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Plant species and subspecies discovered by Dr. Josif Pančić 1 – distribution and floristic importance

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ABSTRACT: In this paper, we present 17 taxa that Josif Pančić discovered and published during investigations of flora of Serbia, Montenegro and Bulgaria in the period 1846-1888. For each species distribution maps are given based on our own field research, rich herbarium collections (BEOU, BEO, SOM) and literature sources. Classification of plant taxa into floristic elements and basic information about the habitat and ecology of each taxon are also presented. The following 17 species and subspecies are presented: *Picea omorika* (Pančić) Purk., *Parietaria serbica* Pančić, *Cerastium rectum* Friv. subsp. *petricola* (Pančić) H. Gartner, *Heliosperma macranthum* Pančić, *Heliosperma pusillum* (Waldst. & Kit.) Rchb. subsp. *monachorum* (Vis. & Pančić) Niketić & Stevan., *Heliosperma pusillum* (Waldst. & Kit.) Rchb. subsp. *moehringiifolium* (Uechtr. ex Pančić) Niketić & Stevan., *Dianthus moesiacus* Vis. & Pančić, *Consolida uechtritziana* (Pančić ex Huth) Soó, *Erysimum commatum* Pančić, *Malcolmia orsiniana* (Ten.) Ten. subsp. *serbica* (Pančić) Greuter & Burdet, *Barbarea balcana* Pančić, *Cardamine serbica* Pančić, *Sempervivum leucanthum* Pančić, *Viola orbelica* Pančić, *Althaea kragujevacensis* Pančić ex Diklić & Stevan., *Euphorbia subhastata* Vis. & Pančić and *Haplophyllum boisserianum* Vis. & Pančić. The remainder of Pančić's 48 plants will be presented in following issues of "Botanica Serbica".

Key words: Josif Pančić, endemic flora, distribution of vascular plants, Balkan Peninsula.

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INTRODUCTION

During explorations of the flora of Serbia, Montenegro and Bulgaria between 1846 and 1888, Josif Pančić discovered and published, alone or with Roberto de Visiani and Sava Petrović, about 217 taxa and 47 species (Mayer & Diklić 1967). However, on the basis of the most recent Nomenclature review of the plants published by Josif Pančić (Niketić 2014), it can be concluded that Josif Pančić published 226 plant names, of which he claimed 167 as new taxa for science, including 118 new plant species. The analysis of validity revealed that 87 of Pančić's taxa, or more than half (52.10%) are currently accepted, including 54 in specific and 11 in subspecific rank (Niketić 2014). The rest of the taxa (at the rank of species or subspecies) published by Pančić and coauthors are placed as synonyms or are determined as taxa at lower rank (variety or form). Some of the unaccepted Pančić taxa

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are the subject of current investigations and consideration of their taxonomical evaluation.

It is understandable that, at the time of their discovery and description, Pančić's species were known mostly just from the *locus classicus* or only from several localities. Subsequent chorological and other investigations of these plants showed that their ranges, in most cases, are much wider. However, most of Pančić's plants are endemic to the Balkan Peninsula, though some species have a wider distribution, such as *Bupleurum pachnospermum* Pančić, *Centaurea stoebe* L. subsp. *australis* (Pančić ex A. Kerner) Greuter, *Erysimum commatum* Pančić, *Geum molle* Vis. & Pančić, *Hieracium naegelianum* Pančić, *Jurinea mollis* (L.) Rchb. subsp. *subhastata* (Pančić) Diklić & Nikolić, *Koeleria eriostachya* Pančić, *Lactuca aurea* (Vis. & Pančić) Stebbins, *Parietaria serbica* Pančić, *Securigera elegans* (Pančič) Lassen and *Tragopogon pterodes* Pančić ex Petrović.

The aim of this paper is to provide an overview, after more than 150 years, of the distribution of Pančić's species and subspecies, using data from herbarium collections, personal field investigations and numerous literature sources. Emphasis is given to floristic and phytogeographical importance, as well as phylogenetical position and relation to the closest relatives of Pančić's plants, to provide a worthy tribute to the great contribution Pančić made to our knowledge of flora of the Balkan Peninsula.

This paper includes 17 species and subspecies (Pinaceae to Rutaceae), while another 48 species and subspecies will be presented in forthcoming issues of "Botanica Serbica".

MATERIAL AND METHODS

Checking and revision of herbarium material, personal field investigations and relevant literature sources were used to prepare distribution records. Distribution of the species and subspecies was presented on 10×10 sq. km using the UTM grid system (UTM Zones 33-35T). In addition, doubtful data were identified with a question mark (?) and incorrect data with a minus sign (–). Imprecise localities were presented by larger circles. For typified species, the *locus classicus* was indicated by an arrow.

Plant material is deposited in the Herbarium of the Institute of Botany and Botanical Garden "Jevremovac", University of Belgrade (BEOU), the Herbarium of the Natural History Museum in Belgrade (BEO), the Herbarium of the Faculty of Biology, Sofia University, Sofia, Bulgaria (SO) and the Herbarium of Vascular Plants and Mosses Collections, Institute of Botany, Bulgarian Academy of Sciences (SOM) (Thiers 2014). Nomenclature used was according to the databases Euro+Med (2006-), The Plant List (2013), IOPI (http://plantnet.rbgsyd.nsw.gov.au/iopi/iopihome.htm), etc.

Classification of plant taxa into floristic elements, chorological subgroups and groups corresponds to the phytogeographic division presented in Stevanović (1992, 2012), adapted and modified by Stevanović for the Balkan endemic flora in Serbia (Tomović *et al.* 2014) and in Bosnia and Herzegovina (Lubarda *et al.* 2014).

RESULTS

Picea omorika (Pančić) Purk. in Österr. Monatschr. Forstwes. 27: 446 (1877) – Pinaceae
≡ *Pinus omorika* Pančić, Neu. Conif. Alp.: 4 (1876); Gard. Chron. 1: 620 (1877) [basion.]

A very distinctive coniferous species of the European dendroflora that was described by Pančić (1876: 4) under the name *Pinus omorika* from two localities in Serbia: Mt Tara (near Zaovine and in Crvena Stena near Rastište) and two localities in Bosnia and Herzegovina: Mt Janjac above Štula and Mt Semeće above Višegrad city. As Pančić did not mark the type specimen, as well as *locus classicus*, lectotypification of this species was done by Farjon (2010: 590) and for the type locality this author selected Crvena Stena "Type: W Serbia, Rastiste, Crvena Stena, *J. Pančić s.n.* (lectotype, K)".

Distribution of this local endemic conifer is restricted to W. Serbia and E. Bosnia and Herzegovina along the middle stretch of the Drina river (Fig. 1), within four disjuncted parts of the range: 1) Main part with numerous small sites is situated in National Park "Tara" in Serbia and adjacent sites in Bosnia and Herzegovina between Višegrad and Srebrenica (Mt Stolac, Mt Devetak); 2) Mt Viogor (Municipality of Čajniče) in Bosnia and Herzegovina; 3) Radomišlje, part of the Mt Zelengora (Municipality of Foča) in Bosnia and Hercegovina; 4) Canyon of the Mileševka river, locality Ravnište (Municipality of Prijepolje) in S.W. Serbia (Fukarek 1951; Čolić 1953; Mataruga *et al.* 2011).

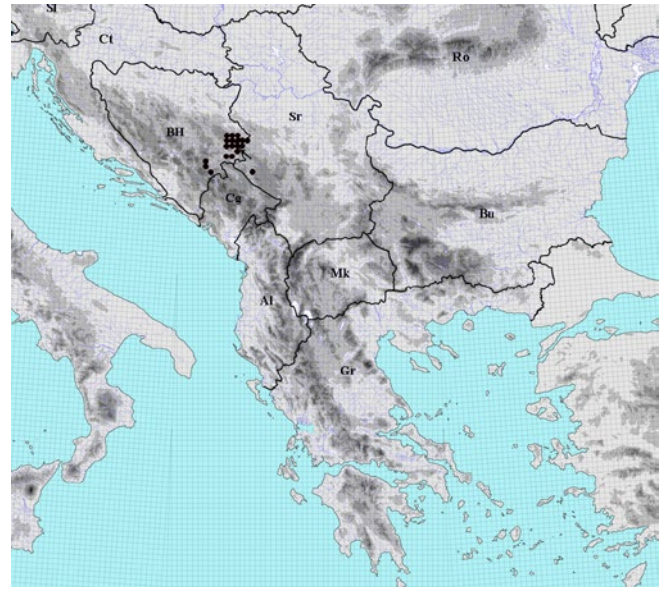

Fig. 1. Distribution of the species *Picea omorika* (Pančić) Purk. in the Balkan Peninsula

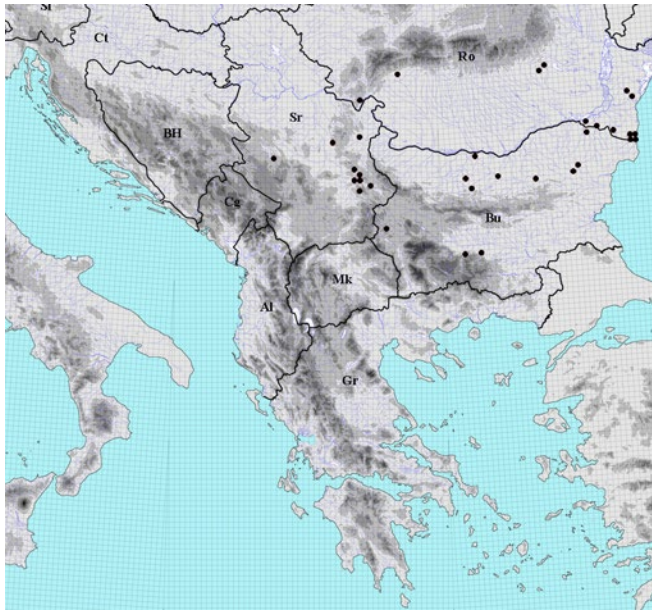

Fig. 2. Distribution of the species *Parietaria serbica* Pančić in the Balkan Peninsula and Romania

