Bulletin of the Natural History Museum, 2008, 1: 113-148.

UDC: 582.49.6/.9:504.73.05/.06

SURVEY OF SOME RARE AND ENDANGERED PLANTS IN SERBIA WITH NEW CHOROLOGICAL DATA

Marjan Niketić[1], Gordana Tomović[2]

[1] Natural History Museum, Belgrade
E-mail: mniketic@nhmbeo.rs

[2] Institute of Botany and Botanical Garden, Faculty of Biology,
University of Belgrade, Belgrade

The distribution of five threatened or rare subendemic and one endemic taxa in Serbia based on field research, herbarium and literature data is presented. These taxa were mapped on a 10×10 sq. km UTM grid. The following taxa were analysed: *Silene fabarioides* Hausskn., *Hypericum annulatum* Moris subsp. *annulatum, Securigera elegans* (Pančić) Lassen, *Lathyrus hallersteinii* Baumg., *Pulmonaria rubra* Schott and *Achillea grandifolia* Friv. The species *Silene fabarioides* Hausskn. is a new plant for the Flora of Serbia. Besides the distribution data for each of the analyzed taxa, the taxonomic status, ecological features, pharmacological values as well as the estimated IUCN threatened status, for some of the taxa, in Serbia are given. The study of the ecology and distribution in Serbia of these six plant species provided useful information for plant protection management in this region.

Key words: vascular flora, endangered plants, distribution, new chorological data, Serbia.

INTRODUCTION

According to its ecological and phytogeographical features, Serbia is characterized by a significant number of mesophilous and xeromesophilous habitat types, which generate adequate conditions for the development and establishment of plant species which belong to the Central European areal type. Although they belong to different floristic elements, a certain number of Central European plants is subendemic and/or probably of Tertiary origin. They can be sporadically found at shielded positions (orographic or vegetation) – refuges in a hilly or mountainous region. The distribution of these floristic elements is particularly characteristic in the territory of Serbia.

On the other hand, many plant taxa, whose distribution area is situated south Serbia, generally speaking belong to the eastern submediterranean areal type. These plants are also related to similar refugial habitats, but in such cases these habitats are situated at the lower altitude in southern parts of Serbia. The spreading of plants that belong to the eastern submediterranean areal type to the north is predominantly limited by the influence of the continental climate which is more dominant in central parts in Serbia.

The aim of the present study was to examine the distribution patterns of these species in relation to their environment and to better understand the responses of these species to different ecological habitat types. During floristic investigations in the territory of Serbia, we recorded new distribution data of six subendemic taxa in Serbia. A survey of herbarium collections as well as of referent floristic literature resulted in complete distribution patterns of these plants in Serbia.

In this paper we have presented the distribution range, new chorological data, ecological and phytochemical features as well as the regional IUCN threatened status of six plant species in Serbia. Chorological data are based on field research, herbarium and literature data. Some of these taxa are also included on the Preliminary Red List of Threatened Plant Species of Serbia (Stevanović *et al.* 1996). The following taxa were analysed: *Silene fabarioides* Hausskn., *Hypericum annulatum* Moris subsp. *annulatum*, *Securigera elegans* (Pančić) Lassen, *Lathyrus hallersteinii* Baumg., *Pulmonaria rubra* Schott and *Achillea grandifolia* Friv.

MATERIAL AND METHODS

During most of the last two decades (from 1991 to 2008), abundant plant material has been collected in the territory of Serbia. Besides the field survey, herbarium material from the Collections of the Natural History Museum (BEO) and the Institute of Botany and Botanical Garden, Faculty of Biology, University of Belgrade (BEOU), and considerable literature data for chosen taxa were examined. For the literature records, only the the first (the oldest one) citation for certain locality was presented. On the basis of relevant distribution data, all investigated species are mapped on 10 x 10 sq. km and shown in a UTM grid system.

The estimation of the threatened status of some of the listed species for the territory of Serbia has been made according to criteria and categories of IUCN (2001), referent national legislative of the Republic of Serbia and, finally, by following the Preliminary Red List of Threatened Plant Species of Serbia (Stevanović *et al.* 1996).

Floristic elements were determined and classified into adequate areal types according to Meusel *et al.* (1965; 1978), and Meusel & Jäger (1992), and modified for the territory of Serbia according to Stevanović (1992).

For a new species of Serbian flora, *Silene fabarioides* Hausskn. description is based on mophological featues of the inspected herbarium specimens as well as on the recent floristic sources (Micevski 1993; Greuter *et al.* 1997).

RESULTS AND DISCUSSION

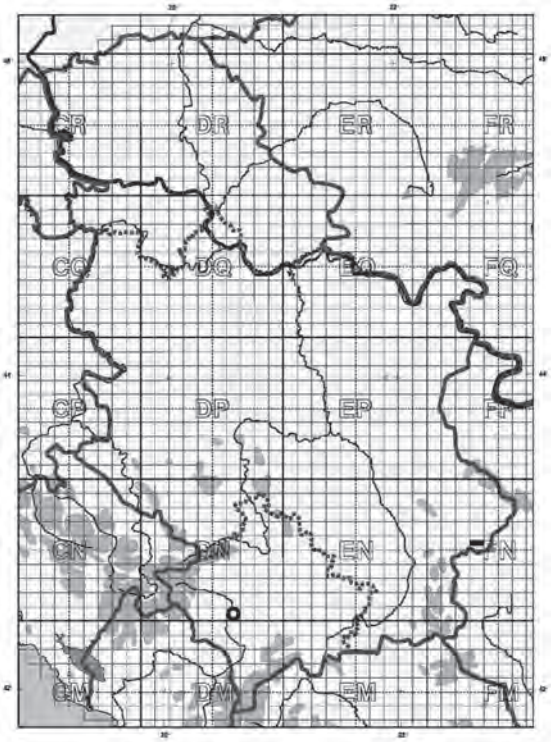
fam. *CARYOPHYLLACEAE*

Silene L. sect. *Behen* Dumort. (sect. *Inflatae* (Boiss.) Chowdhuri)

1. ***Silene fabarioides*** Hausskn.

General distribution: Until today, the known data of the species range has included the southern and eastern parts of the Balkan Peninsula: central and northern Greece (Halácsy 1901: 159; Greuter *et al.* 1997: 272), south-eastern Albania (Greuter *et al.* 1997: 272;

Jalas & Suominen 1986: 64, Map 1121), southern Macedonia (Vandas 1909: 60; Micevski 1993: 324), and western and south-eastern Bulgaria (Stojanov & Stefanov 1924: 373; 1933: 348; Jordanov & Panov 1966: 473-474). This species was also preliminarily announced in the abstract (Diklić *et al.* 1995: 26) as a new one for Serbian flora (also including one erroneous record for eastern Serbia) (Map 1).



Map 1. - Distribution of the species *Silene fabarioides* Hausskn. in Serbia. Indication of locations: black circle with white spot – according to herbarium new chorological data only; **–** - literature data preliminary reported in error.

Floristic element: s.eur mount (e.submed) / w.moes-c.scarpind-thess

Distribution in Serbia: Metohia: Mt Koznik: Miruša (DN60), bare semi-mobile serpentine screes, 370-500 m s.m. (leg. *Diklić, N.* 28-May-1971, sub *S. vulgaris* subsp. *marginata 38913*, BEO).

Estimated threatened status: CR B_1;B_2d,e / EN C_2b / VU D_2. This species is included on the Preliminary Red List of Threatened Plant Species of Serbia (Stevanović *et al.* 1996).

Habitat and ecology: It grows mostly in rocky places and screes (*Drypetea spinosae*), but also very often on xerophytic pastures and rocky grounds on serpentinite substratum (*Halacsyetalia sendtneri*), as well as in clearings among trees or scrub, dry river beds and road embankments. In Greece it grows at the altitudinal range from 300 to 1900 m s.m. (Greuter *et al.* 1997: 272). It represents a diagnostic species of the association *Achillea abrotanoides–Arenaria conferta* (Quézel 1967) in the Greek mountains on the limestone as well as of *Asperula chlorantha–Centaurea pawlowskii* chasmophytic community on exposed limestone cliffs and other rocky outcrops of the Vikos gorge in Greece (Amanatidou 2005: 87). It was also recorded within the *Quercus ilex* Mediterranean forest, *Platanus orientalis* riparian forest and *Marrubium peregrinum* nitrophylous communities (Amanatidou 2005) as an accompanied species. In Serbia it was recorded on bare semi-mobile screes at a lower altitude (370-500 m s.m.) of southerly exposition, among the underbrush zone of *Carpinetum orientalis*, where as a pioneer species it forms almost monodominant communities.

In Greece it usually grows on serpentinite (Constantinidis *et al.* 2002: 113), but also on various siliceous and calcareous substrate (Greuter *et al.* 1997: 272). In Serbia it was found only on serpentine bedrock. It was also noticed that this plant accumulates large amounts of chromium, copper and zinc (Babalonas *et al.* 1984).

Life form: Mes-Meg a H scap bien (Mes-Meg a T scap)

Chromosome number: 2n=24 was reported from serpentinite in Greece (Constantinidis *et al.* 2002: 113).

Description: Biennial, rarely annual glabrous herb, (20)30-70 cm in height, branched from the base, with 1-10(15) ascending to erect stems. Leaves are glaucos beneath, rarely with a violet tinge, usually green above, glabrous, slightly fleshy; with pectinate ciliate to finely serrulate margins. Cauline leaves (5)6-8(10) in pairs. Basal leaves of the sterile sheets in rosette in the first year, spathulate-obovate, subobtuse, (1.5)2-4(6) cm long and (1)1.8-2.5(3.5) cm wide, abruptly contracted into petiole; leaves of the basal parts of fertile stems, spathulate-elongate to spathulate-lanceolate, shortly acuminate, usually caducous during flowering period; leaves of the middle and upper parts of the stems spathulate-lanceolate to lanceolate, acuminate, often semi-amplexicaul,

usually not ciliate. Inflorescence rather lax, many-flowered, and from the middle of fertile stem symmetrical dichasium; in the base often with the shorter lateral branch (Fig. 1); flowers bisexual. Flowers pendent at anthesis; pedicels 0.8-3 cm long, bending upward in fruit. Calyx glabrous, membranous, obturbinate, strongly inflated at anthesis, not accumbent to capsule in fruit, abruptly contracted on the top, with the narrow throat, bluish-grey to pale pink, (8)9-13(15) mm long and 5-7 mm wide, with 10 reddish or reddish-violet anastomosing veins which raised in fruit; teeth 2-3 mm long, broadly triangular acute, with thin hyaline margins. Petals white; petal limb 2.8-3.7 mm long, spathulate, bifid; the lobes lanceolate or linear-lanceolate, rounded at the top; coronal scales linear, up to 1/3 as long as petal limb, auriculate at base; claw 6-9 mm long, glabrous. Filaments usually white, somewhat tinged with violet above. Ovary glabrous, stigmas 3. Capsule ovoid to pyriform, narrowed into a short neck at the top, (6)8-9(12) mm long, somewhat longer than calyx; antophore glabrous, 2-2.5(3) mm long. Seeds 1-1.3 mm, dark grey, ashy-grey to reddish-brown, reniform to suborbicular, only slightly flattened laterally; densely and regularly tuberculate; apices of tubercles blackish. V-VII (VIII).

Fig. 1. - *Silene fabarioides* Hausskn. in Mt Smolika (Greece). Inflorescence. Photo M. Niketić.

