

Floristic records from the Karavanke/Karawanken and Kamniške Alpe/Steiner Alpen (Slovenia and Austria)

Frajman B.¹, Schönswetter P.², Latzin S.², Sinn E.³, Hilpold A.⁴, Schratt-Ehrendorfer L.², Schneeweiß G. M.², Pany P.², Englisch T.², Niklfeld H.²

¹ Biology Department, Biotechnical Faculty, University of Ljubljana, Večna pot 111, SI-1000 Ljubljana, Slovenia;
E-mail: bozo.frajman@bf.uni-lj.si.

² Department of Biogeography and Botanical Garden, Faculty Centre Botany, University of Vienna, Rennweg 14, A-1030 Vienna, Austria; E-mails: peter.schoenswetter@univie.ac.at, harald.niklfeld@univie.ac.at.

³ Friedensstraße 6, A-3300 Amstetten, Austria.

⁴ Museum of Nature South Tyrol, Bindergasse/Via Bottai 1, I-39100 Bozen/Bolzano, Italy.

Abstract. New floristic records from the eastern Karavanke/Karawanken and Kamniške Alpe/Steiner Alpen (Slovenia and Austria) are reported. *Allium kermesinum* is new for Austria; *Arabis soyeri* subsp. *subcoriacea*, *Carex rupestris* and *Draba dubia* are new for the Kamniške Alpe/Steiner Alpen; for *Androsace hausmannii*, *Arabis stellulata*, *Carex ornithopodooides*, *Pedicularis rosea*, *Salix serpillifolia* and *Veronica fruticulosa* new localities are presented. Furthermore, taxonomic problems in *Oxytropis* sect. *Oxytropis* and *Arabis pumila* sensu lato are discussed.

Key words: floristic mapping, Southeastern Alps, alpine flora, high mountain taxa

Izveček. FLORISTIČNE ZANIMIVOSTI KARAVANK IN KAMNIŠKIH ALP (SLOVENIJA IN AVSTRIJA) - Predstavljamo floristične novosti iz vzhodnih Karavank in Kamniških Alp (Slovenija in Avstrija). *Allium kermesinum* je nova vrsta za Avstrijo; *Arabis soyeri* subsp. *subcoriacea*, *Carex rupestris* in *Draba dubia* so nove za Kamniške Alpe. Dodajamo tudi nekaj novih nahajališč nekaterih redkejših taksonov: *Androsace hausmannii*, *Arabis stellulata*, *Carex ornithopodooides*, *Pedicularis rosea*, *Salix serpillifolia* in *Veronica fruticulosa*. Razpravljamo tudi o taksonomski problematiki znotraj *Arabis pumila* sensu lato in sekcije *Oxytropis* sect. *Oxytropis*.

Ključne besede: kartiranje flore, Jugovzhodne Alpe, alpinska flora, visokogorske rastline.

Introduction

Situated at the eastern edge of the Southern Calcareous Alps, the mountain ranges of Karavanke/Karawanken and Kamniške (Savinjske) Alpe/Steiner (Sanntaler) Alpen provide, just before sinking below the timberline, a broad variety of habitats and a full sequence of altitudinal belts that is the necessary requirement for rich and diverse mountain flora. Compared with other parts of the Alps, the distance to and the somewhat weak connection with the higher and larger alpine areas in the West (Julijske Alpe/Alpi Giulie, Karnische Alpen/Alpi Carniche/Karnijske Alpe) may be the reason for a certain decline of strictly high-alpine species. On the other hand, the position outside the continuous ice-shields that had covered the basins and valleys adjacent to the West and North, but not to the East and South during the cold phases of the Quaternary (van Husen 1987), has designed the area as a favourable survival area or »massif de refuge«, as testified by a high concentration of plant and animal species with restricted, disjunct and even endemic distributions. Though this particular combination of biogeographic features is basically well established for our area, a refined knowledge of distributional traits appears desirable as a basis for future in-depth analyses.