Despite the fact that Serbian spruce was described more than a century ago, there has been a long-standing dilemma about its phylogenetic position in the genus *Picea*. More than 10 infrageneric classifications of the genus *Picea* were done in the 20th century and they all determined Serbian spruce as a founder of the section *Omorika* where different species of the genus *Picea* were classified. However, in the 70-ies of the last century there was an accepted opinion (Krüssmann 1972), that the section *Spruce* still includes three species: *P. breweriana* S. Watson from North America, *P. spinulosa* (Griff.) A. Henry and *P. brachytyla* (Franch.) E. Pritz. from China. Moreover, Liu (1982) proposed division of the genus *Picea* into two subgenera: *Omorika* (Willk.) Liu with two sections *Omorika* Willd. emend. Liu and *Morinda* Mayr emend. Liu and *Picea* with two sections *Picea* and *Casicta* Mayr emend. Liu. In the last decade, phylogenetic studies of the genus *Picea* based on plastid and mitochondrial DNA (Bouillé & Bousquet 2005; Ran *et al.* 2006) suggested the origin of *Picea* to be in North America and placed *P. omorika* into the clade with two broadly distributed boreal North-American species *P. mariana* (Mill.) Britton, Sterns & Poggenb. and *P. rubens* Sarg. On the contrary, Lockwood *et al.* (2013) found three clades and positioned *P. omorika* into the Eurasian clade together with two Japan-Sakhalin species *P. maximowiczii* Regel ex Mast. and *P. alcoquiana* (H. J. Veitch ex Lindl.) Carrière and Caucasian-Asia Minor spruce *P. orientalis* (L.) Peterm. These two opposite viewpoints about the origin and phylogenetic position of *P. omorika*, demonstrate that this species remains an unsolved puzzle for botanists.

Serbian spruce belongs to the East Dinaric floristic element, in a broader sense to the Boreal Balkan-Boreal subgroup of plants. This paleoendemic tree predominantly inhabits steep north to northwest facing limestone slopes, with an altitudinal range from 800-1500 m. Depending on the altitude and slope, the associated tree species are *Picea abies* (L.) H. Karst., *Abies alba* Mill. and *Fagus sylvatica* L. It can also occur with *Pinus nigra* J. F. Arnold, *P. sylvestris* L., *Acer platanoides* L. and *Carpinus betulus* L. and sometimes it forms almost pure stands. The habitat at the locality Crveni Potok is peatland where the population of Serbian spruce is near to being extinct. In addition, it very rarely inhabits serpentine rocky slopes at locality Zmajevački Potok in the vicinity of Zaovine in Mt Tara (Fukarek 1951; Čolić 1953). Due to its restricted distribution range, as well as a decreasing population trend, *P. omorika* is included in The IUCN Red List of Threatened Species. Version 2014.2. under the EN category (Mataruga *et al.* 2011).

Parietaria serbica Pančić, Flora Serbiae: 620 (1874), in clavi – Urticaceae
≡ *P. lusitanica* L. subsp. *serbica* (Pančić) P. W. Ball., Feddes Repert. Spec. Nov. Regni Veg. 68: 186 (1963).
– *P. chersonensis* sensu Grecescu, Consp. Fl. Romaniei: 518 (1898) [non (Láng & Szov.) Dörfl., Herb. Norm.: No. 3581 (1898)].
– *P. lusitanica* var. *chersonensis* sensu Stoj. & Stef., Fl. Bulg.: 328 (1925) [non Láng & Szov Flora 10(1/3): 67 (1827)].

This taxon Pančić (1874: 620) described from two localities: above the villages Niševci and Đurinci near Knjaževac and above the monastery Ravanica in the vicinity of Ćuprija. Its closest relative is the widespread Mediterranean species *P. lusitanica* L. and some botanists consider *P. serbica* as a subspecies of this species (Ball 1993).

It is widely distributed in the eastern part of the Balkan Peninsula (Fig. 2): W., C., N. and N.E. Bulgaria (Georgiev 1966), N.E. and E. Serbia with an isolated locality in W. Serbia (Tomović *et al.* 2012), as well as in Romania in the S. and E. Carpathians and Dobrogea (Negrean & Dihoru 2009).

It belongs to the West-East Moesian-South Carpathian-Dobrogean floristic element, in the wider sense to the subgroup of Submediterranean-(Pontic) plants. Unlike most European representatives of the genus *Parietaria* that inhabit exposed rocks and walls, *P. serbica* is mainly an ombrofuge chasmophyte that primarily grows on limestone rocks inclinated more than 90^0, usually in rock shelters and around the entrance of caves (Tatić & Petković 2012). In Romania this species inhabits shady rock crevices (Negrean & Dihoru 2009).

Cerastium rectum Friv. subsp. ***petricola*** (Pančić) H. Gartner, Repert. Spec. Nov. Regni Veg. Beih. 113: 38 (1939) – Caryophyllaceae
≡ *Cerastium petricola* Pančić, Glasn. Srpskog Učenog Društva 53: 180 (1883) [Elem. Fl. Bulg.: 20] [basion.]
Locus classicus: Mt Rila, between Monastery Rila and Samokovo (Pančić 1883: 180).

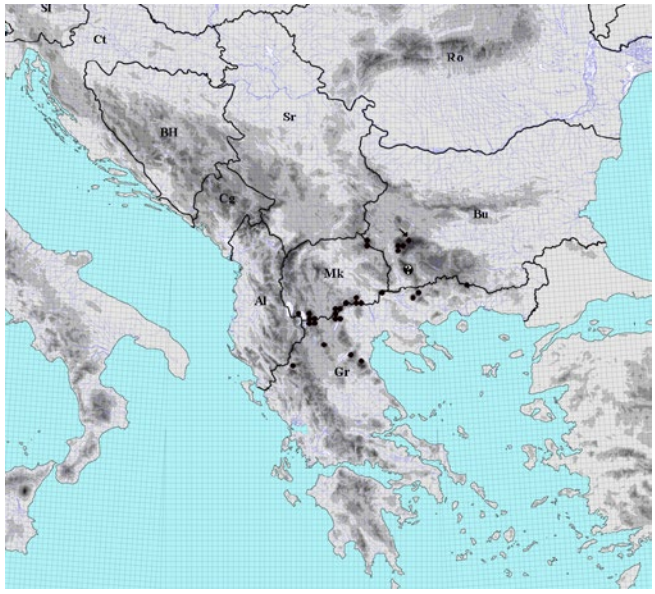

Fig. 3. Distribution of the subspecies *Cerastium rectum* Friv. subsp. *petricola* (Pančić) H. Gartner in the Balkan Peninsula

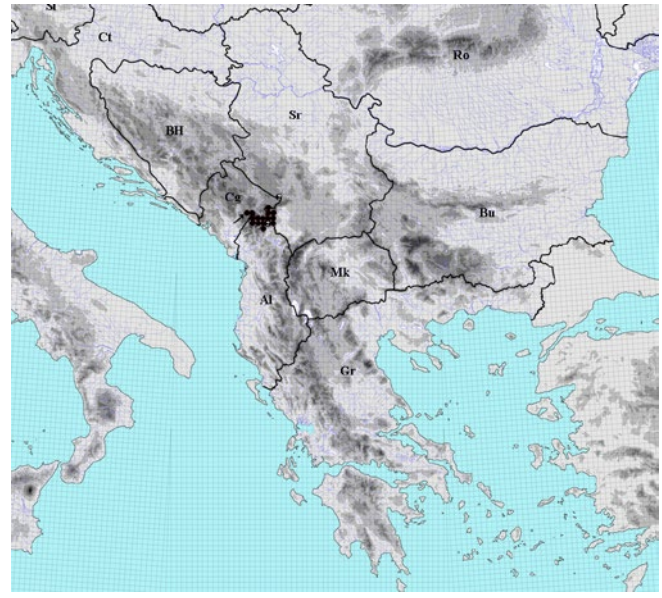

Fig. 4. Distribution of the species *Heliosperma macranthum* Pančić in the Balkan Peninsula

Species *C. rectum* Friv. belongs to subsect. *Vulgata* Hayek that includes mainly biennial, rarely annual and short-lived herbaceous representatives (Niketić 2012). Within this subsection, *C. rectum* is closely related to the widespread Eurasian species *C. sylvaticum* Waldst & Kit. and the Caucasian species *C. ruderale* M. Bieb. (Strid 1997). *C. rectum* is divided into two subspecies: subsp. *petricola* (Pančić) Gartner is distributed in S.W. Bulgaria (Mt Osogovske Planine and Mt Rila; the literature record from Mt Pirin (Velenovský 1891) is doubtful), E. and S. Macedonia and N. and N.E. Greece (Fig. 3), while the range of subsp. *rectum* includes C. Bosnia and Herzegovina, Montenegro, Albania, W., C. and E. Serbia, W., S.W. and C. Bulgaria, S. Macedonia and N. and N.E. Greece. In S.W. Bulgaria, S. Macedonia and N.E. Greece the ranges of these two subspecies overlap. However, habitats of subsp. *petricola* are situated at higher altitudes above 1000 m in comparison with the subsp. *rectum* which mainly grows at lower altitudes.

This taxon belongs to the Southwest Moesian-Macedonian-Thessalian floristic element, and in the wider sense to Submediterranean-continental subgroup of plants. It inhabits moderately wet or dry siliceous rocky slopes, forest clearings, beside mountain roads, from mountain to subalpine belts (Niketić 2012).

Heliosperma macranthum Pančić, Elench. Crna Gora: 11 (1875) – Caryophyllaceae
≡ *Silene macrantha* H. Neumayer ex Hayek, Denkschr. Akad. Wiss. Wien 94: 143 (1918)
Locus classicus: Mt Komovi, locality Visoke Grede (Pančić 1875: 11).