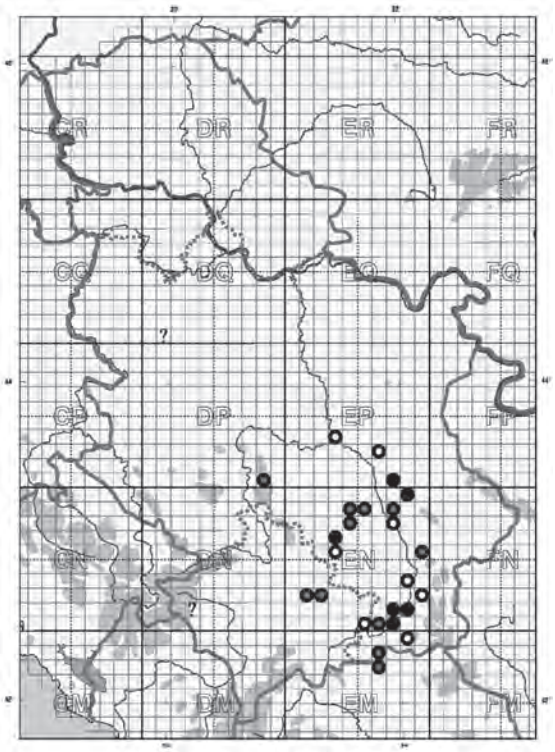
Silene fabarioides is Balkan endemic species which differs from the rest of usually perennial plants of its section, especially *S. vulgaris* (Moench) Garcke from Serbian flora, in the duration of its reproductive cycle, being a strictly biennial (rarely annual) plant. Furthermore, the peduncles often bend dramatically after pollination, wherefore the flowers are pendent, linear coronal scales, constituting 1/3 of the length of the petal limb and by the petal claw distinctly auricular in the upper part. It is also closely related to the endemic perennials *S. caesia* Sm. and *S. fabaria* (L.) Sm.

fam. *GUTTIFERAE*
Hypericum L. sect. *Adenosepalum* Spach.
2. *Hypericum annulatum* Moris subsp**. *annulatum***
H. degenii Bornm., "*H. atomarium*" auct.

General distribution: This species has a remote area of disjunctive distribution which corresponds to the three subspecies. The European type subspecies (subsp. *annulatum*) was described from those found in Sardinia (Moris 1827: 9), but the main part of the taxon range is situated in the central parts of the Balkan Peninsula: Albania (Robson 1968: 265; Qosja *et al.* 1992: 297), Serbia (Pančić 1884: 126; Stjepanović-Veseličić 1972: 112), Macedonia (Bornmüller 1925: 432; Micevski 1995: 491), Greece (Robson 1968: 265) and Bulgaria (Velenovský 1891: 105; Jordanov & Kožuharov 1970: 239-240). It was also cited for eastern Bosnia (Fritsch 1915: 192; Beck 1918: 205, fide Fritsch), but this seems questionable given the subspecies distribution area in the Balkan Peninsula and that the author took over the unconfirmed record from Wettstein. It is interesting that Balkans authors (Pančić 1884: 126, auct. plur.) did not distinguish this taxon from the closely related eastern Balkan-Anatolian species *H. atomarium* Boiss. Bornmüller (1910: 90) was the first who separated these two taxa. He described the new species *H. degenii* Bornm. from the central Balkans, but later on Robson (1968: 265) established it as conspecific with the Sardinian *H. annulatum*. The type subspecies (subsp. *annulatum*) have also been found as an adventive plant on the former railway in Denmark (Anonymous 2008) as well as in Poland (Piątek 2004). Two other subspecies are known from eastern and north-eastern Africa and southwest Asia. *H. annulatum* subsp. *afromontanum* (Bullock) N. Robson inhabits east tropical and subtropical Africa (Ethiopia, Uganda, Kenya, Tanzania) (Robson 1993: 69; 1996: 200). *H. annulatum* subsp. *intermedium* (Steud. ex A. Rich.) N. Robson was recorded for north-eastern subtropical Africa (Eritrea, Ethiopia, Sudan) (Robson 1993: 69;1996: 199-201) and most probably for south-western Saudi Arabia (Al-Turki 2004: 93, reported as species only).

Floristic element: submed / sard-e.submed (w.moes-n.scarpind-macthrac)

Distribution in Serbia: Distribution of this subendemic plant in Serbia is predominantly linked to the confluence of the Južna Morava and Vardar Rivers (including the Toplica, Nišava and Pčinja Rivers). This species was found in **C. Serbia** at Mt Pasjača and Mt Vidojevica (Ružić 1981: 188; 1983: 32), Mt Kopaonik (Stjepanović-Veseličić



Map 2. - Distribution of the species *Hypericum annulatum* Moris in Serbia. Indication of locations: black circle - according to literature and herbarium data; black circle with white spot - according to herbarium new chorological data only; black circle with gray spot - according to literature data only; ? - doubtful records.

1972: 112), Drenjska Gorge (Lakušić & Niketić 1988: 47) and Mt Sokolovica (Tomović *et al.* 2005: 27); **E. Serbia** in the surroundings of Niš (Petrović 1882: 181); **S.E. Serbia** in the surroundings of Vlasotince (Adamović 1910a: 107); **S. Serbia** at Mt Rujan (Gudžić *et al.* 2000: 60), Vranje: Vrtogoš ["Karpina"] (Pančić 1884: 126), Mt Pljačkavica and Vranjska Banja Spa (Ničić 1893: 27). This plant was recorded in the **Kosovo** region in Mt Grmija near Priština (Krivošej 1989: 55) and

in the **Metochia** region in the Prokletije Mountains (Rechinger 1935: 321). The record of *H. annulatum* in **N.W. Serbia** in Valjevo (Petnica village) has its origin in literature (Sabovljević & Marić 1993: 57). Bearing in mind that no herbarium evidence is available to support the presence of this species in this locality, this record needs to be checked. The new locality in Pomoravlje (Stalać gorge – Braljina) represents the northernmost record of the species range (Map 2).

Distribution in Serbia (new and unpublished data):

Pomoravlje: Stalać: Stalać gorge, Braljina (EP33) (leg. *Niketić, M.* 18-Apr-1993, sub *H. atomarium*, *ko19930402/2* BEO)

C. Serbia: Mt Radan: Sokolov Vis peak, Veliki Krš (EN35), siliceous (andesite) rocky ground (leg. *Niketić, M. & Tomović, G.* 01-May-2008, *26924* BEOU, *ko20080501/12* BEO).

E. Serbia: Mt Ozren: Leskovik (EP62) (leg. *Pančić, J.* 1881, sub *H. atomarium*, *3347* BEOU); Niš: Mt Seličevica, Malošište (EN68) siliceous bedrock (leg. *Niketić, M.* 04-May-1996, *19960402/34* BEO)

S.E. Serbia: Grdelica gorge: Devojkin kamen (EN83) (leg. *Tomović, G. et al.* 07-Aug-1997, sub *H. atomarium*, *8173* BEOU); Leskovac: Pečenjevce-Donje Živkovo, Vanos hill (EN77) (*Niketić, M.*, observ.); Surdulica: Jelašnica gorge (EN92) siliceous rocks, 450-600 m, ass. *Carpinetum orientale* (*Niketić, M., Tomović, G. & Zlatković, B.*, observ.)

S. Serbia: Bujanovac**:** Binačka Morava River, Končulj gorge (EN50) (leg. *Nikolić, V.* 29-Jun-1965, sub *H. atomarium* subsp. *degenii*, *s.n.* BEO); Pčinja River gorge: Jablanica (EM89), rocky ground (leg. *Zlatković, B.* 19-Jun-2006, *16269* BEOU).

Estimated threatened status: VU B_1;C_{2a}

Habitat and ecology: It is recorded in the pasture community *Sedo–Potentilletum arenariae* (Ranđelović & Ružić 1986: 83, Tab. 1), as well as at the forest, shrubbery and underbrush margins e.g. *Querco–Carpinetum orientalis* (Tomović *et al.* 2005: 27) and *Ostryetum carpinifoliae* (Stjepanović-Veseličić 1972: 112). In Serbia this plant grows mostly on siliceous geological substratum, but it also inhabits limestone habitats (Ranđelović & Ružić 1986: 83, Tab. 1). It can be found in the lower hilly regions from 280 m (Ranđelović & Ružić 1986: 83, Tab. 1) to 650 m s.m. (Lakušić & Niketić 1988: 47). In southern Bulgaria *H. annulatum* reaches an elevation of about 1800 m s.m.

(Jordanov & Kožuharov 1970: 240). This species is characteristic of slightly inclined, shady and hilly slopes shielded from strong wind.

Phytochemical and pharmacological features: *H. annulatum* subsp. *annulatum* is used in folk medicine for the treatment of gastric and liver disorders. This taxon has not yet been well investigated in terms of pharmacology (Kitanov & Akhtardzhiev 1979), but in the last eight years (Kitanov & Nedialkov 2000; 2001; Nedialkov & Kitanov 2002; Šavikin-Fodulović *et al.* 2003; Gudžić *et al.* 2004; Mitcheva *et al.* 2006; Momekov *et al.* 2006; Nedialkov *et al.* 2007; Zheleva-Dimitrova *et al.* 2007; Momekov *et al.* 2008) studies of this plant have demonstrated the presence of flavonoids, catechins, naphtodianthrones (hypericin and pseudohypericin), xanthones, one isocoumarin derivative, a phloroglucinol (hyperatomarin) and benzophenones.

fam. *LEGUMINOSAE*

Securigera L. sect. *Elegans* Karpenko

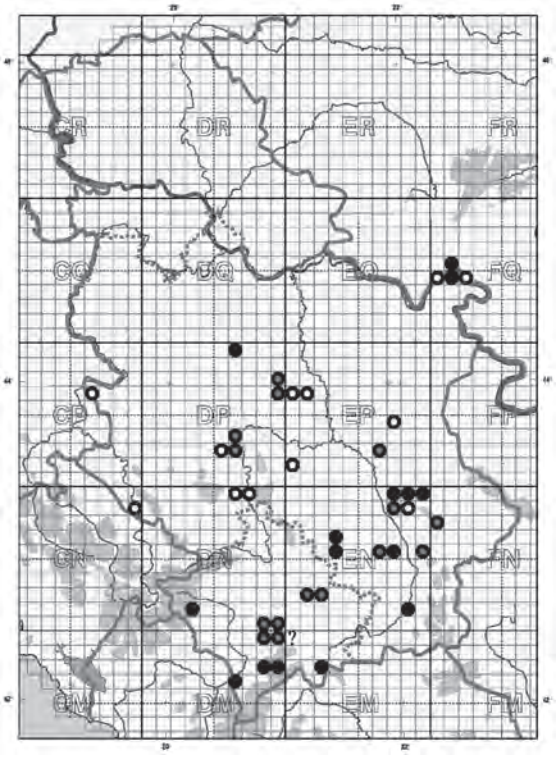
3. *Securigera elegans* (Pančić) Lassen

Coronilla elegans Pančić; *C. varia* L. var. *latifolia* Hazslinszky

Taxonomic position: This species was first discovered in north-eastern Serbia by Pančić (1874: 262), who described it under the name *Coronilla elegans*. After that, its taxonomic status had not been changed for more than a hundred years until Lassen (1989: 60) included it in the genus *Securigera* DC. on the basis of several morphological characters, together with some other related species. This inclusion has been proved by the recent molecular, electrophoretic, morphological and palynological studies (Allan & Mark Porter 2000; Karpenko 2006; Karpenko & Fedoronchuk 2007) in spite of some opposite opinions which have treated *Securigera* as congeneric with *Coronilla* (Sokoloff 2003; 2003a; Allan *et al.* 2006; Degtjareva *et al.* 2006). Furthermore, according to Karpenko & Fedoronchuk (2007) *S. elegans* represents a new described monotypic section, *Securigera* sect. *Elegans*.

General distribution: *S. elegans* as Balkan–West Pontian species occurs sporadically in south-eastern Europe from the central Balkans eastwards to the Ukraine. It was recorded among the floras of Bosnia and Herzegovina (Beck 1927: 291), Albania (Hayek 1924: 150), Serbia (Pančić 1874: 262; Diklić 1972: 544), Montenegro (Blečić *et al.* 1968:

230), Macedonia (Micevski 2001: 1367), Greece (Ball 1968a: 183), Bulgaria (Velenovský 1891: 146; Kožuharov 1976: 222-225), northern Hungary (Simon 2005: 76), Romania (Nyárády 1957: 333), Moldova (Geideman 1976), Slovakia (Dostál 1989: 578) and the Ukraine (Gorshkova 1948: 252; Karpenko 2006). Its alleged presence in the



Map 3. - Distribution of the species *Securigera elegans* (Pančić) Lassen in Serbia. Indication of locations: black circle - according to literature and herbarium data; black circle with white spot - according to herbarium new chorological data only; black circle with gray spot - according to literature data only; ? - doubtful record.

flora of Croatia has been recently treated as a doubtful (Nikolić 2007).

