DIVERSITY AND ECOLOGICAL ANALYSIS OF SERPENTINE FLORA IN THE KOSOVO SECTION OF THE IBAR RIVER VALLEY - COMPARISION WITH THE FLORA OF NEARBY REGIONS

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(Received 7th May 2020; accepted 20th Aug 2020)

Abstract. Formation of serpentine flora and vegetation is primarily influenced by local geology and they represent an extraordinary area for botanical research studies (from both taxonomical and ecological perspective). During a sixteen-year research of serpentine terrain flora of the Ibar river middle-stream valley in northern Kosovo and Metohija, the existence of 882 taxa grouped into 83 families and 386 genera has been proven. The collected serpentine flora was analysed on taxonomical, ecological and phytogeographical basis. Out of the total number of identified taxa, 73 (8.27%) are endemic, sub-endemic, relict and endomorelic. 31 taxa belong to a group of internationally significant vascular plants. Of these, 14 taxa have been protected by CITES Convention. The taxonomic structure of the serpentine flora of the Ibar river middle-stream valley is compared to the serpentine flora of Mt. Studena and Goleš Mt. (parts of Ibar serpentine massive).
Keywords: *floristic composition, Ibar serpentine massif, endemism, floristic similarity, Serbia*

Introduction

Serpentine is technically a mineral, but the same word is often used for all ultramafic rocks, the soils that form from them, and the unique ecosystems that form on them (Harrison and Rajakaruna, 2011). Serpentine is a ferromagnesian silicate mineral which contains high concentrations of nickel (Ni) and often chromium (Cr) and cobalt (Co) in a form available for plants (Westerbergh and Saura, 1992). Serpentine soils are often deficient in plant essential nutrients such as nitrogen (N), phosphorus (P), potassium (K), and sulfur (S) (Rajakaruna and Boyd, 2014)**,** while ratio of calcium (Ca): magnesium (Mg) is less than 1.0, and pH values range from basic to ultrabasic (Brooks, 1987; Selvi, 2007; Pavlova, 2007; Bani et al., 2013). Owing to this chemical composition, Novák (1926) described serpentine ranges as "dead rocks". Serpentine soils are typically recognized on the landscape as patchily distributed rock outcrops with stunted vegetation (Anacker, 2014). Serpentine outcrops are often steep and comparatively rocky, making them particularly vulnerable to erosion, which results in shallow soils (Brady et al., 2005) and stony structure (Kurt et al., 2013).

The serpentinite is rather unfavorable to plant growth, and its physical conditions also are inhospitable for many plants (Bani et al., 2013). However, plants would not be

http://www.aloki.hu ● ISSN 1589 1623 (Print) ● ISSN 1785 0037 (Online)
DOI: http://dx.doi.org/10.15666/aeer/1805_72897322

what they are, if they weren't able to conquer any tolerably suitable substratum by adapting to it (Vasić and Diklić, 2001). Plants adapted to grow under these constraints are called serpentinophytes (Selvi, 2007), distinguished by characteristic structural-morphological adaptations (Stevanović and Jakovljević, 2014); they posses capacity for removal and accumulation of metals (Branković et al., 2017). Many serpentine species are xeromorphic, and water deficiency has been suggested as another stress factor of many serpentine soils (Tumi, 2013). The serpentine flora contains both basophilous and acidophilous plants (Marin and Tatić, 2001). Vegetation growing on serpentinised rocks is often reduced in height, biomass, and ground cover (Gavrilović et al., 2017).

Ultramafic outcrops (also called "serpentine"), formed during tectonic movements, are widespread but sparse, covering roughly 3% of the Earth's surface (Guillot and Hattori, 2013). The largest serpentine areas in Europe are in the Balkans (Stevanović et al., 2003), with an estimated size of over 1,300 km^2 (Pustahija, 2011).

The serpentine areas on the Balkan Peninsula traverse discontinuously from the northwest to central Bosnia, over western and central Serbia, Metohija, Albania, Epirus and northern Thessaly all the way to the Island of Evia, Greece (Stevanović and Jakovljević, 2014). In Bulgaria serpentine areas are smaller and scattered (Pavlova, 2010), distributed in Soutwestern & Central Bulgaria (Stevanović et al., 2003). It should be emphasized that the floristic opulence of these habitats increases with the serpentinites of western and central Serbia, over Albania to northern Pindo and the Evia Island, Greece (Stevanović and Jakovljević, 2014).

In the territory of Serbia the largest serpentine surfaces are located in its western and central regions, as well as in Kosovo and Metohija territory, covering about 250000 ha (Stevanović et al., 2003). These serpentine zones are distinctly delimited from the adjacent surrounding regions with a different geological substratum (e.g., limestone) (Dudić et al., 2007). Kosovo, as a part of the Balkan, hosts an ultramafic area of 487 km^2 within its territory (Salihaj et al., 2018). The largest complexes of serpentine in Kosovo region are found in the valley of the Ibar River and the same are continued in a discontinuous chain through Koznica Mt. and Goleš Mt. to the southwest of Kosovo (Krasniqi and Millaku, 2007). The Ibar serpentine massif stretches along the middle course of the Ibar River and represents a link in the extension chain of the serpentines in Bosnia-Zlatibor and the Ibar gorge-Albania direction (Prodanović et al., 2008). The identified age ranges from post-trias to lower jurassic.

The serpentine terrains of northeastern Kosovo, i.e. the middle stream of the Ibar river, have been rarely visited and floristically researched, which resulted in scarce scientific literature (Pavlović, 1967; Rexhepi, 1979, 1992; Krasniqi et al., 1981; Ranđelović et al., 1982; Krivošej et al., 1993, 1995-1998; Tatić and Krivošej, 1997). A more thorough exploration of this area was started in 2003 by Prodanović, whose work resulted in publishing new chorological data on the flora of Kosovo and Metohija, and entire Serbia (Prodanović, 2007; Prodanović et al., 2004, 2008, 2010, 2012, 2013, 2018; Krivošej et al., 2003, 2011, 2013). However, a comprehensive study involving all vascular serpentine flora in the Ibar valley has not been published so far.

This paper presents a synthesis of all research studies performed in these area, both literature data and intensive field study data, starting from 2003 up to the present days. Its aim is to compile a complete checklist of floristic diversity of this area, analyse it on taxonomical, ecological and phytogeographical base and to compare the flora of two serpentinite regions in central Kosovo and central Serbia. It would be a significant scientific contribution to taxonomic and ecological studies of flora in whole Serbia.

http://www.aloki.hu ● ISSN 1589 1623 (Print) ● ISSN 1785 0037 (Online)
DOI: http://dx.doi.org/10.15666/aeer/1805_72897322

Only a good knowledge of floristic diversity may initiate the procedures that may lead to preserving and protecting rare and endangered and internationally important species in these areas.

Materials and Methods

Study area

The intensive research studies of serpentine terrain in middle stream of the Ibar river started in March 2003 and continued till today. The researched area covers terrains in the Ibar river canyon north of Kosovska Mitrovica towards the administrative boundary of Kosovo and Metohija and central Serbia and a 50 km long village area of Donje Jarinje (*Fig. 1*). It should be emphasized that this highway more or less follows the Ibar river course. The actual length of the investigated area, due to naturally winding river course, is much bigger.

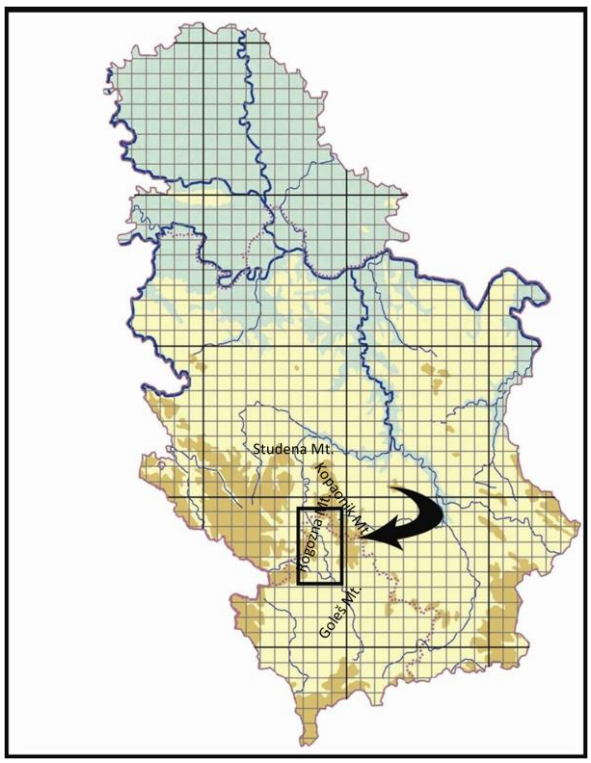

Figure 1. *Geographical position of investigated area in Serbia (UTM 10x10 sq km)*

The geographic relief of the Ibar river middle stream valley may be characterized as mountainous region – the Mountains of Rogozna, Kopaonik and Mokra raise up in the direction of the Ibar river canyon and they provide the main landscape characteristics to Kosovska Mitrovica basin. The altitude on the researched terrain varies between 500 and 900 meters above sea level. The climate of the Ibar river middle steam is defined as moderate –continental. The average air temperature is 10.2 ^{0}C. The researched area belongs to the zone with limited precipitation rate, around 614 mm.

The researched area in north Kosovo and Metohija covers the position between the Mesian and Illyrian provinces, since the Ibar river represents the farthest eastern

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boundary of the Illyrian province. Due to this herbal-geographic position complex floristic and vegetation relations occur.

Data collection

The floral material was collected in the wider area on both sides of the river, through the gorge. The collected material was processed on usual ways for herbariums and stored in the Herbarium of the Institute for Natural Conservation of Serbia (a department in Belgrade) and some specimens are stored in the Herbarium of the Institute of Botany and Botanical Garden "Jevremovac", University of Belgrade (BEOU). The contemporary literature has been used for plant determination. The nomenclature used for all the registered species in the area under investigation was adjusted to comply with Euro+Med Plantbase (2006) and The Plant List (2013). The floristic catalogue is arranged in alphabetical order of families and genera.

The floristic elements for phytogeographic analyses have been processed and analyzed in line with herbal-geographic classification of Stevanović (1992a). The well-known Raunkiaer system (1934) amended by Stevanović (1992b) for Serbian conditions, has been used for the classification of life forms. Checklist of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), as well as International Union for Conservation of Nature (IUCN) were used to determine the category of internationally significant and endangered species.

For the analysis of the similarity of flora in the researched area in the Ibar river valley and Studena planina/Mt. Studena and Goleš Mt., as parts of the Ibar serpentine massive, Sørensen's (1948) similarity index was used.

Results and Discussion

Taxonomic analysis of the flora

Biologically, serpentine sites frequently host a depauperate flora compared to the surrounding regions (Obratov-Petković et al., 2006). Serpentine habitats are important centres for floristic differentiation and speciation (Stevanović et al., 2003) distinguished by high number of endemics. Considering the fact that the serpentine terrains with the insufficiently developed soil and unfavourable water and mineral regime, and high levels of magnesium, iron, nickel and chrome are "inhospitable" for floral development, the total number of 882 identified taxa in the investigated area still show floral treasure (Prodanović et al., 2008).

During a 16-year research of serpentine terrain flora of the Ibar river middle-stream valley, 882 taxa (species, subspecies) has been identified, which represent about 25% of total flora of Serbia. They have been grouped into 83 families and 386 genera (*Table 1*). Class *Polypodiopsida* is presented by 8 families and 13 taxa. Only two species of *Pinopsida* can be found. Floristically speaking, the richest class is *Magnoliopsida* with 867 taxa. The greatest number of taxa is noted in family *Compositae* (105), followed by *Leguminosae* (86), *Poaceae* (66), *Lamiaceae* (51), *Brassicaceae* (50), *Caryophyllaceae* (49) which coincides with the most numerous families in the flora of entire Serbia (Stevanović et al., 1995).

http://www.aloki.hu ● ISSN 1589 1623 (Print) ● ISSN 1785 0037 (Online)
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Table 1. *Catalogue of the vascular plants observed in the serpentine terrains of Kosovo's section of the Ibar river valley*