Regarding the Kamniške Alpe and the eastern part of the Karavanke Mts, botanical knowledge dates back to the 18th century, when J. A. Scopoli (1760) visited Storžič and Grintovec and F. X. Wulfen explored the mountains Grintovec, Obir and Peca/Petzen (see e. g. Klemun 1999). Among the scattered notes published in the 19th century, those by Weiss (1859) and Kocbek (1891, 1894) from Kamniške Alpe may be mentioned. Intensive floristic fieldwork, combined with early vegetation mapping, was undertaken from 1898 to 1905 by A. Hayek in the central Kamniške Alpe. The floristic results of this study, together with additional data by A. Paulin and others, were jointly published in 1907 by Hayek & Paulin. Up to now, this remained the only such detailed floristic publication for the whole Kamniške Alpe and the Karavanke region. For other parts of the region, the data collected up to that time are summarized in the provincial floras for Carinthia by Pacher & Jabornegg (1880-1888) and Pacher (1888-1894), and for historical Styria by Hayek (1908-1914, 1956).

Later, in Slovenia mostly fragmentary floristic and/or taxonomic reports were published, e.g. for Kamniške Alpe by Rechinger (1935), Mayer (1951), Mayer (1954a & 1954b), Prekoršek (1956a & 1956b), Strgar (1973), Wraber (1978), Wraber (1995), Cenčič (1997), and for the eastern Karavanke by Sušnik (1961), Melzer (1970), Dakskobler & Mayer (1992), Jogan (1995). A cartographic summary of the published or otherwise accessible data is provided by the map series by Jogan et al. (2001).

For the Austrian portion, floristic records were published in many contributions covering wider territories (mostly Carinthia as a whole or Austria as a whole). Among taxonomic novelties, the endemic species *Helictotrichon petzense* Melzer and *Pulmonaria carnica* W. Sauer, soon detected also in Slovenian territory, were most noteworthy (Melzer 1968a, Sauer 1973). The flora of two mountains in the eastern Karawanken was described in particular: that of Petzen/Peca by Melzer (1968b), and that of Obir by Hartl & Türk (1999), Leute & Zwander (1999), and Perko (1999). Towards the end of the 1960s, methodical floristic field work was started throughout Austria within the scheme of Mapping the Flora of Central Europe. For Carinthia, in 1992 the results achieved by then were published in a regional distribution atlas (Hartl & al. 1992). At that time, the average number of taxa recorded per quadrant had reached approximately the value of 645 for the 16 purely or partly Austrian quadrants of our area. This was backed by the – mainly voluntary – fieldwork of about 20 botanists (among which four, namely O. Pruggert†, G. Kniely, A. Neumann† and L. Schratt-Ehrendorfer, had contributed more than half of the records), and by the additional use of literature and collection data, the latter mainly extracted from the herbarium KL at Klagenfurt. In the meanwhile, the area's vascular plants were also included into the new Flora of Austrian Styria and adjacent regions (Maurer 1996-2006), and an essentially updated set of distribution maps for the *Orchidaceae* of Carinthia was provided by Perko (2004).

In addition to the flora, plant communities were studied in manifold investigations that, however, cannot be listed here in detail. We just like to remember that our area's vegetation was the subject of one of the classical regional monographs, namely by Aichinger (1933), as they coined the early time of Braun-Blanquetian phytosociology, and that the alpine vegetation of the central Kamniške Alpe was, 75 years after Hayek, newly analysed in phytosociological terms by Haderlapp (1982), treating both the Slovenian and the Austrian side.

Rare and endangered species in the Slovenian part of the area were documented by Wraber & Skoberne (1989), those in the Austrian part by Kniely et al. (1995).

This paper presents new records of rare, mainly alpine plant species from the eastern Karavanke/Karawanken and Kamniške (Savinjske) Alpe/Steiner Alpen that were mainly recorded during fieldwork executed within the framework of Mapping the Flora of Central Europe. These excursions were conducted by the Department of Plant Biogeography and Botanical Garden, University of Vienna, in 2003 and 2005.