This species belongs to the subendemic Balkan genus *Heliosperma* Rchb. whose centre of largest taxa richness is the Dinaric Alps, especially in the S.E. part of the mountain chain. The genus *Heliosperma* was segregated as a distinct genus by Reichenbach (1841), but soon it was included in the genus *Silene* L. and until recently had kept this taxonomic status. Recent studies of molecular phylogeny of the genus *Heliosperma* confirmed the validity of this genus and supported its separation from the genus *Silene* (Frajman & Oxelman 2007). *Heliosperma* is an ancient genus which probably differentiated into a number of closely-related taxa during glacial-interglacial periods in the Balkans (Niketić & Stevanović 2007).

H. macranthum is a species very well distinguished from all other taxa of the genus *Heliosperma* by its very large pink flowers. This feature was stressed by Pančić (1875: 12) who gave the name *H. macranthum*. It is closely related to the recently described species *H. oliverae* Niketić & Stevan. from Mt Prokletije, *H. retzdorfiana* K. Malý from the Gorge of the Neretva river in Bosnia and Herzegovina and to *H. nikolicii* (Seliger & Wraber) Niketić & Stevan. distributed in N. Albania and Metohija province (Niketić & Stevanović 2007).

The distribution range of *H. macranthum* includes S.E. Dinaric Alps from Mt Komovi (*locus classicus*) over Mt Visitor to Mt Prokletije in Montenegro, Serbia and Albania (Fig. 4). For the locality in Tutin area from the literature source (Petković *et al.* 1989), there is no herbarium specimen which could prove this record.

It is a local endemic of Prokletije mountain floristic district (S.E. Dinaric orophytic elements), while in a broader sense it belongs to the South-European

mountainous subgroup. It inhabits limestone rocky crevices in a wide range of altitudes from 1000 m in the gorges and canyons to over 2000 m in the surrounding mountains. It is a member of the chasmophytic communities of vegetation order *Amphoricarpetalia* (Niketić & Stevanović 2012).

Heliosperma pusillum (Waldst. & Kit.) Rchb. subsp. ***monachorum*** (Vis. & Pančić) Niketić & Stevan. Arh. Biol. Nauka 59(4): 393 (2007) – Caryophyllaceae
≡ *H. monachorum* Vis. & Pančić, Mem. Reale Ist. Veneto Sci. 12: 463, tab. 8 (1865) [basion.]
≡ *Silene monachorum* Vis. in Vis. & Pančić, Mem. Reale Ist. Veneto Sci. 12: 463 (1865), nom. inval., pro syn.
≡ *S. monachorum* Vis. & Pančić in Pančić, Flora Kn. Srbije: 168 (1874), in clavi
≡ *S. quadridentata* (L.) Pers. subsp. *monachorum* H. Neumayer in Hayek, Repert. Spec. Nov. Regni Veg. Beih. 30(1): 265 (1924) [Prodr. Fl. Penins. Balc. 1]
≡ *S. pusilla* subsp. *monachorum* (Vis. & Pančić) Slavnić in Josifović, Flora SR Srbije 2: 236 (1970).
= *Silene pusilla* subsp. *tymphyaea* Greuter, Willdenowia 25(1): 132 (1995).
= *Silene quadridentata* (L.) Pers. f. *biloba* Novák, Preslia 5: 95 (1927).

Locus classicus: Derventa river Gorge (Visiani & Pančić 1865: 463).

It belongs to the complex *H. pusillum* which is distributed from the Alps and the Carpathians to the mountains of the Balkan Peninsula. The largest number of taxa of this complex is located in the Dinaric Alps and Scardo-Pindic mountain chain. *H. pusillum* subsp. *monachorum* is a relatively widespread endemic plant of the western part of the peninsula (Fig. 5) with the center of distribution in the C. and E. Dinaric Alps in Bosnia and Herzegovina, Montenegro, W. Serbia, extending southerly to Albania, W. Macedonia and N.W. Greece (Niketić & Stevanović 2012). It was also mentioned for the central Apennines, but according to a recent literature source (Conti *et al.* 2005), this record seems to be erroneous.

It belongs to the Central-East Dinaric-North Scardo-Pindic floristic element, in the wider sense to the subgroup of South-European mountainous species. This is a typical chasmophyte inhabiting shady limestone rocks, usually in the gorges and canyons, within various forest communities from mountain to subalpine belt. Less commonly it inhabits serpentine rocks (Niketić & Stevanović 2012).

Heliosperma pusillum (Waldst. & Kit.) Rchb. subsp. ***moehringiifolium*** (Uechtr. ex Pančić) Niketić & Stevan. Arh. Biol. Nauka 59(4): 392 (2007) – Caryophyllaceae
≡ *Silene moehringiifolia* Uechtr. ex Pančić, Add. Fl. Princ. Serb.: 118 (1884) [basion.]

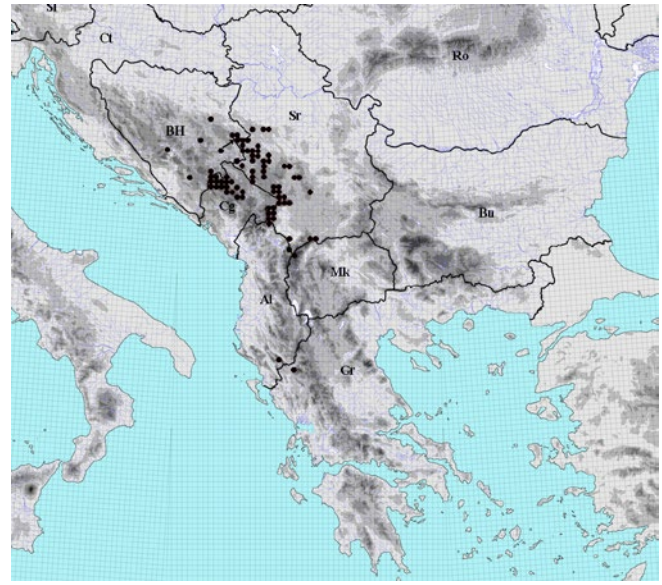

Fig. 5. Distribution of the subspecies *Heliosperma pusillum* (Waldst. & Kit.) Rchb. subsp. *monachorum* (Vis. & Pančić) Niketić & Stevan. in the Balkan Peninsula

≡ *Silene quadridentata* (L.) Pers. subsp. *moehringiifolia* (Uechtr. ex Pančić) H. Neumayer in Hayek, Repert. Spec. Nov. Regni Veg. Beih. 30(1): 266 (1924) [Prodr. Fl. Penins. Balc. 1];
≡ *S. pusilla* subsp. *moehringiifolia* (Uechtr. ex Pančić) Slavnić in Josifović, Flora SR Srbije 2: 236 (1970), comb. inval.

Locus classicus: Mt Stol in Krajinska region (Pančić 1884: 118).

This is also a taxon from the complex *H. pusillum* which is distributed in N.E and E. Serbia and C. Bulgaria (Mt Central Stara Planina) (Fig. 6). In the central part of the Balkan Peninsula it can be regarded as vicarious with the taxon *H. pusillum* subsp. *monachorum* whose distribution range covers the western part of the peninsula (Tomović *et al.* 2012).

It belongs to the West-Central Moesian floristic element and in the wider sense to the South-European mountainous subgroup of species. It is a predominantly calcicole chasmophyte inhabiting similar shady habitats as *H. pusillum* subsp. *monachorum*, but rarely can be found on siliceous rocks (Niketić & Stevanović 2012).

Dianthus moesiacus Vis. & Pančić, Mem. Reale Ist. Veneto Sci. 15: 17, tab. 19 (1870) – Caryophyllaceae
≡ *D. carthusianorum* L. var. *moesiacus* Williams, Journ. Linn. Soc. 29: 376 (1893).
= *D. burgasensis* Tutin, Feddes Repert. Spec. Nov. Regni Veg. 68: 192 (1963)
Locus classicus: Mt Vrška Čuka (Visiani & Pančić 1870: 17).

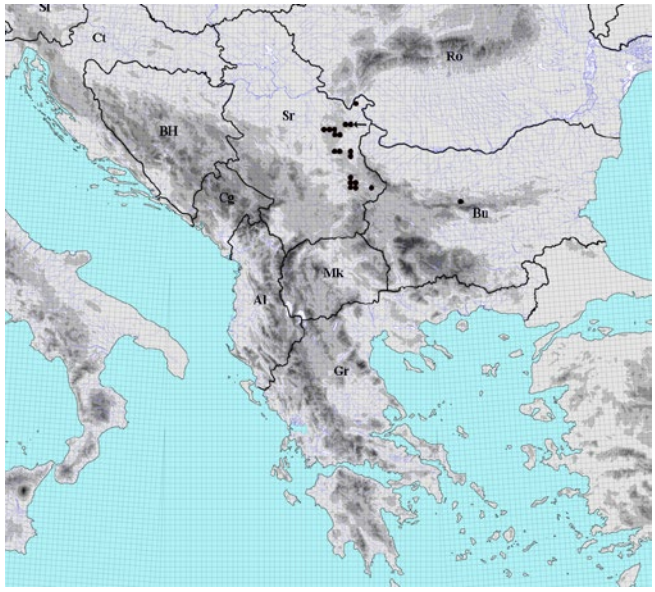

Fig. 6. Distribution of the subspecies *Heliosperma pusillum* (Waldst. & Kit.) Rchb. subsp. *moehringiifolium* (Uechtr. ex Pančić) Niketić & Stevan. in the Balkan Peninsula