CLASS/ FAMILY/*Species*	Source/Literature	Common English names
POLYPODIOPSIDA		
ASPLENIACEAE		
Asplenium adiantum-nigrum subsp. *serpentini* (Tausch) Heuf	Prodanović, 2007	black spleenwort
Asplenium ceterach L. subsp. *ceterach*	Prodanović, 2007	rustyback
Asplenium ruta-muraria L.	Prodanović, 2007	wall-rue
Asplenium trichomanes L.	Prodanović, 2007	maidenhair spleenwort
CYSTOPTERIDACEAE		
Cystopteris fragilis (L.) Bernh.	Prodanović, 2007	brittle bladder-fern
DENNSTAEDTIACEAE		
Pteridum aquilinum (L.) Kuhn	Prodanović, 2007	bracken
DRYOPTERIDACEAE		
Dryopteris filix-mas (L.) Schott	Prodanović, 2007	
EQUISETACEAE		male-fern
Equisetum arvense L.	Prodanović, 2007; Krivošej et al., 2013	field horsetail
Equisetum palustre L.	Prodanović, 2007	marsh horsetail
OPHIOGLOSSACEAE		
Ophioglossum vulgatum L.	Krivošej et al., 2013	adder's tongue
POLYPODIACEAE		
Polypodium vulgare L.	Prodanović, 2007	polypody
PTERIDACEAE		
Paraceterach marantae (L.) R.M. Tryon	Rexhepi, 1979; Prodanović, 2007	
Cheilanthes persica (Bory) Mett. ex Kuhn	Krivošej et al., 2003; Prodanović, 2007	
PINOPSIDA		
CUPRESSACEAE		
Juniperus communis L.	Prodanović, 2007	common juniper
Juniperus oxycedrus L.	Pavlović, 1967; Rexhepi, 1979; Rexhepi 1992; Prodanović, 2007	western prickly juniper, cade juniper
MAGNOLIOPSIDA		
ADOXACEAE		
Adoxa moschatellina L.	Prodanović, 2007	moschatel
Viburnum lantana L.	Prodanović, 2007	wayfaring tree
AMARANTHACEAE		
Amaranthus albus L.	Prodanović, 2007	tumble pigweed
Amaranthus blitoides S. Watson	Prodanović, 2007	mat amaranth
Amaranthus retroflexus L.	Prodanović, 2007	redroot pigweed
Chenopodium bonus-henricus L.	Prodanović, 2007	poor-man's asparagus
Chenopodium hybridum L.	Prodanović, 2007	goosefoot
Chenopodium opulifolium Schrad. ex W.D.J. Koch & Ziz	Prodanović, 2007	grey goosefoot
Chenopodium polyspermum L.	Prodanović, 2007	manyseed goosefoot
Dysphania botrys (L.) Mosyakin & Clemants	Prodanović, 2007	jerusalem oak goosefoot
Polycnemum majus A. Braun	Prodanović, 2007	giant needleleaf
AMARYLLIDACEAE		
Allium carinatum subsp. pulchellum (G.Don.) Bonnier & Layens	Prodanović, 2007	witch's garlic
Allium flavum L.	Pavlović, 1967; Prodanović et al., 2004; Prodanović, 2007	small yellow onion
Allium moschatum L.	Prodanović, 2007	wild onion
Allium pendulinum Ten.	Prodanović, 2007	italian garlic

http://www.aloki.hu ● ISSN 1589 1623 (Print) ● ISSN 1785 0037 (Online)
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CLASS/ FAMILY/*Species*	**Source/Literature**	**Common English names**
Allium scorodoprasum L.	Pavlović, 1967; Prodanović, 2007	rocambole
Allium sphaerocephalum L.	Prodanović, 2007	round-headed leek
Galanthus nivalis L.	Prodanović, 2007	snowdrop
ANACARDIACEAE		
Cotinus coggygria Scop.	Pavlović, 1967; Rexhepi, 1979; Prodanović, 2007	smoke tree
APIACEAE		
Aegopodium podagraria L.	Prodanović, 2007; Krivošej et al., 2013	goutweed
Anthriscus caucalis M.Bieb.	Prodanović, 2007	bur-chervil
Anthriscus cerefolium (L.) Hoffm.	Prodanović, 2007	garden chervil
Anthriscus sylvestris (L.) Hoffm.	Prodanović, 2007	cow parsley, wild chervil
Bifora radians M. Bieb.	Prodanović, 2007	wild bishop
Bupleurum praealtum L.	Prodanović, 2007	hare's-ears
Bupleurum rotundifolium L.	Prodanović, 2007	round-leaved thoroughwax
Bupleurum tenuissimum L.	Prodanović et al., 2013	slender hare's-ear
Chaerophyllum aureum L.	Prodanović, 2007	golden chervil
Chaerophyllum bulbosum L.	Prodanović, 2007	turnip rooted chervil
Chaerophyllum temulum L.	Prodanović, 2007	rough chervil,
Conium maculatum L.	Prodanović, 2007	poison hemlock
Daucus carota L.	Prodanović, 2007	wild carrot, bird's nest
Eryngium campestre L.	Rexhepi, 1979; Prodanović, 2007	field eryngo
Eryngium palmatum Pančić & Vis.	Prodanović, 2007	blue eryngo, flat sea holly
Eryngium serbicum Pančić	Prodanović, 2007; Prodanović et al., 2008	serbian sea holly
Falcaria vulgaris Bernh.	Prodanović, 2007	sickleweed
Foeniculum vulgare Mill.	Prodanović, 2007	sweet fennel
Heracleum sphondylium L.	Prodanović, 2007	common hogweed
Laser trilobum (L.) Borkh.	Prodanović, 2007	gladich
Laserpitium siler L.	Prodanović, 2007	laserwort
Laserpitium siler L. subsp. *siler*	Prodanović, 2007	laserwort
Myrrhoides nodosa (L.) Cannon	Prodanović, 2007	sweet cicely
Oenanthe silaifolia M.Bieb.	Prodanović, 2007; Krivošej et al., 2013	narrow-leaved water-dropwort
Orlaya grandiflora (L.) Hoffm.	Prodanović, 2007	white laceflower
Pastinaca sativa L.	Prodanović, 2007	parsnip
Pastinaca sativa L. subsp. *urens* (Godr.)	Prodanović, 2007	wild parsnip
Peucedanum alsaticum L.	Prodanović, 2007	hog's fennel
Peucedanum austriacum (Jacq.) W.D.J. Koch	Prodanović, 2007	giant hog's fennel
Peucedanum cervaria (L.) Cusson ex Lapeyr.	Prodanović, 2007	hart's word
Peucedanum officinale L.	Prodanović, 2007	marsh hog's fennel
Peucedanum oreoselinum (L.) Moench	Prodanović, 2007	mountain hog's Fennel
Pimpinella saxifraga L.	Prodanović, 2007	burnet-saxifrage,
Physospermum cornubiense (L.) DC.	Prodanović, 2007	bladderseed
Scandix pecten-veneris L.	Prodanović, 2007	Venus' comb
Seseli pallasii Besser	Prodanović, 2007	
Seseli peucedanoides (M.Bieb.) Koso.-Pol.	Prodanović, 2007	
Seseli rigidum Waldst. & Kit.	Prodanović, 2007	
Seseli rigidum Waldst. & Kit. subsp. *rigidum*	Prodanović, 2007	
Sium latifolium L.	Prodanović, 2007	water hemlock
Smyrnium perfoliatum L.	Prodanović, 2007	perfoliate alexanders
Torilis japonica (Houtt.) DC.	Prodanović, 2007	erect hedgeparsley
Trinia glauca (L.) Dumort.	Prodanović, 2007	honewort

http://www.aloki.hu ● ISSN 1589 1623 (Print) ● ISSN 1785 0037 (Online)
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CLASS/ FAMILY/*Species*	Source/Literature	Common English names
subsp. *glauca*		
APOCYNACEAE		
Vinca major L.	Prodanović, 2007	greater periwinkle
Vincetoxicum hirundinaria Medik.	Prodanović, 2007	white swallow-wort
ARACEAE		
Arum maculatum L.	Prodanović, 2007	cuckoo pint
ARALIACEAE		
Hedera helix L.	Prodanović, 2007	english ivy
ARISTOLOCHIACEAE		
Aristolochia clematitis L.	Prodanović, 2007	birthwort
Asarum europaeum L.	Prodanović, 2007	wild ginger
ASPARAGACEAE		
Anthericum liliago L.	Pavlović, 1967; Prodanović, 2007	lily
Asparagus officinalis L.	Prodanović, 2007	sparrow grass
Asparagus tenuifolius Lam.	Rexhepi, 1979	
Convallaria majalis L.	Prodanović, 2007	lily of the valleys
Leopoldia comosa (L.) Parl.	Prodanović, 2007	tassel hyacinth
Muscari racemosum Mill.	Prodanović, 2007	starch grape hyacinth
Ornithogalum gussonei Ten.	Prodanović, 2007	star-of-Bethlehem
Ornithogalum pyramidale L.	Prodanović, 2007	pyramidal star-of-Bethlehem
Ornithogalum refractum Kit. ex Schltdl.	Prodanović, 2007	star-of-Bethlehem,
Ornithogalum umbellatum L.	Prodanović, 2007	garden star-of-Bethlehem
Polygonatum hirtum (Bosc ex Poir) Pursh	Prodanović, 2007	king Solomon's-seal
Polygonatum odoratum (Mill.) Druce	Prodanović, 2007	fragrant Solomon's seal
Scilla bifolia L.	Prodanović, 2007	twin leaf squill
BERBERIDACEAE		
Berberis vulgaris L. f. *vulgaris*	Prodanović, 2007	common barberry
Epimedium alpinum L.	Prodanović et al., 2013	alpine barrenwort
BETULACEAE		
Alnus glutinosa (L.) Gaertn.	Prodanović, 2007; Krivošej et al., 2013	european black alder
Carpinus betulus L.	Prodanović, 2007	common hornbeam
Carpinus orientalis Mill.	Pavlović, 1967; Prodanović et al., 2004; Prodanović, 2007	oriental hornbeam
Corylus avellana L.	Prodanović, 2007; Krivošej et al., 2013	hazel
Ostrya carpinifolia Scop.	Prodanović et al., 2004; Prodanović, 2007	hop-hornbeam
BORAGINACEAE		
Anchusa azurea Mill.	Prodanović, 2007	bugloss
Anchusa officinalis L.	Prodanović, 2007	common bugloss, alkanet
Anchusa officinalis L. subsp. *officinalis*	Prodanović, 2007	common bugloss, alkanet
Asperugo procumbens L.	Prodanović, 2007	german-madwort
Buglossoides arvensis (L.) I.M. Johnst.	Prodanović, 2007	corn gromwell
Buglossoides purpurocaerulea (L.) I.M. Johnst.	Prodanović, 2007	purple gromwell
Cerinthe minor L.	Prodanović, 2007	honeyworts
Cynoglossum creticum Mill.	Prodanović, 2007	blue houndstonge
Cynoglossum officinale L.	Prodanović, 2007	houndstongue
Echium rubrum Forssk.	Rexhepi, 1979; Krivošej et al., 1993; Prodanović, 2007	viper's bugloss rubrum
Echium italicum L.	Prodanović, 2007	italian bugloss
Echium vulgare L.	Prodanović, 2007	common vipersbugloss
Halacsya sendtneri (Boiss.) Dörfl.	Pavlović, 1967; Rexhepi, 1979; Ranđelović et al., 1982; Prodanović, 2007; Prodanović et al., 2008	halacsya
Heliotropium europaeum L.	Prodanović, 2007	european turn-sole

http://www.aloki.hu ● ISSN 1589 1623 (Print) ● ISSN 1785 0037 (Online)
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CLASS/ FAMILY/*Species*	Source/Literature	Common English names
Lappula squarrosa (Retz.) Dumort.	Prodanović, 2007	bur forget-me-not
Myosotis arvensis (L.) Hill.	Prodanović, 2007	field forget-me-not
Myosotis discolor Pers.	Prodanović, 2007	changing forget-me-not
Myosotis sparsiflora J.K.Mikan ex Pohl.	Prodanović, 2007	forget-me-not
Nonnea pulla DC.	Prodanović, 2007	monkswort
Onosma montana Sm.	Prodanović, 2007	onosma
Pulmonaria mollissima Wulfen ex Hornem.	Prodanović, 2007	lungwort
Pulmonaria officinalis L.	Prodanović, 2007	common lungwort
Symphytum tuberosum L.	Prodanović, 2007	tuberous comfrey
BRASSICACEAE		
Aethionema saxatile subsp. *graecum* (Boiss. & Spruner) Hayek	Rexhepi, 1979; Prodanović, 2007	burnt candytuft
Aethionema saxatile (L.) R.Br. subsp. *saxatile*	Prodanović, 2007	burnt candytuft
Alliaria petiolata (M.Bieb.) Cavara & Grande	Prodanović, 2007	garlic mustard
Alyssum alyssoides (L.) L.	Prodanović, 2007	yellow alyssum
Alyssum markgrafii O.E.Schulz.	Pavlović, 1967; Rexhepi, 1979; Krivošej et al., 1993; Prodanović, 2007; Prodanović et al., 2008;	
Alyssum montanum L. subsp. *serbicum* Novák f. *macrophyllum* Novák	Pavlović, 1967; Prodanović, 2007; Prodanović et al., 2008	mountain alyssum
Alyssum montanum L. subsp. *serbicum* Novák f. *microphyllum* Novák	Pavlović, 1967; Prodanović, 2007	mountain alyssum
Alyssum montanum L. subsp. *serbicum* Novák f. *serbicum*	Pavlović, 1967; Prodanović, 2007	mountain alyssum
Alyssum wierzbickii Heuff.?	Prodanović, 2007	alpine alyssum
Arabidopsis arenosa (L.) Lawalrée	Prodanović, (unpublished, field observation)	rockcres
Arabidopsis thaliana (L.) Heynh.	Prodanović, 2007	thale cress, mouse-ear cress
Arabis hirsuta (L.) Scop.	Prodanović, 2007	hairy rock-cress
Arabis turrita L.	Prodanović, 2007	rockcress,
Berteroa incana (L.) DC.	Prodanović, 2007	hoary alyssum
Calepina irregularis (Asso) Thell.	Prodanović, 2007	white ballmustard
Camelina sativa (L.) Crantz.	Prodanović, 2007	camelina, false flax
Capsella bursa-pastoris (L.) Medik	Prodanović, 2007	shepherd's purse
Cardamine bulbifera (L.) Crantz.	Prodanović, 2007	coralroot
Cardamine graeca L.	Krivošej & Prodanović, 2011	southern bitter-cress
Cardamine impatiens L.	Prodanović, 2007	narrowleaf bittercress
Cardamine pratensis L.	Prodanović, 2007	cuckoo flower, lady's smock
Descurainia sophia (L.) Webb. ex Prantl	Prodanović, 2007	flixweed
Diplotaxis muralis (L.) DC.	Prodanović, 2007	wall rocket
Draba lasiocarpa Rochel	Prodanović, 2007	whitlow-grasses
Draba muralis L.	Prodanović, 2007	whitlowgrass
Erysimum cuspidatum (M. Bieb.) DC.	Prodanović, 2007	wallflower
Erysimum diffusum Ehrh.	Pavlović, 1967; Prodanović, 2007	diffuse wallflowe
Erysimum odoratum Ehrh.	Prodanović, (unpublished, field observation)	smelly wallflower
Erysimum kuemmerlei Jáv.	Prodanović, 2007	wallflower
Erysimum sylvestre (Crantz) Scop.	Prodanović, 2007	wallflower
Fibigia clypeata (L.) Medik	Prodanović et al., 2004; Prodanović, 2007	false-gypsophila ankyropetalum
Hesperis matronalis L.	Prodanović, 2007	mother-of-the-evening
Isatis tinctoria L.	Prodanović, 2007	dyer's woad, glastum