Floristic element: pont-c.eur / w.pont-dac-balk(w.illyr-moes-n. scarpind-macthrac)

Distribution in Serbia: *S. elegans* is distributed in the **Šumadija** vicinity of Kragujevac (Rudski 1949: 16, Tab. 2); **C. Serbia** at Mt

Stolovi (Novák 1929: 71), Mt Prolom Planina, Đavolja Varoš (Petković *et al.* 2002: 334) and Mt Sokolovica (Tomović *et al.* 2005: 16); **N.E. Serbia** at the Đerdap gorge, Tekija (*locus classicus)* (Pančić 1874: 262); **E. Serbia** in the surroundings of Aleksinac (Ilić 1897: 24), and the surroundings of Niš (Petrović 1882: 246), the Sićevačka gorge and Mt Seličevica (Diklić 1972: 544) and Mt Suva Planina (Jovanović 1980: 8, Tab. 26); **S.E. Serbia** in the vicinity of Leskovac (Ilić 1900: 17) and Vlasotince (Adamović 1910: 335); **S. Serbia** in the vicinity of Vranje, Vranjska Banja spa (Ilić 1900: 20); and in the **Kosovo** region at Mt Grmija (Tatić & Krasnići 1963: 326), Mt Lipovica (Nikolić 1966: 114) and Kačanik (Nikolić *et al.* 1986: 294). The record of *S. elegans* in the vicinity of Uroševac (Štimlje) has its origin in literature (Kojić & Pejčinović, 1982: 137) and needs to be checked. In the **Metochia** region this species was found at Mt Koritnik, Prizren: Vlašnja, Mt Crnoljeva Planina and Mt Birač (Krasnići 1972: Tab. 2, 3, 5, 6, 7, 8), the Prokletije Mountains (Rechinger 1935: 324) and the Šar-Planina Mountains (Nikolić *et al.* 1986: 294). The new locality in Brodarevo, Lim gorge (S.W. Serbia), represents the westernmost record of the species range in the territory of Serbia (Map 3).

Distribution in Serbia (new and unpublished data):

N.E. Serbia: Đerdap gorge: Ploče (FQ04), 650 m (leg. *Stevanović, V. et al.* 20-Apr-2002, sub *Coronilla elegans*, *14778* BEOU); Kladovo (FQ24) (leg. *Pančić, J.* Jun-1884, sub *Coronilla elegans*, *6073* BEOU)

E. Serbia: Mt Rtanj (EP74), limestone, 1100 m, S exp., ass. *Carpinetum orientalis* (*Lakušić, D. & Tomović, G.* obs.); Niš**:** Sićevo gorge (EN88), (leg. *Ilić, Đ.* Jul-1910, sub *Coronilla elegans*, *14864*, *14858* BEO)

Pomoravlje: Jagodina: Belica (EP06; EP16), pine forest (leg. *Petrović, J.* Jul-1914, sub *Coronilla elegans, s.n.* BEOU)

C. Serbia: Župa**:** Aleksandrovac, near the church (EP01) (leg. *Pančić, J.* 1874, sub *Coronilla elegans, 6071* BEOU); Raška**:** Jaruta hill (DN69, DN79), beech forest, N exp. (leg. *Košanin, N.* 22-Jun-1926, sub *Coronilla elegans*, *s.n.* BEOU)

W. Serbia: Mt Tara: Derventa River gorge (CP66), limestone (leg. *Stevanović, V., Tomović, G.* 27-May-2003, sub *Coronilla elegans*,

16635 BEOU; leg. *Stevanović, V.* 05-Jun-2004, sub *Coronilla elegans*, *20571* BEOU)

S.W. Serbia: Brodarevo: Lim gorge (CN98), rocks and rocky ground (leg. *Stevanović, V. et al.* 11-Jun-1990, sub *Coronilla elegans*, *657/90* BEOU)

Estimated threatened status: LR(nt). This species is included on the Preliminary Red List of Threatened Plant Species of Serbia (Stevanović *et al.* 1996).

Habitat and ecology: In Serbia it inhabits clearings, forest margins, as well as forest streams from 250 to 1370 m on the Prokletije Mountains (Rudski *et al.* BEO). According to Micevski (2001: 1367) it can also be found in Macedonia in the hilly and mountain pastures up to 1200 m s.m. It is recorded within the associations *Dioscoreo–Carpinetum orientalis, Corylo colurnae–Ostryetum carpinifoliae dioscoretosum*, (Krasnići 1972: Tab. 2, 3), *Quercetum frainetto–cerris* (Nikolić 1966: 107; Krasnići 1972: Tab. 5), *Quercetum montanum* (Nikolić 1966: 114; Krasnići 1972: Tab. 6), *Fagetum moesiacae* (Krasnići 1972: Tab. 8; Tomović *et al.* 2005: 16), *Querco–Carpinetum serbicum* (Rudski 1949: 16, Tab. 2; Krasnići 1972: Tab. 7), *Fago–Colurnetum colurnae* (Tomović *et al.* 2005: 16) and *Carpinetum orientalis serbicum* (Jovanović 1980: 8, Tab. 26). It is also recorded in the ruderal orchard association *Tanacetum vulgaris–Epilobium lamyi* within mixed apple and pear cultivations (Kojić & Pejčinović 1982: 137). It is most abundant on siliceous geological substratum, but it can also grow on limestone as well as on serpentinite Novák (1929: 71).

Phytochemical features: Six coumarins were detected from the seed material (Kovalev & Komissarensko 1984).

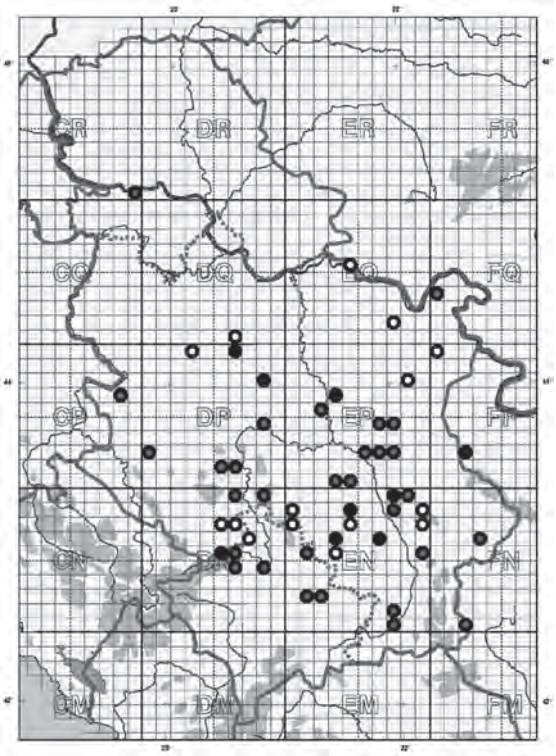
Lathyrus sect. *Pratensis* Bässler

4. *Lathyrus hallersteinii* Baumg.

General distribution: This species belongs to the *L. pratensis* L. taxonomic aggregate. It is known as subendemic, distributed in Romania (Nyárády 1957a: 425), Serbia (Pančić 1874: 256; Kojić 1972: 380), southern Bulgaria (Kožuharov 1976a: 527) and north-eastern Greece (Ball 1968: 140).

Floristic element: c.eur / carp-dac-balk(moes-macthrac)

Distribution in Serbia: **Srem** Mt Fruška Gora: Čerević (Kojić 1972: 380); **N.E. Serbia** at Mt Veliki Štrbac (Pančić 1874: 256); **Šumadija** at Kragujevac (Rudski 1949: 16, Tab. 2), and Mt Juhor (Gajić 1965: 30); **W. Serbia** on Mt Tara, Mt Murtenica (Pavlović 1964: 36), and Mt Čemerno (Pavlović 1964: 51, Tab. 3); **S.W. Serbia** at Ribarići and Tutin (Tomić 2000: 186, Tab. 1); **C. Serbia** at Raška (Pavlović 1964: 46, Tab. 2), Studenica and Ušće (Pavlović 1964: 51, Tab. 3), Mt Kopaonik (Ranđelović *et al.* 1982: 42), Mt Jastrebac and Prokuplje (Kojić 1972:



Map 4. - Distribution of the species *Lathyrus hallersteinii* Baumg. in Serbia. Indication of locations: black circle - according to literature and herbarium data; black circle with white spot - according to herbarium new chorological data only; black circle with gray spot - according to literature data only.

380), and Mt Sokolovica (Tomović *et al.* 2005: 30); **E. Serbia** in the gorge of the Grza River (Zajić & Lakušić 2004: 419), on Mt Rtanj (Pančić 1874: 256), Mt Stara Planina (Kojić 1972: 380), Aleksinac

(Ilić 1897: 24), Mt Ozren (Diklić 1962: 54, Tab. 1), in Niš and on Mt Seličevica (Petrović 1882: 273), and in the gorge of the Jerma River ["Manastir Suhodol"] (Kojić 1972: 380); **S.E. Serbia** on Mt Rudina (Milosavljević *et al.* 2006: 85), and in Leskovac (Ilić 1900: 17) and Vlasotince (Adamović 1910a: 86); **S. Serbia** in Vranje (Kojić 1972: 380); **Metochia** on the Prokletije Mountains: Mt Mokra Planina (Kojić 1972: 380); **Kosovo** in Zvečan near Kosovska Mitrovica (Bornmüller 1925: 502); and on Mt Grmija (Kojić 1972: 380), Podujevo (Nikolić *et al.* 1986: 289) (Map 4).

Distribution in Serbia (new and unpublished data):

N. Serbia: Bor: Brestovačka Banja spa (EP87) (leg. *Pančić, J.* Jul-1876, *5381* BEOU); Golubac: Golubački Grad Ruin (EQ45) (leg. *Nikolić, V.* 11-Jun-1970, *s.n.* BEO); Majdanpek (EQ71) (leg. *Pavlović* 1878, *s.n.* BEOU); Mt Deli Jovan: Crni Vrh peak (FP09), siliceous bedrock, 1100 m, ass. *Luzulo-Fagetum moesiacae* (leg. *Niketić, M. & Tomović, G.* 02-Jun-2005, *ko20050601/43* BEO).

E. Serbia: Mt Suva Planina: Devojački Grob pass (EN98), limestone bedrock, 1000-1100 m, ass. *Fago-Coryletum colurnae* (leg. *Niketić, M.* 04-Jun-1985, *ko19850402/22* BEO); Mt Suva Planina: Trem-Golemo Stražište-Valožje (EN97), limestone, 1300-1800 m, (leg. *Zlatković, B. & Gussev, Ch.* 07-Jul-2007, *6465* BEOU).

Šumadija: Mt Suvobor: Čardak hill near Ba (DP39), siliceous (granite) bedrock, 600 m, ass. *Orno-Quercetum petraeae* (leg. *Niketić, M. & Jovanović, M.* 07-May-2004, *ko20040503/03* BEO); Mt Venčac: north side slopes below the peak (DQ60), siliceous and marble bedrock, 450-500 m, ass. *Luzulo-Fagetum moesiacae* (leg. *Niketić, M. & Tomović, G.* 16-Apr-2005, *ko-20050403/11* BEO, *19421* BEOU).

C. Serbia: Mt Kopaonik: Lukovska Banja spa, Karidski Krš (EN07), siliceous and limestone bedrock, 800-900 m, ass. *Luzulo-Fagetum moesiacae* (leg. *Niketić, M. & Tomović, G.* 04-Apr-1998, *ko19980402/12* BEO, *10912* BEOU, 02-May-2002, *ko20020501/29* BEO, *15443*, *15450* BEOU); Prokuplje: Žitni Potok, on the hill (EN47) (leg. *Jurišić, Ž.* 30-May-1911, *12874*, *12875* BEO); Mt Prolom Planina: Đavolja Varoš (EN35), siliceous bedrock, 800 m, ass. *Orno-Quercetum petraeae* (leg.

Niketić, M. 02-Jun-2008, *ko20080601/03* BEO).

S.W. Serbia: Mt Rogozna: Novi Pazar - Grižani Han (DN76), 650 m (leg. *Soška, T.* 24-Jun-1914, *393* BEOU); Novi Pazar: Bačvar hill, Gradina (DN57), oak-hornbeam forest (leg. *Nikolić, V.* 16-May-1985, *s.n.* BEO).