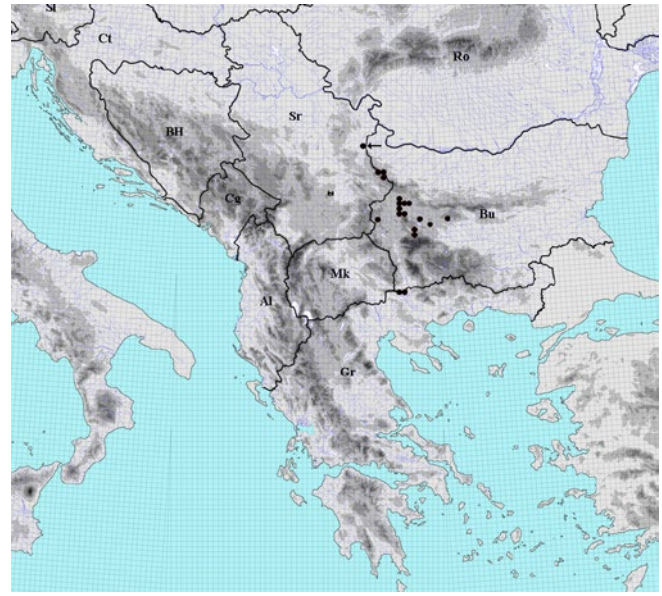

Fig. 7. Distribution of the species *Dianthus moesiacus* Vis. & Pančić in the Balkan Peninsula

D. moesiacus is an interesting endemic species from the section *Carthusianum* Williams which is represented by numerous endemic taxa in the Balkans. Several infraspecific taxa at subspecies rank with few forms were described in Bulgaria: *D. moesiacus* subsp. *genuinus* Stoj. & Acht. (with forms *typicus*, *pallidus*, *macedonicus* and *macrocephalus*), *D. moesiacus* subsp. *grancarovii* (Urum.) Stoj. & Acht., *D. moesiacus* subsp. *sevlivensis* (Degen & Neiceff) Stoj. & Acht., *D. moesiacus* subsp. *skobelevii* (Velen.) Stoj. & Acht. and *D. moesiacus* subsp. *stribrnyi* (Velen.) Stoj. & Acht. (Stojanoff & Achtaroff 1935). However, the taxonomical status of these subspecies is unclear. Some authors (Jalas & Suominen 1986: 219) included these taxa into *D. moesiacus* as synonyms, while others (Marhold 2011a) accepted these taxa in the rank of subspecies. In any case, the complex *D. moesiacus* requires a substantial taxonomical revision.

In the description of a new species, Visiani & Pančić (1870) pointed out that *D. moesiacus* is most similar to *D. pinifolius* Sm. and specified differential characters for these two species. Later studies indicated that within the section *Carthusianum*, the species *D. moesiacus* is positioned among three groups or aggregates: *D. pontedere*, *D. pinifolius* and *D. cruentus* (Stojanoff & Achtaroff 1935). However, according to Diklić & Stevanović (2012), *D. moesiacus* is most similar to the Moesian species *D. stribrnyi* Velen. (*D. moesiacus* subsp. *stribrny* (Velen.) Stoj. & Acht.) and Moesian-Macedonian species *D. stenopetalus* Griseb., forming a particular group of similar taxa in the section *Carthusianum*.

D. moesiacus is endemic to the central and eastern part of the Balkan Peninsula, and its distribution area includes E. Serbia (the literature record from Mt Radan (Jovanović 1984) is doubtful) and W., C., and S. Bulgaria (Fig. 7). It belongs to the West-East Moesian floristic element and in the wider sense it is a Pontic-(Submediterranean) plant. It grows on grassy, siliceous rocky places in mountain and subalpine belt (Diklić & Stevanović 2012).

Consolida uechtritziana (Pančić ex Huth) Soó, Oesterr. Bot. Z. 71: 236 (1922) – *Ranunculaceae*
≡ *Delphinium uechtritzianum* Pančić ex Huth Bot. Jahrb. Syst. 20(3): 378 (1895) [basion.]
≡ *Delphinium uechtritzianum* Pančić, Srpska Kralj. Bot. Bašta Beograd 1887: 5 (1888), [nom. inval., nom. nud.]

Pančić collected this plant from Grdelica area, Derven Gorge in Southeastern Serbia in 1881. The name *Delphinium uechtritzianum* Pančić (1888) is included in the list of plants that were cultivated in the Botanical Garden in Belgrade in 1887. However, this name should be treated as "nomen nudum", as Pančić did not provide any formal description for this plant. This species was described by Huth (1895: 378), on the basis of Pančić's herbarium material. According to Huth (1895), *C. uechtritziana* belongs to the tribe *Microcarpa*, which, in addition to the widely-distributed Atlantic-Mediterranean species *C. ajacis* (L.) Schur and *C. orientalis* (J. Gay) Schrödinger, also includes the Balkan-West Anatolian plant *C. phrygia* (Boiss.) Soó as well as the Adriatic endemic species *C. brevocornis* (Vis.) Soó. *C. uechtritziana* differs from all other species of this tribe in having a longer spur and the presence of undivided lower bracts.

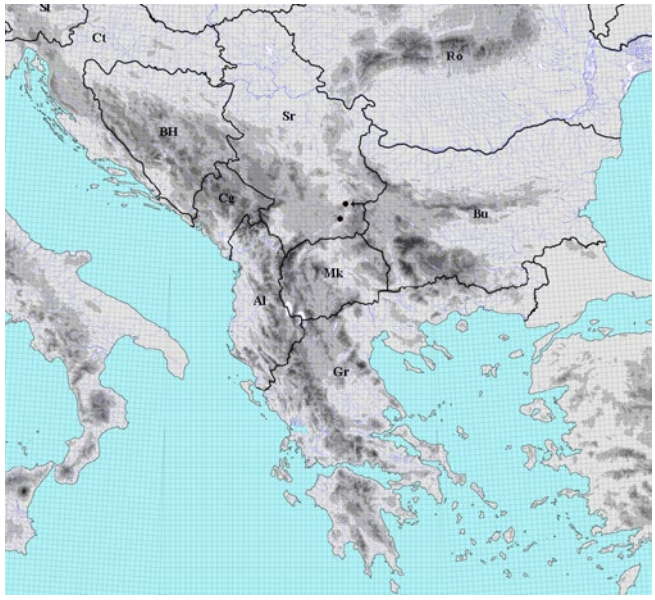

Fig. 8. Distribution of the species *Consolida uechtritziana* (Pančić ex Huth) Soó in the Balkan Peninsula

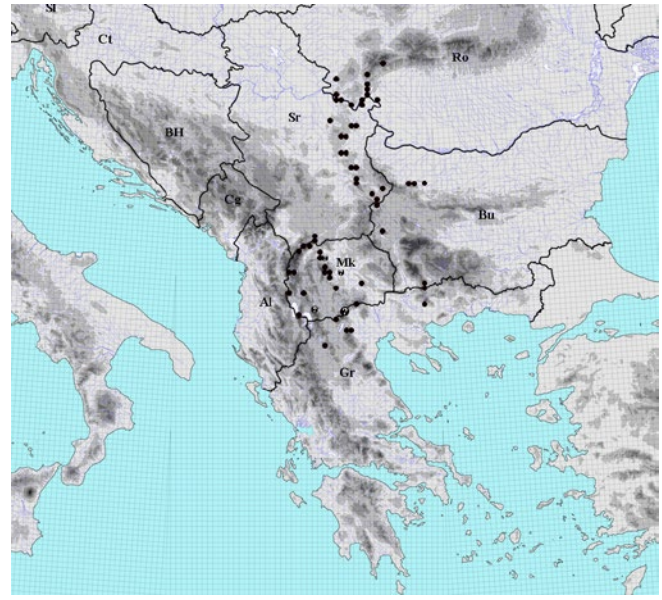

Fig. 9. Distribution of the species *Erysimum commatum* Pančić in the Balkan Peninsula and Romania

Apart from the type locality, *C. uechtritziana* was found only in the surroundings of the city of Vranje (Fig. 8) and at these two localities it can safely be supposed to be extinct (Lakušić 1999). In the Atlas Florae Europaeae (Jalas & Suominen 1989: 71) it was mapped on several UTM 50×50 km squares in Kosovo and Metohija regions, Montenegro as well as from a single locality in north Peloponnesus in Greece. However, these records have not been confirmed either by herbarium material or field research. According to Strid (2002: 25) this species is somewhat obscure and in Greece it may refer to a form of *C. ajacis*.

This species belongs to the West Moesian floristic element and in a broader sense it belongs to the Submediterranean-continental subgroup of plants. It is representative of the group of ancient Mediterranean annual plants which spread along dry continental areas in the Balkans due to agricultural practice (Lakušić 1999).

Erysimum commatum Pančić, Fl. Serbiae: 131 (1874) – Brassicaceae
≡ *E. helveticum* (Jacq.) DC. var. *commatum* (Pančić), Fl. Bulg. ed. 3: 523 (1948).
= *E. banaticum* Griseb. ex Ják., Magyar, Fl. 2: 439 (1924)
≡ *E. sylvestre* (Crantz) Scop. subsp. *banaticum* (Griseb. ex Ják.) Borza, Bul. Grad. Bot. Univ. Cluj 26: 169 (1946)
= *E. saxosum* Nyár., Bull. Sci. Acad. Reipubl. Popul. Roman., Sect. Sci. Biol., 7(2): 238 (1955)

Pančić (1874: 131) described this plant from two localities in E. Serbia - Mt Malinik and Niševac near the city of Svrljig. As he did not specify the type specimen, lectotypification of this species was done by Polatschek & Snogerup (2002: 151) and for the type locality these authors marked Mt Malinik "in rupestribus m. Malinik Serb. Austr., 05–06.1872, Pančić s.n. [GOET (herb. Grisebachianum)]".

According to Polatschek (2013), the species *E. commatum* belongs to the *E. diffusum* group of biennial plants with mostly cuneate petals. This group includes, in addition to widely distributed *E. diffusum* Ehrh., the following species: *E. andrzejowskianum* DC., *E. crassistylum* C. Presl, and *E. welchevii* Urumov. It differs from the very similar *E. andrzejowskianum* by the shape of its petals and by the angle of siliquae forming, while from all the other species of this group it can be separated on the basis of the following morphological characters: stem base without tunic, petals up to 15 mm long and flowers not fragrant (Ančev & Polatschek 2006).

