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Pedicularis julica E. Mayer × *Pedicularis rostratocapitata* Crantz = *Pedicularis* × *mayeri* nothosp. nov., a new spontaneous hybrid in the genus *Pedicularis* L.

Igor Dakskobler & Branko Vreš

Summary: In the Tolmin-Bohinj ridge of the Julian Alps, on Mt. Čétrt west of Mt. Črna Prst, on Mt. Vrh Škrli east of Mt. Mahavšček and on Mt. Košutnikov Turn (Košuta / Koschuta ridge, the Karavanke / Karawanken), we found unusual specimens from the genus *Pedicularis* L. on a subalpine grassland classified into the association *Ranunculo hybridi-Caricetum sempervirentis*. Some of their morphological characters (plant height, shape of basal leaves, pilose calyx and bracts) resemble the taxon *Pedicularis julica* (= *P. elongata* subsp. *julica*), the shape of the inflorescence which is head-like but elongated, the size of flowers and pubescence of the lower lip is similar to *Pedicularis rostratocapitata*. The colour of the flowers is different from both. The upper lip is yellowish with a pink beak, the lower lip is light pink. Because both taxa, *P. julica* and *P. rostratocapitata* grow in the vicinity, we described the new hybrid as *Pedicularis* × *mayeri* nothosp. nov. (*P. julica* × *P. rostratocapitata*). We named it after Ernest Mayer (1920–2009), a Slovenian botanist who described the endemic taxon *P. julica* on Mt. Črna Prst.

Keywords: *Pedicularis julica, Pedicularis rostratocapitata, Pedicularis* × *mayeri, Ranunculo hybridi-Caricetum sempervirentis,* Julian Alps, Karavanke, Mt. Črna Prst, Košuta, Slovenia

Mt. Črna Prst with its vicinity is known for its extremely rich flora (Dakskobler et al. 2008) which comprises the following species from the genus *Pedicularis*: *P. recutita, P. rostratocapitata, P. rostratospicata, P. julica* (= *P. elongata* subsp. *julica*), *P. hacquetii* and *P. hoermanniana* (the latter has not been observed on this mountain until recently, Dakskobler 2011). Mt. Črna Prst is also the classical locality of the taxa *P. hacquetii* and *P. julica* (Graf 1834, Mayer 1961). Species from the genus *Pedicularis* are known to cross frequently with each other (Hartl 1974: 271). Steininger (1887: 155–156) described the hybrid *Pedicularis* × *bohatschii* (*P. rostratocapitata* × *P. elongata*) based on the specimens from Monte Piano in the Venetian Alps (northern Italy).

During our research of flora and vegetation of the southern Julian Alps in the summer of 2015, we observed on a stony subalpine grassland on the sunny slopes of Mt. Čétrt west of Mt. Črna Prst specimens from the genus *Pedicularis* that were different from all other species of this genus occurring on Mt. Črna Prst and its vicinity. Due to their morphological characters they clearly belong to a hybrid between the taxa *Pedicularis julica* (= *P. elongata* subsp. *julica*) and *P. rostratocapitata* s. str. (= *P. rostratocapitata* subsp. *rostratocapitata*).

Identical hybrid specimens were found in July 2016 also on stony subalpine grasslands on Mt. Vrh Škrli east of Mt. Mahavšček above the Tolminka Valley. In July 2012, we photographed such a hybrid (determined as *P.* × *mayeri* in October 2016) on southeastern slopes of Mt. Košutnikov Turn in the Košuta ridge (the Karavanke / Karawanken). This article provides the description of the new hybrid and its sites.

Materials and methods

Flora and vegetation were studied according to established central-European standard methods (Braun-Blanquet 1964; Ehrendorfer & Hamann 1965). Floristic records and phytosociological relevés were entered into the FloVegSi database (Seliškar et al. 2003). This database was also the source for the distribution maps for some of the discussed syntaxa (Figs 5, 6). The nomenclature sources for the names of taxa are 'Flora alpina' (Aeschimann et al. 2004) and 'Mala flora Slovenije' (Martinčič et al. 2007) as well as Šilc & Čarni (2012) for the names of syntaxa. Dried herbarium specimens were stored in herbaria LJS (holotype, paratypes) and LJU (isotype).

