

**Taxonomy, phytogeography and phytosociology of *Laserpitium krapfii*
Crantz. in Slovenia**

Taksonomska, fitogeografska in fitocenološka oznaka vrste *Laserpitium krapfii*
Crantz. v Sloveniji

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Abstract: The article discusses the occurrence, distribution and phytosociological affinity of *Laserpitium krapfii* in Slovenia. According to some literature sources (Tutin 1968, Fischer et al. 2008) and the distribution patterns, two subspecies of *L. krapfii* are expected in Slovenia: *L. krapfii* subsp. *krapfii* and *L. krapfii* subsp. *gaudinii*. The revision of the Slovene herbarium material in LJU and LJS herbaria confirmed only the occurrence of its type subspecies. It has a Dinaric pattern of distribution (NW-SE) in the Alpine, Prealpine, Dinaric and Predinaric phytogeographical regions, with most of its known localities in the hills south of Ljubljana, in the Snežnik mountains, in the Kočevje region with the Kolpa Valley and in the Gorjanci mountains. Since the species mostly thrives in the mountain beech forests, it can be considered as a diagnostic (differential) species of the Illyrian alliance *Aremonio-Fagion*.

Key words: *Laserpitium krapfii* subsp. *krapfii*, taxonomy, phytogeography, *Aremonio-Fagion*, Slovenia

Izvleček: V članku obravnavamo pojavljanje, razširjenost in fitocenološko navezanost vrste *Laserpitium krapfii* v Sloveniji. Glede na literaturne navedbe (Tutin 1968, Fischer et al. 2008) in vzorca razširjenosti, bi pri nas lahko pričakovali uspevanje dveh podvrst: *L. krapfii* subsp. *krapfii* in *L. krapfii* subsp. *gaudinii*. Z revizijo herbarijskega gradiva v LJU in LJS smo za Slovenijo potrdili le pojavljanje podvrste *L. krapfii* subsp. *krapfii*. Razširjena je v dinarski smeri (severozahod-jugovzhod), v alpskem, predalpskem, dinarskem in preddinarskem fitogeografskem območju, z največjo gostoto nahajališč v hribovju južno od Ljubljane, v Snežniškem pogorju, na Kočevskem s Kolpsko dolino in na Gorjancih. Največ nahajališč je v montanskih bukovih gozdovih, zato jo lahko štejemo za diagnostično (razlikovalno) vrsto ilirske zveze *Aremonio-Fagion*.

Ključne besede: *Laserpitium krapfii* subsp. *krapfii*, taksonomija, fitogeografija, *Aremonio-Fagion*, Slovenija

Introduction

Laserpitium krapfii is a member of the Umbelliferae family (*Apiaceae*). The identification of the members of this family is relatively difficult, especially since fully ripe fruits and flowers are very important for their identification. Among other members of the *Laserpitium* genus, *L. krapfii* is well characterized by its ovoid to oblong, dentate leaf-segments, 0-5 bracts, which are glabrous, and 5-15 rays of the umbel, which are distinctly of different lengths; flowers are usually greenish (Martinčič 2007).

The distribution of *L. krapfii* in Slovenia was discussed in Fleischmann (1844), Plemel (1862), Paulin (1904), Neugebauer (1932), Mayer (1952), T. Wraber (1966), Thellung (1975) etc.; contemporary knowledge is summarized by Martinčič (2007). According to this literature source, *L. krapfii* thrives in the Slovenian Alpine (Tolminsko), Dinaric and Predinaric (Gorjanci mountain range) phytogeographical region. In the work *Gradivo za Atlas flore Slovenije* (Jogan & al. 2001), the distribution map of *L. krapfii* has accidentally been omitted.

According to Flora Europaea (Tutin 1968) there are two subspecies of *L. krapfii*: *L. krapfii* subsp. *krapfii* (syn. *L. marginatum* Waldst. & Kit.; incl. *L. alpinum* Waldst. & Kit.) and *L. krapfii* L. subsp. *gaudinii* (Moretti) Thell. (*L. gaudinii* Moretti). The type subspecies has a Dinaric-Carpathian pattern of distribution: it thrives in the northern part of Balkan Peninsula, extending to NE Italy and in Carpathians (Tutin 1968). The other subspecies, *L. krapfii* subsp. *gaudinii* has an Alpine distribution. According to Flora Europaea (Tutin 1968), it grows in W Austria, E Switzerland, N Italy, and in the northwestern part of the former Yugoslavia, which implicitly include Slovenia. Similarly, Fischer et al. (2008) also indicate that *L. krapfii* L. subsp. *gaudinii* thrives in Slovenia (with its main distribution area in E Switzerland, N Italy and N Tyrol).

However, according to Martinčič (2007) there is only one subspecies present in Slovenia, that is the type species *L. krapfii* subsp. *krapfii*. There are no older Slovenian data referring to *L. krapfii* L. subsp. *gaudinii*. Only *L. krapfii* subsp. *krapfii* (sin. *L. marginatum*) is considered by the authors

(f. e. Paulin 1904, Neugebauer 1932, Mayer 1952).