Estimated threatened status: LR(nt)

Habitat and ecology: This plant can be found in Serbia in different types of predominantly mesophilous forest communities, at the various geological substrata from 270 m (Rudski 1949: 16, Tab. 2) to 1300 m s.m. (Pavlović 1964: 36) in the following communities: *Fagetum moesiacae, Querco–Carpinetum orientalis* (Tomović *et al.* 2005: 30), *Querceto petraei–Pinetum nigrae* (Pavlović 1964: 51, Tab. 3), *Quercetum dalechampii–cerris* (Milosavljević *et al.* 2006: 85), *Carpinetum orientalis* (Diklić 1962: 54, tab. 1), *Pinetum sylvestris–nigrae genistetosum* (Pavlović 1964: 46, Tab. 2), *Orno–Ostryetum aceretosum intermedii* (Tomić 2000: 186, Tab. 1) and *Querco–Carpinetum* (Rudski 1949: 16, Tab. 2). It is also known as an edificator of the Dacian oak-hornbeam forest (*Lathyro hallersteinii–Carpinetum*) in Romania (Doniţă *et al.* 2005).

fam. *BORAGINACEAE*

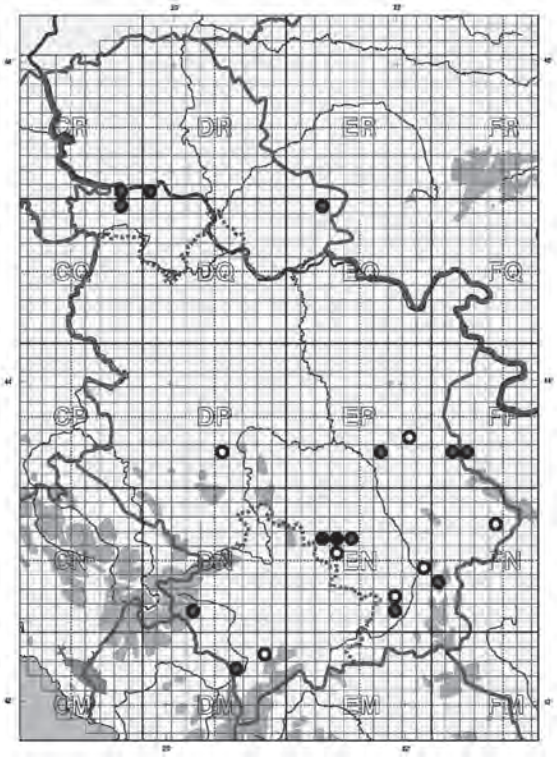
Pulmonaria L. sect. *Molles* A. Kerner

5. ***Pulmonaria rubra*** Schott

General distribution: This subendemic species is distributed in the Balkan Peninsula, Romania (Guşuleac 1960: 264) and the Ukraine (Cherepanov 1995). The Balkan part of the range encircles Albania (Hayek 1924: 157), Macedonia (Degen & Dörfler 1897: 730; Bornmüller 1928: 29), Serbia (Adamović 1901: 42; Cincović & Kojić 1974: 42), Bulgaria (Velenovský 1891: 395; Petrova 1989: 153-154) and northern Greece (Sauer 1987; Pavlides 1997; Bergmeier & Panayotis 2001; Tsiripidis & Athanasiadis 2003; Tsiripidis *et al.* 2007). It is also cultivated as a decorative garden plant in many countries and naturalised in the U.K. (Clement & Foster 1994), Norway (Fremstad & Elven 1997) and southwest Poland (Luczaj 2006). According to Sauer (1987), *P. rubra* represents an ancestral taxon in the same named species complex. In Serbia as well as in the Balkan Peninsula and in Romania and Anatolia

P. rubra is replaced at lower altitudes by the similar species *P. dacica* (Simonkai) Simonkai (*P. mollissima* A. Kerner) which also represents an ancestral taxon in the *P. mollis* Hornem. complex.

A sibling species, *P. filarszkyana* Jáv. is restricted to the northern Carpathians. According to some authors it is conspecific with *P. rubra*.



Map 5. - Distribution of the species *Pulmonaria rubra* Schott in Serbia. Indication of locations: black circle - according to literature and herbarium data; black circle with white spot - according to herbarium new chorological data only; black circle with gray spot - according to literature data only. Enlarged symbol refers to larger area without precise locality.

However, the molecular analysis of chloroplastic DNA sequences clearly showed a delimitation between these two species (Suteu *et al.* 2007).

Floristic element: c.eur / carp-dac-balc(moes-n.scarpind-macthrac)

Distribution in Serbia: Vojvodina on Mt Vršačke Planine and Mt Fruška Gora (Panjković 1983: 123). A detailed distribution of this species in Mt Fruška Gora was given by Butorac (1991: 6); **C. Serbia** on Mt Radan (Dinić *et al.* 1998: 10, Tab. 1), and Mt Sokolovica (Tomović *et al.* 2005: 16); **E. Serbia** on Mt Ozren (Ranđelović *et al.* 2005: 6; Đorđević *et al.* 2007: 72), and Mt Stara Planina (Adamović 1910a: 148; Ranđelović & Jeremić 2007: 66); **S.E. Serbia** on the Vlasina plateau (Ranđelović *et al.* 2003: 113); **S. Serbia** on Mt Krstilovica (Adamović 1901: 42); **Metochia** on Mt Paštrik (Hayek 1924: 157), and the Prokletije Mountains (Rechinger 1935: 357; 1953: 337) (Map 5).

Distribution in Serbia (new and unpublished data):

C. Serbia: Mt Čemerno: Risovac peak (DP52), 1000 m, beech forest (leg. *Stevanović et al.* 01-May-2004, *18657*, *18658* BEOU, *ko20040501/03* BEO); Mt Radan: Sokolov Vis peak, Veliki Krš (EN35), siliceous (andesite) rocky ground (leg. *Niketić, M. & Tomović, G.* 01-May-2008, *26911* BEOU, *ko20080501/02* BEO).

E. Serbia: Mt Vidlič: Odorovački kamen - Golemi Vrh peak (FN47), limestone ground (leg. *Vukojičić, S., Tomović, G. & Zlatković, B.* 14-Aug-2003, *17463* BEOU).

S.E. Serbia: Mt Ostrozub: Zelenički Potok spring (EN94), silicate, 1160 m, ass. *Luzulo-Fagetum moesiacae* (leg. *Niketić, M. & Tomović, G.* 30-Apr-2008, *26847* BEOU, *ko20080411/40* BEO).

S. Serbia: Vranje: Mt Oblik (EN72), silicate, 1100 m, beech forest (leg. *Niketić,M., Tomović,G. & Zlatković, B.* 04-May-2002, *15523* BEOU, *ko20020502/07* BEO).

Metochia: Šar-Planina Mountains: Kodža Balkan, Matos gorge (DM88) (leg. *Soška, Th.* 06-Jun-1923, *s.n.* BEOU).

Estimated threatened status: VU B_1

Habitat and ecology: The investigated species can be found in Serbia in hilly and mountainous mesophilous forests, mostly beech and rarely mixed spruce-fir forests (Cincović & Kojić 1974: 42) on a siliceous and limestone substrata. It is also observed within the associations *Quercetum frainetto-cerris* (Tomović *et al.* 2005: 16) and *Aceri–Carpinetum betuli* (Dinić *et al.* 1998: 10, Tab. 1). In Romania

and Greece it forms neutrophile beech-fir forests (*Pulmonario rubrae–Fagetum*) (Doniţã *et al.* 2005; Bergmeier & Panayotis 2001). In Romania it is a characteristic species of the *Asperulo–Fagetum* forest (Barbati *et al.* 2006: 64) and Dacian Beech forests alliance (*Symphyto–Fagion*) (European Commission 2003: 109) and also is accompanied by *Calamagrosteto–Spireetum ulmifoliae, Spiraeo–Coryletum* and many variants of beech forest (Doniţã *et al.* 2005). In Serbia, it is recorded at the altitudinal range from 500 to 1200 m s.m. and in Greece from (370) 1100 to 1850 m s.m. (Tsiripidis & Athanasiadis 2003: 280), while in Bulgaria (Mt Rila) it is observed at the altitude of 2000 m s.m. (M. Niketić, observ.).

fam. *COMPOSITAE*
Achillea sect. *Millefolium* (DC.) W. Koch

6. *Achillea grandifolia* Friv.

General distribution: As subendemic (Balkan-Anatolian) species, it is distributed in Albania (Jávorka *et al.* 1926: 315), Serbia (Pančić 1874: 414; Gajić 1975: 103), Macedonia (Vandas 1909: 287; Bornmüller 1926: 86), Greece (Boissier 1875: 259; Halácsy 1902: 45; Franzén 1991: 442; Tsiripidis & Athanasiadis 2003; Tsiripidis *et al.* 2007), Bulgaria (Velenovský 1891: 264), and Turkey (European part and Anatolia) (Huber-Morath 1975: 244). It is also cultivated as a decorative garden plant.

Floristic element: e.submed / moes-scarpind-n.pelop-thess-mac-thrac-anatol

Distribution in Serbia: C. Serbia: Mt Sokolovica (Tomović *et al.* 2005: 19), Mt Pasjača (Ružić 1983: 34), Mt Vidojevica (Ružić 1981: 197); **N.E. Serbia:** Kučajske Planine Mountains (Petrović *et al.* 1998: 23), Mt Vrška Čuka (Pančić 1874: 414), and Mt Veliki Krš near Bor (Knapp 1944: 25, Tab. 6); **E. Serbia:** Mt Suva Planina (Petrović 1882: 466) and Sićevačka gorge (Grebenščikov 1950a: Tab. 1), the surrounding of Pirot (Adamović 1911: 105), Mt Tresibaba, Babina Glava peak and Mt Stara Planina (Pančić 1874: 414); **S.E. Serbia**: Vlasotince (Adamović 1911: 105), Mt Besna Kobila (Nikolić *et al.* 1986: 316), and Grdelička gorge (Ranđelović & Stamenković 1979: 38). The only locality in the **Kosovo** region is on Mt Grmija near Priština (Krivošej 1989: 37),

while in the **Metochia** region it was noticed in several localities on the Prokletije Mountains (Rechinger 1935: 339; Rudski 1949a: 6, 37, 44; Grebenščikov 1943: 265) and in the surroundings of Peć, and the Dečanska Bistrica gorge (Nikolić *et al.* 1986: 316). From **W. Serbia** (Mt Tara Planina) and **Šumadija** (Mt Gledićske Planine) it was known only from the literature data (Vukićević 1965: Tab. 3; Rudski 1949: 22, Tab. 3). The new locality in the Šar-Planina Mountains represents the most south-western discovery of the species in the territory of Serbia (Map 6).

