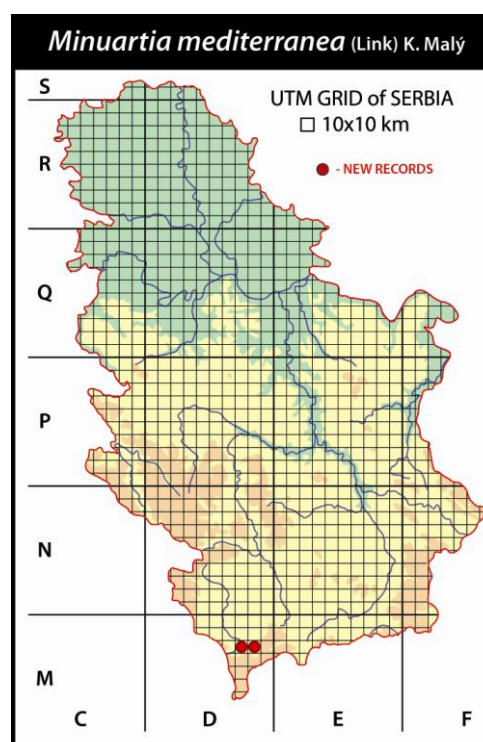


Figure 1. Distribution of *Minuartia mediterranea* in Serbia.

Description: Annual plant, with erect stems branching from the base or growing upward. Stem 3-15 cm tall, glabrous or subglabrous. Leaves linear, 10-12 mm long. Inflorescence dense, almost crowded. Pedicels usually shorter than sepals. Sepal segments 3-5 mm long and 0.5-0.7 mm wide, 3-veined, linear-lanceolate. Petals shorter than sepals or absent. Capsule usually shorter than sepals, with numerous almost smooth seeds, 0.4 mm in diameter (Halliday 1993). In the flora of Serbia this is the fourth reported species from Sect. *Sabulina* (Rchb.) Graebner of genus *Minuartia*, after *M. verna*, *M. hybrida* and *M. mesogitana* (Diklić & Stevanović 2012). Among the enumerated group of species, the newly reported *M. mediterranea* is most similar to *M. hybrida*. Main differences are in inflorescences, as cymes of *M. mediterranea* are denser and more crowded, while pedicels are shorter than sepals in the second species.

This species inhabits xeric and rocky pastures on shallow limestone soils, mainly occupied by annual plants. It was also recorded in warm positions of limestone screes in the gorges of upland region. It grows mainly as a constituent of communities in *Thero-Brachypodietea* alliance, together with *Phleum exaratum*, *Trachynia distachya*, *Helianthemum salicifolium*, *Valerianella coronata*, *Pteroccephalus plumosus* etc.

***Arabis glabra* (L.) Bernh. subsp. *pseudoturritis* (Boiss. & Heldr.) Maire**

General distribution: Algeria, Italy [C & S, incl. Sicily], Albania, Bulgaria, Greece [incl. Aegean Islands], Macedonia, Malta, Morocco.

New distribution data: Kozjak Mt. (Delinovački Rid), *Quercus-Carpinetum orientalis*, granite and migmatites, 560 m, 16-05-2004, [EM78](#), coll./det. B. Zlatković (BEOU 16883), subnom. *Turritis pseudoturritis*; Starac Mt. (Gornji Starac), *Ostrya-Carpinion aegeicum*, migmatites, 800 m, 02-05-2005, [EM78](#), coll./det. B. Zlatković (BEOU 16882), subnom. *Turritis pseudoturritis*; Pčinja river gorge (village Barbace), *Quercus-Carpinetum orientalis*, fine-grained biotite and biotite-muscovite gneiss, 530 m, 23-04-2003, [EM79](#), coll./det. B. Zlatković; Rujan Mt. (Orljak), *Quercus-Fagetum*, silicate, 742 m, 26-06-2009, [EM67](#), coll./det. B. Zlatković & N. Smiljković (BEOU 16884), subnom. *Turritis pseudoturritis* (**Fig. 2**).