Results

Site description

The new hybrid *Pedicularis* × *mayeri* grows on the steep, sunny, stony subalpine grassland on Mt. Čétrt above the village of Stržišče in the Upper Bača Valley west of Mt. Črna Prst, near the Vrata pass (Fig. 1), on the southwestern slopes of Mt. Vrh Škrli east of Mt. Mahavšček above the Tolminka Valley and on southeastern slopes of Mt. Košutnikov Turn in the Košuta ridge (the Karavanke / Karawanken). The phytosociological composition of inventoried grasslands from the

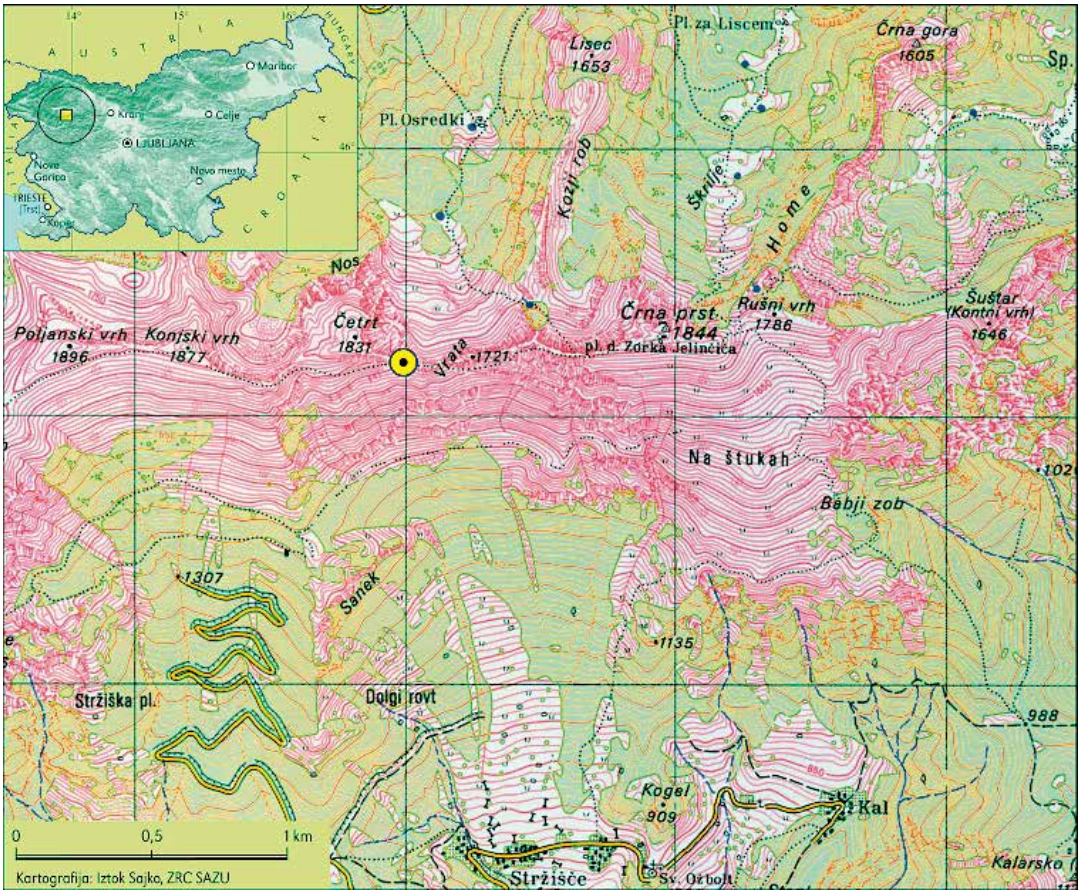

Figure 1. Type locality of the hybrid *Pedicularis* × *mayeri* at the Vrata pass between Mt. Črna Prst and Mt. Čétrt.

Julian Alps is shown in Appendix 1. Both grasslands are classified into the association *Ranunculo hybridi-Caricetum sempervirentis* Poldini et Feoli Chiapella in Feoli Chiapella et Poldini 1993, which is the predominating type of subalpine-alpine grasslands on sunny slopes of the southern Julian Alps. Four out of five diagnostic species of this association are present in the surveyed stand at Mt. Četrt: *Pedicularis julica*, *Ranunculus hybridus*, *Pulsatilla alpina* subsp. *austroalpina* and *Linum alpinum* subsp. *julicum*; the only species that was not recorded was *Oxytropis neglecta* (comp. Feoli Chiapella & Poldini 1993: 78). *Pedicularis rostratocapitata* is also differential for this association, although it is more frequent in the alpine sward from the association *Gentiano terglouensis-Caricetum firmae*, which can be observed in the study area slightly more to the west, especially on Mt. Matajurski Vrh (Hohkovbl) and on the saddle between this mountain and the summit of Poljanski Vrh. The species composition of the studied stand also comprises many species that are diagnostic for dry grasslands from the class *Festuco-Brometea*, for thermophilous forest fringes from the class *Trifolio-Geranietea* and for basophilous pine forests from the class *Erico-Pinetea*, which is associated with expressly sunny aspects and sub-Mediterranean influences in the southern Julian Alps. The climate here is humid, but relatively warm and the snow on steep sunny aspects is soon melted or drifted away by the wind. The stand, where we have found *Pedicularis* × *mayeri* on the slopes of Košutnikov Turn is also classified into the association *Ranunculo hybridi-Caricetum sempervirentis*.