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Lepidium campestre (L.) R.Br.	Prodanović, 2007	field pepperwort , field cress
Lepidium draba L.	Prodanović, 2007	whitetop, hoary cress
Lepidium ruderale L.	Prodanović, 2007	roadside pepperweed
Myagrum perfoliatum L.	Prodanović, 2007	bird's-eye cress, muskweed
Odontarrhena bertolonii subsp. *scutarina* (Nyár) Španiel & al.	Prodanović, 2007	
Rorippa amphibia (L.) Besser	Prodanović, 2007	great yellowcress
Rorippa austriaca (Crantz) Spach.	Prodanović, 2007	austrian yellow-cress
Rorippa lippizensis (Wulfen) Rchb.	Prodanović, 2007	yellowcress
Rorippa sylvestris (L.) Besser	Prodanović, 2007	creeping yellowcress, yellow fieldcress
Sisymbrium altissimum L.	Prodanović, 2007	tall hedge-mustard, tumblemustard
Sisymbrium loeselii L.	Prodanović, 2007	small tumbleweed mustard
Sisymbrium officinale (L.) Scop.	Prodanović, 2007	hedge mustard
Sisymbrium orientale L.	Prodanović, 2007	indian hedgemustard
Sisymbrium strictissimum L.	Prodanović, 2007	perennial rocket
Thlaspi arvense L.	Prodanović, 2007	stinkweed, bastard cress, fanweed
Thlaspi kovatsii Heuff.	Prodanović, 2007	pennycress
Turritis glabra L.	Prodanović, 2007	tower rockcress, tower mustard
CAMPANULACEAE		
Asyneuma canescens (Waldst. & Kit.) Griseb. & Schenk	Prodanović, 2007	harebells
Asyneuma limonifolium (L.) Janch.	Pavlović, 1967; Ranđelović et al., 1982; Prodanović, 2007	harebells
Campanula cervicaria L.	Prodanović, 2007	bristly bellflower
Campanula lingulata Waldst. & Kit.	Rexhepi, 1979; Prodanović et al., 2004; Prodanović, 2007	bellflower
Campanula persicifolia L.	Prodanović, 2007	peach-leaved bellflower
Campanula rapunculoides L.	Prodanović, 2007	creeping bellflower
Campanula rapunculus L.	Prodanović, 2007	rampion bellflower
Campanula rapunculus L. f. *montana* Pančić	Prodanović, 2007	rampion bellflower, rampion
Campanula trachelium L.	Prodanović, 2007	nettle-leaved bellflower
Legousia speculum-veneris (L.) Durande ex Vill.	Prodanović, 2007	looking glass, large Venus's-looking-glass
CANNABACEAE		
Humulus lupulus L.	Prodanović, 2007	common hop
CAPRIFOLIACEAE		
Cephalaria leucantha (L.) Scharad. ex Roem. & Schult.	Rexhepi, 1979; Prodanović, 2007	giant scabious
Knautia arvensis (L.) Coult.	Prodanović, 2007	field scabious
Knautia integrifolia (Honck. ex L.) Bertol	Prodanović, 2007	whole-leaved scabious
Lonicera caprifolium L.	Prodanović, 2007	italian woodbine, perfoliate honeysuckle
Scabiosa argentea L.	Prodanović, (unpublished, field observation)	silver scabious
Scabiosa columbaria L.	Rexhepi, 1979; Prodanović, 2007	pigeon scabious, pincushion flower
Scabiosa fumaroides Vis. & Pančić	Prodanović, 2007; Prodanović et al., 2008	
Valeriana officinalis L.	Prodanović, 2007	garden heliotrope, valerian
Valeriana tuberosa L.	Krivošej et al., 1995-1998; Prodanović, 2007	tuberous valerian
Valerianella coronata (L.) DC.	Prodanović, 2007	corn lettuce
Valerianella dentata (L.) Pollich	Ranđelović et al., 1982; Prodanović, 2007	corn salad
Valerianella locusta (L.) Laterr.	Prodanović, 2007	corn salad

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Valerianella rimosa Bastard	Prodanović, 2007	beaked corn salad
CARYOPHYLLACEAE		
Agrostemma githago L.	Prodanović, 2007	corncockle
Arenaria serpyllifolia subsp. *leptoclados* (Rchb.) Nyman	Prodanović, 2007	thyme-leaf sandwort
Arenaria serpyllifolia L.	Prodanović, 2007	thyme-leaf sandwort
Cerastium brachypetalum Desp. ex Pers	Prodanović, 2007	gray chickweed
Cerastium decalvans Schloss. & Vuk.	Prodanović, 2007	balkan rozhets
Cerastium fontanum Baumg.	Prodanović, 2007	mouse-ear chickweed
Cerastium pumilum Curtis	Prodanović, 2007	dwarf mouse-ear, european chickweed
Cerastium pumilum var. *glutinosum* (Čelak) E.Rico	Prodanović, 2007	dwarf mouse-ear
Cerastium semidecandrum L.	Prodanović, 2007	fivestamen chickweed
Dianthus carthusianorum L.	Prodanović, 2007	carthusian pink
Dianthus giganteus d'Urv	Prodanović, 2007	pink
Dianthus pinifolius Sm.	Prodanović, 2007	immediate children
Dianthus pinifolius subsp. *serbicus* Wettst.	Pavlović, 1967; Prodanović, 2007	Immediate children
Dianthus sylvestris Wulfen subsp. *sylvestris*	Rexhepi, 1979; Prodanović, 2007	wood pink
Herniaria glabra L.	Prodanović, 2007	smooth rupturewort
Herniaria hirsuta L.	Prodanović, 2007	hairy rupturewort.
Herniaria incana Lam.	Prodanović, 2007	grey rupturewort
Holosteum umbellatum L.	Prodanović, 2007	jagged chickweed
Minuartia glomerata (M.Bieb.) Degen.	Prodanović et al., 2004; Prodanović, 2007	stitchwort
Minuartia hamata (Hausskn.) Mattf.	Prodanović, 2007	sandwort
Minuartia hirsuta (M.Bieb) Hand.-Mazz.	Rexhepi, 1979; Prodanović, 2007	hairy sandwort
Minuartia setacea (Thuill.) Hayek	Prodanović, 2007	sandwort
Minuartia verna (L.) Hiern	Prodanović, 2007	leadwort
Moehringia trinervia (L.) Clairv.	Prodanović, 2007	apetalous sandwort , three-nerved sandwort
Petrorhagia illyrica subsp. *haynaldiana* (Janka) P.W. Ball & Heywood	Pavlović, 1967; Prodanović, 2007	
Petrorhagia illyrica (Ard.) P.W.Ball & Heyood.	Pavlović, 1967; Prodanović, 2007	
Petrorhagia prolifera (L.) P.W. Ball. & Heywood	Rexhepi, 1979; Prodanović, 2007	proliferous pink
Petrorhagia saxifraga (L.) Link.	Pavlović, 1967; Rexhepi, 1979; Prodanović et al., 2004; Prodanović, 2007	tunic flower, coat flower
Saponaria glutinosa M. Bieb.	Prodanović, 2007	soapwort
Saponaria officinalis L.	Prodanović, 2007	common soapwort, bouncing-bet
Scleranthus annuus subsp. *polycarpos* (L.) Bonnier & Layens	Prodanović, 2007	annual knawel
Scleranthus perennis subsp. *dichotomus* (Schur) Nyman	Prodanović, 2007	perennial knawel
Silene latifolia subsp. *alba* (Mill.) Greuter & Burdet	Prodanović, 2007	bladder campion
Silene armeria L.	Prodanović, 2007	sweet William catchfly
Silene baccifera (L.) Roth.	Prodanović, 2007	campion
Silene bupleuroides L.	Prodanović, 2007	campion
Silene conica L.	Prodanović, 2007	striped corn catchfly
Silene coronaria (Desr.) Clairv. ex Rchb.	Prodanović, 2007	rose campion
Silene flos-cuculi (L.) Greuter & Burdet	Prodanović, 2007	ragged-robin
Silene italica (L.) Pers.	Prodanović, 2007	italian catchfly

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Silene nutans L.	Prodanović, 2007	nottingham catchfly
Silene otites (L.) Wibel.	Prodanović, 2007, Ranđelović et al., 1982	spanish catchfly
Silene viscaria (L.) Jess.	Prodanović, 2007	sticky catchfly
Silene vulgaris (Moench) Garcke	Prodanović, 2007	bladder campion
Stellaria aquaticua (L.) Scop.	Prodanović, 2007	giant chickweed
Stellaria graminea L.	Prodanović, 2007; Krivošej et al., 2013	grassleaved stichwort
Stellaria holostea L.	Prodanović, 2007	greater stitchwort
Stellaria media (L.) Vill.	Prodanović, 2007	common chickweed
Stellaria nemorum L.	Prodanović, 2007	nodding chickweed
CELASTRACEAE		
Euonymus europaeus L. var. *europaeus* f. *angustifolia* (Schultz) Rony	Prodanović, 2007	european spindle
Euonymus europaeus L. var. *grandifolia* Form. f. *scaberula* (Beck) Jovanović	Prodanović, 2007	european spindle
Euonymus latifolius (L.) Mill.	Prodanović, 2007	broadleaf spindle
Euonymus verrucosus Scop.	Prodanović, 2007	spindle tree
CERATOPHYLLACEAE		
Ceratophyllum submersum L.	Prodanović, 2007	soft hornwort
CISTACEAE		
Fumana bonapartei Maire et Petitm.	Pavlović, 1967; Rexhepi, 1979; Ranđelović et al., 1982; Prodanović, 2007; Prodanović et al., 2008	needle sunrose
Fumana procumbens (Dunal) Gren. & Godr.	Prodanović et al., 2004; Prodanović, 2007	sprawling needle sunrose
Helianthemum nummularium (L.) Mill. subsp. *nummularium*	Prodanović et al., 2004; Prodanović, 2007	common rock-rose
Helianthemum salicifolium (L.) Mill.	Prodanović, 2007	rock rose, sunrose
CLUSIACEAE		
Hypericum barbatum Jacq.	Prodanović, 2007	bearded St. John's wort
Hypericum hirsutum L.	Prodanović, 2007	hairy St John's-wort
Hypericum perforatum L.	Rexhepi, 1979; Prodanović, 2007	perforate St. John's wort
Hypericum rumeliacum Boiss.	Prodanović, 2007	St. John's wort
COLCHICACEAE		
Colchicum autumnale L.	Prodanović et al., 2004; Prodanović, 2007; Krivošej et al., 2013	autumn crocus, meadow saffron
COMPOSITAE		
Achillea coarctata Poir.	Prodanović, 2007	yarrow
Achillea collina (Becker ex Rchb.f.) Heimerl.	Prodanović, 2007	yarrow
Achillea critmifolia Waldst. & Kit.	Prodanović, 2007	yarrow
Achillea millefolium L.	Prodanović, 2007	milfoil, common yarrow
Achillea pseudopectinata Janka	Prodanović, 2007	yarrow
Ambrosia artemisiifolia L.	Prodanović, 2007	common ragweed, annual ragweed
Anthemis arvensis L.	Prodanović, 2007	corn chamomile, mayweed
Arctium lappa L.	Prodanović, 2007	greater burdock
Artemisia absinthium L.	Prodanović, 2007	absinth wormwood
Artemisia alba Turra	Prodanović, 2007	white wormwood
Artemisia campestris L.	Prodanović, 2007	common sagewort
Artemisia scoparia Waldst. & Kitam.	Prodanović, 2007	virgate wormwood
Artemisia vulgaris L.	Prodanović, 2007	common mugwort
Bellis perennis L.	Prodanović, 2007; Krivošej et al., 2013	common daisy
Carduus candicans Waldst. & Kit.	Prodanović, 2007	thistle
Carduus nutans L.	Prodanović, 2007	musk thistle

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Carlina acaulis L.	Prodanović, 2007	stemless carline thistle, dwarf carline thistle
Carthamus lanatus L.	Prodanović, 2007	woolly carthamus, woolly safflower
Centaurea jacea L.	Prodanović, 2007	brown knapweed
Centaurea orientalis L.	Prodanović, 2007	knapweed
Centaurea phrygia L.	Rexhepi, 1979; Prodanović, 2007	wig knapweed
Centaurea scabiosa L. subsp. *fritschii* (Hayek) Hayek	Prodanović, 2007	greater knapweed
Centaurea scabiosa L. subsp. *spinulosa* (Spreng.) Arcang	Prodanović, 2007	scabious knapweed, greater knapweed
Centaurea solstitialis L.	Prodanović, 2007	yellow star-thistle
Centaurea stoebe L. subsp. *austrialis* (Pančić ex A.Kern) Greuter	Pavlović, 1967; Rexhepi, 1979; Prodanović, 2007	spotted knapweed
Centaurea stoebe L.	Prodanović, 2007	panicled knapweed, spotted knapweed
Chondrilla juncea L.	Prodanović et al., 2004; Prodanović, 2007	rush skeletonweed, nakedweed
Cichorium intybus L.	Prodanović, 2007	chicory
Cirsium arvense (L.) Scop.	Prodanović, 2007	creeping thistle
Cirsium creticum (Lam.) Urv.	Prodanović, 2007	bull thistle
Cirsium lanceolatum (L.) Hill.	Prodanović, 2007	bull thistle, common thistle
Cota austriaca (Jacq.) Sch.Bip.	Prodanović, 2007	austrian chamomile
Cota tinctoria (L.) J.Gay.	Prodanović, 2007	golden marguerite, yellow chamomile
Crepis biennis Lapeyr.	Prodanović, 2007	rough Hawksbeard
Crepis foetida subsp. *rhoeadifolia* (M.Bieb.) Čelak	Prodanović, 2007	stinking hawksbeard
Crepis sancta (L.) Bornm.	Pavlović, 1967; Prodanović, 2007	holy hawksbeard
Crepis setosa Haller f.	Prodanović, 2007	bristly hawksbeard
Crupina vulgaris Pers ex Cass.	Ranđelović et al., 1982; Prodanović, 2007	bearded creeper
Cyanus segetum Hill	Prodanović, 2007	cornflower, bachelor's button
Cyanus triumfettii (All.) Dostál ex Á. Löve & D.Löve	Prodanović, 2007	mountain cornflower
Cyanus triumfettii (All.) Dostál ex Á. Löve & D.Löve subsp. *axillaries* (Čelak.) Štepánek	Prodanović, 2007	mountain cornflower
Doronicum columnae Ten.	Prodanović, (unpublished, field observation)	leopard's bane
Doronicum hungaricum (Sadler) Rchb.f	Prodanović, 2007; Krivošej & Prodanović, 2011; Prodanović et al.,2012	
Doronicum orientale Hoffm.	Prodanović, (unpublished, field observation)	leopard's bane
Echinops ritro subsp. *ruthenicus* (M.Bieb.) Nyman	Prodanović, 2007	southern globethistle
Echinops sphaerocephalus L.	Prodanović, 2007	glandular globe-thistle
Erigeron acer L.	Prodanović, 2007	bitter fleabane
Erigeron canadensis L.	Prodanović, 2007	horseweed, canadian horseweed
Eupatorium cannabinum L.	Prodanović, 2007	hemp-agrimony, holy rope
Filago arvensis L.	Prodanović, 2007	field cottonrose
Gallatella albanica Degen	Rexhepi 1992; Krivošej et al., 1993; Prodanović, 2007; Prodanović et al., 2008	
Gallatela linosyris (L.) Rchb.	Prodanović, 2007	goldilocks aster
Hieracium bauhini Besser subsp. *besserianum* Spreng	Prodanović, 2007	hawkweed
Hieracium bauhini Besser subsp. *filiferum* (Tausch) Zahn	Prodanović, 2007	hawkweed