Description: Biennial to perennial plant with usually erect and non-branching stems (40-70 cm), pubescent on ventral side. Basal leaves lanceolate, sinuate-dentate to lyrate, with stellate hairs. Cauline leaves usually ovate, sagittate in the basal part,

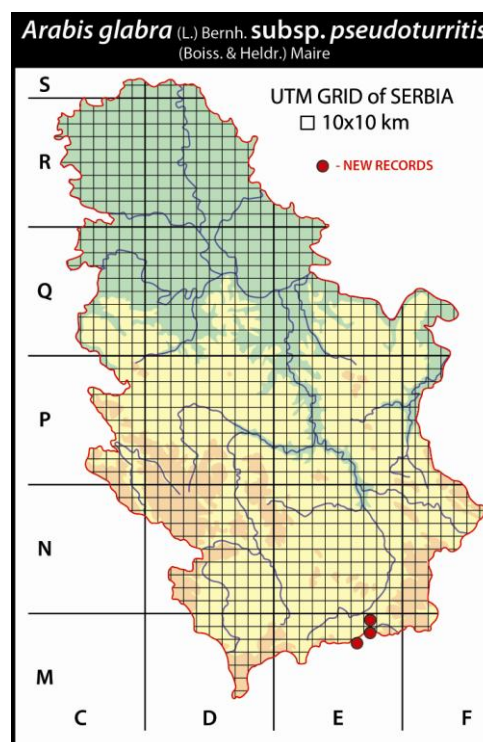


Figure 2. Distribution of *Arabis glabra* subsp. *pseudoturritis* in Serbia.

glabrous and glaucous. Petals 4-8 mm, cream or whitish, compound in lax, elongate inflorescence. Siliqua 50-80 (100) x 0.8-1.2 mm, erect, somewhat compressed and with prominent median veins. Seeds in a single row in each locus (Jones, 1964). The taxonomic position of this taxon is still uncertain as various authors have different opinions. In the earlier floristic literature it was either regarded as a well-defined species: *Turritis pseudoturritis* (Jones, 1964, Asenov, 1970, Trinajstić, 1976) or *A. pseudoturritis* (Micevski, 1995), or in the later period as a variety or synonym for *A. glabra* (Jones & Akeroyd, 1993; Ančev, 2007). According to several morphological traits, subsp. *pseudoturritis* is distinguishable from the typical subspecies of *A. glabra*, in our opinion indicating subspecies level. The most prominent difference from subsp. *glabra* is uniseriate seed alignment within the fruit and generally longer siliquae (up to 110 mm). Some of the authors considered both shape and venal prominence of the fruit wall as valuable additional characters for making difference of two taxa more clear. The valves of siliquae are more compressed and prominently three-veined in subsp. *pseudoturritis*, compared to the single central vein in subsp. *glabra*. The typical subspecies is distributed throughout Europe except for extreme north, while subsp. *pseudoturritis* is confined to southern Europe and northern Africa, overlapping

the southernmost part of the species range. *A. glabra* subsp. *pseudoturritis* may be confused with *A. laxa* which inhabits southern Balkans and Transcaucasia. This last species is distinguished from *A. glabra* subsp. *pseudoturritis* by oblong, sparsely ciliate, cauline leaves cordate in the base, and petals that are rather white or lilac in color. It is also similar with *A. pauciflora*, which is possibly erroneously reported for southern Serbia (A d a m o v i ć , 1899).

A. glabra subsp. *pseudoturritis* inhabits forest edges and stony places on silicate soils in the mountains of study region. Records of this taxon in the neighboring countries also show its sporadic distribution in mountains, but usually at higher altitudes. It was recorded in Bulgaria between 1400 and 2200 m above sea level (A s e n o v , 1970), at higher altitude than records from Serbia. On the other hand, in Macedonia it was reported from a much wider altitudinal range, from 800 to 2300 m above sea level (M i c e v s k i , 1995), similar to the recorded positions in Serbia. This subspecies has probably wider distribution in other mountain regions of Serbia that should be investigated in the future.

Symphytum bulbosum K. F. Schimp.

General distribution: Algeria, Albania, Bulgaria, France [Corse], Croatia, Germany, Greece, Switzerland, Italy [incl. Sardegna and Sicily], Slovenia, Turkey.