Description and taxonomy

Pedicularis × *mayeri* Dakskobler & Vreš, nothosp. nov. (Figs 2–3)

Description. Planta perennis. Caulis ascendens vel erectus, (15)20–25(30) cm altus, biseriato-pilosus, parce foliatus. Folia bipinnatifida, oblongo-lanceolata, segmentes dentatis. Racemi multiflori, initio subcapitati mox valde elongati. Bracteae inferiores pinnatifide, superiores trifidae, lanigero-villose. Calyx campanulatus lanigero-villosus, dentibus foliaceo-dilatatis. Corolla usque 20 mm longa, labio superiore flavescens, rostrum ros(ac)eo, labio inferiore pallescenti-rosea margine breviter ciliato. Capsula ad calicis ± aequalis longa, acutata. Floret mense junio ad augustum. Crescit in solo calcareo-dolomitico.

Type. 9749/4 (UTM 33TWM12): Slovenia: Alpibus Julicis, Mt. Črna prst, declivibus australibus cacuminis montis Četrt haud procul Vrata transitus, in lapidosis pratis subalpinis (*Ranunculo hybridi-Caricetum sempervirentis*), expositio: S, inclinatio: 25°–35°, rendzinas, solo calcareo. 1730 m s.m. [Slovenia: Primorska: Julian Alps: west of Mt. Črna Prst, sunny slopes of Mt. Četrt close to the Vrata pass: a steep stony subalpine grassland (*Ranunculo hybridi-Caricetum sempervirentis*), exposition: south (S), inclination: 25°–35°, rendzina, Dachstein limestone with dolomite interlayers, 1730 m a.s.l.], 7. 7. 2015, leg. & det. *I. Dakskobler*, [holotype: LJS! 11860; isotype: LJU!; paratypes ibidem, 17. 7. 2015, *I. Dakskobler*, LJS! 11858].

Diagnosis. Herbaceous perennial. Stem ascending to erect, biseriate pilose (with two lines of hairs), (15)20–25(30) cm tall, scarcely foliated. Basal leaves similar to the leaves of *Pedicularis julica* (= *P. elongata* subsp. *julica*), oblong-lanceolate, bipinnate with dentate leaf segments. Their apex often less crusted at the margins than at the basal leaves of *P. rostratocapitata*. Stem leaves are smaller and less divided. Racemes capitate, initially very similar to the inflorescence of *P. rostratocapitata*, but in most specimens, especially later, significantly more elongated. Bracts are woolly-villous, pinnate, the upper ones trilobed. The calyx is woolly-villous, similar to the calyx