It should be added, that in Austria, *L. krapfii* subsp. *gaudinii* is very rare. It is included in the red list of threatened species (Niklfeld and Schrott-Ehrendorfer; 1999), but not mentioned in *Verbreitungsatlas der Farn- und Blütenpflanzen Kärntens* (Hartl et al. 1992). In adjacent parts of Italy (Friuli Venezia Giulia) the species doesn't occur (Poldini 2002).

On the other hand, according to the distribution map in *Flora Alpina* (Aeschmann and al. 2004), the type subspecies has an eastern-Alpine-Illyrian pattern of distribution; it grows in Alpine areas of N Italy, Switzerland, W Austria, and (surprisingly) in Dinaric mountains, but not in Slovenia.

Morphologically, the two subspecies are well characterized (see Table 1) and they also differ in ecological preferences. *L. krapfii* subsp. *gaudinii* thrives in low-nutrient meadows, glacial gravel and bushes, in mountain and subalpine belt (Fischer et al. 2008), while the type subspecies prefers forests (Thellung 1975, Martinčič 2007).

Since Slovenia lies between the Alps and the Dinarides, we believe that the occurrence of both subspecies is expected. That was the reason why we revised all the available herbarium material to verify the taxonomic status of Slovene populations. The distribution map of *L. krapfii* has not yet been published, so we systematically gathered floristic data to produce an up-to-date distribution map. We also investigated the occurrence of the species in different forest communities and investigated its phytosociological preferences.

Material and methods

We reviewed all the available herbarium material of this species in Herbarium of the Ljubljana University (LJU) (22 herbarium sheets) and Herbarium of the Institute of Biology ZRC SAZU (LJS) (13 herbarium sheets). Data on the revised herbarium specimens (*Specimina visa*) are in Appendix. We checked the discriminative characters, provided by Pignatti 1982, Tutin 1968 and Thellung 1975 (Table 1).

Table 1: Discriminative characters for *Laserpitium krapfii* subsp. *krapfii* and *L. krapfii* subsp. *gaudinii* (Pignatti 1982, Tutin 1968, Thellung 1975).

Preglednica 1: Razlikovalni znaki med podvrstama *Laserpitium krapfii* subsp. *krapfii* in *L. krapfii* subsp. *gaudinii* (Pignatti 1982, Tutin 1968, Thellung 1975).

Character	<i>L. krapfii</i> subsp. <i>krapfii</i>	<i>L. krapfii</i> subsp. <i>gaudinii</i>
pruinosity of the stem	slightly pruinose	usually strongly pruinose
similarity of the upper cauline leaves with lower leaves	similar	markedly different
the shape of leaf-segments of upper cauline leaves	ovate, usually dentate	oblong, usually entire
roughness of the umbel rays	rays rough or shortly hispid on inner side	rays glabrous and smooth on inner side
presence of setae on primary ridges of fruit	ridges with short setae	ridges glabrous

To get further insight in the discrimination of the two subspecies, we also compared Slovene material with the available material of *L. krapfii* subsp. *gaudinii* from abroad.

Distributional data were obtained from the database of Centre for Cartography of Fauna and Flora and the FloVegSi database of the Institute of Biology of the SRC SASA. We used standard botanical and phytosociological methods (Ehrendorfer and Hamann 1965, Jalas and Suominen 1967, Braun-Blanquet 1964). Nomenclature source for the names of the taxa is Mala flora Slovenije (Martinčič et al. 2007) and for the names of the syntaxa (Šilc and Čarni 2012). The distribution map was made with the application FloVegSi (Seliškar et al. 2003).

Results and discussion

The herbarium revision in the determination of the subspecies

We found that all of the examined specimens, collected in the territory of Slovenia, belong to the type subspecies. Despite the fact that for now we do not have confirmation of the occurrence of *L. krapfii* subsp. *gaudinii* in Slovenia, we need to be aware of this possibility during the fieldwork in the northern part of the country, especially on screes, low-nutrient dry meadows and in tall herb and scrub communities of the mountain and subalpine belt.

Subspecies can reliably be identified, if the plants are flowering or fruiting, that is from mid-July onwards. The fruits are fully developed at the beginning of August, but for the determination of the subspecies they are not required. Especially useful characters are the roughness of the umbel rays (prickle trichomes on the inner side of the rays – Figure 1) and the presence of short setae on primary ridges of the fruit (Figure 2). Both are present only in the type subspecies. When observing these characters, we need to use a stronger magnifying glass (20-30 x magnification). In herbarium material, the characters pruinosity of the stem and the similarity of the upper cauline leaves with the lower ones proved hard to assess. The leaves seemed rather variable and there were not enough material of *L. krapfii* subsp. *gaudinii* to evaluate the differences in shapes of the leaf-segments of upper cauline leaves and their dentation in both of the subspecies.