This Balkan-Carpathian subendemic species is distributed in Bulgaria (Balkan foothills region, Znepole region and Mt Slavjanka), Serbia (Đerdap Gorge and limestone mountains of N.E. and E. Serbia), Republic of Macedonia (N.W., C. and S.W. mountains, including several uncertain records) and Greece (mountains of N.C. and N.E. regions). In Romania it is restricted to the Đerdap Gorge and the Southern parts of the Carpathian massif (Mt Banatske Planine) (Fig. 9). According to Polatschek (2013), *E. commatum* is also distributed in W. Serbia, Bosnia and Herzegovina and Montenegro, but on the basis of personal field investigations, as well as inspection of numerous herbarium materials from these countries, it can be concluded that this species does not

grow in the western part of the Balkan Peninsula, e.g. Dinaric mountains.

E. commatum belongs to the South Carpathian-West Moesian-North Scardo-Pindic, and in the wider sense to the South-European mountainous plants. This species inhabits open slopes and stony grasslands, foothills and mountains, predominantly on carbonate soils (Ančev & Polatschek 2006). It can also be found in oak up to the coniferous belt, at altitudes from 450 to 2100 m in the southern parts of its distribution range.

Malcolmia orsiniana (Ten.) Ten. subsp. ***serbica*** (Pančić) Greuter & Burdet, Willdenowia 13: 94 (1983) – Brassicaceae
≡ *M. serbica* Pančić, Fl. Serbiae: 129 (1874) [basion.]
≡ *M. serbica* Pančić var. *pancicii* Janch., Oesterr. Bot. Z. 68: 167 (1919)
≡ *M. maritima* (L.) R. Br. var. *serbica* (Pančić) G. Beck, Glasn. Zem. Mus. Bosn. i Hercegov. 28: 103 (1916) [Fl. Bosn. Hercegov. 2(7)]
≡ *M. illyrica* Hayek, Denkschr. Akad. Wiss. Wien 94: 150 (1918)
≡ *Wilckia serbica* (Pančić) Halácsy, Oesterr. Bot. Z. 45: 174 (1895)
≡ *Wilckia pancicii* (Adamović) Halácsy, Oesterr. Bot. Z. 45: 174 (1895)
≡ *W. serbica* (Pančić) Halácsy var. *illyrica* Halácsy, Oesterr. Bot. Z. 45: 175 (1895) ["*Wilckia illyrica*"], nom. inval., pro syn.
= *M. pancicii* Adamović, Oesterr. Bot. Z. 42: 405 (1892)
= *M. bassarana* Petrović ex Fritsch, Verh. Zool.-Bot. Vereins Wien 45: 376 (1895), nom. inval., pro syn

Pančić (1874: 129) described this plant from the locality Bučje in the foothills of Mt Tupižnica in E. Serbia. As the type specimen was not marked by the author, lectotypification of the name *M. serbica* was done by Georgiou (2002: 164) and for the type locality this author marked Mt Tupižnica "[SE Serbia] "Mt Tupižnica", May 1870, Pančić s.n. (BEO!)".

This taxon belongs to the Apennine-Balkan complex *M. orsiniana* (Ten.) Ten. in which a larger number of taxa of different ranks from species and subspecies to varieties were described. This Pančić taxon was later wrongly treated as a variety of widespread Mediterranean species *M. maritima* R. Br. var. *serbica* (Pančić) G. Beck. Greuter & Burdet (1984) divided species *M. orsiniana* into three subspecies: subsp. *orsiniana* which is widespread in the central Apennines and the Dinaric Alps from Slovenia, Croatia, Bosnia and Herzegovina to Montenegro, subsp. *serbica* (Pančić) Greuter & Burdet, with a range from N.E., E. Serbia and W. Bulgaria, over W. Macedonia and Albania to W. Greece (Fig. 10) and subsp. *angulifolia* (Boiss. & Heldr.) Stork distributed in Sterea Ellas (Mts Parnassus, Giona, Vardousia), Mt Olympus and the mountains of S.E. Macedonia and

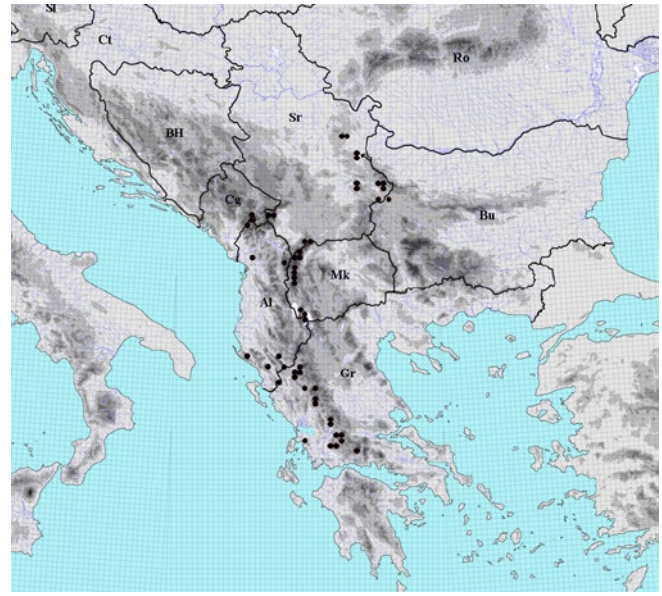

Fig. 10. Distribution of the subspecies *Malcolmia orsiniana* (Ten.) Ten. subsp. *serbica* (Pančić) Greuter & Burdet in the Balkan Peninsula

S. Bulgaria (Central Rhodopes). Such a taxonomic point of view was accepted by Georgiou (2002), who recognized two subspecies in Greece: subsp. *serbica* and subsp. *angulifolia*. These two subspecies are clearly chorologically separated in the central and southern parts of the Balkans, while in the western part of the Balkan Peninsula in S.E. Montenegro, *M. orsiniana* subsp. *serbica* borders with the type subspecies *M. orsiniana* subsp. *orsiniana*.

However, there are different opinions on the taxonomy of *M. orsiniana*. Thus, Jalas & Suominen (1994) recognized only two subspecies within the species *M. orsiniana*: type subspecies *orsiniana* and subsp. *angulifolia*, while the taxon *M. serbica* was considered as a synonym of subsp. *angulifolia*. Such a taxonomical concept was also accepted by Marhold (2011b). Despite the unresolved taxonomic status of this Pančić taxon, the concept proposed by Greuter & Burdet (1984) as *M. orsiniana* subsp. *serbica* is supported not only by morphological, but also chorological evidence.

The genus *Malcolmia* belongs to the Mediterranean-Submediterranean genus of annual to biennial plants with the largest number of representatives distributed in the E. Mediterranean. *M. orsiniana* subsp. *serbica* belongs to the West Moesian-North-South Scardo-Pindic floristic element, and in a broader sense to the South-European mountainous subgroup of plants. Optimal habitats of this subspecies are limestone nitrophytic and stabilized screes and surrounding rocks, usually below the cliffs or at the entrances of caves and rock shelters of the mountain to subalpine regions.

Barbarea balcana Pančić Srpska Kralj. Bot. Bašta Beograd 1877: 6 (1888) – Brassicaceae
≡ *B. rivularis* Pančić, Glasn. Srpskog Učenog Društva 53: 174 (1883) [Elem. Fl. Bulg.: 14], [nom. illeg.] [non Loret, Bull. Soc. Bot. France 6: 90 (1859)].
= *B. alpicola* Murb., Acta Univ. Lund. 27(5): 170 (1892)

Locus classicus: Mt Stara Planina, Midžor peak (Pančić 1883: 174)

This species is closely related to the Balkan endemic species *B. longirostris* Velen. that is distributed in Serbia, Bulgaria, Republic of Macedonia, Albania and Greece (Jalas & Suominen 1994). *B. balcana* is a Balkan endemic plant distributed mostly in the mountains of the central part of the peninsula (Fig. 11) along the Stara Planina mountain chain from E. Serbia to C. Bulgaria, in the W. and C. Rhodopes, Mt Rila and Mt Pirin in Bulgaria (Asenov 1970). In the Balkans it is also present in the mountain massif Šar-planina from Mt Ljuboten to Mt Vraca and Mt Korab (Micevski 1995) as well as in the neighboring mountains of E. Albania (Uzundzhalieva *et al.* 2013); it is also recorded in Mt Prokletije (Tomović 2007). Isolated parts of the range are Mt Vranica in C. Bosnia (Lubarda 2013) and Mt Nemerečka in S. Albania and Kalo Nero in N.W. Greece (Uzundzhalieva *et al.* 2013). *B. balcana* is included in The IUCN Red List of Threatened Species. Version 2014.2. under the LC category, as there are no other immediate major threats reported to most of the subpopulations across its range (Uzundzhalieva *et al.* 2013).

This species belongs to the Central-Southeast Dinaric-West-Central Moesian-North Scardo-Pindic floristic element, and in the broader sense to the group of Central-European mountainous plants. *B. balcana* inhabits damp places near streams, peat and tall herbs vegetation, mainly in siliceous mountains.

Cardamine serbica Pančić, Add. Fl. Princ. Serb.: 111 (1884) - Brassicaceae
≡ *C. maritima* Port. ex DC. f. *serbica* (Pančić) Schultz, Bot. Jahrb. Syst. 32: 579 (1903).
= *C. serbica* Pančić ex Asch. & Kanitz, Cat. Cormoph. Serb.: 76 (1877), nom. inval., nom. nud.
= *C. maritima* subsp. *maglicensis* (Rohlena) Trinajstić, Suppl. Fl. Anal. Jugosl. 4: 8 (1976)
≡ *C. maritima* var. *maglicensis* Rohlena, Repert. Spec. Nov. Regni Veg. 3: 145 (1906).