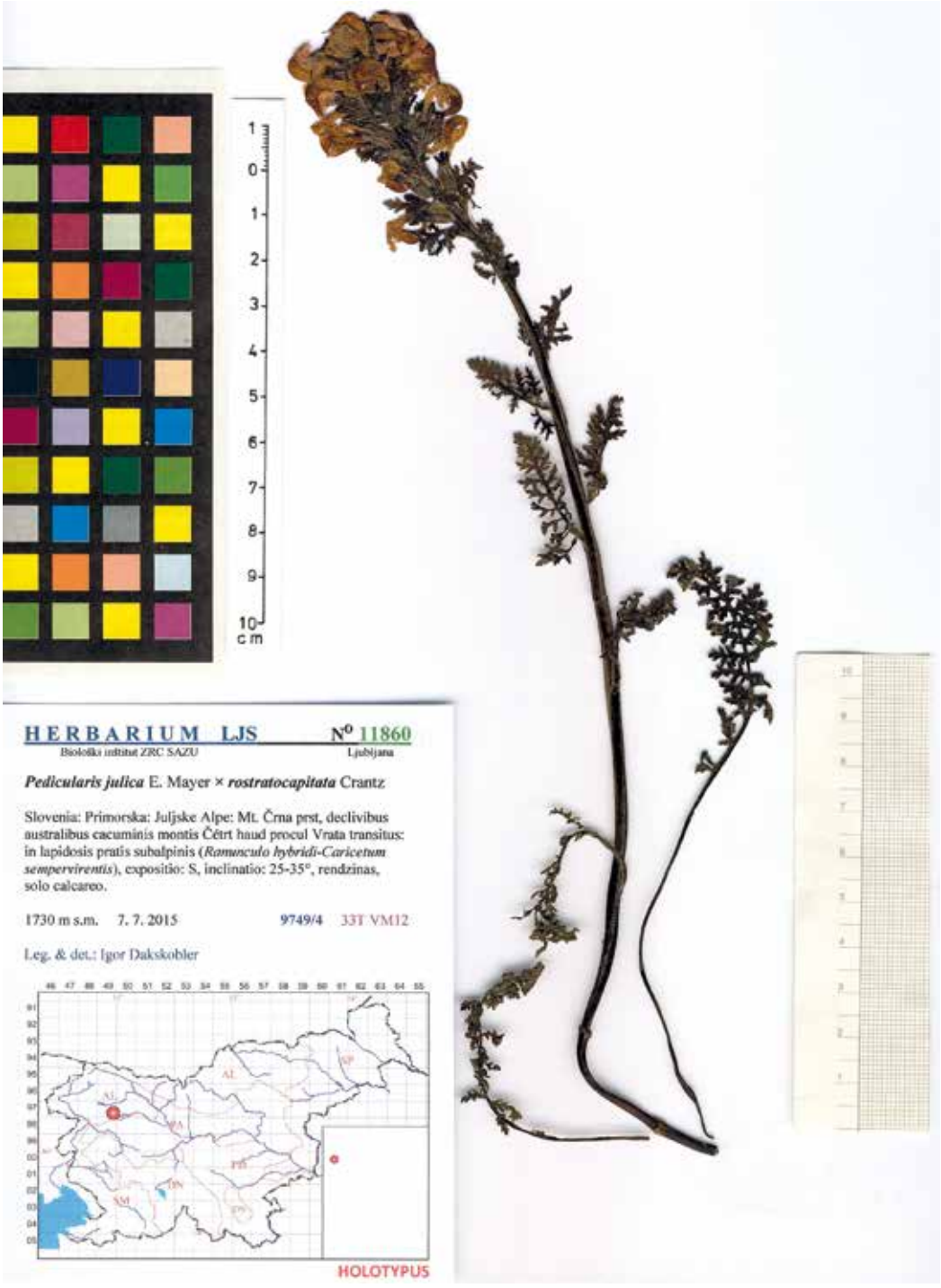

Figure 2. *Pedicularis* × *mayeri* – holotype specimen at LJS.

of *P. julica*, calyx teeth foliose. The corolla is up to 20 mm long, slightly longer than in *P. julica*. Its colour differs from both parental species. The upper lip is yellowish with a dark pink beak, the lower lip light pink and ciliate, but slightly less than the lower lip of *P. rostratocapitata* (Fig. 4). The fruit is an apiculate capsule, equaling calyx. It differs from related hybrid *P.* × *bohatschii*

Figure 3. *Pedicularis* × *mayeri* – flowering (holotype) specimen on the type locality (Julian Alps: west of Mt. Črna Prst, on sunny slopes of Mt. Čétrt close to the Vrata pass, 1730 m a.s.l. 7. 7. 2015. (Photo I. Dakskobler)

(*P. elongata* × *rostratocapitata*) by the following differences: the taxon *P.* × *bohatschii* is taller (up to 35 cm), the inflorescence is a raceme (similar to that of the taxon *P. elongata*), the calyx is glabrous or pubescent only on the veins, flowers are pale yellow with scarlet-reddish shades on the upper lip; but the lower lip is more or less distinctly ciliate in both hybrids.

Flowering time: from mid-June to the end of July.

Habitat. Steep, sunny, stony subalpine-alpine grasslands (*Caricion austroalpinae*; *Ranunculo hybridi-Caricetum sempervirentis*) on the limestone-dolomite bedrock at an elevation of 1700–1900 m a.s.l.

Distribution. SE Calcareous Alps (Julian Alps, Karavanke).

Figure 4. Flowers and bracts of *Pedicularis* × *mayeri* (in the middle) and both parental species (*P. rostratocapitata* on the left and *P. julica* on the right) from the type locality, 12. 7. 2016. (Photo B. Vreš)

Etymology. The new hybrid was named after the university professor and our former colleague, academician Prof. Dr Ernest Mayer (1920–2009) who dedicated some of his extensive and fruitful research to the genus *Pedicularis* (Mayer 1961, 1971).