Study area, materials and methods

The 2003 excursion covered mainly the Austrian side of the western and central parts of the Karawanken, but also excursions to the eastern Karawanken were included (e.g. Tolsta Košuta), and Slovenian territory was touched on the border ridge. In 2005, we focussed on the subalpine to alpine vegetation belts on both sides of the eastern part of the Karavanke and Kamniške Alpe. In Austria, we visited botanically less known portions of Obir and Petzen/Peca, furthermore Reschounikturm/Režovnikovo poldne, Kleiner Grintoutz/Virnikov Grintovec, Kärntner Storschitz/Pristovnikov Storžič, the western summit of Uschowa/Olševa, and Oistra/Ojstra (Karawanken), and Vellacher Kotschna/Belska Kočna including Velika Baba (Steiner Alpen). In Slovenia, field work concentrated on the border area between Savinjsko sedlo and Jenkova planina, the area between Kamniško sedlo and Ojstrica, and on Storžič and Raduha (all Kamniške Alpe), as well as to Virnikov Grintovec and Olševa in the Karavanke. All species observed along the excursion routes were marked on the standardized terrain forms used by the Austrian floristic mapping scheme (see e.g. Niklfeld 1971); later, the records were entered into the floristic database at the Department of Plant Biogeography and Botanical Garden, University of Vienna. The most interesting results are presented herewith.

Taxonomy and nomenclature follow Fischer et al. (2005). Distribution data were taken from Hartl et al. (1992) for Carinthia (Austria) and Martinčič et al. (1999) as well as Jogan et al. (2001) for Slovenia. Herbarium specimens are deposited in the herbaria of the Institute of Botany, University of Vienna (WU), of the Museum of Nature South Tyrol in Bozen/Bolzano (BOZ) and of the Biology Department, University of Ljubljana (LJU).

»Southeastern Alps« refers to Julijske Alpe, Karavanke and Kamniške Alpe (and occasionally includes also Mt. Dobratsch/Dobrač in the easternmost part of Gailtaler Alpen/Ziljske Alpe). The Slovene resp. German names of the main mountain groups, i. e. Kamniške Alpe = Steiner Alpen and Karavanke = Karawanken, are used alternatively, subject to which national territory is concerned. Otherwise, in the bilingual area of Austria toponyms are mostly given in both languages

Abbreviations for collectors or observers are: AH (Andreas Hilpold), BF (Božo Frajman), ES (Erich Sinn), GMS (Gerald M. Schneeweiß), HN (Harald Niklfeld), LSE (Luise Schrott-Ehrendorfer), PP (Peter Pany), PS (Peter Schönschwetter), SL (Sonja Latzin), and ThE (Thorsten Englisch).

Results and discussion

Allium kermesinum Rchb.

- Slovenia, Kamniške Alpe: SE of Savinjsko sedlo, ca. 2000 m s. m. (9653/1). PS, BF, PP, 31.8.2005.
- Austria and Slovenia, Kamniške Alpe/Steiner Alpen: saddle ca. 260 m SSE of Velika Baba, ca. 1960-1980 m s. m., both sides of the border (9653/1). PS, BF, PP, 31.8.2005 (WU).

New for Austria. *Allium kermesinum* is a narrow endemic of the Kamniške Alpe (Mayer 1960) and was previously only known from Slovenian territory. Our record for Austria is from the immediate vicinity of the state border.

Androsace hausmannii Leybold

- Slovenia, Kamniške Alpe: Planjava, 2390 m s. m. (9653/2). PS, BF, PP, 1.9.2005 (WU).

New record of a rare species in the Kamniške Alpe. This eastern-alpine endemic species has its main distribution area in the Southern Alps (mainly Dolomiten/Dolomiti and Karnische Alpen/Alpi Carniche of Italy and Austria), with some disjunct populations in the eastern Central Alps as well as in the Northern Calcareous Alps of Austria and Germany (Merxmüller 1953, Niklfeld 1972, Niklfeld 1973). In Slovenia, *A. hausmannii* is rare and apparently confined to the Kamniške Alpe. It was first found by L. Rechinger on the summit of Skuta (Rechinger 1935). Later on, more localities on Skuta and neighbouring Rinka were recorded (Mayer 1956). *Androsace hausmannii* is included as a rare species in the Red Taxa List of Slovenia (Anonymus 2002).

The newly recorded small population on the summit of Planjava is several kilometres away from the known localities. *Androsace hausmannii* grows in the vicinity of *Draba aspera* Bertol., another rare species that, in the Alps, is restricted to the Kamniške Alpe (Hayek & Paulin 1907) and one locality in the eastern Karawanken (Gutermann 1972).