Pančić (1884: 111) described this plant from Mt Tara, between the village of Perućac and Derventa river Gorge. However, according to Flora Europea (Jones & Akeroyd 1993), Atlas Florae Europeae (Jalas & Suominen 1994) and Flora of Serbia (Jovanović-Dunjić 1972) this species was considered as a synonym of *C. maritima* Portenschl. ex DC. Only recently, Kučera *et al.* (2008) confirmed

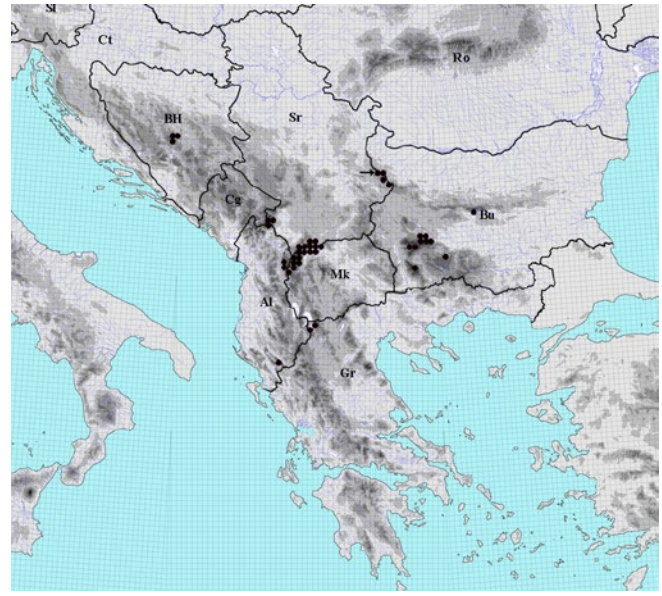

Fig. 11. Distribution of the species *Barbarea balcana* Pančić in the Balkan Peninsula

the status of this plant at the species level. *C. serbica* belongs to the Apennine-Balkan monophyletic group *C. maritima* (Lihová *et al.* 2006) which encompasses four additional species: *C. monteluccii* Brilli-Catt. & Gubellini (Italy), *C. fialae* Fritsch (Bosnia and Herzegovina), *C. rupestris* (O.E. Schulz) K. Malý (Montenegro) and *C. maritima* DC. (Croatia and Montenegro) (Kučera *et al.* 2008).

In addition, molecular analyses of the *C. maritima* group showed that the taxon *C. maritima* var. *maglicensis* described by Rohlena (1906) from Mt Maglić and *C. serbica* from Mt Tara represent, genetically, the same taxon (Kučera *et al.* 2008). Therefore, besides the type locality in Mt Tara (Derventa river Gorge) in W. Serbia this species is also distributed in Mt Maglić (Piva river Gorge) in Montenegro (Fig. 12).

This plant belongs to the Southeast-East-East Illyrian floristic element and in the wider sense to the Submediterranean-continental group of plants. *C. serbica* is restricted to the gorges of the Derventa and Piva rivers in shady limestone screes, which are refugial habitats for this relict plant in the Balkans.

Sempervivum leucanthum Pančić, Glasn. Srpskog Učenog Društva 53: 190 (1883) [Elem. Fl. Bulg.: 30] – Crassulaceae

Locus classicus: Mt Rila (Pančić 1883: 190)

This species belongs to the group of *Sempervivum* species, with light colored, lemon yellow, yellowish, yellowish-green, (rarely at the base) pink petals, that are distributed from the Alps to the mountains of the Balkan Peninsula. Its closest relative is *S. ciliosum* Craib. which

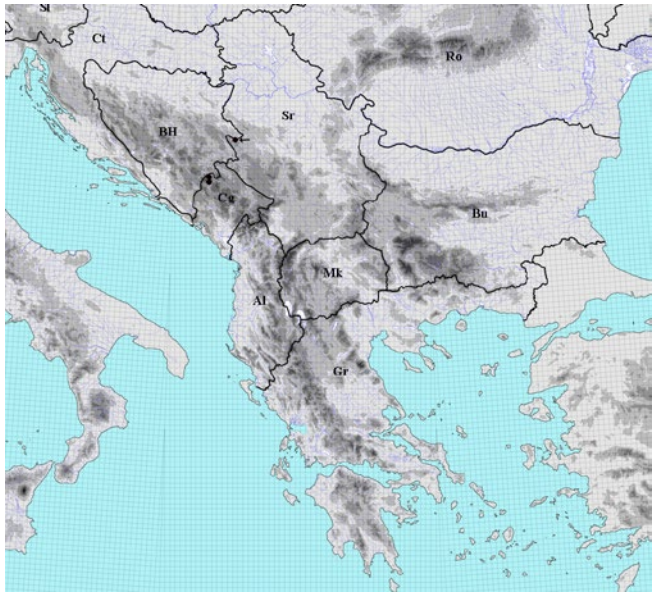

Fig. 12. Distribution of the species *Cardamine serbica* Pančić in the Balkan Peninsula

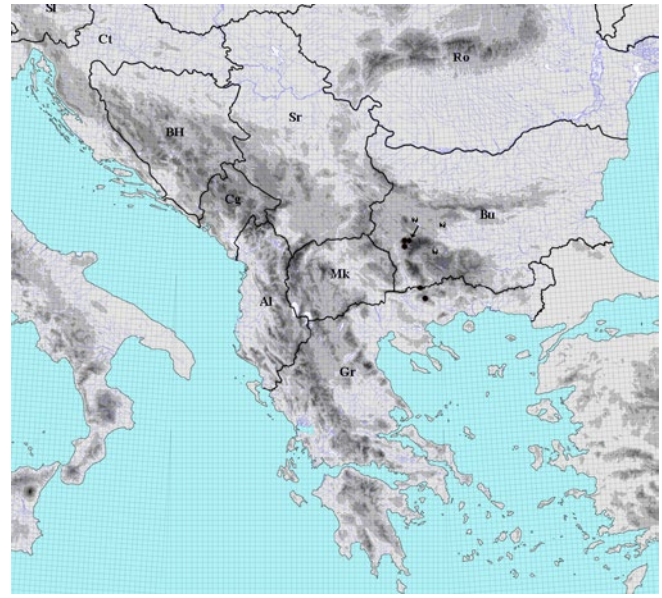

Fig. 13. Distribution of the species *Sempervivum leucanthum* Pančić in the Balkan Peninsula

some authors consider as a variety of *S. leucanthum* (Vălev 1970). *S. leucanthum* is also related with *S. kindingeri* Adamović from the Republic of Macedonia, S. Serbia and N. Greece, which according to some authors is a synonym of *S. leucanthum* (Hart 2002). However, according to a monograph on the genus (Praeger 1932), as well as some modern databases and Floras (Marhold 2011b; Greuter *et al.* 1984), all these taxa are treated as species. In addition, *S. leucanthum* is related to the eastern alpine species *S. pittonii* Schott, Nyman & Kotschy (Parnell & Favarger 1993).

S. leucanthum is distributed only in Mt Rila in Bulgaria (Vălev 1970) and in the mountains of N.E. Greece (Menikon and Orvilos) (Hart 2002). It was also cited to occur on some other mountains in Bulgaria (Mts Vitoša, Pirin, Slavjanka and Central Rhodopes), as well as from the valley of the Struma river and Tundžanska plain (Vălev 1970) (Fig. 13). However, on the basis of inspection of the herbarium specimens deposited in SO and determined as *S. leucanthum*, it was found to be *S. ciliosum*: Therefore, all the material of *S. leucanthum* from Bulgaria needs further taxonomic and chorological revision.

It belongs to the Southwest Moesian floristic element, while in a broader sense to the South-European mountainous subgroup of plants. It grows on dry to moderately moist, predominantly siliceous rocks at an altitudinal range of 300-2000 m (Assyov *et al.* 2006).

Viola orbelica Pančić, Glasn. Srpskog Učenog Društva 53: 176 (1883) [Elem. Fl. Bulg.: 16] – Violaceae
≡ *V. saxatilis* F. W. Schmidt [subsp. *macedonica*] f. *orbelica* (Pančić) Hayek, Repert. Spec. Nov. Regni Veg. Beih. 30(1): 517 (1925) [Prodr. Fl. Penins. Balc. 1]
≡ *V. alpestris* Jord. f. *orbelica* (Pančić) Becker, Beih. Bot. Centralbl. 21(2): 345 (1910)

Pančić (1883: 176) described in the protologue this species from Mt Rila in Bulgaria. Erben (1985: 637) assumed that Pančić's herbarium collection was destroyed during the bombing of Belgrade in 1942, and therefore designated a neotype from the material collected by Merxmüller & Zollitsch from Mt Pirin. However, on the basis of the specimen of *V. orbelica* collected by Pančić on Rila mountain deposited in BEOU, which unambiguously belongs to the original material, the lectotype was designated by Tomović *et al.* (2013), superseding the neotype of Erben. This regional Balkan endemic plant belongs to the section *Melanium* Gang. and is distributed on Mt Rila and Pirin in Bulgaria (Delipavlov 1979; Velchev *et al.* 1992; Petrova 2006), as well as in the eastern part of the Republic of Macedonia - Mt Osogovo, Mt Golak and Mt Plačkovica (Micevski 1995) (Fig. 14).

It belongs to the Southwest Moesian floristic elements, while in the wider sense it is included into the South-European mountainous group of plants. Habitats of this violet are grassy, rocky places, screes and bushes on silicate geological substratum at an altitude of 1000-2000 m (Delipavlov 1979; Micevski 1995).

Althaea kragujevacensis Pančić ex Diklić & Stevan., Proc. Fifth Optima Meeting, Istanbul 1986: 525 (1993) – Malvaceae
≡ *A. kragujevacensis* Pančić, Fl. Serbiae: 200 (1874), in clavi, nom. inval., pro syn. in introduct.