Distribution in Serbia (new and unpublished data):

N.E. Serbia: Mt Beljanica: (EP58) (leg. *Pančić, J.* Jul-1863, *10018* BEOU)

E. Serbia: Svrljig**:** Niševac, Trgoviški Timok gorge (EP81) *(Niketić, M.* obs.); Mt Tupižnica**:** Greben (EP93; EP94) (leg. *Niketić, M.* 28-Jun-1998, *ko19980607/13* BEO)

S.E. Serbia: Surdulica: the Jelašnica gorge (EN92) siliceous rocks, 450-600 m, ass. *Carpinetum orientale* (leg. *Niketić, M., Tomović, G. & Zlatković, B.* 04-May-2002, *ko20020503/23* BEO, *15530* BEOU); Vlasina plateau: the Vrla River gorge (FN02) (leg. *Niketić, M.* 22-Jul-1990, *ko19900605/09* BEO); Bosilegrad: the Božička River gorge near Gornja Božica village (FN02) (leg. *Niketić, M.* 22-Jul-1990, *ko19900605/10* BEO; *Niketić, M., Tomović, G., Zlatković, B. & Anačkov, G.* 14-Aug-2006, *22599* BEOU); Bosilegrad: Donja Ljubata, the Ljubatska River gorge (FN10) rocky ground near the stream (leg. *Niketić, M. & Tomović, G.* 01-May-2001, *ko20010501/05* BEO)

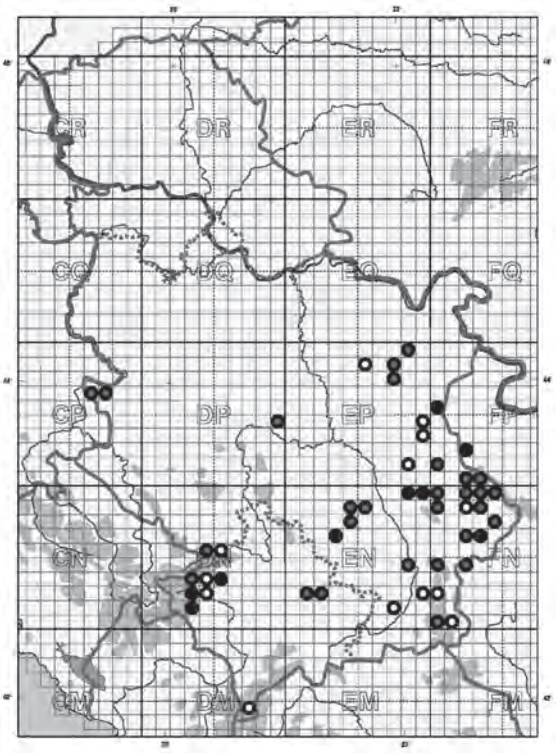
S. Serbia: Vranje: Mt Srednja Čuka peak (EN71) rocky ground (leg. *Ilić, Đ.*, *25304*, *25305* BEO)

S.W. Serbia: Ribarići: the Ibarska gorge, Prometanj (DN55) (leg. *Lakušić, D. & Prelević, N.* 04-Jul-1998, *8642* BEOU)

Metochia: Peć (DN42) (leg. *Sobrijevski* 1933, det. *Černjavski, P.*, *s.n.* BEO); Beli Drim: stream (DN43) (leg. *Košanin, N.* 05-Jun-1922, *s.n.* BEOU, *Niketić, M.* 04-Sep-1997, *ko19970902/51* BEO); Mt Šar-Planina: Dragaš, Brod - Gradski kamen (DM74) (leg. *Niketić, M.* 30-Sep-1991, *2327/91* BEOU)

Estimated threatened status: LR(nt). This species is included on the Preliminary Red List of Threatened Plant Species of Serbia (Stevanović *et al.* 1996).

Habitat and ecology: In Serbia this plant grows mainly on partly nitrophytic soils within mesophilous and xeromesophilous forests and shrub vegetation from the hilly to mountainous belt. It can also be found in clearings, burnt areas, and rocky grounds as well as under cliffs. It is recorded in the following phytocoenosis: *Carpinetum orientalis*



Map 6. - Distribution of the species *Achillea grandifolia* Friv. in Serbia. Indication of locations: black circle - according to literature and herbarium data; black circle with white spot - according to herbarium new chorological data only; black circle with gray spot - according to literature data only. Enlarged symbol refers to larger area without precise locality.

syringetosum (Grebenščikov 1950a: Tab. 1), *Corylo colurnae–Fagetum* (Tomović *et al.* 2005: 19), *Quercetum montanum* and *Humileto–Pinetum nigrae* (Jovanović 1980: 4, Tab. 8), *Fagetum montanum* (Rudski 1949:

22, Tab. 3), *Fagetum subalpinum* (Grebenščikov 1950b: 11), and spruce-beech forest (Rudski 1949a: 44). This plant is a characteristic species of the pioneer association *Epilobietum angustifolii senecieto–achilleetosum* which is developing after the burning of the *Abieto-Fagetum* forest at the altitude from 1200 to 1600 m s.m. on schistose substratum (Vukićević 1965: Tab. 4). This species has also formed a secondary community in Anatolia (*Achilleo grandifoliae–Micromerietum brachycalicii*) after the destruction of the *Cedrus libani* forests (Varol 2001: 342). In Serbia, this plant equally inhabits the limestone soils as well as the siliceous geological substratum at an altitude from 250 m in the Sićevačka gorge up to 1600 m s.m. on Mt Prokletije (Grebenščikov 1943: 265).

Phytochemical and pharmacological features: During the last three decades essential oils, flavonoids, alkaloids and amides have been isolated from different parts of the plant and antioxidative ability has been documented (Greger *et al.* 1982; Wollenweber *et al.* 1987; Hanlidou *et al.* 1992; Konyalioğlu & Karamenderes 2004; 2005; Tuberoso *et al.* 2006; Pavlović *et al.* 2008).

CONCLUSIONS

During the long-term floristic investigations of Serbia, we collected plenty of new chorological data and abundant herbarium material. Some new field and unpublished herbarium data for 6 endangered or rare, endemic or subendemic plant species for this territory are presented. By including numerous comprehensive literature data we created final distribution maps for these plants in Serbia. On the basis of compiled chorological, ecological and conservational information of enumerated taxa, we reached the following conclusions:

Silene fabarioides is a new species for Serbian flora. It was found only on serpentine bedrock on Mt Koznik in the Metochia region, which represents the most continental finding in the north-western part of the species range in the Balkan Peninsula.

Distribution of *Hypericum annulatum* Moris subsp. *annulatum* in Serbia is predominantly linked to the confluence of the Južna Morava and Vardar Rivers (including Toplica, Nišava and Pčinja Rivers),

keeping in mind its ecological features. The valleys of these rivers are predominantly covered with various types of xerophilous and xeromesophilous vegetation types, which are quite suitable for the spreading of this submediterranean plant in the southern and central regions of Serbia. The new locality in Pomoravlje (Stalać gorge) represents the northernmost record of the species range. Two literature records for this plant (the Prokletije Mountains in the Metochia region and the surroundings of Valjevo city) need to be checked in the field.

The Tertiary relic and also subendemic (Balkan–West Pontian) species *Securigera elegans* is not very rare in Serbia, but it is mainly distributed in refuges and isolated habitats in hilly and mountainous regions, as well as in the polydominant forest phytocoenosis of the gorges and valleys in the north-eastern region of Serbia. New records have been reported for 12 different UTM squares.

Correlated with the previous one, but a more frequent plant, *Lathyrus hallersteinii* is found at 15 new spots. The distribution of this central European (Carpathian-Dacian-Balkan) plant is well-documented in the literature, and according to these data it inhabits different types of mostly mesophilous forest communities, at various geological substrata.

The central European (Carpathian-Dacian-Balkan) species *Pulmonaria rubra* is scarcely distributed plant in the territory of Serbia. It forms relatively large populations within the hilly and mountainous mesophilous forests, mostly beech and rarely mixed spruce-fir forests in Serbia. Seven new chorological records for this taxon are presented for Serbia.

Achillea grandifolia is a submediterranean species which is predominantly distributed in the eastern and southern regions in Serbia. Among 13 new distribution data, the new findings on Mt Šar-Planina represents the southernmost record in Serbia. This plant mainly grows within mesophilous and xeromesophilous forests and shrub vegetation from the hilly to mountainous belt. It can also be found in clearings, burnt areas, and rocky grounds, as well as under cliffs at the altitude from 250 to 1600 m s.m.

By using the new IUCN (2000) criteria, we estimated the threatened status of the enumerated species in Serbia. On the basis of these criteria we consider that the following species should be included in the next

volume of the Red Data Book of Flora of Serbia and protected by national law: *Silene fabarioides* under the category critical endangered (CR) bearing in mind that this plant was found at only one locality in Serbia, and *Hypericum annulatum* subsp. *annulatum* and *Pulmonaria rubra* under the category critical vulnerable taxon (VU).

Acknowledgements

The authors warmly thank Dr. Nikola Diklić, Prof. Dr. Vladimir Stevanović, Prof. Dr. Dmitar Lakušić and Bojan Zlatković for supplying plant material. The authors are also grateful to anonymous reviewers whose comments considerably improved this manuscript. The Ministry of Science and Technological Development of Republic of Serbia, Grant 143015 "Diversity of Flora and Vegetation of the Central Balkans - Ecology, Chorology and Conservation" supported this research.

REFERENCES

Adamović, L. (1901): Novine za floru Kraljevine Srbije. Prosvetni glasnik **22**(9): 3-78. [in Serbian]

Adamović, L. (1910): Flora Jugoistočne Srbije. Rad Jugosl. Akad. Znan. Umj. **181**, Mat.-Prir. Razred **47**: 325-336 [163-174]. [in Serbian]

Adamović, L. (1910a): Flora Jugoistočne Srbije. Rad Jugosl. Akad. Znan. Umj. **183**, Mat.-Prir. Razred **48**: 83-176 [175-268]. [in Serbian]

Adamović, L. (1911): Flora Jugoistočne Srbije. Rad Jugosl. Akad. Znan. Umj. **188**, Mat.-Prir. Razred. **50**: 84-140 [318-374]. [in Serbian]

Al-Turki, T. A. (2004): A prelude to the study of the flora of Jabal Fayfa in Saudi Arabia. Kuwait Journal of Science & Engineering **31**(2): 77-145.

Allan, G. J., Mark Porter, J. (2000): Tribal delimitation and phylogenetic relationships of Loteae and Coronilleae (Faboideae: Fabaceae) with special reference to *Lotus*: evidence from nuclear ribosomal its sequences. American Journal of Botany **87**(12): 1871-1881.

Allan, G. J., Francisco-Ortega, J., Santos-Guerra, A., Boerner, E. A., Zimmerf, E. (2004): Molecular phylogenetic evidence for the geographic origin and classification of Canary Island *Lotus* (Fabaceae: Loteae). Molecular Phylogenetics and Evolution **32:** 123-138.

Amanatidou, D. (2005): Analysis and Evaluation of a Traditional Cultural Landscape as a basis for its Conservation Management. A case study in Vikos-Aoos National Park - Greece. - Fakultät für Forst- und Umweltwissenschaften Albert-Ludwigs Universität Freiburg im Breisgau. [PhD Thesis] (manuscr.)

Anonymous (2008 [updated Aug.]): Flora Nordica 6 (public review) [http://www.floranordica.org]. - Department of Phanerogamic botany, Swedish Museum of Natural History, Stockholm.

Babalonas, D., Karataglis, S., Kabassakalis, V. (1984): The ecology of plant populations growing on serpentine soils. III. Some plant species from North Greece in relation to the serpentine problem. Phyton (Austria) **24**: 225-238.

Ball, P. W. (1968a): *Coronilla* L. In Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M., Webb, D. A. (eds): Flora Europaea 2: 182-184. – Cambridge University Press, Cambridge.

Ball, P. W. (1968): *Lathyrus* L. In Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M., Webb, D. A. (*eds*): Flora Europaea 2: 136-143. – Cambridge University Press, Cambridge.

Barbati, A., Corona, P., Marchetti, M. (2006): European forest types. Categories and types for sustainable forest management reporting and policy, ed. 2. – European Environmental Agency, Copenhagen.

Beck, G. (1918): Flora Bosne, Hercegovine i bivšeg Sandžaka Novog Pazara 2(8). Glasnik Zemaljskog muzeja u Bosni i Hercegovini **30**(1-4): 177-217. [in Serbo-Croatian]

Beck, G. (1927): Flora Bosne, Hercegovine i oblasti Novog Pazara. III Horipetale. – Srpska kraljevska akademija. Posebna izdanja **63**, Prirodnjački i matematički spisi **15**: 1-487. [in Serbo-Croatian]

Bergmeier, E., Panayotis, D. (2001): *Fagus sylvatica* forest vegetation in Greece: Syntaxonomy and and gradient analysis. Journal of Vegetation Science **12**: 109-126.

Blečić, V., Tatić, B., Krasnići, F. (1965-1966 [1968]): Kratak prilog flori Jugoslavije. Glasnik Botaničkog zavoda i bašte Univerziteta u Beogradu. Nova serija **3**(1-4): 227-232. [in Serbian]

Boissier, E. (1875): Flora orientalis 3. - H. Georg, Genevae, Basileae & Lugduni [Genève, Bâle & Lyon].

Bornmüller, J. (1910): Einige Bemerkungen über *Hypericum atomarium* Boiss. und eine diesem verwandte, unbeschriebene Art: *Hypericum Degenii* Bornm. spec. nov. Magyar botanikai lapok **9**(3-4): 88-90.

Bornmüller, J. (1925): Beiträge zur Flora Mazedoniens 1. Botanische Jahrbücher **59**: 293-504.