***Arabis soyeri* Reut. et Huet *subsp. subcoriacea* (Gren.) Breistr.**

- Austria, Steiner Alpen: middle part of Vellacher Kotschna (Belska Kočna), below Offnerhütte, 1300-1450 m (9653/1). PS, BF, PP, 31. 8. 2005.

New for the Steiner Alpen/Kamniške Alpe. In contrast to the situation in the Central Alps of Carinthia, where this taxon is frequently growing in base-rich springs and along streams, it is rare on the Austrian side of the Karawanken/Karavanke with one record near Zell Pfarre/Sele Fara (Titz & Weigerstorfer 1976) and two records from Petzen/Peca and its foothill area (mapping data by O. Prugger, presented in Hartl et al. 1992). From the southern side of the Karavanke, *A. soyeri* seems to be entirely absent. It was previously not known from the Steiner Alpen/Kamniške Alpe. In Slovenia, three records exist from Julijske Alpe and Trnovski gozd (Jogan et al. 2001); one more record is given by Titz & Weigerstorfer (1976) for the Sava valley near Kranj.

***Arabis stellulata* Bertol.**

- Austria, Karawanken: ENE ridge of Kuhberg/Kravji vrh (SW of Hochobir/Ojstrc), 1950-2000 m s. m. (9552/2). SL, HN, 31.8.2005.
- Austria, Karawanken: Wackendorfer Spitze/Veška kopa (Petzen/Peca), 2000-2100 m s. m. (9454/3). SL, BF, ES, 29.8.2005.
- Austria, Karawanken: »Mela« E below Tolsta Košuta, 1550-1690 m s. m. (9552/4). SL, 11.7.2003.
- Austria, Karawanken: Kleiner Grintoutz/Virnikov Grintovec, 1320-1654 m s. m. (9552/4). PS, BF, 3.9.2005.
- Austria, Karawanken: northeastern part of Trögernklamm/Korške peči, 680-750 m s. m. (9553/1). W. Gutermann & HN, 8. 6. 1980; HN, SL, PP, ES, 28.8.2005.
- Austria, Karawanken: northern slope of Uschowa/Olševa NE below Felsentore/Vrate, 1060-1200 m s. m. (9554/1). PS, BF, AH, PP, 30.8.2005.
- Slovenia, Karavanke: southern slope of Olševa E – NE above Potočka zijalka, 1675-1820 m s. m. (9554/3). PS, AH, BF, PP, 30.8.2005.
- Slovenia, Kamniške Alpe: Raduha, between Durce and Lanež, ca. 1780-1925 m s. m. (9554/4). PS, AH, BF, PP, 2.9.2005.
- Slovenia and Austria, Kamniške Alpe/Steiner Alpen: Jezersko sedlo/Seeländer Sattel – Velika Baba, 1950-2127 m s. m. (9653/1). PS, BF, PP, 31.8.2005.

- Austria, Steiner Alpen: Vellacher Kotschna/Belska Kočna below Offnerhütte, 970-1469 m s. m. (9653/1). AH, 31.8.2005.
- Austria, Steiner Alpen: SSW of Matkosattel/Matkovo sedlo, 1650-1730 m s. m. (9653/2). ES, 31.8.2005.
- Slovenia, Kamniške Alpe: Logarski kot - waterfall Rinka - Frischaufov dom na Okrešlju, 1020-1400 m s. m. (9653/2). ES, 1.9.2005.
- Slovenia, Kamniške Alpe: Kamniško sedlo - Planjava - Lučka Brana (Baba) - Škarje, 1850-2392 m s. m. (9653/2). PS, BF, PP, 1.9.2005.
- Slovenia, Kamniške Alpe: Škarje - summit area of Ojstrica, 2100-2350 m s. m. (9653/2). SL, 1.9.2005.
- Slovenia, Kamniške Alpe: Sedelce – foot of Veliki vrh, 1840-1900 m s. m. (9654/1). SL, 2.9.2005.