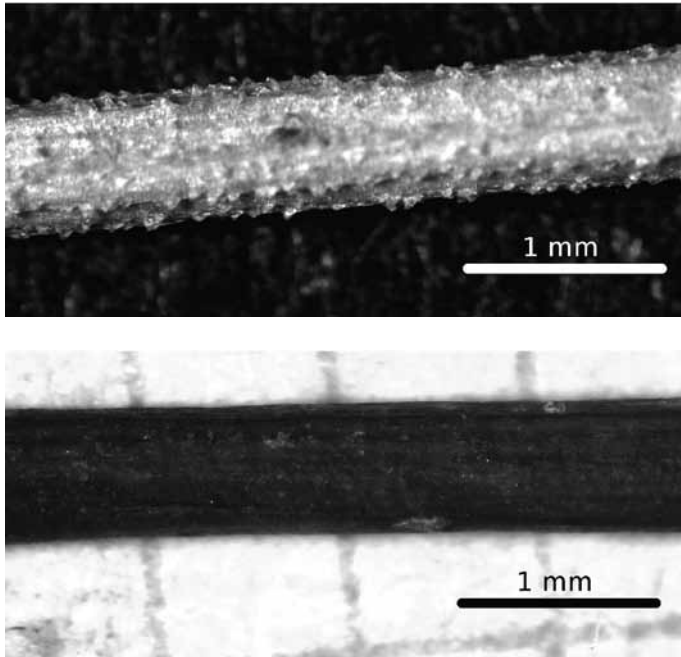


Figure 1: Prickle trichomes on the inner side of the rays present in *L. krapfii* subsp. *krapfii* (top) and absent in *L. krapfii* subsp. *gaudinii* (below).

Slika 1: Žarki kobula z bodičkami na notranji strani pri *L. krapfii* subsp. *krapfii* (zgoraj) in gladki kobulovi žarki pri *L. krapfii* subsp. *gaudinii* (spodaj).

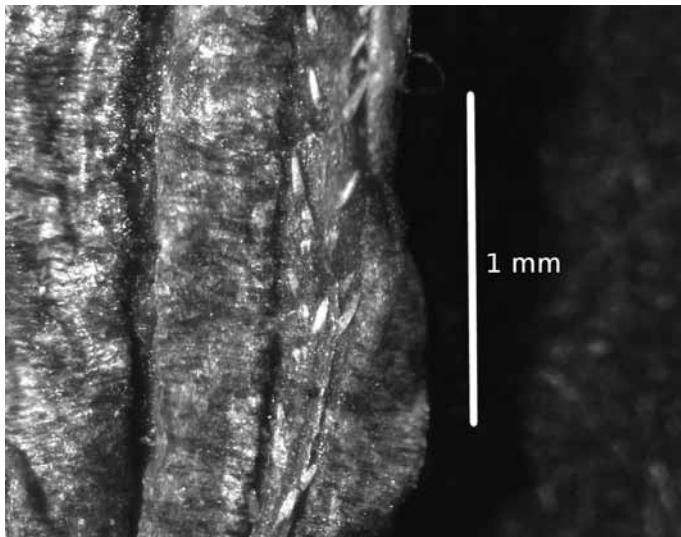


Figure 2: Short setae on primary ridges of the fruit in *L. krapfii* subsp. *krapfii*.

Slika 2: Ščetine na rebrih plodu pri *L. krapfii* subsp. *krapfii*.

The distribution of species in Slovenia

The distribution of L. krapfii subsp. *krapfii* in the Alpine and Prealpine phytogeographical region

According to the results of our study, in the Alpine phytogeographical region, the occurrence of *L. krapfii* is limited to the southern extensions of the Tolmin-Bohinj ridge of the Julian Alps. The localities, that are closest to this ridge, are on the slopes of the peak Žabijski Kuk above the Razor pasture. Most localities lie on the slopes of the side-lying, south-oriented ridge Žabijski Kuk–Vrh nad Sopotom–Krikov vrh–Tolminski Triglav–Kobilja glava – Jalovnik, above the valleys of streams Zadlaščica and Kneža (Knežica) with its right tributary Lipovšček (Dakskobler 1991, 1994, 2001, 2002, 2003, 2006, 2015). The reports for *L. krapfii* in extensions of the Savinja Alps (plateau Krašica above Šmartno at Dreta) were published by Diaci (1997). There are no other reports of *L. krapfii* in this mountain range and Diaci's records are not documented with herbarium material. We assess that these data need verification and that is the reason why we marked them as 'questionable' in our distribution map (Figure 3).

In the phytosociological tables published by Piskernik (1977), there are two additional records of *L. krapfii* for Alpine–Prealpine part of Slovenia. The first relates to Breginjski Stol. Although the flora of this area is relatively well-studied, *L. krapfii* was not observed there by other botanists so far (see Čušin 2006). The second record is from Paški Kozjak above Spodnji Dolič that is in the Prealpine phytogeographic region. These two localities are also marked as 'questionable', since the vaucher herbarium material is not available. We here publish some new data from herbarium LJS (revision by Dakskobler and Vreš, February 2015) for Alpine and Prealpine region (Bača and Idrijska Valleys: 9749/4, 9849/1, 9848/4 – for details see Appendix). There are also reliable records of *L. krapfii* in Prealpine phytogeographical region, on the Zaplana plateau between Vrhnika and Logatec (T. Wraber 1996, Rozman 2000).