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Hieracium bauhini Besser subsp. *heathinum* (N.P.) Zahn	Prodanović, 2007	hawkweed
Hieracium bauhini Besser subsp. *pseudo-kerneri* Zahn	Prodanović, 2007	hawkweed
Hieracium bauhini Besser subsp. *pseudosparsum* Zahn	Prodanović, 2007	hawkweed
Hieracium cymosum Vill.	Prodanović, 2007	hawkweed
Hieracium hoppeanum Wallr. ex Nyman	Prodanović, 2007	Hoppe's hawkweed
Hieracium lachenalii Suter subsp. *festinum* (Boreau) Zahn.	Prodanović, 2007	common hawkweed, yellow hawkweed
Hieracium murorum L. subsp. *gentile* (Boreau) Sudre	Prodanović, 2007	wall hawkweed
Hieracium schmidtii subsp.*pallidum* (Biv.) O.Bolòs & Vigo	Prodanović, 2007	Schmidt's hawkweed
Hieracium sabaudum L. subsp. *vagum* Zahn	Prodanović, 2007	new england hawkweed, european hawkweed
Hypochaeris maculata L.	Prodanović, 2007	spotted cat's ear
Hypochaeris radicata L.	Prodanović, 2007	catsear, hairy cat's ear, false dandelion
Inula britannica L.	Prodanović, 2007	british elecampane, british yellowhead
Inula conyza (Griess.) DC.	Prodanović, 2007	ploughman's spikenard
Inula ensifolia L.	Rexhepi, 1979; Prodanović, 2007	swordleaf inula
Inula hirta L.	Prodanović, 2007	hairiness inula
Inula oculus-christi L.	Prodanović, 2007	Christ's eye hoary fleabane
Inula salicina L.	Prodanović, 2007	irish fleabane
Jurinea mollis (L.) Rchb.	Rexhepi, 1979; Prodanović, 2007	
Klasea radiata (Waldst. & Kit.) A.Löve & D. Löve	Prodanović, 2007	radiating outwords
Lactuca muralis (L.) Gaertn.	Prodanović, 2007	wall lettuce
Lactuca perennis L.	Prodanović, 2007	mountain lettuce, blue lettuce
Lactuca serriola L.	Prodanović, 2007	prickly lettuce
Lactuca viminea (L.) J. Presl.& C. Presl.	Prodanović, 2007	pliant lettuce
Leontodon hispidus L.	Prodanović, 2007	bristly hawkbit
Leucanthemum vulgare (Vaill) Lam.	Prodanović, 2007	ox-eye daisy
Matricaria chamomilla L.	Prodanović, 2007	chamomile
Onopordum acanthium L.	Prodanović, 2007	cotton thistle
Petasites hybridus (L.) G.Gaertn. &al.	Prodanović, 2007	butterbur
Pilosella bauhini (Schult.) Arv.-Touv.	Prodanović, 2007	
Pilosella piloselloides (Vill.) Soják	Prodanović, 2007	hawkweed
Podospermum laciniatum (L.) DC.	Prodanović, 2007	divided -eaved viper's grass
Pulicaria dysenterica (L.) Gaertn.	Prodanović, 2007	common fleabane
Scolymus hispanicus L.	Krasniqi et al., 1981	golden thistle, spanish oyster thistle
Scorzonera austriaca Willd. f. *latifolia* Vis.	Pavlović, 1967; Rexhepi, 1979; Prodanović, 2007	
Scorzonera hispanica L. var. *glastifolia* (Willd.) Wallr.	Prodanović, 2007	black salsify, spanish salsify
Senecio erucifolius L.	Prodanović, 2007	hoary ragwort
Senecio leucanthemifolius subsp. *vernalis* (Waldst. & Kit.) Greuter	Prodanović, 2007	eastern groundsel
Serratula tinctoria L.	Prodanović, 2007	dyer's plumeless saw-wort, saw-wort
Solidago virgaurea L.	Prodanović, 2007	goldenrod, woundwort
Sonchus asper (L.) Hill subsp. *glaucescens* (Jord.) Ball ex Ball	Prodanović, 2007	prickly sow-thistle
Tanacetum corymbosum (L.) Sch.-Bip.	Prodanović, 2007	corymbflower tansy
Tanacetum vulgare L.	Prodanović, 2007	common tansy, garden tansy
Taraxacum campyloides G.E.Haglund	Prodanović, 2007	dandelion

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Tephroseris papposa (Rchb.) Schur.	Prodanović, 2007	
Tragopogon balcanicus Velen.	Prodanović, 2007	
Tragopogon dubius Scop. subsp. *major* (Jacq.) Vollm	Prodanović, 2007	yellow salsify
Tragopogon dubius Scop.	Prodanović et al., 2004; Prodanović, 2007	yellow salsify
Tragopogon pratensis subsp. *orientalis* (L.) Čelak.	Prodanović, 2007	ack-go-to-bed-at-noon, meadow salsify
Tragopogon pterodes Petrović	Pavlović, 1967;	
Tussilago farfara L.	Prodanović, 2007; Krivošej et al., 2013	coltsfoot
Xanthium orientale subsp. *italicum* (Moretti) Greuter	Prodanović, 2007	rough cocklebur, clotbur
Xeranthemum annuum L.	Pavlović, 1967; Rexhepi, 1979; Ranđelović et al., 1982; Prodanović, 2007	annual everlasting, immortelle
CONVOLVULACEAE		
Calystegia sepium (L.) R.Br.	Prodanović, 2007	hedge bindweed
Convolvulus arvensis L.	Prodanović, 2007	field bindweed
Convolvulus cantabrica L.	Pavlović, 1967; Rexhepi, 1979; Ranđelović et al., 1982; Prodanović et al., 2004; Prodanović, 2007	cantabrican morning glory
Cuscuta epithymum (L.) L.	Prodanović, 2007	dodder, lesser dodder
Cuscuta europaea L.	Prodanović, 2007	greater dodder, european dodder
CORNACEAE		
Cornus mas L.	Prodanović, 2007	cornelian cherry dogwood
Cornus sanguinea L.	Prodanović, 2007	common dogwood
CRASSULACEAE		
Hylotelephium telephium (L.) H. Ohba.	Prodanović, 2007	orpine, livelong, life-everlasting
Sedum acre L.	Rexhepi, 1979; Ranđelović et al., 1982; Prodanović et al., 2004; Prodanović, 2007	goldmoss stonecrop
Sedum album L.	Pavlović, 1967; Rexhepi, 1979; Prodanović et al., 2004; Prodanović, 2007	white stonecrop
Sedum dasyphyllum L.	Rexhepi, 1979; Prodanović, 2007	corsican stonecrop
Sedum hispanicum L.	Prodanović, 2007	spanish stonecrop
Sedum ochroleucum Chaix	Prodanović, 2007	european stonecrop
Sedum sexangulare L.	Prodanović, 2007	tasteless stonecrop
Sempervivum heuffelii Schott	Pavlović, 1967; Prodanović, 2007	houseleeks
Sempervivum marmoreum Griseb.	Prodanović, 2007	house leek (houseleek)
CUCURBITACEAE		
Bryonia cretica subsp. *dioica* (Jacq.) Tutin	Prodanović, 2007	english mandrake
Echinocystis lobata (Michx) Torr. & A. Gray	Prodanović, 2007	wild cucumber, prickly cucumber
CYPERACEAE		
Carex acuta L.	Prodanović, 2007	acute sedge
Carex appropinquata Schumach.	Prodanović, 2007	fibrous tussock-sedge
Carex caryophyllea Latour.	Prodanović, 2007	vernal sedge
Carex distans L.	Prodanović, 2007	distant sedge
Carex divulsa Stokes.	Prodanović, 2007	grey sedge
Carex filiformis L.	Prodanović, 2007	downy-fruited sedge
Carex hirta L.	Prodanović, 2007	hairy sedge
Carex leporina L.	Prodanović, 2007	eggbract sedge, oval sedge
Carex montana L.	Prodanović, 2007	mountain, soft-leaved sedge
Carex muricata subsp. *pairae* (F.W.Schultz.) Čelak.	Prodanović, 2007	rough sedge, prickly sedge
Carex ornithopoda Willd.	Prodanović et al., 2004; Prodanović,	bird-foot sedge

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	2007	
Carex panicea L.	Prodanović, 2007	carnation sedge
Carex pendula Huds.	Prodanović, 2007	pendulous sedge, hanging sedge
Carex riparia Curtis	Prodanović, 2007	greater pond sedge
Carex spicata Huds.	Prodanović, 2007	spiked sedge
Carex vulpina L.	Prodanović, 2007	true fox sedge
Schoenoplectus lacustris (L.) Palla	Prodanović, 2007	lakeshore bulrush
DIPSACACEAE		
Lomelosia palaestina (L.) Raf.	Prodanović et al.,2010	palestine scabious
EUPHORBIACEAE		
Euphorbia amygdaloides L.	Prodanović, 2007; Krivošej et al., 2013	wood spurge
Euphorbia barrelieri Savi	Prodanović, 2007	spurge
Euphorbia cyparissias L.	Prodanović et al., 2004; Prodanović, 2007	cypress spurge
Euphorbia esula subsp. *tommasniana* (Bertol.) Kuzmanov	Prodanović, 2007	green spurge, leafy spurge
Euphorbia falcata L.	Prodanović, 2007	sickle spurge
Euphorbia glabriflora Vis.	Pavlović, 1967; Rexhepi, 1979; Ranđelović et al., 1982; Krivošej et al., 1993; Prodanović, 2007	spurge
Euphorbia glareosa Pall. ex M.Bieb.	Prodanović, 2007	spurge
Euphorbia helioscopia L.	Prodanović, 2007	sun spurge
Euphorbia ilirica Lam.	Prodanović, 2007	illyrian spurge
Euphorbia myrsinites L.	Rexhepi, 1979; Ranđelović et al., 1982; Prodanović, 2007	myrtle spurge, blue spurge
Euphorbia platyphyllos L.	Prodanović, 2007	broadleaved spurge
Euphorbia salicifolia Host.	Prodanović, 2007	spurge
Euphorbia stricta L.	Prodanović, 2007	tintern spurge
Euphorbia taurinensis All.	Prodanović, 2007	spurge
Mercurialis ovata Sternb. & Hoppe	Prodanović, 2007	
Mercurialis perennis L.	Prodanović, 2007	dog's mercury
FAGACEAE		
Quercus cerris L.	Prodanović, et al., 2004; Prodanović, 2007	turkey oak
Quercus frainetto Ten.	Prodanović et al., 2004; Prodanović, 2007	hungarian oak
Quercus petraea (Matt.) Liebl.	Prodanović, 2007	sessile oak
Quercus pubescens Willd.	Pavlović, 1967; Prodanović et al., 2004; Prodanović, 2007	downy oak, pubescent oak
GENTIANACEAE		
Centaurium erythraea Rafn	Prodanović, 2007	european centaury
Gentiana cruciata L.	Prodanović, 2007	cross gentian
GERANIACEAE		
Erodium ciconium (L.) L' Hér.	Prodanović, 2007	redstem filaree, redstem stork's bill
Erodium cicutarium (L.) L'Hér.	Prodanović, 2007	redstem filaree, redstem stork's bill
Geranium columbinum L.	Prodanović, 2007	long-stalked crane's-bill, longstalk cranesbill
Geranium dissectum Jusl.	Prodanović, 2007	cut-leaved crane's-bill
Geranium lucidum L.	Prodanović, 2007	shining cranesbill, shiny geranium
Geranium molle L.	Prodanović, 2007	dove's-foot crane's-bill
Geranium phaeum L.	Prodanović, 2007	dusky crane's-bill
Geranium pyrenaicum Burm.f.	Prodanović, 2007	hedgerow cranesbill
Geranium robertianum L.	Prodanović, 2007	herb-Robert, red robin
Geranium sanguineum L.	Prodanović, 2007	bloody crane's-bill
IRIDACEAE		