New for the easternmost part of the Karawanken/Karavanke; first accurately localised records for the Kamniške Alpe. The two species of the *A. bellidifolia* (or *pumila*) aggregate, the tetraploid *A. bellidifolia* Cr. (= *A. pumila* Jacq.) s. str. and the diploid *A. stellulata* (Titz 1974), are easily distinguished by inspection of the indumentum of the basal leaf (furcate vs. stellate), and they differ also ecologically. *Arabis bellidifolia* is tetraploid, possibly originated after hybridisation between *A. soyeri* and *A. stellulata* (Titz & Weigerstorfer 1976), but Wraber (in Martinčič et al. 1999) treats it at the subspecific level (sub *A. pumila* Jacq. subsp. *pumila*). Jogan et al. (2001) list only two quadrants (Snežnik and Govci areas) for *A. stellulata*, in spite of the wide distribution (Julijske Alpe, Karavanke, Kamniške Alpe, Snežnik) given for this taxon by Wraber (in Martinčič et al. 1999) and of ca. 8-10 Slovenian herbarium records roughly mapped for Julijske Alpe and Kamniške Alpe by Titz (1974). The first precise locality for *A. stellulata* in Slovenia (Orlejci-Zeleni rob) was published by Dakskobler (1998). N. Jogan reports it also for Srednji vrh in western Karavanke (9449/3; floristic database of the Centre for Cartography of Fauna and Flora). While both species have been recorded from the Austrian side of the Karawanken from Obir and Košuta westwards (*A. stellulata* more often than *A. bellidifolia*; Hartl et al. 1992, and unpublished data of »Mapping the Flora of Austria«), no records exist for the easternmost part of the Karavanke, and no precisely localised records for the Kamniške Alpe. So far, beside the two map symbols in Julijske Alpe given by Titz & Weigerstorfer, exact localities of *A. bellidifolia* s. str. have not been published in Slovenia; Jogan et al. (2001) show only the map of *A. bellidifolia* including *A. stellulata*. Our records indicate that also in Slovenia, similar to the situation in Austria, *A. stellulata* seems to be far more frequent than *A. bellidifolia*, and both should be searched for more specifically.

Complementarily, we report on recent – exclusively Austrian – records of *A. bellidifolia* **Cr. s. str.**; most of these refer to quadrants new in comparison with Hartl et al. (1992):

- Austria, Karawanken: Wauchza/Bavhca – Korpitscher Alm/Grpiška planina – Korpitschgraben/Grpiški graben (SSW of Fürnitz/Brnca), 740-1540 m s. m. (9448/4). ES, 9.7.2003.
- Austria, Karawanken: northern slope WNW of Schwarzkogel/Kresišče (SSE of Altfinkestein/Stari Bekštanj), 1450-1720 m s. m. (9449/3). LSE, SL, ES, 6.7.2003.
- Austria, Karawanken: northeastern slope of Mittagskogel/Kepa, 1850-1950 m s. m, limestone scree. (9449/4). ThE, 22. 9. 1993; LSE, 8.7.2003.
- Austria, Karawanken: Gratschenitzengraben/Gračenica near Rosenbach/Področica, 650-820 m s. m. (9450/3). HN, SL, 9.7.2003.
- Austria, Karawanken: quadrant Zell-Pfarre/Sele-Fara (9552/1). LSE, 1983 (included already in Hartl et al. 1992).
- Austria, Karawanken: northern slope of Koschuta/Košuta, e. g. between the saddles S of Mejnik and S of Wilze/Vilce, 1480-1790 m s. m. (9552/3). HN, 22.8.1981; LSE, 1983; LSE & T. Wraber, 1.8.1992 (included already in Hartl et al. 1992).
- Austria, Karawanken: Reschounikturm/Režovnikovo poldne (SSE of Zell-Schaida/Sele-Šajda), 1420-1500 m s. m. (9552/2). HN, SL, 3.9.2005.
- Austria, Steiner Alpen: Vellacher Kotschna/Belska Kočna below Offnerhütte, 970-1469 m s. m. (9653/1). AH, 31.8.2005.

***Carex ornithopodoides* Hausm.**

- Austria, Karawanken: northeastern slope of Mittagskogel/Kepa, 1850-1950 m s. m. (9449/4). ThE, 22. 9. 1993; LSE, 8.7.2003.
- Slovenia, Karavanke: cirque east of Stol summit, 1850 m s. m. (9551/3). ThE, 24.9.1993.
- Slovenia, Kamniške Alpe: Jezersko sedlo – Velika Baba, 1950-2127 m s. m. (9653/1). PS, BF, PP, 31.8.2005.
- Slovenia, Kamniške Alpe: Planjava, 2200-2392 m s. m. (9653/2). PS, BF, PP, 1.9.2005.