The distribution of L. krapfii in Dinaric and Predinaric phytogeographical region

The localities of *L. krapfii* in the northwestern-most part of the Dinaric mountains – in Slovenian Dinaric phytogeographical region, were published

by Glowacki and Arnold (1870). This publication was summarized by Neugebauer (1932). According to these authors, the species thrived in Vojšćica on the Vojskarska planota plateau in the Idrija mountains. We confirmed these records in the nearby hill Hudournik, on the edge of the plateau above the valleys of Kanomlja and Hotenja (Dakskobler 2001).

As far as we know, Paulin's (1904) report about locality under Čaven at Predmeja (Dol) has no recent confirmations. Paulin also reported that the species presumably grows near Idrija ("angeblich bei Idria"). Since surroundings of Idrija extend over several MTB quadrants, this record is not precise enough to put it in our distribution map.

The localities in SW part of the Trnovski gozd between Otlica and Col (under Kovk) (Dakskobler 1997, phytocoenological table 4 and herbarium LJU and LJS) and on the western edge of the plateau Nanos above the valley of Bela and at Podkraj (Dakskobler (1997), M. Wraber and Žigon, 16. 10. 1970 – personal notes of Wraber M. and J. Žigon) were recently confirmed.

The localities of *L. krapfii* on the hills south of Ljubljana (Krim, Mokrc, Rakitna plateau, Iška basin) have already been known to botanists for over 170 years (Fleischmann 1843, Paulin 1904). These populations are well documented with herbarium material LJU (authors Budnar, Mayer, Dolšak, Paulin, Zrimec – see Appendix). There are also other recent reports for this area (Robič 1960a, b and Accetto 2010, 2013) – the systematic mapping of flora was carried out particularly in Iška.

The records for the Snežnik mountains have been contributed by Paulin (1904), Justin (1923, LJU), Tregubov (1957), T. Wraber (1966, also herbarium material in LJU), Zupančič (1972, LJU), Piskernik (1977, 1991), Marinček (1996) and Surina and Rakaj (2007) – our observations during floristic fieldwork in this area showed the same (unpublished data BV).

Older data referring to the presence of *L. krapfii* in Kočevsko and Kolpa valley (Fleischmann 1844, Plemel 1862, LJU, Paulin 1904) are recently confirmed with numerous records: Martinčič (1958, LJU), Peterlin (1960, LJU), M. Wraber (1962, 1963, in litt.), Štimec (1982), Hočvar et al. (1985, 1995), Accetto (1995, 1999a, b, 2002a, 2003, 2007a, b, 2008), Accetto et al. (1996), Frajman (2001, LJU),

Trčak et al. (2002) and our own unpublished data (BV). According to these reports, the taxon is widespread in the Kočevsko: it thrives in Bela stena near Ribnica, Fridrihštajn, Podstene at Koprivnik in the Kočevski Rog, Goteniški Snežnik, Goteniška gora, the mountains of Borovška gora with Firstov rep, Krokav and Krempa and in their ravines above the Kolpa valley, Stružnica, Mirna gora near Semič, the slopes above the Čabranka valley (Strma reber, Belica) etc.

The presence of *L. krapfii* in the Gorjanci mountain range was noticed already by Paulin (1904). In the following decades, the plants were collected by Rataj (1954, LJU), Martinčič (1954, LJU), Strgar (1960, LJU), T. Wraber (1992, LJU) and recorded by Košir (1979), Hočevar et al. (1985) and Accetto (2002b). In Gorjanci, we recorded the species in forest reserve Kobile (Dakskobler et Grah, 2013, 2014, in litt.).

Distribution map

According to the distribution map (Figure 3), *L. krapfii* s. str. has a Dinaric pattern of the distribution, extending from NW to SE of Slovenia. It thrives in the Alpine, Prealpine, Dinaric and Predinaric phytogeographical region, with a concentration of its localities in the hills south from Ljubljana, the Snežnik Mountains, the Kočevje region with the Kolpa valley and in the Gorjanci mountain range.

Phytosociological characteristics of *L. krapfii*

According to Aeschimann et al. (2004), *L. krapfii* subsp. *gaudinii* is predominantly a scree taxon, a character species of the alliance *Petasi-tion paradoxii*. Zupančič (1999) characterizes *L. krapfii* as character species of the alliance *Vaccinio-Piceion* or the order *Vaccinio-Piceetalia*, while Accetto (2010, 2013) treats *L. krapfii* to be character species of the class *Erico-Pinetea*.