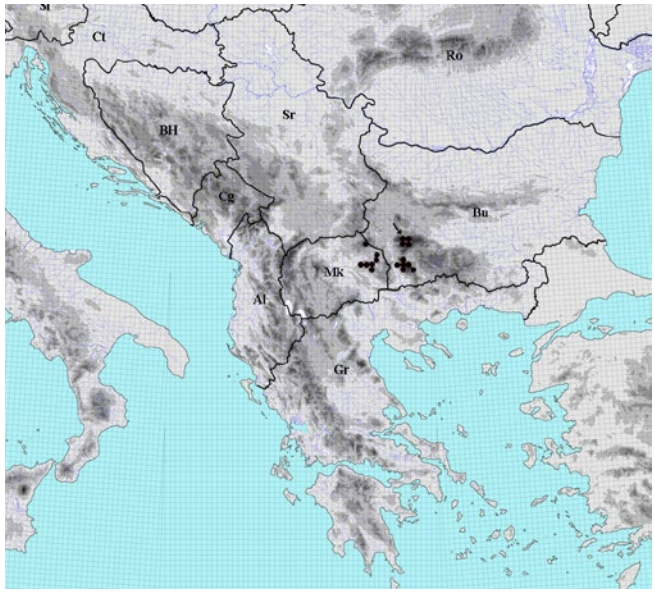

Fig. 14. Distribution of the species *Viola orbelica* Pančić in the Balkan Peninsula

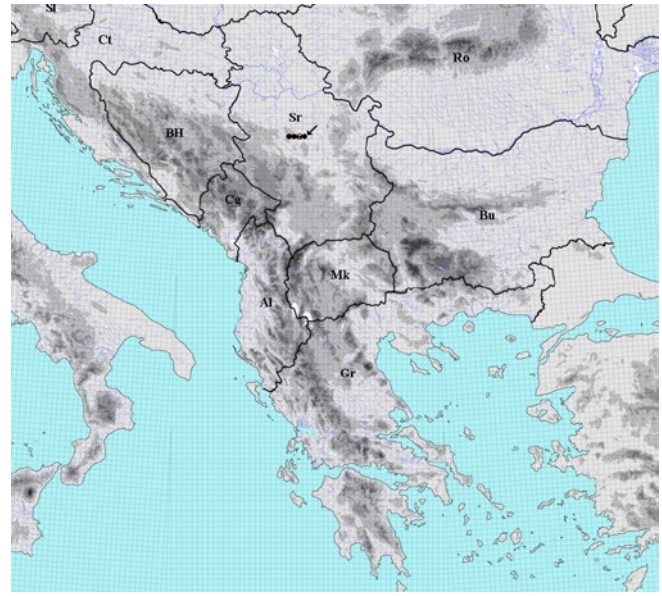

Fig. 15. Distribution of the species *Althaea kragujevacensis* Pančić ex Diklić & Stevan. in the Balkan Peninsula

– *A. taurinensis* sensu Pančić, Fl. Serbiae: XXV (1874), in introduct. [non DC., Prodr. 1: 436 (1824)]

Pančić (1874: 200) described this species in the *Flora Principatus Serbiae*, but he did not present any information on the *locus classicus*. Later, Diklić & Stevanović (1993) provided information about the type locality (Metino brdo near the city of Kragujevac) on the basis of Pančić's herbarium material deposited in BEOU. Besides the type locality, this plant was found in only three localities (Fig. 15) in the vicinity of Kragujevac city. For two localities from the literature source (Veljović 1967), there are no herbarium specimens which could prove these records.

A. kragujevacensis is a local endemic plant and belongs to the polymorphic complex of *A. officinalis* L. which includes a great number of taxa distributed in southern and central Europe. It is related to *A. taurinensis* DC. from Italy and to *A. armeniaca* Ten. from central and southwestern Asia. This plant is included in the Red Data Book of Flora of Serbia in the category EX - globally extinct taxa (Diklić 1999).

A. kragujevacensis belongs to the East Illyrian floristic element (restricted only to Šumadija region), and in a broader sense, to Central European group of plants. Although Pančić (1874) did not provide a specific description of the habitat of this species, it may be assumed that it inhabited wetlands near rivers and streams, similar to *A. officinalis* habitats.

Euphorbia subhastata Vis. & Pančić, Mem. Reale Ist. Veneto Sci. 10: 444, tab. 7 (1862) – Euphorbiaceae
≡ *E. agraria* M. Bieb. var. *subhastata* Griseb ex Asch. & Kanitz, Cat. Cormoph. Serb.: 92 (1877)

Visiani & Pančić (1862: 444) described this species from several localities in Serbia (Mt Ovčar, Stjenik peak on Mt Jelica, near Užice and in Mt Mokra Gora). However, Grisebach in Ascherson & Kanitz (1877) was the first botanist who considered *E. subhastata* as a variety of the East-European-Caucasian species *E. agraria* M. Bieb. and later, this concept was accepted by many other botanists (Hayek 1924; Smith & Tutin 1968; Janković & Nikolić 1972; Kuzmanov 1979) in 20th century. Morphological characters which separate the taxon *E. subhastata* from *E. agraria* are: stems branched in the upper part with non-flowering branches and lingulate-panduriform, glossy leaves (Hayek 1924; Janković & Nikolić 1972).

This species is distributed mostly in the Dinaric mountain massif that includes river gorges in C. Bosnia, mountains and gorges of C. (Mt Durmitor) and S.E. Montenegro (Mt Prokletije), W., S.W. Serbia and Metohija (Mt Prokletije). A disjunct part of the species distribution range is situated in the northern part of the Republic of Macedonia - Mt Suva Gora (Matevski & Teofilovski 2004). There are no data for this species in the Flora of Albania, but Meyer (2011) found the species *E. agraria* in Mt Prokletije "Thethi, Autstieg zum Shtegu i Dhenve" and it can be assumed that this record refers to *E. subhastata*. The species *E. subhastata* was cited for the Flora of Bulgaria (Kuzmanov 1979, sub. *E. agraria* M. B. var. *subhastata* (Vis. et Panč.) Griseb.) from the locality Popovica, Plovdiv area on the Trakijska plain. There are two additional herbarium specimens: west of village Krivina in the Sofia area (SO) and near town of Gabrovo in the Mt Central Stara Planina (SOM). Nevertheless, following revision of the herbarium material as well as comparision with the material from W. Serbia it is

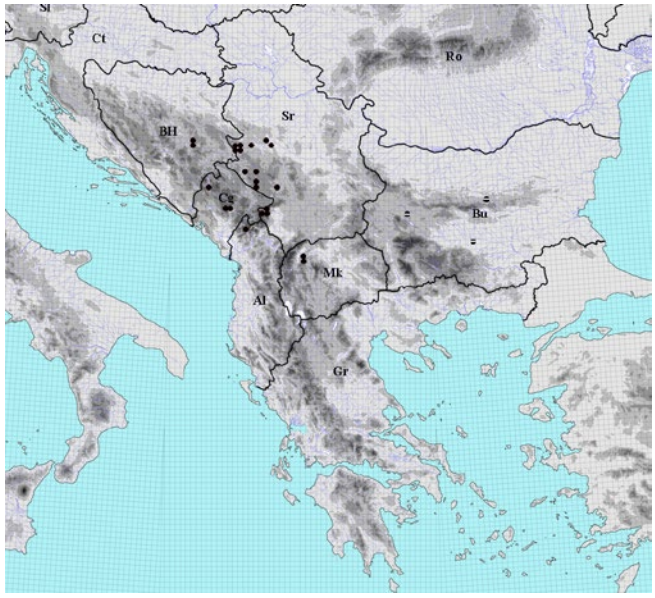

Fig. 16. Distribution of the species *Euphorbia subhastata* Vis. & Pančić in the Balkan Peninsula

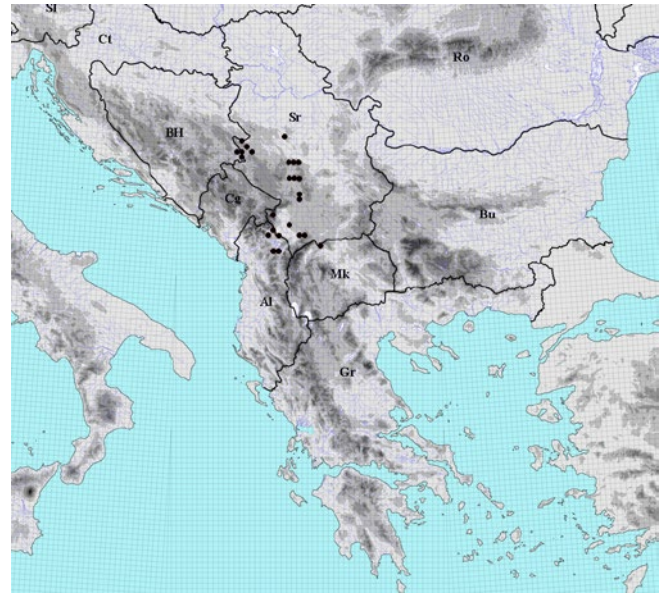

Fig. 17. Distribution of the species *Haplophyllum boisserianum* Vis. & Pančić in the Balkan Peninsula

Table 1. Number of Pančić's taxa recorded in the countries of the Balkan Peninsula and Romania