Second and third records for the Kamniške Alpe, second and third records for the Karawanken. While *Carex ornithopodoides* is treated at subspecific rank by Martinčič (in Martinčič et al. 1999), floras from other Alpine countries (e.g. Heß et al. 1967, Fischer 2005) rank it at specific level. It is most easily distinguished from *C. ornithopoda* Willd. by its glabrous utricles. Although *C. ornithopodoides* was already reported by Hayek (1907) from

Ojstrica in the Kamniške Alpe, it is only listed for the Julijske Alpe by Martinčič (in Martinčič et al. 1999). Jogan et al. (2001) present only a map of the *C. ornithopoda* aggregate. However, there are seven localities from three quadrants published for the Julijske Alpe by Wraber (1969). From the Austrian side of the Karawanken, only a single locality near Koschutnikurm/Košutnikov turn (LSE, 1983; quadrant presented in Hartl et al. 1992) had previously been known.

***Carex rupestris* All.**

- Slovenia, Kamniške Alpe: Raduha, SW ridge of Lanež, ca. 1850-1925 m s. m. (9554/4). PS, AH, BF, PP, 2.9.2005.
- Slovenia, Kamniške Alpe: Raduha, summit area, ca. 2000-2062 m s. m. (9554/3). PS, AH, BF, 2.9.2005.
- Slovenia, Kamniške Alpe: Storžič, SE ridge, ca. 2100 m s. m. (9652/3, in immediate vicinity to 9652/1). PS, BF, 10.6.2006 (LJU).
- Austria, Karawanken: SW ridge of Hochobir (Ojstrc), ca. 2030 m s. m. (9552/2). SL, HN, 31.8.2005.

New for the Kamniške Alpe, third record for the Karawanken. The arctic-alpine *C. rupestris* is an often overlooked inconspicuous sedge of exposed mountain crests (Wraber 1985) growing on limestone as well as on basic siliceous substrate. In the southeastern Alps, it was only known from the Julijske Alpe and Karavanke (Koschuta/Košuta and Petzen/Peca: L. Schratt-Ehrendorfer resp. H. Melzer in Hartl et al. 1992, Wraber 1993), but until now there have been no records of its occurrence in the Kamniške Alpe. We have found large stands on the summit crest of Velika Raduha and on nearby Lanež, as well as on the southeast ridge of Storžič. Its occurrence on the most peripheral peaks of the Kamniške Alpe strongly suggests that it is present also on the main chain of this mountain range.

***Draba dubia* Suter**

- Slovenia, Kamniške Alpe: W ridge of Velika Zelenica (ENE above Molička planina), 2020-2100 m s. m. (9653/2). SL, 2.9.2005 (WU).
- Slovenia, Kamniške Alpe: Raduha, between Durce and Lanež, ca. 1900 m s. m. (9554/4). PS, AH, BF, PP, 2.9.2005 (BOZ).

New for the Kamniške Alpe (third and fourth record for Slovenia). *Draba dubia* differs from *D. tomentosa* Clairv., which is far more frequent in the southeastern Alps mainly in shape and indumentum of the fruits (\pm acute on both ends and glabrous on the surface in *D. dubia* vs. elliptic and stellate hairy in *D. tomentosa*; Buttler 1967). Whereas *D. tomentosa* is a characteristic species of exposed, rather high-alpine limestone crests, *D. dubia* occurs mainly on basic siliceous substrate in the Central Alps (for Carinthia, see Hartl et al. 1992). Consequently, *D. dubia* is very rare in the southeastern Alps, from where it has been recorded only from the Julijske Alpe (two localities; Wraber 1983) and from Dobratsch (Gailtaler Alpen; Hartl et al. 1992).

***Oxytropis neglecta* Ten.**

- Slovenia and Austria, Kamniške Alpe/Steiner Alpen: Jezersko sedlo/Seeländer Sattel – Velika Baba, on both sides of the border, 1950-2127 m s. m. (9653/1). PS, BF, PP, 31.8.2005.
- Slovenia, Kamniške Alpe: Kamniško sedlo - Planjava - Lučka Brana (Baba) - Škarje, 1850-2392 m s. m. (9653/2). PS, BF, PP, 1.9.2005; confirm. W. Gutermann.
- Austria and Slovenia, Karawanken/Karavanke: Mlinzasattel/Sedlo Mlinca - Frauenkogel/Baba, 1580-1892 m s. m. (9549/2). A. Tribsch, 6.7.2003.
- Austria, Karawanken: Schwalbenwand/Koprivnjak, 1750-1820 m s. m. (9550/1). PS, 6.7.2003.