New records: Pčinja river gorge (village Jablanica), humid and shady places in the woods (*Quercus-Fagetia*), fine-grained biotite and biotite-muscovite gneiss, 560 m, 15-05-2005, EM78, coll./det. B. Zlatković (BEOU 16856); **Literature data for Serbia:** Bosilegrad (village Gornja Ljubata) – FN00, Bosilegrad (village Musulj) – FN00 (U r u m o f f 1937), (Fig. 3).

Description: Perennial plant with slender and creeping stock, producing subglobose underground tubers. Stems up to 50 cm, poorly branched in the upper part or simple, covered with short hooked hairs and (about 1.5 mm long) setae like the remaining part of the plant. Basal leaves large, with ovate to elliptical-lanceolate lamina, tapered to a distinct, long petiole. The cauline leaves elliptical to lanceolate with short petioles, the upper sessile and narrowly decurrent. Corolla about 8 – 11 mm long, pale yellow, with short and erect lobes. Tubular scales acute, lanceolate-subulate, papillose and exerted about 1-4 (5) mm from the tube. Stamens small and included, with minutely apiculate 2-2.5 mm long anthers (P a w l o w s k i , 1972). According to the phenotype, this plant is similar to *S. tuberosum*, and may be confused because both

species have swollen subterranean parts, especially in the vegetative stage. However, *S. bulbosum* is well distinguished according to several flower traits, first of all longer and exerted scales. Corolla is generally smaller, with terminal lobes that are not deflexed like in *S. tuberosum*.

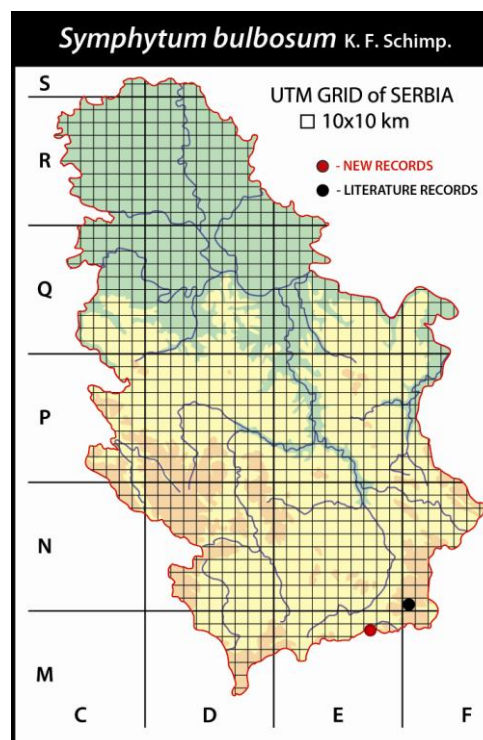


Figure 3. Distribution of *Symphytum bulbosum* in Serbia.

The reconstruction of its occurrence in Serbia is based at the data by U r u m o f f (1937), who reported this species for two localities in the Serbian part of Krajište region, formerly regarded as Bulgarian territory. The species inhabits different types of deciduous, termophilous forests mainly at lower altitudes of the montane region, in the zone of oak forests. It is sporadically recorded in the lower part of Pčinja Valley, close to the river at somewhat damp and shady habitats in the oak woods, together with *Lathyrus laxiflorus*, *Primula vulgaris*, *Arum orientale*, *Cardamine bulbifera*, *Helleborus odoratus*, *Galanthus nivalis*, *Corydalis solida* and other species of the herb layer.

Valerianella microcarpa Loisel.

General distribution: Bulgaria, France [incl. Corse], Greece [incl. Crete & Aegean Islands], Spain [incl. Balearic Islands], Italy [incl. Sardinia & Sicily], Portugal, Turkey [European part], Northern Africa.

New records in Serbia: Prizren (village Našec), *Thero-Brachypodietea*, xerophilous pastures on shallow soil, limestone, 390 m, 26-05-1997, DM77, coll./det. B. Zlatković (BEOU 16852); Prizrenska Bistrica gorge (St. Arhangeli Monastery), *Thero-Brachypodietea*, thermophilic pastures on shallow surface, limestone, 390 m, 26-05-1997, DM87, coll./det. B. Zlatković (BEOU 16851); **Literature data for Serbia:** Bosilegrad – FN20 (Urumoff 1937); (**Fig. 4**).