Bornmüller, J. (1926): Beiträge zur Flora Mazedoniens 2. Botanische Jahrbücher **40**(136): 1-125.

Bornmüller, J. (1928): Beiträge zur Flora Mazedoniens 3. Botanische Jahrbücher **41**(140): 1-196.

Butorac, B. (1991): Neke biljke diferencijalnog karaktera za floru zapadnog dela Fruške gore. Zbornik radova PMF, Univerziteta u Novom Sadu. Serija za biologiju **21**: 5-14. [in Serbian]

Cincović, T., Kojić, M. (1974): Fam. *Boraginaceae* A. L. de Jussieu. In Josifović, M. (*ed.*): Flora SR Srbije 6: 1-71. – Srpska akademija nauka i umetnosti, Beograd. [in Serbian]

Cherepanov, S. K. (1995): Vascular Plants of Russia and Adjacent Countries of Former USSR. – Mir i Semya, Saint-Petersburg. [in Russian]

Clement, E. J., Foster, M. C. (1994): Alien plants of the British Isles. – Botanical Society of the British Isles, London.

Constantinidis, Th., Bareka, E.-P., Kamari, G. (2002): Karyotaxonomy of Greek serpentine angiosperms. Botanical Journal of the Linnean Society **139**(1): 109-124.

Degen, A., Dörfler, I. (1897): Beitrag zur Flora Albanien und Macedoniens. Ergebnisse einer von I. Dörfler im Jahre 1893 unternommenen Reise. Kaiserl. Akad. Wiss., Wien, Math.-Naturwiss. Kl., Denkschr. **64:** 701-748.

Degtjareva, G., Valiejo-Roman, C., Samigullin, T., Sokoloff, D. (2006): On generic rank and phylogenetic relationships of *Doryc*nopsis Boiss. (Leguminosae, Loteae). Anales del Jardín Botánico de Madrid **63**(1): 41-50.

Diklić, N. (1962): Prilog poznavanju šumskih i livadskih fitocenoza Ozrena, Device i Leskovika kod Soko Banje. Glasnik Prirodnjačkog muzeja u Beogradu, Serija B **18**: 49-83. [in Serbian]

Diklić, N. (1972): *Coronilla* L. In Josifović, M. (*ed.*): Flora SR Srbije 4: 537-545. – Srpska akademija nauka i umetnosti, Beograd. [in Serbian]

Diklić, N. (1977): Dopuna flori SR Srbije novim podacima o rasprostranjenju biljnih vrsta. In Josifović, M. (*ed.*): Flora SR Srbije 9: 205-210. – Srpska akademija nauka i umetnosti, Beograd. [in Serbian]

Diklić, N., Stevanović, V., Niketić, M. (1995): *Silene fabarioides* Hauskn. (sect. Inflatae, Caryophyllaceae) nova vrsta za floru Jugoslavije. In Ranđelović, V. (*ed.*): II Simpozijum o flori Srbije (IV Simpozijum o flori jugoistočne Srbije). Zbornik rezimea: 26-27. – Tehnološki fakultet u Leskovcu, DD "Zdravlje" Leskovac, Univerzitet u Nišu, Opština Vranje. Vranje. (abstract) [in Serbian]

Dinić, A., Jovanović, V., Kalinić, M. (1998): Phytocoenosis of sycamore and hornbeam (*Aceri-Carpinetum betuli* ass. nova) on the Radan Mt., Serbia. Zbornik Matice srpske, Serija za prirodne nauke **94**: 5-18.

Doniţã, N., Popescu, A., Paucã-Comãnescu, M., Mihãilescu, S., Biriş, I.-A. (2005): Habitatele din România. – Editura Tehnicã Silvicã, Bucureşti. [in Romanian]

Dostál, J. (1989): Nová květena ČSSR. 1. – Academia, Praha. [in Czech]

Đorđević, V., Avramović, D., Lilić, A., Ranđelović, N. (2007): Značajne biljne vrste Leskovika. In Anonymous: 15. Naučno-stručni skup "Ekološka istina" sa međunarodnim učešćem. Zbornik radova: 71-75. – Tehnički fakultet u Boru Univerziteta u Beogradu, Zavod za zaštitu zdravlja "Timok", Zaječar, Centar za poljoprivredna i tehnološka istraživanja, Zaječar, Društvo mladih istraživača, Bor, Fakultet zaštite na radu Univerziteta u Nišu, Sokobanja. [in Serbian]

European Commission, DG Environment (2003): Interpretation Manual of European Union Habitats. Version EU25. – Natura 2000.

Franzén, R. (1991): *Achillea* L. In Strid, A., Tan, K. (*eds*): Mountain flora of Greece 2: 431-450. – Edinburgh University Press, Edinburgh.

Fremstad, E., Elven, R. (1997): Alien plants in Norway; a review. Norsk geografisk tidsskrift **51**: 199-218.

Fritsch, K. (1914 (1915)): Neue Beiträge zur Flora der Balkanhalbinsel, insbesonders Serbiens, Bosniens und der Herzegovina. V. Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark **51**(1): 173-215.

Frivaldzsky, E. (1836): Succinctae diagnoses specierum plantarum novarum anno 1835 in Turcia europaea collectam. Flora **19**(2): 433-448.

Gajić, M. (1965): Prilog poznavanju flore srednje i južne Šumadije. Glasnik Muzeja šumarstva i lova **5**: 7-54. [in Serbian]

Gajić, M. (1975): Asteraceae Dumortier. In Josifović, M. (*ed.*): Flora SR Srbije 7: 1-465. – Srpska akademija nauka i umetnosti, Beograd. [in Serbian]

Geideman, T. S. (1976): On distribution of *Coronilla elegans* Panc. on the territory of Moldavskoi SSR. Bulletin of Moldavian Academy of Sciences, Ser. Biol.-Hem. **2**(5): 5-12. [in Moldavian]

Gorshkova, S. G. (1948): *Coronilla* L. In Komarov, V. L., Shishkin, B. K., Bobrov, E. G. (*eds*): Flora URSS 13: 247-255. – Izdateljstvo Akademii Nauk SSSR, Moskva, Leningrad. [in Russian]

Greger, H., Grenz, M., Bohlmann, F. (1982): Piperides and other amides from *Achillea* species. Phytochemistry (Oxford) **21**: 1071-1074.

Grebenščikov, O. (1943): Prilog poznavanju vegetacije Planine Koprivnik kod Peći. Srpska Kraljevska Akademija. Posebna izdanja **136**. Prirodnjački i matematički spisi. **35**, Ohridski zbornik **11**: 241-267. [in Serbian]

Grebenščikov, O. (1950a): O vegetaciji Sićevačke klisure (Prethodna beleška). Glasnik Prirodnjačkog muzeja srpske zemlje, Ser. B **3-4**: 176-194. [in Serbian]

Grebenščikov, O. (1950b): O vegetaciji centralnog dela Stare Planine. Srpska Akademija Nauka, Zbornik radova, Institut za ekologiju i biogeografiju **1**: 1-36. [in Serbian]

Greuter, W., Pirker, B., Oxelman, B. (1997): *Silene* L. In Strid, A. & Tan, K. (*eds*): Flora Hellenica 1: 239-323. – Koeltz Scientific Books, Königstein.

Gudžić, B., Đorđević, S., Nedeljković, J. (2000): Gasno-masena analiza etarskog ulja *Hypericum atomarium* Boiss. In Anonymous: 6. Simpozijum o flori jugoistočne Srbije i susednih područja sa međunarodnim učešćem. Zbornik rezimea: 60. – Biološko društvo "Sava Petrović", Tehnološki fakultet u Leskovcu, DD "Zdravlje" Leskovac, Opština Sokobanja, DOO "Adonis" Sokobanja, Sokobanja. (abstract) [in Serbian]

Gudžić, B., Dorđević, S., Nedeljković, J., Šmelcerović, A. (2004): Essential oil composition of *Hypericum atomarium* Boiss. Chemische Industrie **58**: 413-415.

Guşuleac, M. (1960): *Pulmonaria* L. In Săvulescu, T. (*ed.*): Flora Reipubliciae Popularis Romanicae 7: 254-271. – Academia Republicii Populare Romîne, Bucuresti. [in Romanian]

Halácsy, E. (1901): Conspectus Florae Graecae 1. – Guilelmi Engelmann, Lipsiae [Leipzig].

Halácsy, E. (1902): Conspectus Florae Graecae 2. - Guilelmi Engelmann, Lipsiae [Leipzig].

Hanlidou, E., Kokkalou, E., Kokkini, S. (1992): Volatile constituents of *Achillea grandifolia*. Planta Medica **58**: 105-107.

Hayek, A. (1924): Zweiter Beitrag zur Kenntnis der Flora von Albanien. Akademie der Wissenschaften in Wien, Mathematisch-Naturwissenschaftliche Klasse **99**: 101- 223.

Huber-Morath, A. (1975): *Achillea* L. In Davis, P. H. (*ed.*): Flora of Turkey and the East Aegean Islands 5: 224-252. – Edinburgh Universitu Press, Edinburgh.

Ilić, Đ. (1897): Nekolikoređih fanerogama iz Aleksinačke okoline i mesta na kojima rastu. In Srpska kraljevska učiteljska škola u Aleksincu. Izveštaj 1896: 23-26. – Beograd. [in Serbian]

Ilić, Đ. (1900): Prilog flori okruga Vranjskog. In Gimnazija Nemanjina u Vranju. Izveštaj školske 1899-1900: 15-21. – Beograd. [in Serbian]

IUCN (2001): IUCN Red List Categories and Criteria : Version 3.1. – IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

Jalas, J., Suominen, J. (1986): Atlas Florae Europaeae. Distribution of Vascular Plants in Europe. 7. Caryophyllaceae (Silenoideae). - The Committee for Mapping the Flora of Europe & Societas Biologica Fennica Vanamo, Helsinki.

Jávorka, A[S]., Degen, A., Gáyer, Gy., Soó, R., Trautmann, R., Zahn, K. H. (1926): *Anthophyta* [In Csiki, E., Jávorka, S., Kümmerle, J. B.: Adatok Albánia flórájához]. In Teleki, P., Csiki, E. (*eds*): A Magyar tudományos akadémia Balkán-Kutatásainak Tudományos Eredményei 3: 219-346. – A Magyar Tudományos Akadémia Kiadása, Budapest.

Jordanov, D., Panov, P. (1966): *Silene* L. In Jordanov, D. (*ed.*): Flora na Narodna Republika Bălgaria 3: 435-512. – Bălgarskata Akademija na Naukite, Sofija. [in Bulgarian]

Jordanov, D., Kožuharov, S. (1966): Guttiferae Juss. In Jordanov, D., Kožuharov, S. (*eds*): Flora na Narodna Republika Bălgaria 4: 224-263. – Bălgarskata Akademija na Naukite, Sofija. [in Bulgarian]

Jovanović, B. (1980): Šumske fitocenoze i staništa Suve planine. Glasnik Šumarskog fakulteta, Serija A – Šumarstvo **55**: 1-216. [in Serbian]

Karpenko, N. I. (2006): The *Coronilleae* (Adans.) Boiss. tribe (Fabaceae Lindl.) in the flora of Ukraine. – Taras Sevshenko National University, Kiev. [PhD Thesis] (manuscr.) [in Ukrainian]

Karpenko, N. I., Fedoronchuk, M. M. (2007): The Coronilleae (Adans.) Boiss. tribe (Fabaceae) of the flora of Ukraine. Ukrainian Botanical Journal **64**(5): 643-650.

Kitanov, G., Akhtardzhiev, Ch. (1979): Isolierung von Gentisein aus *Hypericum degenii* Bornm. Pharmazie **34**: 447–448.

Kitanov, G. M., Nedialkov, P. T. (2000): Xanthohypericoside, a new xanthone-O-glucoside from *Hypericum annulatum*. Pharmazie **55**(5): 397-398.

Kitanov, G. M., Nedialkov, P. T. (2001): Benzophenone O-glucoside, a biogenic precursor of 1,3,7–trioxygenated xanthones in *Hypericum annulatum*. Phytochemistry **57**(8): 1237-1243.

Knapp, R. (1944): Vegetationsstudien in Serbien. – Vervielfkigtes Manuskr., Halle.