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Crocus chrysanthus (Herb.) Herb.	Prodanović, 2007	golden crocus
Iris graminea L.	Prodanović, 2007; Krivošej et al., 2013	grass leaved Iris
Iris pseudacorus L.	Prodanović, 2007	yellow iris, water flag
Iris reichenbachii Heuff.	Prodanović, 2007	
JUNCACEAE		
Juncus bufonius L.	Prodanović, 2007	toad rush
Juncus compressus Jacq.	Prodanović, 2007	compressed rush
Juncus inflexus L.	Prodanović, 2007	hard rush, blue rush
Luzula campestris (L.) DC.	Prodanović, 2007	field wood-rush
Luzula forsteri (Sm.) DC.	Prodanović, 2007	southern wood-rush
LAMIACEAE		
Ajuga chamaepitys (L.) Schreb.	Prodanović et al., 2004; Prodanović, 2007	yellow bugle, ground-pine
Ajuga chamaepitys subsp.*chia* (Schreb.) Arcang.	Prodanović, 2007	yellow bugle, ground-pine
Ajuga genevensis L.	Prodanović, 2007; Krivošej et al., 2013	blue bugle, geneva bugleweed
Ajuga laxmannii (Murray) Benth.	Prodanović, 2007	bugleweed, ground pine
Ballota nigra L.	Prodanović, 2007	black horehound
Clinopodium acinos (L.) Kuntze	Prodanović et al., 2004; Prodanović, 2007	basil thyme, spring savory
Clinopodiuma alpinum (L.) Kuntze	Prodanović, 2007	alpine calamint
Clinopodium nepeta subsp. *glandulosum* (Req.) Govaerts	Prodanović, 2007	lesser calamint
Clinopodium thymifolium (Scop.) Kuntze	Prodanović, 2007	clinopodium thymifolium from the wild
Clinopodium vulgare L.	Prodanović, 2007	wild basil
Galeopsis speciosa Mill.	Prodanović, 2007	arge-flowered hempnettle
Glechoma hederacea L.	Prodanović, 2007	creeping charlie
Glechoma hirsuta Waldst.& Kit.	Prodanović, 2007	ground-ivy
Lamium amplexicaule L.	Prodanović, 2007	common henbit
Lamium bifidum subsp. *balcanicum* Velen.	Prodanović, 2007	dead-nettles
Lamium galeobdolon (L.) L.	Prodanović, 2007	yellow archangel, yellow deadnettle
Lamium garganicum L. subsp. *garganicum*	Prodanović, 2007	large dead nettle
Lamium garganicum L. subsp. *glabratum* (Griseb.) Briq.	Prodanović, 2007	large dead nettle
Lamium purpureum L.	Prodanović, 2007	red dead-nettle
Leonurus cardiaca L.	Prodanović, 2007	motherwort in english
Lycopus europaeus L.	Prodanović, 2007	gypsywort
Marrubium peregrinum L.	Prodanović, 2007	horehound
Marrubium vulgare L.	Prodanović, 2007	white horehound, common horehound
Melittis melissophyllum L.	Prodanović, 2007	bastard balm
Mentha aquatica L.	Prodanović, 2007	water mint
Mentha longifolia (L.) L.	Prodanović, 2007; Krivošej et al., 2013	asian mint
Nepeta cataria L.	Prodanović, 2007	catnip, catswort
Origanum vulgare L.	Prodanović, 2007	origanum, wild marjoram
Phlomis tuberosa L.	Prodanović et al.,2018	tuberous jerusalem sage
Prunella laciniata (L.) L.	Ranđelović et al., 1982; Prodanović, 2007	cutleaf selfheal
Prunella vulgaris L.	Prodanović, 2007	common self-heal, heal-all
Salvia amplexicaulis Lam.	Prodanović, 2007	stem-clasping sage
Salvia nemorosa L.	Prodanović, 2007	woodland sage, balkan clary
Salvia pratensis L. subsp. *pozegensis* (Watzl) Diklic	Prodanović, 2007; Prodanović et al., 2008	meadow sage
Salvia sclarea L.	Prodanović et al., 2004; Prodanović,	salvia romana, clary sage

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	2007	
Salvia verticillata L.	Prodanović, 2007	lilac sage
Scutellaria altissima L.	Prodanović, 2007	tall skullcap
Scutellaria galericulata L.	Prodanović, 2007	marsh skullcap, hooded skullcap
Sideritis montana L.	Prodanović et al., 2004; Prodanović, 2007	mountain ironwor
Stachys germanica L.	Prodanović, 2007	downy woundwort
Stachys officinalis (L.) Trevis	Prodanović, 2007	common hedgenettle, betony
Stachys palustris L.	Prodanović, 2007	marsh woundwort
Stachys recta subsp. *baldacii* (K. Malý) Hayek	Ranđelović et al., 1982; Rexhepi, 1979; Prodanović, 2007	stiff hedgenettle
Stachys recta L. subsp. *recta* var. *chrysophaea* (Pančić) Hayek f. *chrysophae*	Prodanović, 2007	stiff hedgenettle
Stachys scardica (Gris.) Hayek	Rexhepi, 1979; Prodanović, 2007	
Teucrium chamaedrys L.	Prodanović et al., 2004; Prodanović, 2007	wall germander
Teucrium montanum L.	Pavlović, 1967; Ranđelović et al, 1982; Prodanović, 2007	mountain germander
Teucrium montanum L. subsp. *montanum*	Prodanović, 2007	mountain germander
Thymus longicaulis C. Presl.	Pavlović, 1967	thyme
Thymus pulegioides subsp. *montanus* (Benth.) Ronniger.	Prodanović, 2007	broad-leaved thyme
Ziziphora capitata L.	Prodanović, 2007	oriental zizifora
LEGUMINOSAE		
Amorpha fruticosa L.	Prodanović, 2007	false indigo bush
Astragalus cicer L.	Prodanović, 2007	chickpea milkvetch
Astragalus dasyanthus Pall.	Prodanović, 2007; Prodanović et al., 2008; Prodanović et al.,2012	milkvetch
Astragalus glycyphyllos L.	Prodanović, 2007	liquorice milkvetch
Astragalus hamosus L.	Prodanović, 2007	southern milk vetch
Astragalus onobrychis L.	Pavlović, 1967; Ranđelović et al., 1982; Prodanović, 2007	sainfoin milk vetch
Chamaecytisus ciliatus var. *alpestris* (Schur.) Diklić	Prodanović, 2007	
Colutea arborescens L.	Prodanović, 2007	bladder senna
Coronilla scorpioides (L.) Koch.	Prodanović, 2007	yellow crown vetch, annual scorpion-vetch
Cytisus austriacus subsp. *heuffelii* (Wierzb.) Asch. & Graebn	Prodanović, 2007	broom
Cytisus decumbens (Durande) Spach.	Ranđelović et al., 1982; Prodanović, 2007	scotch broom
Cytisus hirsutus L.	Prodanović, 2007	clustered broom
Cytisus procumbens (Willd.) Spreng.	Prodanović, 2007	broom
Dorycnium pentaphyllum subsp. *germanicum* (Gremli) Gams	Pavlović, 1967; Rexhepi, 1979; Prodanović, 2007	prostrate canary clover, badassi
Dorycnium pentaphyllum subsp. *herbaceum* (Vill.) Rouy	Prodanović et al., 2004; Prodanović, 2007	prostrate canary clover, badassi
Genista januensis Viv.	Prodanović, 2007	broom
Genista sagittalis L.	Prodanović, 2007; Krivošej et al., 2013	winged broom
Genista tinctoria L.	Prodanović, 2007	dyer's greenweed, dyer's broom
Hippocrepis comosa L.	Prodanović, 2007	horseshoe vetch
Hippocrepis emerus (L.) Lassen	Ranđelović et al., 1982; Prodanović, 2007	scorpion senna
Lathyrus hallersteinii Baumg.	Prodanović, 2007	yellow pea
Lathyrus hirsutus L.	Prodanović, 2007	caley pea, singletary pea, hairy vetchling

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Lathyrus latifolius L.	Prodanović, 2007	everlasting-pea, perennial pea
Lathyrus niger (L.) Bernh.	Prodanović, 2007	black pea
Lathyrus nissolia L.	Prodanović, 2007	grass vetchling, grass pea
Lathyrus pannonicus (Jacq.) Garcke	Prodanović, 2007	felted vetch
Lathyrus pratensis L.	Prodanović, 2007; Krivošej et al., 2013	meadow vetchling
Lathyrus setifolius L.	Prodanović, 2007	narrow-leaved red vetchling
Lathyrus sphaericus Retz.	Prodanović, 2007	grass pea, round-seeded vetchling
Lathyrus tuberosus L.	Prodanović, 2007	tuberous pea, tuberous vetchling
Lathyrus venetus (Mill.) Wohlf.	Prodanović et al., 2004; Prodanović, 2007	bushy vetchling
Lathyrus vernus (L.) Bernh.	Prodanović, 2007	spring vetchling, spring pea
Lembotropis nigricans (L.) Griseb.	Ranđelović et al., 1982; Prodanović, 2007	black broom
Lens nigricans (M. Bieb.) Godr.	Prodanović, 2007	lens
Lotus corniculatus L.	Prodanović, 2007	birdsfoot trefoil
Medicago arabica (L.) Huds.	Prodanović, 2007	spotted medick
Medicago falcata L.	Ranđelović et al., 1982; Prodanović, 2007	yellow lucerne, sickle alfalfa
Medicago lupulina L.	Prodanović et al., 2004; Prodanović, 2007	black medick, nonesuch
Medicago minima (L.) L.	Prodanović, 2007	little burclover
Medicago orbicularis (L.) Bartal.	Prodanović, 2007	blackdisk medick, button clover
Medicago prostrata Jacq.	Pavlović, 1967; Rexhepi, 1979; Prodanović, 2007	alfalfa, wild
Medicago rigidula (L.) All.	Prodanović, 2007	tifton burclover, rigid medick
Medicago sativa L.	Prodanović, 2007	lucerne
Melilotus albus Medik.	Prodanović, 2007	honey clover, white melilot
Melilotus officinalis (L.) Pall.	Prodanović, 2007	yellow sweet clover
Onobrychis alba (Waldst. & Kit.) Desv.	Prodanović, 2007	sainfoin
Onobrychis viciifolia Scop.	Prodanović, 2007	common sainfoin
Ononis spinosa subsp. *hircina* (Jacq.) Gams	Prodanović, 2007	spiny restharrow
Ononis pusilla L.	Prodanović, 2007	
Oxytropis pilosa (L.) DC.	Prodanović, 2007; Prodanović et al.,2012	hairy milk vetch
Pisum sativum subsp. *elatius* (M.Bieb.) Asch.& Graebn.	Prodanović, 2007	dun pea
Robinia pseudoacacia L.	Prodanović, 2004; Prodanović, 2007	black locust
*Securigera elegans (*Pancic) Lassen	Prodanović, 2007	crownvetch
Securigera varia (L.) Lassen	Prodanović et al., 2004; Prodanović, 2007	purple crownvetch
Trifolium angustifolium L.	Prodanović, 2007	narrowleaf crimson clover
Trifolium arvense L.	Prodanović, 2007	hare's-foot clover
Trifolium dalmaticum Vis.	Prodanović, 2007	dalmatian clover
Trifolium fragiferum L.	Prodanović, 2007	strawberry clover
Trifolium glomeratum L.	Krivošej & Prodanović, 2011	clustered clover
Trifolium hirtum All.	Prodanović, 2007	rose clover
Trifolium incarnatum L.	Prodanović, 2007	crimson clover, italian clover
Trifolium medium L.	Prodanović, 2007	zigzag clover
Trifolium montanum L.	Prodanović, 2007; Krivošej et al., 2013	mountain clover
Trifolium ochroleucon Huds.	Prodanović, 2007	sulphur clover
Trifolium patens Schreb.	Prodanović, 2007; Krivošej et al., 2013	clover
Trifolium pignantii Fauchė & Chaub.	Prodanović, 2007	clover
Trifolium pratense L.	Prodanović, 2007	red clover
Trifolium repens L.	Prodanović, 2007	white clover, landino clover
Trifolium striatum L.	Prodanović, 2007	knotted clover

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Trifolium strictum Jusl	Prodanović, 2007; Krivošej & Prodanović, 2011	upright clover
Trifolium trichopterum Pancic	Pavlović, 1967; Prodanović, 2007	
Trigonella esculenta Willd.	Prodanović, 2007	fenugreek
Trigonella gladiata M. Bieb.	Prodanović et al.,2010	fenugreek
Vicia cracca L.	Prodanović, 2007	tufted vetch, cow vetch, bird vetch
Vicia cracca subsp. *incana* (Gouan) Rouy.	Prodanović, 2007	tufted vetch, cow vetch, bird vetch
Vicia grandiflora Scop.	Prodanović, 2007	large-flowered vetch, large yellow vetch
Vicia hirsuta (L.) Gray	Prodanović, 2007	hairy tare, hairy vetch
Vicia lathyroides L.	Prodanović, 2007	spring vetch
Vicia pannonica Crantz	Prodanović, 2007	hungarian vetch
Vicia peregrina L.	Prodanović, 2007	wandering vetch
Vicia pisiformis L.	Prodanović, 2007	pea vetch
Vicia sativa L.	Prodanović, 2007	common vetch
Vicia sativa subsp. *nigra* (L.) Ehrh.	Prodanović, 2007	common vetch, garden vetch
Vicia sparsiflora Ten.	Prodanović, 2007	vetch
Vicia tenuifolia Roth.	Prodanović, 2007	fine-leaved vetch, cow vetch
Vicia villosa Roth.	Prodanović, 2007	winter vetch, hairy vetch
LILIACEAE		
Erythronium dens-canis L.	Prodanović, 2007	dog's tooth violet
Fritillaria montana Hoppe ex W.D.J. Koch	Prodanović, 2007	missionbells
Gagea lutea (L.) Ker Gawl.	Prodanović, 2007	yellow star-of-bethlehem
Gagea pusilla (F.W.Schmidt) Sweet	Krivošej et al., 1995-1998, Prodanović, 2007	yellow star-of-bethlehem
Lilium martagon L.	Prodanović, 2007	martagon lily, turk's cap lily
Tulipa sylvestris L.	Prodanović, 2007	wild tulip, woodland tulip
Tulipa serbica Tatić & Krivošej	Tatić & Krivošej, 1997; Prodanović, 2007; Prodanović et al., 2008	serbian tulip
LINACEAE		
Linum bienne Mill.	Prodanović, 2007	pale, narrowleaf flax
Linum austriacum L.	Prodanović, 2007	austrian flax
Linum flavum L.	Prodanović, 2007	golden flax, yellow flax
Linum nervosum Waldst.& Kit.	Krivošej & Prodanović, 2011	
Linum tenuifolium L.	Pavlović, 1967; Prodanović, 2007	narrow-leaved flax
LYTHRACEAE		
Lythrum salicaria L.	Prodanović, 2007	purple loosestrife
MALVACEAE		
Althaea hirsuta L.	Prodanović, 2007	hairy marshmallow
Althaea officinalis L.	Prodanović, 2007	marsh-mallow
Lavatera thuringiaca L.	Krasniqi et al., 1981; Prodanović, 2007	garden tree-mallow
Malva sylvestris L.	Prodanović, 2007	high mallow
Tilia cordata Mill.	Prodanović, 2007	small-leaved lime
Tilia tomentosa Moench	Prodanović, 2007	silver lime
MELANTHIACEAE		
Veratrum nigrum L.	Prodanović, 2007	black false hellebore
NYMPHAEACEAE		
Nuphar lutea (L.) Sm.	Prodanović et al.,2010	yellow pond-lily
OLEACEAE		
Fraxinus ornus L.	Prodanović et al.,2004; Prodanović, 2007	manna ash
Ligustrum vulgare L.	Prodanović, 2007	wild privet
ONAGRACEAE		
Epilobium angustifolium L.	Prodanović, 2007	fireweed