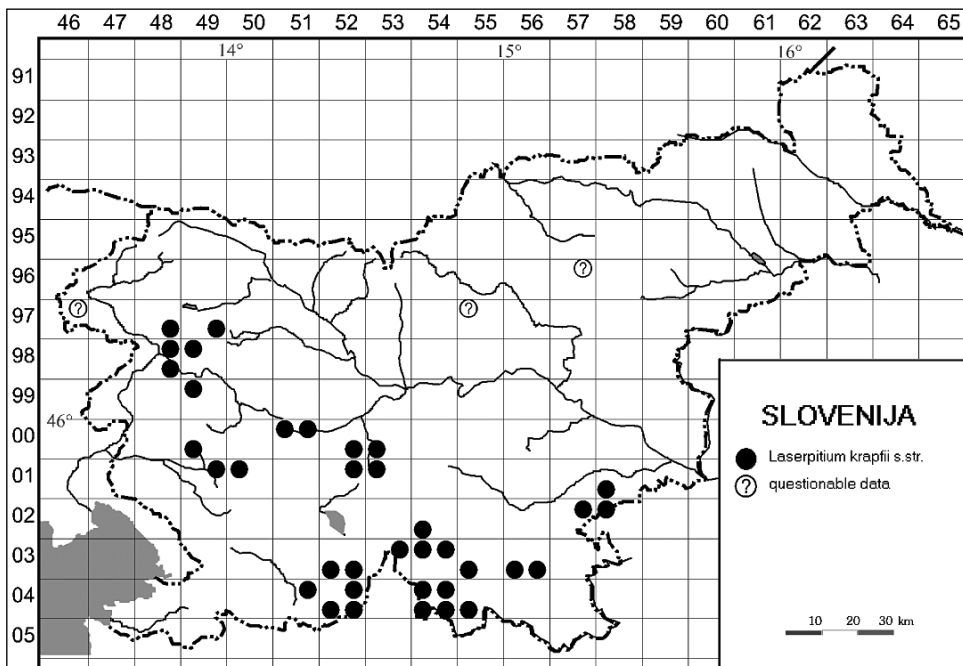


Figure 3: Distribution of *Laserpitium krapfii* subsp. *krapfii* in Slovenia.

Slika 3: Razširjenost vrste *Laserpitium krapfii* subsp. *krapfii* v Sloveniji.

Košir (1979) selected *L. krapfii* (= *L. marginatum*) as character species for the association *Arunco-Fagetum*. After this species, Vukelić et al. (2010) named the altimontane-subalpine spruce forest in northern part of the Velebit range – *Laserpitio krapfii-Piceetum*. In the Snežnik Mts., Tregubov (1957) considers *L. krapfii* as a differential species for the subassociation *Calamagrostio-Abietetum piceetosum*. Surina and Rakaj (2007) found the species in the same area in the stands of the subassociation *Polysticho lonchitis-Fagetum rhododendretosum hirsuti*. In the stands of the association *Polysticho lonchitis-Fagetum* under Snežnik, *L. krapfii* was recorded by T. Wraber (1966) and a few decades later also by Marinček (1996). In the Snežnik mountains, Marinček and Čarni (2010) recorded this species also in the stands of the syntaxon *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora typicum* var. *Helleborus niger*.

In the southern Julian Alps, *L. krapfii* thrives in the stands of the following syntaxa: *Seslerio autumnalis-Fagetum*, *Ostryo-Fagetum* (Dakskobler 1991), *Arunco-Fagetum* (Dakskobler 1994, 2004), *Ranunculo platanifolii-Fagetum*, *Luzulo-Fagetum* (Dakskobler 2001), *Homogyno sylvestris-Fagetum* (Dakskobler 2002), *Rhododendro hirsuti-Fagetum* (Dakskobler 2003), *Rhodothamno-Laricetum ostryetosum* (Dakskobler 2006) and *Rhododendro hirsuti-Ostryetum* (Dakskobler 2015). In the summer 2004, we found the species on the north-west slopes of the peak Žabijski Kuk above the Razor pasture (ca. 1350 m – 1400 m a. s. l.), in the Alpine dwarf pine stands (*Rhodothamno-Pinetum mugo*).

On the northern edge of the Vojsko plateau and on the edges of the Trnovski gozd and Nanos plateaus, we recorded the species in the stands of the associations *Omphalodo-Fagetum*, *Ranunculo platanifolii-Fagetum*, *Arunco-Fagetum*, *Rhododendro hirsuti-Fagetum* and *Seslerio autumnalis-Fagetum*.

Near Zaplana, T. Wraber (1996) recorded the species in the stand of the association *Ostryo-Fagetum*. On Mokrc, Robič (1960) observed it in the stands of the associations *Arunco-Fagetum* and *Omphalodo-Fagetum*.

In Iška basin, Accetto (2013) found the species in the stands of the associations *Omphalodo-Fagetum* and *Ostryo carpinifolii-Piceetum*, but

it is also present in the stands of the association *Arunco-Fagetum*.

In the Gorjanci mountain range, Accetto (2002b) recorded the species in the stands of the association *Tanaceto clusii-Fagetum*. In the Kočevsko region, Zupančič and Accetto (1994) reported *L. krapfii* for the stands of the association *Ribeso alpini-Piceetum*, while Accetto (1995, 1999 a, b, 2002a, 2003, 2007b, 2008) observed the species in the stands of the syntaxa *Carici sempervirentis-Pinetum nigrae*, *Aconito lycoctoni-Fagetum*, *Omphalodo-Fagetum*, *Lamio orvalae-Fagetum*, *Allio victorialis-Fagetum*, *Rhododendro hirsuti-Fagetum*, *Arunco-Fagetum* var. geogr. *Acer obtusatum* and in the stands of two non-forest associations, *Seslerio kalnikensis-Arabidetum muralis* and *Neckero crispae-Campanuletum justiniana*.