Kojić, M. (1972): *Lathyrus* L. In Josifović, M. (*ed.*): Flora SR Srbije 4: 358-385. – Srpska akademija nauka i umetnosti, Beograd. [in Serbian]

Kojić, M., Pejčinović, D. (1982): Korovska flora i vegetacija Kosova. – Zavod za udžbenike i nastavna sredstva SAP Kosova, Posebna izdanja, Priština. [in Serbian]

Konyalioğlu, S., Karamenderes, C. (2004): Screening of total flavonoid, phenol contents and antioxidant capacities of *Achillea* L. species growing in Turkey. Acta Pharmaceutica Turcica **46**: 163-170.

Konyalioğlu, S., Karamenderes, C. (2005): The protective effects of *Achillea* L. species native in Turkey against H_2O_2-induced oxidative damage in human erythrocytes and leucocytes. Journal of Ethnopharmacology **102**(2): 221-227.

Kovalev, V. N., Komissarensko, A. N. (1984): Coumarins of *Coronilla elegans*. Khimiya Prirodnykh Soedinenii **2**: 246-247. [in Ukrainian]

Kožuharov, S. (1976): *Coronilla* L. In Jordanov, D. (*ed.*): Flora na Narodna Republika Bălgaria 6: 220-229. – Bălgarskata akademija na naukite, Sofija. [in Bulgarian]

Kožuharov, S. (1976a): *Lathyrus* L. In Jordanov, D. (*ed.*): Flora na Narodna Republika Bălgaria 6: 503-548. – Bălgarskata akademija na naukite, Sofija. [in Bulgarian]

Krasnići, F. (1972): Šumska vegetacija brdskog regiona Kosova. – Zajednica naučnih ustanova Kosova. Studije, Knjiga 27, Priština. [in Serbian]

Krivošej, Z. (1989): Flora planine Grmije kod Prištine. Magistarska teza. – Prirodno-matematički fakultet, Univerzitet u Beogradu, Beograd. (manuscr.) [in Serbian]

Lakušić, D., Niketić, M. (1988): Novi podaci o rasprostranjenju biljaka u Srbiji. In Anonymous: Zbornik radova "Prvih deset godina BID-a Josif Pančić": 43-59. – Biološko istraživačko društvo "Josif Pančić", PMF, Beograd. [in Serbian]

Lassen, P. (1989): A new delimitation of the genera *Coronilla*, *Hippocrepis* and *Securigera* (Fabaceae). Willdenowia **19**(1): 49-62.

Luczaj, L. (2006): *Pulmonaria rubra* (Boraginaceae) - new species to the flora of Poland. Fragmenta Floristica et Geobotanica Polonica **13**(2): 414-416.

Meusel, H., Jäger, E., Weinert, E. (1965): Vergleichende Chorologie der zentraleuropäischen Flora [1]. Karten. – Gustav Fischer, Jena.

Meusel, H., Jäger, E., Weinert, E. (1965): Vergleichende Chorologie der zentraleuropäischen Flora [1]. Text. – Gustav Fischer, Jena.

Meusel, H., Jäger, E., Weinert, E. (1978): Vergleichende Chorologie der zentraleuropäischen Flora [2]. Karten. – Gustav Fischer, Jena.

Meusel, H., Jäger, E., Weinert, E. (1978): Vergleichende Chorologie der zentraleuropäischen Flora [2]. Text. – Gustav Fischer, Jena.

Meusel, H., Jäger, E. (1992): Vergleichende Chorologie der zentraleuropäischen Flora 3. Text. – Gustav Fischer, Jena, Stuttgart, New York.

Meusel, H., Jäger, E. (1992): Vergleichende Chorologie der zentraleuropäischen Flora 3. Karten, Literatur, Register. – Gustav Fischer, Jena, Stuttgart, New York.

Micevski, K. (1993): Flora na Republika Makedonija 1(2). – Makedonska akademija na naukite i umetnostite, Skopje. [in Macedonian]

Micevski, K. (1995): Flora na Republika Makedonija 1(3). – Makedonska akademija na naukite i umetnostite, Skopje. [in Macedonian]

Micevski, K. (2001): Flora na Republika Makedonija 1(5). – Makedonska akademija na naukite i umetnostite, Skopje. [in Macedonian]

Milosavljević, V., Ranđelović, V., Zlatković, B., Ranđelović, N. (2006): Forest communities of Rudina Mt. and their economical significance. In Pešić, V., Hadžiablahović, S. (*eds*): II International Symposium of Ecologist of the Republic of Montenegro. Proceedings of the Symposium: 83-92. – The Republic Institution for the Protection of Nature, Natural History Museum of Montenegro, University of Montenegro, Institute for Marine Biology, Centre for Biodiversity of Montenegro, Podgorica. [in Serbian]

Mitcheva, M., Kondeva, M., Vitcheva, V., Nedialkov, Kitanov, P. G. (2006): Effect of benzophenones from *Hypericum annulatum* on carbon tetrachloride-induced toxicity in freshly isolated rat hepatocytes. Redox Report **11**(1): 3-8.

Momekov, G., Nedialkov, P. T., Kitanov, G. M., Zheleva-Dimitrova, D., Tzanova, T., Girreser, U., Karaivanova, M. (2006): Cytoprotective effects of 5 benzophenones and a xanthone from *Hypericum annulatum* in model. Medicinal Chemistry Reviews **2**: 377-384.

Momekov, G., Ferdinandov, D., Zheleva-Dimitrova, D., Nedialkov, P., Girreser, U., Kitanov, G. (2008): Cytotoxic effects of hyperatomarin, a prenylated phloroglucinol from *Hypericum annulatum* Moris subsp. *annulatum*, in a panel of malignant cell lines. Phytomedicine, doi:10.1016/j.phymed.2008.04.008. (*online, in press*)

Moris, J. H. (1827): Stirpium sardoarum elenchus 1. – Ex Regio Typographeo, Caralis [Cagliari].

Nedialkov, P. T., Kitanov, G. M. (2002): Two benzophenone O-arabinosides and a chromone from *Hypericum annulatum*. Phytochemistry **59**(8): 867–871.

Nedialkov, P. T., Zheleva-Dimitrova, D., Girreser, U., Kitanov, G. M. (2007): A new isocoumarin from *Hypericum annulatum*. Natural Products Resources **27**(12): 1056-1060.

Ničić, Đ. (1893): Građa za floru okoline Vranje. Nastavnik **4**(1-6): 1-32. [in Serbian]

Nikolić, T. (2007 [updated Jan.]): Flora Croatica data base. On-Line [http://hirc.botanic.hr/fcd]. – Botanički zavod, Prirodoslovno-matematički fakultet, Sveučilište u Zagrebu.

Nikolić, V. (1966): Proučavanje spora i polena iz pliocenskog lignita Kosovskog basena – sa osvrtom na današnji izgled vegetacije Kosova. Prirodnjački muzej u Beogradu, Posebno izdanje **31**: 1-156. [in Serbian]

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

Novák, F. (1929): Ad florae Serbiae cognitionem additamentum tertium. Preslia **8**: 51-77.

Nyárády, E. I. (1957): *Coronílla* L. In Săvulescu, T. (*ed.*): Flora Reipubliciae Popularis Romanicae 5: 324-333. – Academia Republicii Populare Romîne, Bucuresti. [in Romanian]

Nyárády, E. I. (1957a): *Lathyrus* L. In Săvulescu, T. (*ed.*): Flora Reipubliciae Popularis Romanicae 5: 405-495. – Academia Republicii Populare Romîne, Bucuresti. [in Romanian]

Pančić, J. (1874): Flora Kneževine Srbije. – Državna štamparija, Beograd. [in Serbian]

Pančić, J. (1884): Dodatak flori kneževine Srbije. – Kralj. -srp. državna štamparija, Beograd. [in Serbian]

Panjković, V. (1983): Biljnogeografska analiza flore Vršačkog brega. Doktorska disertacija. – Institut za Biologiju. Prirodno-matematički fakultet Univerziteta u Novom Sadu, Novi Sad. (manuscr.) [in Serbian]

Pavlides, G. (1997): The flora of Prespa National Park with emphasis on species of conservation interest. Hydrobiologia **351**(1-3): 35-40.

Pavlović, M., Petrović, S., Milenković, M., Kukić, J., Couladis, M., Tzakou, O., Niketić, M. (2008): Composition and antiradical capacity of *Achillea grandifolia* essential oil from Serbia. Planta Medica **74**(9): 1191. (abstract)

Pavlović, Z. (1964): Borove šume na serpentinama u Srbiji. Glasnik Prirodnjačkog muzeja u Beogradu, Ser. B **18**: 25-64. [in Serbian]

Petković, B., Tatić, B., Marin, P., Veljić, M. (2002): Vegetacija spomenika prirode "Đavolja varoš". In Ranđelović, V. (*ed.*): 6. Simpozijum o flori jugoistočne Srbije i susednih područja. Zbornik radova: 323-347. – Univerzitet u Nišu, Prirodno-matematički fakultet, Odsek za biologiju sa ekologijom, Niš. [in Serbian]

Petrova, A. (1989): *Pulmonaria* L. In Jordanov, D., Velchev, V., Kuzmanov, B. (*eds*): Flora na Narodna Republika Bălgaria 9: 150-156. – Bălgarskata akademija na naukite, Sofija. [in Bulgarian]

Petrović, D., Lacić, M., Plavšić, B., Radonjić, J., Rančić, A., Simić, A. (1998): Prilog poznavanju vaskularne flore Dubašnice. In Ranđelović, N. (*ed.*): V Simpozijum o flori jugoistočne Srbije, Zaječar '97. Zbornik radova: 19-36. – Univerzitet u Nišu, Tehnološki fakultet u Leskovcu, BD "Dr Sava Petrović", Niš, DD "Zdravlje" Leskovac, Niš. [in Serbian]

Petrović, S. (1882): Flora okoline Niša. – Kraljevsko-srpska državna štamparija, Beograd. [in Serbian]

Piątek, M. (2004): Miscellaneous Novelties on Powdery Mildew Fungi from Poland. Polish Botanical Journal **49**(2): 151–159.

Qosja, X., Paparisto, K., Demiri, M., Vangjeli, J. (1992): Flora de l'Albanie 2. –

Academie des Sciences de la Republique d'Albanie, Tirana. [in Albanian]

Quézel, P. (1967): La végétation des hauts sommets du Pinde et del'Olympe de Thessalie. Vegetatio **14**: 127-228.

Ranđelović, N., Jeremić, Ž. (2007): Flora Zaglavka na Staroj planini. 15. In Anonymous: Naučno-stručni skup "Ekološka istina" sa međunarodnim učešćem. Zbornik radova: 62-66. – Tehnički fakultet u Boru Univerziteta u Beogradu, Zavod za zaštitu zdravlja "Timok", Zaječar, Centar za poljoprivredna i tehnološka istraživanja, Zaječar, Društvo mladih istraživača, Bor, Fakultet zaštite na radu Univerziteta u Nišu, Sokobanja. [in Serbian]

Ranđelović, N., Ružić, M. (1986): Pašnjačka dolomitska vegetacija jugoistočne Srbije. Ekologija **21**(2): 75-91. [in Serbian]

Ranđelović, N., Stamenković, V. (1979): Flora of the Grdelica gorge. Acta Biologiae et Medicinae Experimentalis **4**(1): 31-40. [in Serbian]

Ranđelović, N., Rexhepi, F., Jovanović, V. (1982): Contribution to the study of the north-eastern Kosovo flora. Acta Biologiae et Medicinae Experimentalis **7**(1)**:** 39-45. [in Serbian]

Ranđelović, N., Avramović, D., Đorđević, V., Lilić, A. (2005): Flora Leskovika 1. In Ranđelović, V. (*ed.*): VIII Simpozijum o flori jugoistočne Srbije i susednih regiona. Zbornik radova: 5-12. – Department of Biology and Ecology Faculty of Sciences and Mathematics University, Biological Society "Dr Sava Petrović", Niš. [in Serbian]

Ranđelović, V., Mitrović, T., Jušković, M. (2003): Farmakodinamska analiza lekovitih biljaka Vlasinske visoravni. In Ranđelović, V. (*ed.*): Proceedings of Seventh Symposium on the Flora of Southeastern Serbia and Neighbouring Regions, Dimitrovgrad, 2002: 111-116. – Odsek za biologiju sa ekologijom Prirodno-matematičkog fakulteta Univerziteta u Nišu, Biološko društvo "Dr Sava Petrović", Institut za botaniku Bugarske akademije nauka, Sofija, Bugarsko botaničko društvo, Niš. [in Serbian]

Rechinger, K. H. fil. (1935): Ergebnisse einer botanischen Reise in den Bertiscus (Nordalbanische Alpen). Feddes Repertorium specierum novarum regni vegetabilis **38**(13-25)**:** 319-389.