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Epilobium hirsutum L.	Prodanović, 2007	great willowherb
Epilobium parviflorum Schreb.	Prodanović, 2007	hoary willowherb
Oenothera biennis L.	Prodanović, 2007	common evening-primrose
ORCHIDACEAE		
Anacamptis morio (L.) R.M.Bateman, Pridgeon & M.W.Chase	Prodanović, 2007; Prodanović et al., 2008	green-winged orchid
Anacamptis papilionaceae (L.) R.M.Bateman, Pridgeon & M.W.Chase	Prodanović, 2007; Prodanović et al., 2008	butterfly orchid
Anacamptis pyramidalis (L.) Rich.	Prodanović, 2007	pyramidal orchid
*Cephalanthera damasonium (*Mill.) Druce	Prodanović, 2007	white helleborine
Cephalanthera rubra (L.) Rich.	Prodanović, 2007; Prodanović et al., 2008	red helleborine
Epipactis helleborine (L.) Crantz.	Prodanović, 2007	broad-leaved helleborine
Epipactis helleborine (L.) Crantz. subsp. *helleborine*	Prodanović, 2007	broad-leaved helleborine
Epipactis microphylla (Ehrh.) Sw.,	Prodanović et al., 2004; Prodanović, 2007; Prodanović et al., 2008;	small-leaved helleborine
Himantoglossum caprinum (M. Bieb.) Spreng.	Prodanović et al.,2018	
Limodorum abortivum (L.) Sw.	Prodanović, 2007; Prodanović et al., 2008	violet limodore
Neottia nidus-avis (L.) Rich.	Prodanović, 2007; Prodanović et al., 2008;	bird's-nest orchid
Neotinea tridentata (Scop.) R.M.Bateman, Pridgeon & M.W.Chase	Prodanović, 2007; Prodanović et al., 2008; Krivošej et al., 2013	three-toothed orchid
Ophrys apifera Huds.	Prodanović, 2007	bee orchid
Orchis mascula (L.) L.	Prodanović, 2007; Prodanović et al., 2008;	early-purple orchid, early spring orchis
Orchis purpurea Huds.	Prodanović, 2007; Prodanović et al., 2008;	lady orchid
Platanthera bifolia (L.) Rich	Prodanović, 2007; Prodanović et al., 2008	lesser butterfly-orchid
OROBANCHACEAE		
Lathraea squamaria L.	Prodanović, 2007	common toothwort
Melampyrum arvense L.	Prodanović, 2007	field cow-wheat
Melampyrum cristatum L.	Prodanović, 2007	crested cow-wheat
Melampyrum heracleoticum Boiss. & Orph.	Prodanović, 2007; Prodanović et al., 2008	cow wheat
Orobanche alba Stephan ex Willd.	Prodanović, 2007	scalloped broomrape
Orobanche caryophyllacea Sm.	Prodanović, 2007	clove-scented broomrape
Parentucellia latifolia Caruel	Prodanović, 2007	broadleaf glandweed
Pedicularis comosa subsp. *campestris* (Griseb. & Schenk) Soó	Prodanović, 2007	glandweed
Pedicularis comosa L.	Prodanović, 2007	glandweed
Pedicularis friderici-augusti Tomm.	Prodanović, 2007	Frederick Augustus' lousewort
Rhinanthus rumelicus Velen.	Prodanović, 2007	rattle
PAPAVERACEAE		
Chelidonium majus L.	Prodanović, 2007	reater celandine, nipplewort
Corydalis cava (L.) Schweigg. & Körte	Prodanović, 2007	hollow root
Corydalis solida (L.) Clairv.	Prodanović, 2007	fumewort
Papaver dubium L.	Prodanović, 2007	long-headed poppy
Papaver rhoeas L.	Prodanović, 2007	common poppy, corn poppy
PLANTAGINACEAE		
Digitalis laevigata Waldst. & Kit.	Prodanović, 2007	grecian foxglove
Digitalis lanata Ehrh.	Prodanović et al., 2004; Prodanović, 2007	woolly foxglove
Linaria genistifolia (L.) Mill.	Pavlović, 1967; Prodanović, 2007	toadflax
Linaria genistifolia (L.) Mill. subsp. *genistifolia*	Prodanović, 2007	broomleaf toadflax

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Linaria vulgaris Mill.	Prodanović, 2007	yellow toadflax
Plantago argentea Chaix	Rexhepi, 1979; Prodanović, 2007	silver plantain
Plantago lanceolata L.	Prodanović, 2007	ribwort plantain
Plantago major L.	Prodanović, 2007	roadleaf plantain, white man's foot, greater plantain
Plantago major L. subsp. *major*	Prodanović, 2007	roadleaf plantain, white man's foot, greater plantain
Plantago media L.	Prodanović, 2007	hoary plantain
Plantago subulata L.		plantain
Veronica anagallis-aquatica L.	Prodanović, 2007	water speedwell
Veronica arvensis L.	Prodanović, 2007	wall speedwell, corn speedwell
Veronica austiaca L.	Prodanović, 2007	broadleaf speedwell, large speedwell
Veronica beccabunga L.	Prodanović, 2007	european speedwell, brooklime
Veronica chamaedrys L.	Prodanović, 2007	germander speedwell, bird's-eye speedwell
Veronica hederifolia L.	Prodanović, 2007	ivy-leaved speedwell
Veronica officinalis L.	Prodanović, 2007	heath speedwell
Veronica persica Poir.	Prodanović, 2007	persian speedwel
Veronica polita Fr.	Prodanović, 2007	grey field-speedwell
Veronica praecox All.	Prodanović, 2007	breckland speedwell
Veronica prostrata L.	Prodanović, 2007	rock speedwell
Veronica serpyllifolia L.	Prodanović, 2007	thyme-leaved speedwell
Veronica serpyllifolia L. subsp. *serpyllifolia*	Prodanović, 2007	thyme-leaved speedwell
Veronica spicata L.	Prodanović, (unpublished, field observation)	spike speedwell
PLUMBAGINACEAE		
Goniolimon incanum (L.) Hepper	Prodanović, 2007	lavender statice, sea lavender
Goniolimon collinum (Griseb.) Boiss.	Pavlović, 1967; Prodanović, 2007	sea lavender
Goniolimon tataricum (L.) Boiss.	Prodanović, 2007	german statice, tatarian statice
POACEAE		
Aegilops cylindrica Host	Prodanović, 2007	jointed goatgrass
Aegilops geniculata Roth.	Prodanović, 2007	goat grass, ovate goatgrass
Agropyron cristatum (L.) Gaertn.	Rexhepi, 1979; Prodanović, 2007	crested wheatgrass
Agrostis stolonifera L.	Prodanović, 2007	creeping bentgrass, fiorin
Alopecurus myosuroides Huds.	Prodanović, 2007	mousetail grass, black grass
Alopecurus pratensis L.	Prodanović, 2007; Krivošej et al., 2013	meadow foxtail
Anthoxanthum odoratum L.	Prodanović, 2007; Krivošej et al., 2013	sweet vernal grass
Apera spica-venti (L.) P. Beauv.	Prodanović, 2007	common windgrass
Arrhenatherum elatius (L.) P. Beauv.ex J.Presl & C.Presl	Prodanović, 2007	false oat-grass
Brachypodium silvaticum (Huds.) P. Beauv.	Prodanović, 2007	slender false-brome
Bothriochloa ischaemum (L.)	Prodanović, 2007	yellow bluestem
Briza media L. Keng	Prodanović, 2007; Krivošej et al., 2013	quaking grass
Bromus arvensis L.	Prodanović, 2007	field brome
Bromus commutatus Schrad.	Prodanović, 2007	meadow brome
Bromus erectus Huds.	Rexhepi, 1979; Prodanović, 2007	erect brome, upright brome
Bromus hordeaceus L.	Prodanović, 2007	soft brome
Bromus inermis Leyss.	Prodanović, 2007	smooth brome
Bromus racemosus L.	Prodanović, 2007	smooth brome
Bromus squarrosus L.	Prodanović, 2007	corn brome
Bromus sterilis L.	Rexhepi, 1979; Prodanović, 2007	poverty brome
Bromus tectorum L.	Prodanović, 2007	drooping brome, cheatgrass
Chrysopogon gryllus (L.) Trin	Rexhepi, 1979; Prodanović, 2007	
Cynodon dactylon (L.) Pers.	Prodanović, 2007	bermuda grass, couch grass

http://www.aloki.hu ● ISSN 1589 1623 (Print) ● ISSN 1785 0037 (Online)
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Cynosurus cristatus L.	Prodanović, 2007; Krivošej et al., 2013	crested dogstail grass
Dactylis glomerata L.	Prodanović et al., 2004; Prodanović, 2007; Krivošej et al., 2013	cock's-foot, orchard grass
Danthonia alpina Vest.	Prodanović, 2007; Krivošej et al., 2013	heathgrass, wallaby grass
Dasypyrum villosum (L.) Borbás	Prodanović, 2007	mosquitograss
Eragrostis minor Host	Prodanović, 2007	ovegrass, canegrass
Elymus hispidus (Opiz) Melderis	Prodanović, 2007	hairy couch grass
Elytrigia repens (L.) Nevski.	Prodanović, 2007	couch grass
Festuca arundinacea Schreb.	Prodanović, 2007	tall fescue
Festuca pratensis Huds.	Prodanović, 2007	meadow fescue
Festuca rubra L.	Prodanović, 2007	red fescue
Festuca valesiaca Schleich. ex Gaudin	Prodanović, 2007	volga fescue
Glyceria fluitans (L.) R.Br.	Prodanović, 2007	floating sweet-grass, water mannagrass
Glyceria notata Chevall.	Prodanović, 2007	plicate sweet grass
Helictotrichon compressum (Heuff.) Henrard	Prodanović, 2007	
Holcus lanatus L.	Prodanović, 2007	yorkshire fog, tufted grass
Hordeum murinum subsp. *leporinum* (Link) Arcang.	Prodanović, 2007	wall barley
Koeleria macrantha (Ledeb.) Schult.	Prodanović, (unpublished, field observation)	prairie junegrass
Koeleria pyramidata (Lam.) P. Beauv.	Prodanović, 2007	
Lolium perenne L.	Prodanović, 2007	perennial ryegrass, english ryegrass
Melica ciliata L.	Pavlović, 1967; Prodanović et al., 2004; Prodanović, 2007	hairy melic, silky spike melic
Melica nutans L.	Prodanović, 2007	mountain melick
Melica uniflora Retz.	Prodanović, 2007	wood melick
Milium effusum L.	Prodanović, 2007	american milletgrass, wood millet
Phalaris arundinacea L.	Prodanović, 2007	reed canary grass
Phleum montanum K.Koch	Prodanović, 2007	Timothy grass
Phleum phleoides (L.) H. Karst.	Prodanović, 2007	boehmer's cat's-tail, purple-stem cat's-tail
Phleum pratense L.	Prodanović, 2007	Timothy grass, meadow cat's-tail
Phragmites australis (Cav.) Trin. ex Steud.	Prodanović, 2007	common reed
Poa annua L.	Prodanović, 2007	annual meadow grass
Poa bulbosa L.	Prodanović, 2007	bulbous bluegrass
Poa compressa L.	Prodanović, 2007	canada bluegrass
Poa nemoralis L.	Prodanović, 2007	wood bluegrass
Poa pratensis L.	Prodanović, 2007; Krivošej et al., 2013	kentucky bluegrass
Poa perconcinna J. R. Edm.	Prodanović, 2007	
Poa trivialis L.	Prodanović, 2007	rough bluegrass
Sclerochloa dura (L.) P. Beauv.	Prodanović, 2007	common hardgrass
Sesleria rigida Heuff. ex Rchb.	Prodanović, 2007	
Stipa capillata L.	Prodanović, 2007	needle grass
Stipa joannis Celak	Prodanović, 2007	feather grass
Taeniatherum caput-medusae (L.) Nevski	Prodanović, 2007	medusahead wildrye
Tragus racemosus (L.) All.	Krivošej et al. 1995-1998; Prodanović, 2007	stalked bur grass
Vulpia myuros (L.) C.C.Gmel.	Prodanović, 2007	annual fescue
POLYGALACEAE		
Polygala major Jacq.	Prodanović, 2007	milkworts, snakeroots
Polygala supina Schreb.	Pavlović, 1967; Prodanović, 2007	milkwort
POLYGONACEAE		