There seems to be confusion about the Slovenian *Oxytropides*. Whereas the second edition of Mala flora Slovenije (Martinčič in Martinčič & Sušnik 1984) includes only *O. neglecta* (sub *O. pyrenaica* Godr. et Gren.), Martinčič (in Martinčič et al. 1999) in the third edition without comment lists only *O. montana* (L.) DC. s. str. (sub *O. jacquinii* Bunge) and gives the same distribution range. Consequently, Jogan et al. (2001) present only a map of *O. montana* s. str. (again sub *O. jacquinii*).

In their revision of the European taxa of *Oxytropis* sect. *Oxytropis*, Gutermann & Merxmüller (1961) have seen specimens of *O. × carinthiaca* Fisch.-Oost. (*O. montana* s. str. × *O. neglecta*) from the Karavanke (Golica/Kahlkogel, Bodental/Poden – Bärental/Medvedji dol) and the Kamniške Alpe (Korošica) as well as from the Julijske Alpe (Travnik, Triglav). Furthermore, they cite numerous localities for *O. neglecta* (sub *O. pyrenaica*) from the Karavanke, Kamniške and Julijske Alpe as well as from Snežnik, whereas *O. montana* s. str. is not reported for this region (the nearest locality listed by these authors being Dobratsch in Gailtaler Alpen, Austria). The two records of *O. montana* s. str. presented by Hartl et al. (1992) for the Austrian side of the Karawanken (Hochstuhl/Stol group and Obir) remain to be checked; nevertheless, this species, which is widespread in many other parts of the Alps, should also be critically looked for in Slovenia. Whereas the hybrid origin of *O. × carinthiaca* implies that its determination is fairly difficult, *O. montana* s. str. and *O. neglecta* can be distinguished by the length of the carpophor (as long or longer than the calyx tube vs. half as long), the length of the calyx teeth (c. $\frac{1}{4}$ as long as the calyx tube vs. usually $>\frac{1}{2}$ as long) and the indumentum of the scape, i.e. flowering stem (hairs bent upwards vs. conspicuously patent). *Oxytropis neglecta* is normally rosulate with reduced basal internodes whereas in *O. montana* s. str. the basal internodes are usually elongated (Gutermann & Merxmüller 1961).

Our data confirm the presence of *O. neglecta* in the Slovenian and the Austrian parts of the Kamniške Alpe/Steiner Alpen, as well as in the Austrian part and on the border ridge of the Karawanken/Karavanke, and add new localities to those quoted by Gutermann & Merxmüller (1961) and by Hartl et al. (1992).

Complementarily, we report on new records of the hybridogenous ***Oxytropis × carinthiaca* Fisch.-Oost.:**

- Austria and Slovenia, Karawanken/Karavanke: between Bärensattel/Medvedjak and the main ridge 1,3 km WNW of Wainasch/Vajnež, on both sides of the border, 1700-1950 m s. m. (9550/2). GMS, 11.7.2003.
- Austria, Karawanken: main ridge of Wainasch/Vajnež, 1950-2104 m s. m. (9550/4). GMS, 11.7.2003.
- A further observation that probably also refers to this taxon (from the Austrian side of Uschowa/Olševa, 9554/1) still needs confirmation on the basis of more suitable material.

***Pedicularis rosea* Wulfen**

- Slovenia, Kamniške Alpe: northern slopes of Velika Raduha, ca. 1700 m s. m. (9554/3). PS, AH, BF, 2.9.2005.
- Austria, Karawanken: Mittagskogel/Kepa, 2050-2145 m s. m. (9449/4). LSE, 8.7.2003 (confirmation of historical records).
- Austria, Karawanken: Bärentaler Kotschna/Struška, 1750-1944 m s. m. (9550/2). GMS, 9.7.2003 (confirmation of a historical record).
- Austria, Karawanken: W ridge to summit of Loibler Baba/Košutica, 1800-1969 m s. m. (9551/4). PS & A. Tribsch, 5.7.2003 (confirmation of a historical record).
- Austria, Karawanken: northern slope of Kleiner Grintoutz/Virnikov Grintovec, 1420 m s. m. (9552/4). PS, BF, 3.9.2005.
- Austria, Karawanken: Wackendorfer Spitze/Veška kopa (Petzen/Peca), 2000-2100 m s. m. (9454/3). SL, BF, ES, 29.8.2005.