Taxon	BH	CG	AL	SR	BU	MK	GR	RM
Picea omorika	x			x				
Parietaria serbica				x	x			x
Cerastium rectum subsp. *petricola*					x	x	x	
Heliosperma macranthum		x		x				
Heliosperma pusillum subsp. *monachorum*	x	x	x	x		x		
Heliosperma pusillum subsp. *moehringiifolium*				x	x			
Dianthus moesiacus				x	x			
Consolida uechtritziana				x				
Erysimum commatum				x	x	x	x	x
Malcolmia orsiniana subsp. *serbica*			x	x	x	x	x	
Barbarea balcana	x		x	x	x	x	x	
Cardamine serbica		x		x				
Sempervivum leucanthum					x		x	
Viola orbelica					x	x		
Althaea kragujevacensis				x				
Euphorbia subhastata	x	x	x	x		x		
Haplophyllum boisserianum	x		x	x				
Total	**5**	**4**	**5**	**14**	**9**	**7**	**5**	**2**

Table 2. Pančić's taxa, presented in this paper, and their corresponding chorological groups, subgroups and floristic elements

Taxon	Chorological group	Chorological subgroup	Floristic element
Picea omorika	Boreal	Balkan-Boreal	E. Dinaric
Althaea kragujevacensis	Central European	S.E European (Balkan)	E. Illyrian
Euphorbia subhastata	Pontic	Pontic-(Submediterranean)	C.-E. Illyrian
Dianthus moesiacus	Pontic	Pontic-(Submediterranean)	W.-E. Moesian
Parietaria serbica	Mediterranean-submediterranean	Submediterranean -(Pontic)	W.-E. Moesian-S. Carpathian-Dobrogean
Cardamine serbica	Mediterranean-submediterranean	Submediterranean-continetal	S.E.-E. Illyrian
Cerastium rectum subsp. *petricola*	Mediterranean-submediterranean	Submediterranean-continental	S.W. Moesian-Macedonian-Thessalian
Consolida uechtritziana	Mediterranean-submediterranean	Submediterranean-continental	W. Moesian
Haplophyllum boisserianum	Mediterranean-submediterranean	Submediterranean-continental	E.Illyrian-N. Albanian
Erysimum commatum	Central-South European mountainous	South European mountainous	S. Carpathian-W. Moesian-N. Scardo-Pindic
Heliosperma macranthum	Central-South European mountainous	South European mountainous	S.E. Dinaric
Heliosperma pusillum subsp. *monachorum*	Central-South European mountainous	South European mountainous	C.-E. Dinaric-N. Scardo-Pindic
Heliosperma pusillum subsp. *moehringiifolium*	Central-South European mountainous	South European mountainous	W.-C. Moesian
Malcolmia orsiniana subsp. *serbica*	Central-South European mountainous	South European mountainous	W. Moesian-N.-S. Scardo-Pindic
Sempervivum leucanthum	Central-South European mountainous	South European mountainous	S.W. Moesian
Viola orbelica	Central-South European mountainous	South European mountainous	S.W. Moesian
Barbarea balcana	Central-South European mountainous	Central European mountainous	C.-S.E. Dinaric-W.-C. Moesian-N. Scardo-Pindic

confirmed that *E. subhastata* does not grow in Bulgaria (Fig. 16).

E. subhastata belongs to the Central-East Illyrian floristic element and in a broader sense to the Pontic-(Submediterranean) group of plants. It is a typical calcicole plant that grows on rocky places and screes at altitudes from 500 to 1400 m, while *E. agraria* inhabits open steppe areas, meadows, as well as segetal habitats.

The taxonomical status of *E. subhastata* is still unresolved and in future investigation it will be essential to establish whether it is a good species, clearly distinguished from *E. agraria*. Additionally, it is necessary to determine if the populations from the Dinaric Alps differ from the isolated population in the Republic of Macedonia.

Haplophyllum boisserianum Vis. & Pančić, Mem. Reale Ist. Veneto Sci. 15: 14, tab. 20 (1870) – Rutaceae
≡ *Ruta boisseriana* (Vis. & Pančić) K. Malý ex Asch. & Graebn., Syn. Mitteleur. Fl. 7: 251 (1915)

This species was described by Visiani & Pančić (1870: 14) from several ultramafic (serpentine) localities in W. Serbia (Panjak, Mt Zlatibor and Mt Mokra Gora). During the investigations that followed during the 20th and early 21st century, this species was recorded at several sites in E. Bosnia, W. and C. Serbia, Kosovo (Lubarda 2013; Tomović 2007; Rexhepi 2013) and N. Albania (Fig. 17). Compared with other representatives of the genus *Haplophyllum* in the Balkan Peninsula, this species occupies a relatively isolated position. Some authors considered the species *H. albanicum* (Bald). Bornm. as a synonym of *H. boisserianum* (The Plant List 2013). However, in relevant literature sources (Mayer & Wraber 1974; Micevski 2005), *H. albanicum* is treated as a valid species that is closely related more to *H. patavinum* (L.) Don fil. than to *H. boisserianum*. These three species belong to the section *Haplophyllum* and series *Patavinae* E. Mayer & T. Wraber.

H. boisserianum is an East Illyrian-North Albanian floristic element, while in the broader sense it belongs to the Mediterranean-Submediterranean group of plants, more precisely to the sub-Mediterranean-continental group of plants, which represent ancient Mediterranean-sub-Mediterranean species that are distributed deep in the continental part of the peninsula. This species belongs to a group of obligate serpentinophytes (Stevanović *et al.* 2003) and inhabits open and warm serpentinite rocky slopes of the alliances *Potentillion visianii* and *Centaureo-Bromion fibrosi*.

DISCUSSION

After more than 150 years of research of the flora of the Balkan Peninsula, taxa that Pančić discovered and described from Serbia, Montenegro and Bulgaria are mainly chorologicaly well-explored and their taxonomic status verified. However, there are still a number of Pančić's taxa whose distribution is still insufficiently known, and those with unclear taxonomic status. Such plants are, or should be, the subject of comparative morphological and molecular analyzes.

Most Pančić plants that are presented in this paper belong to endemic plants of the Balkan Peninsula. Bearing in mind that in the 19th century, the flora of the Balkan Peninsula was still insufficiently known, it is understandable that Pančić considered that all plants he discovered were localy distributed. However, subsequent floristical surveys revealed that the highest number of taxa have wider distributions that include the territory of two or more Balkan countries (Table 1). The greatest number of Pančić's taxa presented in this paper was recorded in Serbia (14) and Bulgaria (9), followed by Macedonia (7), Bosnia and Herzegovina, Albania and Greece (5), Montenegro (4) and Romania (2).

Pančić's taxa presented in this paper in phytogeographical terms can be classified into several groups and subgroups of floristic elements (Table 2). The highest number of taxa belong to the Central-South European mountainous group (8) and Mediterranean-Submediterranean group (5), while a significantly smaller number belong to the Pontic (2) and Boreal and Central European (1 respectively).

In the Central-South European mountainous group, Moesian (3 taxa) are the most abundant, while Dinaric and widespread plants are represented by a single taxon. Within the Mediterranean-Submediterranean group the most numerous are Submediterranean-continental (4 taxa), while Pontic species are represented equally with one Illyrian and one Moesian floristic element.

CONCLUSION

The aim of this paper was to overview, after more than 150 years, the distribution of 17 species and subspecies (Pinaceae to Rutaceae) in the Balkan Peninsula and Romania that Josif Pančić discovered and published during his investigations of the flora of Serbia, Montenegro and Bulgaria in the period 1846-1888. Emphasis was given to the floristic and phytogeographical importance, as well as phylogenetical position and relation to the closest relatives of Pančić's plants.

A review of the number of Pančić's taxa recorded in countries of the Balkan Peninsula was presented, as well as their corresponding chorological groups, subgroups and floristic elements.

A complete analysis of the flora consisting of species and subspecies that Pančić discovered and described will be presented in the fourth article (Stevanović *et al.* in preparation), after the presentation of all plant taxa. The final conclusions will also be given upon completion of all four parts regarding the distribution of Pančić's taxa at the species and subspecies rank.

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Botanica SERBICA

REZIME

Biljne vrste i podvrste koje je otkrio Dr. Josifa Pančić 1 – distribucija i floristički značaj

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U ovom radu predstavljano je 17 vrsta i podvrsta koje je Josif Pančić otkrio i opisao tokom svojih istraživanja na području Srbije, Crne Gore i Bugarske u periodu 1846-1888. godina. Za sve taksone date su karte rasprostranjenja, zasnovane na sopstvenim terenskim istraživanjima, uvida u bogate herbarske zbirke (BEOU, BEO, SOM), kao i na pregledu obimne florističke literature. Pored toga, za svaku biljnu vrstu ili podvrstu istaknuta je njena pripadnost određenom florističkom elementu, kao i ekologija i tipovi staništa koje ove biljke naseljavaju. U ovom radu, obrađene su sledeće vrste i podvrste: *Picea omorika* (Pančić) Purk., *Parietaria* serbica Pančić, *Cerastium rectum* Friv. subsp. *petricola* (Pančić) H. Gartner, *Heliosperma macranthum* Pančić, *Heliosperma pusillum* (Waldst. & Kit.) Rchb. subsp. *monachorum* (Vis. & Pančić) Niketić & Stevan., *Heliosperma pusillum* (Waldst. & Kit.) Rchb. subsp. *moehringiifolium* (Uechtr. ex Pančić) Niketić & Stevan., *Dianthus moesiacus* Vis. & Pančić, *Consolida uechtritziana* (Pančić ex Huth) Soó, *Erysimum commatum* Pančić, *Malcolmia orsiniana* (Ten.) Ten. subsp. *serbica* (Pančić) Greuter & Burdet, *Barbarea balcana* Pančić, *Cardamine serbica* Pančić, *Sempervivum leucanthum* Pančić, *Viola orbelica* Pančić, *Althaea kragujevacensis* Pančić ex Diklić & Stevan., *Euphorbia subhastata* Vis. & Pančić and *Haplophyllum boisserianum* Vis. & Pančić. Ostalih 48 Pančićevih vrsta i podvrsta biće predstavljeno u narednim sveskama časopisa "Botanica Serbica".

Ključne reči: Josif Pančić, endemična flora, rasprostranjenje vaskularnih biljaka, Balkansko poluostrvo