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Fallopia convolvulus (L.) Á. Löve	Prodanović, 2007	black-bindweed, wild buckwheat
Fallopia dumetorum (L.) Holub	Prodanović, 2007	european climbing buckwheat
Persicaria lapathifolia (L.) Delarbre	Prodanović, 2007	pale persicaria
Polygonum aviculare L.	Prodanović, 2007	common knotgrass
Rumex acetosa L.	Prodanović, 2007; Krivošej et al., 2013	sorrel
Rumex acetosella L.	Prodanović, 2007	red sorrel, sheep's sorrel
Rumex conglomeratus Murray	Prodanović, 2007	clustered dock, sharp dock
Rumex crispus L.	Prodanović, 2007	curled dock, yellow dock
Rumex obtusifolius L.	Prodanović, 2007	bitter dock
Rumex pulcher L.	Prodanović, 2007	fiddle dock
PRIMULACEAE		
Anagallis arvensis L.	Prodanović, 2007	scarlet pimpernel
Anagallis foemina Mill.	Prodanović, 2007	blue pimpernel
Androsace elongata L.	Prodanović et al.,2012	rock jasmine, elongate ilisha
Lysimachia nummularia L.	Prodanović, 2007; Krivošej et al., 2013	moneywort, creeping jenny
Primula veris Huds.	Prodanović, 2007	ommon cowslip
Primula acaulis (L.) L.	Krivošej et al., 2013	common primrose
RANUNCULACEAE		
Anemone apennina L.	Prodanović, 2007	blue anemone
Anemone nemorosa L.	Prodanović, 2007	wood anemone
Clematis recta L.	Prodanović, 2007	erect clematis, ground virginsbower
Consolida regalis Gray	Prodanović, 2007	forking larkspur, rocket-larkspur
Ficaria verna Huds.	Prodanović (unpublished, field observation)	fig buttercup
Helleborus odorus Waldst. & Kit. ex Willd.	Prodanović et al., 2004; Prodanović, 2007	fragrant hellebore
Helleborus multifidus subsp. *serbicus* (Adamovic) Merxm.& Podlech	Prodanović, 2007	hellebore
Hepatica nobilis Mill.	Prodanović, 2007	common hepatica, liverwort
Nigella arvensis L.	Prodanović, 2007	love-in-a-mist, black bread-weed
Pulsatilla vulgaris subsp. *grandis* (Wender) Zämelis	Prodanović, 2007	pasqueflower
Ranunculus arvensis L.	Prodanović, 2007	corn buttercup
Ranunculus bulbosus L.	Prodanović, 2007	bulbous buttercup
Ranunculus millefoliatus Vahl	Prodanović, 2007; Krivošej et al., 2013	erusalem butercup
Ranunculus polyanthemos L.	Prodanović, 2007	multiflowered buttercup
Ranunculus psilostachys Griseb.	Prodanović, 2007	buttercup
Ranunculus repens L.	Prodanović, 2007	the creeping buttercup
Ranunculus sceleratus L.	Prodanović, 2007	celery-leaved buttercup
Ranunculus serbicus Vis.	Prodanović, 2007	
Thalictrum flavum L.	Prodanović, 2007	common meadow-rue
Thalictrum lucidum L.	Prodanović, 2007	shaning meadow rue
Thalictrum minus L.	Prodanović, 2007	lesser meadow-rue
RESEDACEAE		
Reseda lutea L.	Prodanović, 2007	wild mignonette
Reseda luteola L.	Prodanović, 2007	dyer's weed, weld, woold, yellow weed
Reseda phyteuma L.	Prodanović, 2007	rampion mignonette
RHAMNACEAE		
Frangula alnus Mill.	Prodanović, 2007	alder buckthorn
Paliurus spina-christi Mill.	Prodanović, 2007	Jerusalem thorn
Rhamnus saxatilis subsp. *tinctoria* Nyman	Prodanović, 2007	rock buckthorn
ROSACEAE		
Agrimonia eupatoria L.	Prodanović, 2007	agrimony, cocklebur

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Amelanchier ovalis Medik.	Prodanović, 2007	snowy mespilus
Aremonia agrimonioides (L.) DC.	Krivošej et al., 2013	bastard-agrimony
Cotoneaster integerrimus Medik.	Prodanović, 2007	cotoneaster
Crataegus monogyna Jacq.	Prodanović et al., 2004; Prodanović, 2007	ommon hawthorn
Filipendula vulgaris Moench.	Prodanović, 2007; Krivošej et al., 2013	dropwort,fern-leaf dropwort
Fragaria vesca L.	Prodanović et al., 2004; Prodanović, 2007; Krivošej et al., 2013	wild strawberry
Geum urbanum L.	Prodanović, 2007; Krivošej et al., 2013	wood avens
Malus florentina (Zuccagni) C.K. Schneid.	Prodanović et al., 2013	florentine crabapple
Malus sylvestris (L.) Mill.	Prodanović, 2007	european crab apple
Potentilla argentea L.	Prodanović et al., 2004; Prodanović, 2007	hoary cinquefoil, silver cinquefoil
Potentilla heptaphylla subsp. *australis* (Nyman) Gams	Prodanović et al., 2004; Prodanović, 2007	
Potentilla hirta L. var. *zlatiborensis* Novak	Rexhepi, 1979; Prodanović, 2007	hairy cinquefoil
Potentilla micrantha Ramond ex DC	Prodanović, 2007	pink barren strawberry
Potentilla neglecta Baumg.	Prodanović, 2007	
Potentilla recta L.	Prodanović, 2007	sulfur cinquefoil
Potentilla tommassiniana F. W. Schultz.	Pavlović, 1967	
Potentilla visianii Pančić	Rexhepi, 1979; Prodanović, 2007; Prodanović et al., 2008	
Prunus avium (L.) L.	Prodanović et al., 2004; Prodanović, 2007	wild cherry
Prunus mahaleb L.	Prodanović, 2007	mahaleb cherry
Prunus spinosa subsp. *dasyphylla* (Schur) Domin	Prodanović, 2007	blackthorn, sloe
Prunus spinosa L. subsp. *spinos*a	Prodanović et al., 2004; Prodanović, 2007	blackthorn, sloe
Pyrus spinosa Forssk.	Prodanović, 2007	almond-leaved pear
Rosa arvensis Huds.	Prodanović, 2007	field rose
Rosa canina L.	Prodanović, 2007	dog rose
Rosa corymbifera Borkh.	Prodanović, 2007	rose
Rosa x dumetorum Thuill	Prodanović, 2007	corymb rose
Rosa gallica L.	Prodanović, 2007; Krivošej et al., 2013	french rose
Rosa micrantha Borrer ex Sm.	Prodanović, 2007	rugosa rose
Rosa rubiginosa L.	Prodanović, 2007	sweetbriar rose
Rosa spinosissima L.	Prodanović, 2007	scotch rose
Rubus caesius L.	Prodanović, 2007	european dewberry
Rubus ulmifolius Schott	Prodanović, 2007	elm-leaf blackberry
Sanguisorba minor Scop	Prodanović, 2007; Krivošej et al., 2013	salad burnet
Sanguisorba officinalis L.	Prodanović, 2007	great burnet
Spiraea media Schmidt	Prodanović, 2007	spirea
Sorbus aucuparia L.	Prodanović, 2007	mountain ash
Sorbus torminalis (L.) Crantz	Prodanović, 2004; Prodanović, 2007	wild service tree, chequers
Waldsteinia geoides Willd.	Prodanović et al.,2010	barren strawberries
RUBIACEAE		
Asperula cynanchica L.	Rexhepi, 1979; Prodanović, 2007	squinancywort, squincywort
Asperula purpurea (L.) Ehrend.	Prodanović, 2007	purple squinancywort
Cruciata glabra (L.) Opiz.	Prodanović, 2007	
Cruciata laevipes Opiz.	Prodanović, 2007; Krivošej et al., 2013	crosswort smooth bedstraw
Cruciata pedemontana (Bellardi) Ehrend., All.	Prodanović, 2007	Piedmont bedstraw
Galium aparine L.	Prodanović, 2007	catchweed bedstraw
Galium mollugo L.	Prodanović, 2007	hedge bedstraw

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Galium pseudoaristatum Schur	Prodanović, 2007	bedstraw
Galium verum L.	Prodanović, 2007	yellow bedstraw
Sherardia arvensis L.	Prodanović, 2007	blue fieldmadder
RUTACEAE		
Dictamnus albus L.	Prodanović, 2007	burning bush, dittany
Haplophyllum boissierianum Vis. et Pančić	Pavlović, 1967; Ranđelović et al., 1982; Prodanović, 2007; Prodanović et al., 2008	
SALICACEAE		
Populus alba L.	Prodanović, 2007	silver poplar, silverleaf poplar
Populus nigra L.	Prodanović, 2007	black poplar
Populus tremula L.	Prodanović, 2007; Krivošej et al., 2013	aspen, common aspen
Salix alba L.	Prodanović, 2007	golden willow, white willow
Salix caprea L.	Prodanović, 2007	goat willow, pussy willow
Salix eleagnos Scop.	Prodanović, 2007	bitter willow, olive willow
Salix x fragilis L.	Prodanović, 2007	crack willow
Salix purpurea L.	Prodanović, 2007	purple willow
SANTALACEAE		
Arceuthobium oxycedri (DC.) M. Bieb.	Ranđelović et al., 1982; Prodanović 2007	juniper dwarf mistletoe
Comandra umbellata subsp. *elegans* (Rochel ex Rchb.) Piehl	Prodanović, 2007	bastard toadflax
Thesium arvense Horv.	Rexhepi, 1979; Prodanović, 2007	
SAPINDACEA		
Acer campestre L.	Prodanović et al., 2004; Prodanović, 2007	field maple
Acer campestre subsp. *marsicum* (Guss.) Hayek	Prodanović, 2007	field maple
Acer platanoides L.	Prodanović, 2007	emerald queen maple, norway maple
Acer pseudoplatanus L.	Prodanović, 2007	sycamore
Acer tataricum L.	Prodanović, 2007	tatarian maple
SAXIFRAGACEAE		
Saxifraga paniculata Mill.	Rexhepi, 1979; Prodanović, 2007	alpine saxifrage
Saxifraga bulbifera L.	Prodanović, 2007	bulbous saxifrage
Saxifraga rotundifolia L.	Prodanović, 2007	round-leaved saxifrage
Saxifraga tridactylites L.	Prodanović, 2007	rue-leaved saxifrage
SCROPHULARIACEAE		
Scrophularia canina subsp. *bicolor* (Sm.) Greuter	Prodanović, 2007	dog figwort
Scrophularia canina L.	Ranđelović et al., 1982; Prodanović, 2007	dog figwort
Scrophularia canina L. subsp. *tristis* (K. Malý) V. Nikolic	Pavlović, 1967; Prodanović, 2007	dog figwort
Scrophularia nodosa L.	Prodanović, 2007	figwort, woodland figwort
Scrophularia umbrosa Dumort.	Prodanović, 2007	green figwort
Verbascum banaticum Schrad.	Prodanović, 2007	mullein
Verbascum chaixii Vill.	Prodanović, 2007	narrow-leaved mullein
Verbascum nigrum L.	Prodanović, 2007	black mullein, dark mullein
Verbascum phlomoides L.	Prodanović, 2007	orange mullein
Verbascum phoeniceum L.	Prodanović, 2007	purple mullein
SOLANACEAE		
Datura stramonium L.	Prodanović, 2007	thorn apple, jimsonweed
Hyoscyamus niger L.	Prodanović, 2007	henbane, black henbane
Lycium barbarum L.	Prodanović, 2007	chinese boxthorn, Himalayan goji
Solanum dulcamara L.	Prodanović, 2007	bittersweet, bittersweet nightshade

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THYMELAEACEAE		
Thymelaea passerina (L.) Coss. & Germ.	Prodanović et al.,2010	sparrow-wort
ULMACEAE		
Ulmus carpinifolia Gled.	Prodanović, 2007	elm
Ulmus laevis Pall.	Prodanović, 2007	european white elm, fluttering elm
Ulmus minor Mill.	Prodanović et al., 2004; Prodanović, 2007	elm
Ulmus minor Mill var. *tortuosa* (Host) Hayek	Prodanović, 2007	elm
URTICACEAE		
Parietaria officinalis L.	Prodanović, 2007	eastern pellitory-of-the-wall
Urtica dioica L.	Prodanović, 2007	common nettle, stinging nettle
VERBENACEAE		
Verbena officinalis L.	Prodanović, 2007	common vervain
VIBURNACEAE		
Sambucus ebulus L.	Prodanović, 2007	danewort, dane weed
Sambucus nigra L.	Prodanović, 2007	elderberry, black elder
VIOLACEAE		
Viola arvensis Murray	Ranđelović et al., 1982; Prodanović, 2007	field pansy
Viola hirta L.	Prodanović, 2007	sweet violet, english violet
Viola kitaibeliana Schult.	Prodanović, 2007	Kitaibel's violet
Viola reichenbachiana Boreau	Prodanović, 2007	early dog-violet, pale wood violet

A vast majority of genera belong to the familiy *Compositae* (51), followed by *Poaceae* (38), *Apiaceae* (26), *Brassicaceae* (24), *Leguminosae* (24), *Lamiaceae* (22). Among the genera the most species rich are *Trifolium* (17) followed by *Carex* (16), *Euphorbia* (14), *Veronica* (14), *Vicia* (13), *Lathyrus* (12), *Hieracium* (11), *Centaurea* (8), *Medicago* (8), *Rosa* (7) etc. The dominance of the genera *Trifolium*, *Vicia* and *Lathyrus* (*Leguminosae* family) is most likely conditioned by the higher presence of areas under xerothermic meadows and pastures as well as thermophilic rocks in the study area. Genus *Carex* is on second position. This is explained by the fact that species within this genus require moist habitats, which were abundant in the investigated terrains, on the banks of river Ibar, as well as streams flowing into the river. Genera *Trifolium* and *Carex* are also dominant in serpentine complexes in Eastern Rhodopes (Bulgaria) (Pavlova et al., 2004).

31 taxa in total have been recorded in this area for the first time and they present a novelty for the flora of Kosovo and Metohija and entire Serbia. The records for most of these were first published in Prodanović et al. (2004, 2008, 2010, 2012, 2013, 2018).

Life-form spectrum and phytogeographical analysis

The analysis of life forms indicates domination of hemicryptophytes (48.29%) (*Fig. 2*). The significant representation of therophytes (21.99%), is typical for the serpentine floras, where the plants are adapted to ensure reproduction within a short period of time under stress conditions (Brooks, 1987). Other herbal life forms are present in smaller numbers, geophytes (10.54%) phanerophytes (8.27%), chamaephytes (6.91%), scandentophytes (1.81%) etc. Such biological spectrum is characteristic for the Balkan Peninsula, as well as for the territory of Serbia (Diklić, 1984).