Most of the localities are in the montane belt, between 400 m and 1200 m n. m. The highest localities of the species in the Julian Alps are in the alpine dwarf pine stands below the peak Žabijski Kuk, about 1400 m a. s. l., while in the Dinaric Mountains, the vertical distribution of *L. krapfii* reaches (current) upper timberline below Snežnik, at an altitude of about 1600 m.

The localities are mostly on calcareous bedrock (dolomite, dolomite limestone and limestone), occasionally with admixture of chert marlstone or claystone. The soils are shallow (mainly rendzina), sometimes due to the admixture of chert somewhat acidic.

Although this species occasionally thrives in some spruce, black pine and alpine dwarf pine stands, we ascertained that most localities are in the Illyrian beech forests and therefore we may reasonably consider it as diagnostic (differential) species of the Illyrian alliance *Aremonio-Fagion*.

Taking into account its habitat-type preferences in Slovenia, the species doesn't seem to have strong affinity to communities of the alliance *Vaccinio-Piceion*, except for the fact that it predominantly grows on shallow and often rocky ground with moder rendzina.

If (when) we rank it among the character species of spruce forests, in our opinion it should be associated with the suballiance *Abieti-Piceion*.

Conclusions

According to some literature sources (Tutin 1968, Fischer et al. 2008) and the distribution patterns, two subspecies of *L. krapfii* would be expected in Slovenia: *L. krapfii* subsp. *krapfii* and *L. krapfii* subsp. *gaudinii*. The revision of Slovene herbarium material in LJU and LJS confirmed only the presence of the type subspecies. However, we need to be aware of the possibility of finding the other subspecies, during the fieldwork in the northern part of the country, especially on screes, low-nutrient dry meadows, in tall herb and scrub communities of the mountain and subalpine belt.

In Slovenia, *L. krapfii* subsp. *krapfii* has a Dinaric pattern of distribution, extending from NW to SE of Slovenia. It has scattered distribution in the Alpine, Prealpine, Dinaric and Predinaric phytogeographical region, with a concentration of its localities in the mountains south of Ljubljana, the Snežnik Mountains, the Kočevje region with the Kolpa valley and in the Gorjanci mountain range. The north-westernmost localities in the whole distribution area of this taxon are in the southern Julian Alps (the southern extension of the Tolmin-Bohinj ridge), while the localities in the pre-Alpine region include those above the valleys of Bača and Idrija and on the Zaplana plateau between the towns of Vrhnika and Logatec.

Most of its localities are in beech forests extending from the submontane to the subalpine belt (300 m to 1600 m a.s.l.), on calcareous bedrock (dolomite, limestone, in places mixed with chert, marlstone or claystone) and on shallow soil (moder rendzina). The species was observed also in several spruce communities, in Dinaric black pine community, in Alpine dwarf pine and hop hornbeam communities, as well as in communities of moist rock crevices and screes.

Phytosociologists treat *L. krapfii* as a character species of either spruce or pine forests. With most of its localities in the montane beech forests it can legitimately be considered as a diagnostic (differential) species of the Illyrian alliance *Aremonio-Fagion*.

Povzetek

Vrsta *L. krapfii* je kobulnica, ki uspeva pri nas predvsem v dinarskih gozdovih. Od ostalih vrst tega rodu jo ločimo po najčastih do podolgastih listnih segmentih, golem, malolistnem ogrinjalu in le 5-15 kobulovih žarkih, ki so izrazito različno dolgi. Zbirna evropska floristična dela (npr. Tutin 1968, Pignatti 1982, Thellung 1975, Fischer et al. 2008) navajajo dve podvrsti krapfovega jelenovca: *L. krapfii* subsp. *gaudinii* (*L. gaudinii*) in *L. krapfii* subsp. *krapfii* (*L. krapfii* s. str., sin. *L. marginatum*). Prvi takson ima predvsem alpsko razširjenost, drugi dinarsko-karpatško. Glede na lego Slovenije in nekatere navedbe (npr. Fischer 2008, Tutin 1968) naj bi pri nas uspevali obe. Da bi to preverili, smo pregledali ves dostopni herbarijski material te vrste v herbariju LJU in LJS. Opazovali smo razlikovalne znake, ki jih navajajo Pignatti (1982), Tutin (1968) in Thellung (1975). Ugotovili smo, da pregledani herbarijski material pripada tipski podvrsti, kar je v skladu z navedbami iz domače literature (npr. Mayer 1952, Martinčič 2007), po katerih naj bi pri nas uspevala le *L. krapfii* subsp. *krapfii*.