Rechinger, K. H. fil. (1952(1953)): Phytographische Notizen. Godišnjak Biološkog instituta u Sarajevu **5**(1-2)**:** 335-338.

Robson, N. K. B. (1968): *Hypericum* L. In Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M., Webb, D. A. (*eds*): Flora Europaea 2: 261-269. – Cambridge University Press, Cambridge.

Robson, N. K. B. (1993): Studies in *Hypericum*: validation of new names. Bulletin of the Natural History Museum of London (Botany) **23**(2)**:** 67–70.

Robson, N. K. B. (1996): Studies in the genus *Hypericum* L. (Guttiferae): 6. Sections 20. *Myriandra* to 28. *Elodes*. Bulletin of the Natural History Museum of London (Botany) **26**(2)**:** 75–217.

Rudski, I. (1949): Tipovi lišćarskih šuma jugoistočnog dela Šumadije. Prirodnjački muzej srpske zemlje **25**: 1-67. [in Serbian]

Rudski, I. (1949a): Ekskurzija na Žljeb i Mokru planinu. Prirodnjački muzej srpske zemlje **23**: 5-65. [in Serbian]

Ružić, M. (1981). Ekološko-fitocenološka studija flore i vegetacije planine Vidojevice kod Prokuplja. Doktorska disertacija. – Prirodno-matematički fakultet, Univerzitet u Beogradu, Beograd. [PhD] (manuscr.) [in Serbian]

Ružić, M. (1983): Flora of Pasjača and Vidojevica mountains. Acta Biologiae et Medicinae Experimentalis **8**(2): 29-39. [in Serbian]

Sabovljević, M., Marić, J. (1993): Prilog poznavanju šumskih fitocenoza Petničkog kraja. In Anonymous: Biološko istraživačko društvo "Josif Pančić" - pet godina posle, Zbornik radova: 53-60. – Biološko istraživačko društvo "Josif Pančić", Beograd. [in Serbian]

Sauer, W. (1987): The *Pulmonaria dacica* group: Its affinities with central and south-east European allies and with the genus *Paraskevia* (Boraginaceae). Plant Systematics and Evolution **155**(1-4): 257-276.

Simon, T. (2005): Angaben zur Flora des Zempléner-Gebirges (1950-1980) und die Grenze der Karpaten-Florenprovinz. Botanikai közlemények **92**(1-2): 69-84.

Sokoloff, D. D. (2003): On taxonomy and phylogeny of the tribe Loteae DC. (Leguminosae). Byulleten' Moskovskogo Obshchestva Ispytatelei Prirody Otdel Biologicheskii **108**: 35-48.

Sokoloff, D. D. (2003a): On the generic limits of *Coronilla* and *Hippocrepis* (Leguminosae). Botanicheskii Zhurnal **88**(6): 108-113.

Stevanović, V. (1992): Floristička podela teritorije Srbije sa pregledom viših horiona i odgovarajućih flornih elemenata. In Sarić, M. R. (*ed.*): Flora Srbije 1: 47-56. – Srpska akademija nauka i umetnosti, Beograd. [in Serbian]

Stevanović, V., Niketić, M., Lakušić, D., Jovanović, S., Bulić, Z., Butorac, B., Boža, P., Knežević, A., Ranđelović, V., Ranđelović, N., Stevanović, B., Vukojičić, S., Savić, D., Tomović, G. (1996): Crvena lista vaskularne flore Jugoslavije-radni materijal. – Biološki fakultet, Beograd. (manuscr.) [in Serbian]

Stjepanović-Veseličić, L. (1972): *Hypericaceae* Lindl. In Josifović, M. (*ed.*): Flora SR Srbije 3: 102-125. – Srpska akademija nauka i umetnosti, Beograd. [in Serbian]

Stojanov, N., Stefanov, B. (1924): Flora na Bălgarija 1. – Državna pečatnica, Sofija. [in Bulgarian]

Stojanov, N., Stefanov, B. (1933): Flora na Bălgarija ed. 2. – Kooperativna pechatnica "Gutenberg", Sofia. [in Bulgarian]

Suteu, D., Popescu, F., Popescu, O. (2007): Genetic diversity evaluation of the species *Pulmonaria rubra* (Boraginaceae). Annals of West University of Timisoara, Series of Chemistry **16**(3): 55-64.

Šavikin-Fodulović, K., Aljancić I., Vajs V., Menković N., Macura S., Gojgić G., Milosavljević S. (2003): Hyperatomarin, an antibacterial prenylated phloroglucinol from *Hypericum atomarium* ssp. *degenii*. Journal of Natural Products **66**(9): 1236-1238.

Tatić, B., Krasnići, F. (1963): *Ranunculus falcatus* i *Asphodeline liburnica* nove vrste za floru Srbije. Zbornik Filozofskog fakulteta u Prištini **1**: 323-326. [in Serbian]

Tomić, Z. (2000): Zajednica *Orno-Ostryetum* Aich. 1933 u refugijumima jugozapadne Srbije. Glasnik Šumarskog fakulteta **82**: 177-189. [in Serbian]

Tomović, G., Niketić, M., Ranđelović, V., Stevanović, V. (2005): The vascular flora of Mountain Sokolovica in Central Serbia (Serbia and Montenegro). Flora Mediterranea **15**: 9-55.

Tsiripidis, I., Athanasiadis, N. (2003): Contribution to the knowledge of the vascular flora of NE Greece: Floristic composition of the beech (*Fagus sylvatica* L.) forests in the Greek Rodopi. Willdenowia **33**: 273-297.

Tsiripidis, I., Karagiannakidou, V., Alifragis, D., Athanasiadis, N. (2007): Classification and gradient analysis of the beech forest vegetation of the southern Rodopi (northeast Greece). Folia Geobotanica **42**(3): 249-270.

Tuberoso, C. I. G., Kowalczyk, A., Sarritzu, E., Cabras, P. (2006): Chemical composition of the essential oil of *Achillea grandifolia* Friv. from flowering tops and leaves. – In Joulain, D. (*ed.*): 37th International Symposium on Essential Oils: P-72. – Grasse, France. (abstract)

Vandas, C. (1909): Reliquiae Formánekianae. – Jos. Lelínek, Brunae [Brno].

Varol, Ö. (2001): The Vegetation of Çimen Mountain (Kahramanmaraş). Turkish Journal of Botany **25**: 335-358.

Velenovský, J (1891): Flora bulgarica. Descriptio et enumeratio systematica plantarum vascularium in principatu Bulgariae sponte nascentium... – Fr. Řivnáč, Pragae [Prague].

Vukićević, E. (1965): Sukcesija vegetacije i prirodno obnavljanje šuma na šumskim požarištima u Srbiji. Glasnik Šumarskog fakulteta **29**: 1-87. [in Serbian]

Wollenweber, E., Valant-Vetschera, K. M., Ivancheva, S., Kuzmanov, B. (1987): Flavonoid Aglycones from the Leaf Surfaces of Some *Achillea* Species. Phytochemistry (Oxford) **26**: 181-182.

Zajić, V., Lakušić, D. (2004): Contribution to the flora of the Grza river gorge (E. Serbia). In Anonymous: Proceedings of the II Congress of Ecologists of the Republic of Macedonia with International Participation. Special Issues of Macedonian Ecological Society **6**: 415-422. [in Serbian]

Zheleva-Dimitrova, D, Gevrenova, R, Nedialkov, P, Kitanov, G. (2007): Simultaneous determination of benzophenones and gentisein in *Hypericum annulatum* Moris by high-performance liquid chromatography. Phytochemical Analysis **18**(1): 1-6.

ПРИКАЗ НЕКИХ РЕТКИХ И УГРОЖЕНИХ БИЉАКА У СРБИЈИ СА НОВИМ ХОРОЛОШКИМ ПОДАЦИМА

Марјан Никетић, Гордана Томовић

Р Е З И М Е

Током дуготрајних флористичких истраживања Србије, прикупљен је велики број нових хоролошких података, као и обиман хербарски материјал. У овом раду представљени су нови теренски, као и досад непубликовани хербарски подаци о распрострањењу шест угрожених или ретких ендемичних или субендемичних биљних таксона за територију наше земље. Поред теренских и хербарских података, коришћена је и обимна литературна грађа како би се комплетирале карте распрострањења за наведене таксоне. На основу обимних хоролошких и еколошких података, као и конзервационог статуса за шест обрађених таксона, дошло се до следећих закључака:

Silene fabarioides Hausskn. је нова врста за флору Србије. Ова врста нађена је на серпентинитским теренима планине Козник у Метохији, што представља најконтиненталније налазиште у северозападном делу ареала врсте на подручју Балканског полуострва.

Распрострањење таксона *Hypericum annulatum* Moris subsp. *annulatum* у Србији је претежно везано за долине Јужне Мораве и Вардара (укључујући и долине река Топлице, Нишаве и Пчиње), имајући у виду еколошке карактеристике ове врсте. За долине наведених река карактеристични су различити типови ксерофилних и ксеромезофилних типова вегетације, што је посебно погодно за успостављање и ширење распрострањења ове субмедитеранске биљке. Ново констатовани локалитет у региону Поморавља (Сталаћка клисура), представља најсевернији налаз ове биљке у целокупном њеном ареалу. Два литературна податка о присуству ове биљке (Проклетије и околина Ваљева) потребно је проверити теренским истраживањима.

Терцијарно реликтна и субендемична (балканско-западнопонтска) врста *Securigera elegans* (Pančić) Lassen, није толико ретка

биљка у Србији, али је превасходно распрострањена у рефугијумима и изолованим стаништима брдских и планинских предела Србије, као и у полидоминантним шумским типовима вегетације клисура и кањона североисточне Србије. Нови подаци о распрострањењу ове врсте дати су за 12 различитих UTM квадрата.

Lathyrus hallersteinii Baumg. је врста која је још заступљенија у Србији, јер постоје бројни литературни и хербарски подаци о присуству ове средњеевропске (карпатско-дацијско-балканске) врсте на територији наше земље. За ову врсту констатовано је 15 нових тачака. На основу литературних података, као и сопствених запажања, може се истаћи да ова врста насељава различите типове углавном мезофилних шумских заједница, које се развијају на различитим геолошким подлогама.

Централноевропска (карпатско-дацијско-балканска) врста *Pulmonaria rubra* Schott је доста спорадично присутна на територији Србије. Ова врста изграђује релативно бројне популације у оквиру мезофилних шумских (углавном букових а ретко мешовитих јелово-смрчевих) фитоценоза брдског и планинског подручја Србије. За ову врсту констатовано је 7 нових или до сада необјављених хоролошких података.

Achillea grandifolia Friv. је субмедитеранска биљка, која је углавном присутна у источним и јужним деловима Србије. Од 13 нових података о распрострањењу, налаз на Шар-планини представља најјужнију тачку у ареалу ове врсте у нашој земљи. Ова врста претежно расте у оквиру мезофилних или ксеромезофилних шума и жбуњака у брдским и планинским подручјима, али се спорадично може јавити и на шумским чистинама, на пожариштима, као и на каменитим местима и испод литица. Јавља се висинском дијапазону од 250 до 1600 м. н. в.

Применом нових IUCN (2001) критеријума, извршена је процена статуса угрожености за наведене врсте биљака на територији Србије. На основу ових критеријума сматрамо да би следеће врсте требало укључити у наредни волумен Црвене књиге флоре Србије: *Silene fabarioides* у категорију крајње угрожених таксона (CR), с обзиром на чињеницу да је ова биљка позната само са једног локалитета на територији Србије, а *Hypericum annulatum* subsp. *annulatum* и *Pulmonaria rubra* у категорију рањивих таксона (VU).