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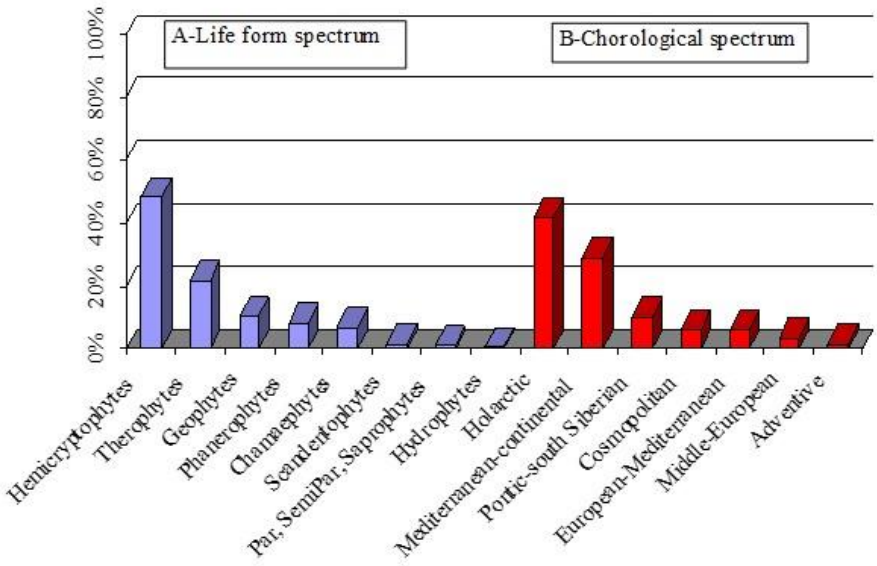

Figure 2. *Life form spectrum (A) and chorological spectrum (B), by basic area types, of the serpentinite flora in the middle course of the Ibar river valley*

The chorological floristic analysis indicates that this is an area with interim holarctic-Mediterranean character (*Fig. 2*). Holarctic areal type with 369 taxa (41.83%) is the most presented on the terrain, followed by Mediterranean – continental areal type (29.18%) and pontic – south Siberian areal type (10.31%), cosmopolitan areal type (6.45%) as well as central European –Mediterranean (6.23%). The least reported species in the serpentine terrains of the Ibar river valley are Middle European dispersion areal type and Adventive areal type. The presence of plants belonging to Adventive areal type indicates anthropogenic influence, which is present in settlements around river banks, as well as around main roads and local rural roads. Xeromorphic species are predominant due to conditions for their growth on serpentine soil.

Endemism and internationally significant vascular plants

Serpentine habitats are the most important endemic regions in the world and also called "geological islands" (Kurt et al., 2013). Despite the shallow active layer of serpentine soil, biodiversity is high with a great number of interesting local and regional endemics (Shuka and Hallaçi, 2010). It is estimated that the total number of endemic plants in the Balkans is bigger than 2200 taxa. 300-350 (15-16%) taxa of this number have been identified on the serpentine background; 123 of them are obligate serpentine endemics (Stevanović et al., 2003).

Due to diverse physical and geographical characteristics, the Republic of Serbia has a considerable number of endemic plant taxa. Centres of endemism are located in the southern and eastern regions of Serbia and on the territory of Kosovo and Metohija (Gavrilović et al., 2017). The serpentine mountains of Central Serbia along the river Ibar represent a relatively large core of ophiolithic flora in the Central Balkans. It is the centre of distribution of old trans-regional endemics such as: *Halacsya sendtneri, Haplophyllum boisserianum, Potentilla visianii* and *Eryngium serbicum*. Local endemics include *Tulipa serbica* (Stevanović et al., 2003).

http://www.aloki.hu ● ISSN 1589 1623 (Print) ● ISSN 1785 0037 (Online)
DOI: http://dx.doi.org/10.15666/aeer/1805_72897322

Out of the total taxon number in the investigated area, 73 (8.27%) belong to group of endemic, sub-endemic, relict and endomorelic taxa. There are 40 of endemic and sub-endemic species (*Eryngium serbicum, Helleborus multifidus* subsp. *serbicus, Tulipa serbica, Odontarrhena bertolonii* subsp. *scutarina (syn. Alyssum janchenii), Alyssum markgrafii, Galatella albanica, Dianthus pinifolius, Euphorbia glabriflora, Fumana bonapartei, Halacsya sendtneri, Haplophyllum boissierianum, Hieracium bauhini* subsp. *pseudosparsum, Hypericum rumeliacum, Lamium bifidum* subsp. *balcanicum, Potentilla visianii, Ranunculus psilostachys, Scabiosa fumaroides, Scrophularia canina* subsp. *tristis, Sedum album* (syn. *S. serpentini), Stachys scardica, Linum flavum, Trifolium trichopterum, Rorippa lippizensis, Salvia amplexicaulis, Digitalis laevigata, Melampyrum heracleoticum, Eryngium palmatum, Achillea coarctata, Alyssum montanum* subsp. *serbicum, Campanula lingulata, Cytisus austriacus* subsp. *heuffelii, Galium pseudoaristatum, Iris reichenbachii, Lamium garganicum* L. subsp. *garganicum, Lamium garganicum* L. subsp. *glabratum, Lathyrus hallersteinii, Petrorhagia illyrica* subsp. *haynaldiana, Poa perconcinna, Ranunculus serbicus, Rhinanthus rumelicus, Trifolium pignantii*).

Based on the distributional range of obligate serpentine endemics, Stevanović et al. (2003) presented the following general classification: (1) trans-Balkan or trans-regional Balkan endemics (taxa distributed in the greater part of serpentine areas in the Balkans); (2) regional endemics (taxa restricted to a single floristic subregion or province); and (3) local or steno-endemics (taxa distributed in a single floristic district or narrow geographical area such as a single mountain or island).

On the investigated terrains in the middle course of the Ibar river valley, 11 taxa from obligate serpentine endemics are in the trans-regional endemic (TRE) category : *Alyssum markgrafii, Sedum album* (syn. *S. serpentini*), *Potentilla visianii, Potentilla heptaphylla subsp. australis, Euphorbia glabriflora, Haplophyllum boissierianum, Fumana bonapartei, Eryngium serbicum, Halacsya sendtneri, Stachys recta* subsp. *baldacii* and *Scrophularia canina* subsp. *tristis.*

4 taxa are obligate serpentine endemics from the regional endemics (RE) category: *Helleborus multifidus* subsp. *serbicus, Alyssum montanum* subsp. *serbicum, Galatella albanica* and *Tulipa serbica* (stenoendemic according to Millaku et al., 2018). It was right here, on the Ibar Valley serpentines, Beli Laz locality (locus classicus), that this endemic *Tulip* was identified (Tatić and Krivošej, 1997). Unfortunately, in the last three years, due to the regional dumping site development, the primary habitat has been devastated, without any possibility to be protected.

Out of the total taxon number, 31 taxa belong to a group of internationally significant vascular plants (IUCN, Stojanović et al., 2015). Out of that, 14 taxa have been protected by CITES Convention. These are the followings: *Anacamptis pyramidalis, Cephalanthera rubra, Epipactis helleborine, Epipactis microphylla, Galanthus nivalis, Limodorum abortivum, Neottia nidus-avis, Orchis mascula, Orchis morio, Orchis papilionaceae, Orchis purpurea, Orchis tridentata, Ophrys apifera* and *Platanthera bifolia.*

Comparative floristic analysis

In order to gain a better insight into the flora diversity in these habitats, as well as the level of floristic closeness, a comparative analysis of the flora from Studena mountain, near the city of Kraljevo, has been done by Tatić (1969) in his multi-year research as well as with flora of Goleš mountain, researched by Krasniqi et al. (2019).

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The Ibar serpentine massive with the valley in the lower course of the Ibar river traverses though central Serbia and extend west from the mountain Studena (Lukić et al., 2015) where it covers the largest space on Studena mountain; the river itself flows 17.1 km along the mountain. In his studies Tatić reported 390 taxa, the largest number of which belonged to *Compositae, Poaceae, Leguminosae, Caryophyllaceae, Rosaceae* and *Lamiaceae* families, which is similar to the spectrum of the most numerous families of flora in the Kosovo part of the Ibar serpentine range. The number of two mutual taxa in two compared areas is 196, so the index of similarity by Sørensen is 30.66%, which is unexpectedly low since Studena mountain represents the continuation of the Ibar serpentine massive that starts in the middle course of the river in Kosovo.

An assumption of floristic dissimilarities in the Kosovo part of the Ibar valley and Studena mountain, has been based on the differences between the altitudes of these two areas (the Ibar gorge 500-900 ma, Studena mountain above 1000 ma, with the highest peak of Kavgalija 1356). Furthermore, the composition of the geological background has probably influenced floral development. The geological background of Studena mountain exclusively consists of serpentinite; in the Kosovo part of the Ibar valley apart from serpentinite, there are also peridotite and unmodified ultramaphyte rocks. While Tatić emphasized phytocenologic research studies on Studena mountain, our attention was turned to purely floristic research projects in the Kosovo's part of the Ibar valley (which may be corroborated by a total number of 882 identified taxa), taking also into account the size of the investigated area. Since the serpentine is considered as a vulnerable habitat, it is important to emphasize that no Studena mountain species recorded by Tatić has been classified as extinct in Serbian flora. Our assumption is that the described species can be found there nowadays, but we also recommend future field research to prove this assumption.

Mountain Goleš, in the central part of Kosovo and Metohija, represents the beginning of the serpentine-peridotite massif, which covers the left bank of the Sitnica river, goes towards the Čičavica Mountain, enters the valley of the upper stream of the Ibar river in Ibarski Kolašin, and continues along the middle Ibar river course. Krasniqi et al. (2019) recorded 295 taxa on this mountain (with a surface area of 22.2 km^2) over a three-year study (2015-2019). Considering the size of the mountain range covered by the conducted survey, a larger number of taxa would be expected. However, such floristic "poverty" confirmed the fact that serpentinite habitats are floristically poorer than habitats with other types of geological substrates. The number of two mutual taxa in the two compared areas is 218, so the index of similarity by Sørensen is 37.04%. It should be noted that this value is not large, although the number of common species is as high as 2/3 of all taxa found on Goleš Mountain. The reason could certainly be a disproportion to the number of identified species and the size of territories explored.

Families with the highest number of taxa on Goleš mountain were *Compositae* (34), *Leguminosae* (25), *Rosaceae* (25), *Poaceae* (18), and *Caryophyllaceae* (18). In taxonomic spectrum in the Ibar river valley, *Compositae* (105) and *Leguminosae* (86) are also dominant, followed with *Poaceae* (66), *Lamiaceae* (51), *Brassicaceae* (50), *Caryophyllaceae* (49). *Rosaceae* family in taxonomic spectrum of most dominant plant families in the Ibar river valley occupies eight position. Significant involment of the *Lamiaceae* and *Caryophyllaceae* families indicate the expression of stronger Mediterranean floristic influences, as well as a greater presence of bare rocky habitats.

Krasniqi et al. (2019) on Goleš Mountain state that out of the total number of identified taxa, 8 of them are endemic, of which 5 endemic species occur on the Ibar

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valley serpentinite (*Galatella albanica, Halacsya sendtneri, Linum flavum, Potentilla visianii* and *Haplophyllum boissierianum*). Various floristic elements meet and overlap in mountain ranges in the central part of Kosovo, dominated by European floral element, followed by Euro-Asiatic and Sub-Mediterranean, Balcan, Mediterranean and Pontic elements similar to the interim holarctic- Mediterranean character of flora in the Ibar river valley.

Due to the background characteristics, the serpentine areas of the Ibar valley and their flora have not been exposed to negative anthropogenic influences so far. Yet, in the previous 3-4 years, the negative human influences have been detected in the areas along the highway. We consider that establishing a better connection between scientific and professional public and the people who are in charge of planning and infrastructural construction along the Ibar valley could contribute to the preservation of the habitats of some significant and endangered species, which unfortunately was not the case with locus classicus of the *Tulipa serbica* species.

Conclusion

The presence of 882 taxa grouped into 83 families and 386 genera has been identified in the course of the research of serpentinite flora performed in the middle stream Ibar river valley, for the period of 16 years. Taxonomic spectrum of families is dominated by *Compositae* (105), followed by *Leguminosae* (86), *Poaceae* (66), *Lamiaceae* (51), *Brassicaceae* (50), *Caryophyllaceae* (49), *Apiaceae* (43) etc. The greatest number of genera belong to families *Compositae* (51), followed by *Poaceae* (38), *Apiaceae* (26), *Brassicaceae* (24), *Leguminosae* (24), *Lamiaceae* (22). Among the genera the most species rich are *Trifolium* (17) followed by *Carex* (16), *Euphorbia* (14), *Veronica* (14), *Vicia* (13), *Lathyrus* (12), *Hieracium* (11), *Centaurea* (8), *Medicago* (8), *Rosa* (7) etc. An analysis of life forms showed that the investigated area has hemicryptophyte characters, with significant participation of therophytes (21.99%). The chorological spectrum is dominated by Holarctic species (41.83%). The presence of 73 taxa from a group of endemic, sub-endemic, relict and endomorelic taxa was determined. Out of the total taxon number, 31 taxa belong to a group of internationally significant vascular plants. Out of that, 14 taxa have been protected by CITES Convention. A comparative analysis of the serpentinite flora in the Ibar river valley and the Studena mountain as well as in the Goleš mountain showed a relatively small floristic similarity, which was unexpected, since these two mountains represent the beginning and continuation of the Ibar serpentine massive that starts in the middle course of the river in Kosovo. Only a good knowledge of floristic diversity may initiate the procedures that may lead to preserving and protecting rare and endangered and internationally important species in these areas. Since serpentinite habitat is considered as vulnerable we are proposing continual habitat monitoring as well as monitoring of all endangered and rare species in the Ibar river valley in future research projects. For some species seed collecting for a seed bank could be one of the conservation measures.

Acknowledgements. The authors are grateful to dr Marjan Niketić, from the Natural History Museum in Belgrade, for his help in the determination of genus *Hieracium* and *Cerastium*.

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http://www.aloki.hu ● ISSN 1589 1623 (Print) ● ISSN 1785 0037 (Online)
DOI: http://dx.doi.org/10.15666/aeer/1805_72897322