Iz podatkov, zbranih v podatkovnih bazah Centra za kartografijo favne in flore (CKFF) in FloVegSi Biološkega inštituta Jovana Hadžija ZRC SAZU, literaturnih podatkov in podatkov iz herbarijev LJU in LJS smo izdelali zemljevid znane razširjenosti Krapfovega jelenovca v Sloveniji. Ugotavljamo, da je v Sloveniji razširjen v alpskem, predalpskem, dinarskem in preddinarskem fitogeografskem območju. Najbolj severozahodna nahajališča v njegovem celotnem arealu so v južnih Julijskih Alpah. Glavnina nahajališč leži v dinarski smeri severozahod-jugovzhod, z največjo gostoto nahajališč v hribovju južno od Ljubljane, v Snežniškem pogorju, na Kočevskem s Kolpsko dolino in na Gorjancih. Največ nahajališč je v montanskih bukovih gozdovih, zato Krapfov jelenovec lahko štejejo za diagnostično vrsto ilirske zveze *Aremonio-Fagion*.

Vrsta največkrat raste v bukovih gozdovih od submontanskega do subalpskega pasu (300 m do 1600 m n. m.), na karbonatni podlagi (dolomit, apnenec, ponekod s silikatno primesjo) in plitvih tleh (prhlinasta rendzina). Popisali smo ga tudi v nekaterih smrekovih združbah, v dinarskem črnoborovju, v alpskem ruševju in črnogabrovju ter v združbah vlažnih skalnih razpok in melišč.

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Appendix

Data on the revised herbarium specimens (*Specimina visa*) of *Laserpitium krapfii* subsp. *krapfii*

- 0051/2** Slovenija: In silvis lucidis declinalis septentrionali - orientalis montis Ulovka supre opp. Vrhnika, s. dolom., 610 m s. m.; leg. T. Wraber, 18. 7. 1994 (LJU10032497).
- 0052/4** Slovenija: Carniola. In silvaticis et dumetosis montis Krim (ditio Labacensis), s. calc.; 800 m, leg. Dolšak F., 6. 7. 1925 (LJU10032509).
- 0052/4** Slovenija: Carniola. In silvaticis et dumetosis montis Krim (ditio Labacensis), s. calc.; 800 m, leg. Dolšak F., 7. (LJU10032510).
- 0052/4** Slovenija: Krim. leg. Budnar, 8. 8. 1948 (LJU10032500).
- 0052/4** Slovenija: Carniola. In pratis et silvaticis lapidosis montis Krim prope Labacum; solo calcareo; 1000 m s. m. (Flora exsiccata Carniolica); leg. Paulin A., 7. (LJU10032496).
- 0149/2** Slovenija: Primorska, Otlica, Kovk: bukov gozd (*Seslerio autumnalis-Fagetum*), ekspozicija: NE, nagib: 30°; 740 m n. m.; leg. I. Dakskobler, 13. 7. 1989 (LJS03258).
- 0149/2** Slovenija: Primorska, Otlica, Kovk: bukov gozd (*Seslerio autumnalis-Fagetum*), ekspozicija: N, nagib: 30°. 830 m n.m.; leg. I. Dakskobler, 13.7.1989 (LJS03259)
- 0152/2** Slovenija: Ljubljanska okolica: Iški Vintgar - in fruticosis, solo calcareo, cca 330 m s. m., leg. E. Mayer, 19.8.1954 (LJU10032507).
- 0152/2** Slovenija: Rakiška planota JZ od Krima nad Ljubljano, ob umetnem jezeru J od vasi Rakitna; listnat gozd, 800 m n. m.; leg. A. Zrimec, 22.7.1991 (LJU10032498).
- 0153/1** Slovenija: Dolenjska, Mokrec pri Igu, tik pod vrhom: bukov gozd (*Omphalodo-Fagetum* (Treg. 1957) Marinček et al. 1993), ekspozicija: W, nagib: 25°, rendzina, apnenec. 972 m n.m.; leg. V. Babij, det. D. Robič, 17. 6. 1997 (LJS05987).
- 0158/3** Slovenija, Gorjanci: ob poti s Polma na Mirčev grič, leg. V. Strgar, 29. 6. 1960 (LJU10032506).
- 0257/2** Slovenija: Gorjanci: Gospodična - pr. Miklavž, gozd, 920 m, leg. J. Rataj, 23. 6. 1954 (LJU10032490).
- 0257/2** Slovenija: In silvis umbrosis humidis prope refugium alpinum Paderšičeva koča in monte Gorjanci, solo dolomitico, 850 m s. m., A. Martinčič, 24. 6. 1954 (LJU10032508).
- 0257/2** Slovenija, Gorjanci: In silvis prope locum Gospodična dictum supra vicum Gabrje. 830 m s. m.; leg. T. Wraber, 26. 6. 1992 (LJU10032501).
- 0257/2** Slovenija: Dolenjska, Gorjanci, Gabrje (Novo mesto), Gospodična: v bukovem gozdu (*Arunco-Fagetum*), karbonat, ca. 900 m n.m.; leg. I. Dakskobler, 23. 8. 1989 (LJS03257).
- 0352/4** Slovenija: Snežnik, Peklo: solo dolomitico; 1230 m s. m., leg. M. Zupančič, 31. 8. 1972 (LJU10032502).
- 0353/1** Slovenija: Kranjsko-notranjska flora: Biva med grmovjem ob cesti pod Mašunom pod Snežnikom, leg. R. Justin, 15. 7. 1923 (LJU10032511).
- 0356/3** Slovenija: Podstene v Kočevskem Rogu pri Koprivniku pri Kočevju, leg. V. Plemel, 2. 8. 1849 (LJU10032495).