New for Raduha, additional records and recent confirmations for the Karawanken. This alpine species has a continuous distribution in the southeastern Alps from the Julijske Alpe over the Karavanke to the Kamniške Alpe (Jogan et al. 2001, Hartl et al. 1992), but it has not yet been published for Raduha (Jogan et al. 2001). However, there is a herbarium specimen from Raduha deposited in LJU (leg. L. Godic, LJU 10040879). The occurrence in humid rock crevices at the base of the northern rock face of Kleiner Grintoutz (Virnikov Grintovec) is worth mentioning because of the low altitude and the exceptional ecology, given that *P. rosea* is a taxon characteristic for windexposed Caricion firmae (Aichinger 1933). An even lower locality (1200 m s. m.) is known from the scree base of the northern slope of Begunjščica (T. Wraber, pers. com.). Altogether, on the Austrian side of the Karawanken, where the map by Hartl et al. (1992) shows recent records only for four quadrants, occurrences in five more quadrants are confirmed or newly recorded.

***Salix serpillifolia* Scop.**

- Slovenia, Kamniške Alpe: ridge between Velika Raduha and Durce, ca. 1900-2062 m s. m. (9554/3). PS, AH, BF, 2.9.2005.
- Slovenia, Kamniške Alpe: Raduha, between Durce and Lanež, ca. 1780-1925 m s. m. (9554/4). PS, AH, BF, PP, 2.9.2005.

- Slovenia, Kamniške Alpe: Jezersko sedlo – Velika Baba, 1950-2127 m s. m. (9653/1). PS, BF, PP, 31.8.2005.
- Slovenia, Kamniške Alpe: Planjava 2200-2392 m s. m. (9653/2). PS, BF, PP, 1.9.2005.

New localities for the Kamniške Alpe. Within the southeastern Alps, this dwarf alpine willow is fairly common in the Julijske Alpe and rare in the Karavanke/Karawanken (Hartl et al. 1992, Jogan et al. 2001). In the Kamniške Alpe, it has only been known from the central parts (Kočna to Planjava) and from Krvavec (Hayek 1907, Haderlapp 1982). The record from quadrant 9755/2 in Jogan et al. (2001) is most probably erroneous, since the area does not exceed 1077 m above sea level. It is based on a floristic record by M. Wraber and has possibly been confused with *S. retusa* L.

We have found *S. serpillifolia* on Raduha as well as between Jezersko sedlo and Baba, suggesting that it is more common in the Kamniške Alpe than previously thought.

***Veronica fruticulosa* L.**

- Slovenia, Kamniške Alpe: between Koča v Grohotu (beneath Raduha) and the path-crossing 0.5 km WNW below Durce, ca. 1460-1620 m s. m. (9554/3). PS, AH, BF, 2.9.2005.
- Austria, Karawanken: below Bärensattel/Medvedjak, 1600-1690 m s. m. (9550/2). GMS, 11.7.2003.

New for Raduha, third record for the Karawanken. *Veronica fruticulosa* is a species of calcareous subalpine and alpine stony meadows and rock crevices, distributed throughout most of the Alps (Aeschmann et al. 2004). In the southeastern Alps it is common in the Julijske Alpe (Jogan et al. 2001) and rare in the Karavanke/Karawanken (Jogan et al. 2001, Hartl et al. 1992). From the Kamniške Alpe it was only reported by Hayek (1907) from the northern side of Kamniško sedlo in Slovenia and from around Vellach/Bela in Austria. We recorded it on the northern slope of Raduha on large, sunny rocks above Koča v Grohotu. *Veronica fruticulosa* could be mistaken with *V. fruticans* Jacq. when not in flower, but the former has glandular pubescent peduncles and calyces, whereas the latter lacks glandular hairs.

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