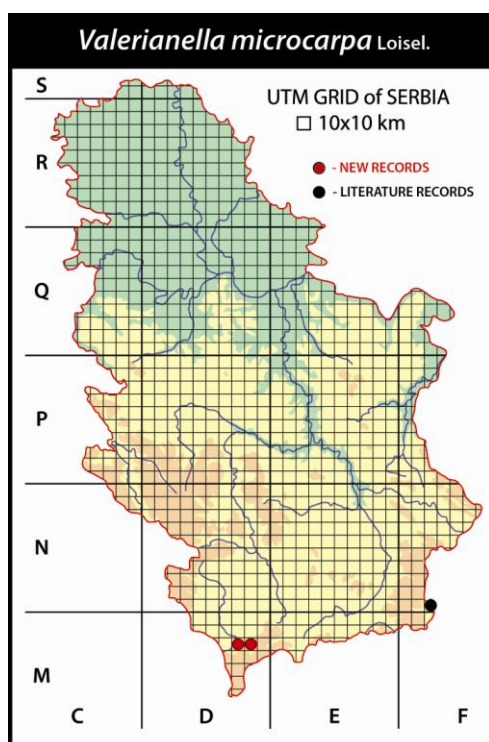


Figure 4. Distribution of *Valerianella microcarpa* in Serbia.

Description: Dwarf plant with stems 5-15 (35) cm long, in upper part dichotomously branched. Lower cauline and basal leaves ovate-spatulate, obtusate, entire to sinuate. Inflorescence dichotomous, dense, crowded. Bracts more or less auriculate, green, with a narrow scarious margin, the lower linear to spatulate, obtusate, the upper narrowly triangular acuminate. Fruits ovate to connate, densely hairy or glabrous, c. 1-1.5 mm long, numerous, arranged in fasciculate terminal clusters. Sterile loculi of the fruit reduced to tiny ribs, separated by ovate flat area. Calyx reduced to an indistinctly dentate, narrow rim (Ernet & Richardson, 1976).

As one of the representatives with smallest fruit size, this species is easily recognized among the species of genus *Valerianella* in Serbian flora. According to the shape of the fruit it might be confused with *V. dentata* and *V. muricata*, but both have larger fruits. After *V. costata*, this is the second report of the presence of neglected species of this

genus in Serbia (Zlatković et al., 2011) after the reports by Kojić (1973) and Randelović (1975). Occurrence of *V. microcarpa* was first reported by Urumoff (1937) from the former territory of Bulgaria close to Bosilegrad in SE Serbia. Remarkable flora of this area was consequently investigated in the later period (Randželović & Stamenković, 1986; 1987; Randželović et al., 1988), but presence of *V. microcarpa* has not been confirmed there yet. As in the case of *V. costata*, existence of this Mediterranean species may be expected from several other new sites influenced by mild climate in southern Serbia. The species is recorded in dense plant communities at hill slopes and along the roadsides, formed at slightly eutrophic soils, consisting mainly of grasses and annuals, e.g. *Poa bulbosa*, *Vulpia cilliata*, *Trifolium dalmaticum*, *Medicago minima*, *Parentucellia latifolia*.

Conclusion

According to the recent floristic studies, presence of two completely new and two neglected taxa for the flora of Serbia is reported from its southern regions and the province of Kosovo-Metohija. To the best of our knowledge, presence of *Minuartia mediterranea* and *Arabis glabra* subsp. *pseudoturritis* has not been reported from this region before. Reports on their occurrence from the new, remote sites in the central part of Balkan Peninsula are especially thought-provoking. The new records of these two taxa extend their ranges in northward direction, out of their known distribution in southern areas. The presence of neglected species *Symphytum bulbosum* and *Valerianella microcarpa* in the flora of Serbia is confirmed by adding new floristic data on their distribution. All new records contributed to knowledge of their general distribution and are important for the comprehensive publications that consider diversity of vascular plants of Serbia. Details on habitat preferences for the reported taxa offer additional information on their ecology in the newly established parts of their range in Balkan Peninsula.

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