- 0356/3** Slovenija: Podstene v Kočevskem Rogu pri Koprivniku pri Kočevju, leg. V. Plemel, 2. 8. 1849 (LJU10032499).
- 0356/4** Slovenija: Kočevski Rog, Semič, Planina - Mirna gora, 800-1000 m n. m. v.; suh, topel travnat pas pod el. daljnovodom (RTŠB Semič 01), leg. B. Frajman, 26. 7. 2001 (LJU10130873).
- 0452/2** Slovenija, Notranjski Snežnik: Veliki Snežnik, in fagetis /*Fagetum subalpinum*/ declivitatibus septentrionalis; 1550 n. s. m.; leg. T. Wraber, 12. 8. 1965 (LJU10032503).
- 0454/1** Slovenija, Kočevsko: Goteniški Snežnik, gozdna jasa, 1100 m n. m.; leg. I. Štivec, 16. 7. 1981 (LJU10032491).
- 0454/1** Slovenija: Dolenjska, Bezgovica (Osilnica), Bezgarska planina: travnik, opuščen pašnik, 894 m n. m.; leg. B. Vreš B. & T. Čelik, 13. 7. 2013 (LJS11851).
- 0454/2** Slovenija: Kočevsko: pobočje Krempe, med grmovjem, 900 m n.m. (Flora osnovnega polja 0454 Cerk), leg. I. Štivec, 4. 7. 1982 (LJU10032494).
- 0454/2** Slovenija: Kočevsko: Ravne, na gozdni poseki ob poti v Krokarski pragozd, 840 m n. m. (Flora osnovnega polja 0454 Cerk), leg. I. Štivec, 17. 7. 1981 (LJU10032493).
- 0454/4** Slovenija: In silvis montis Krempe supra vallem fluvii Kolpa, 800 m s. m. leg. A. Martinčič, 9. 7. 1958 (LJU10032504).
- 0454/4** Slovenija: Potok nad Mitroviči v dolini Kolpe, peščeno apnenčasto pobočje; 270 m n. m.; leg. S. Peterlin, 5.-10. 8. 1960 (LJU10032505).
- 9748/4** Slovenija: Primorska, Julijske Alpe, Krikov vrh: *Arunco-Fagetum*, 1150 m n.m.; leg. I. Dakskobler, 29. 7. 1992 (LJS03164).
- 9748/4** Slovenija: Primorska, Julijske Alpe, Krikov vrh: *Arunco-Fagetum*, 1150 m n. m.; leg. I. Dakskobler, 30. 7. 1992 (LJS03171).
- 9748/4** Slovenija: Julijske Alpe, Krikov vrh, pobočja nad Mirno grapo: bukov gozd (*Arunco-Fagetum*), strmo gruščnato pobočje, dolomit z rožencem, rendzina, ekspozicija: NE, nagib: 40°, 940 m n.m.; leg. I. Dakskobler, 21. 7. 1989 (LJS03260).
- 9748/4** Slovenija: Primorska, dolina Zadlaščice, Pod Sopotom: listopadni gozd (*Rhododendro hirsuti-Ostryetum*), strmo kamnito pobočje, ki se prelomi v steno, ob lovski poti, ekspozicija: NNW, nagib: 40°, rendzina, apnenec z rožencem. 780 m n. m.; leg. I. Dakskobler, 21. 7. 1993 (LJS03261).
- 9749/4** Slovenija: Baška dolina, Podbrdo, Batava, pobočje Robarjevega griča, 760 m n. m., bukov gozd, *Arunco-Fagetum* s. lat., leg. I. Dakskobler, 24. 6. 1990 (LJS, study collection). New locality in Prealpine phytogeographical region.
- 9848/4** Slovenija: dolina Idrijce, Slap ob Idrijci, osovna pobočja Špehovega brda, Vresnica nad domačijo Bukovca, 350 m n. m., bukov gozd, *Arunco-Fagetum*; leg. I. Dakskobler, 14. 5. 2002, (LJS, study collection) New locality in Prealpine phytogeographical region, but actually in northwesternmost edge of Trnovski gozd plateau (Dinaric mountains).
- 9849/1** Slovenija: Baška dolina, vznožje Koriške gore nad cesto Humar-Hudajužna, 390 m in 470 m n. m., bukov gozd, *Ostryo-Fagetum*; leg. I. Dakskobler, 29.6. 1989 (LJS, study collection) (new locality in Alpine phytogeographical region).
- 9849/1** Slovenija: Baška dolina, vznožje Kobilice nad čuvajnico ob železniški progi Grahovo ob Bači-Hudajužna, okoli 400 m n. m., bukov gozd, *Ostryo-Fagetum*; leg. I. Dakskobler, 29.6. 1989 (LJS, study collection) New locality in Prealpine phytogeographical region.