Discussion

Potential localities of the newly described hybrid *P.* × *mayeri* are in areas with sites where the taxa *P. julica* and *P. rostratocapitata* occur together (Fig. 6). The taxon *Pedicularis julica* (Mayer 1961; Aeschimann et al. 2004: 266; Fischer et al. 2008: 761) is also frequently treated as subspecies *Pedicularis elongata* subsp. *julica* (Hartl 1974; Wraber 2006) and it is distributed in the Southeastern Alps (the Julian Alps, Karavanke, Kamnik-Savinja Alps). It is listed in 'Flora alpina' (Aeschimann et al. 2004) also for the Italian provinces of Treviso and Belluno, but this data should probably be verified. Its distribution in Slovenia based on the data collected in the FloVegSi database (Seliškar et al. 2003) is shown in Fig. 5. *Pedicularis rostratocapitata* is a southeastern-European montane species distributed in the eastern Alps, the Dinaric Alps and the Carpathians (Aeschimann et al. 2004: 268). Aeschimann et al. (2004) also include into the taxon *P. rostratocapitata* s. str. the subspecies *P. rostratocapitata* subsp. *glabra*, which differs from the typical form only in a glabrous lower lip, and it occurs in the Bergamo Alps in northern Italy (Wraber 2006: 154). In Slovenia, *Pedicularis rostratocapitata* is common in the Julian and the Kamnik-Savinja Alps, in the Karavanke and on Mt. Snežnik (Fig. 5). Both species are characteristic for stony subalpine-alpine grasslands from the alliance *Caricion austroalpinae*; the main distribution area of *Pedicularis julica* is in the stands of the association *Ranunculo hybridi-Caricetum sempervirentis*, whereas the main distribution area of *P. rostratocapitata* is in the stands of the association *Gentiano terglouensis-Caricetum firmae* and similar communities (i.e. *Caricetum*

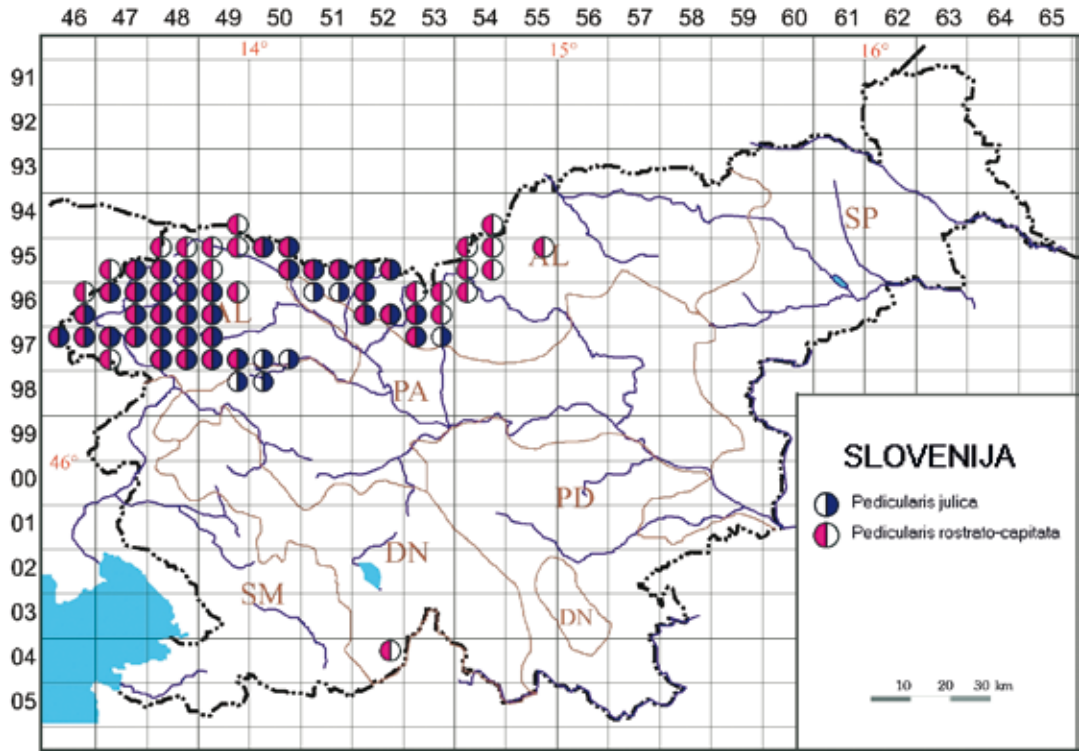

Figure 5. Distribution of *Pedicularis julica* and *Pedicularis rostratocapitata* in Slovenia.

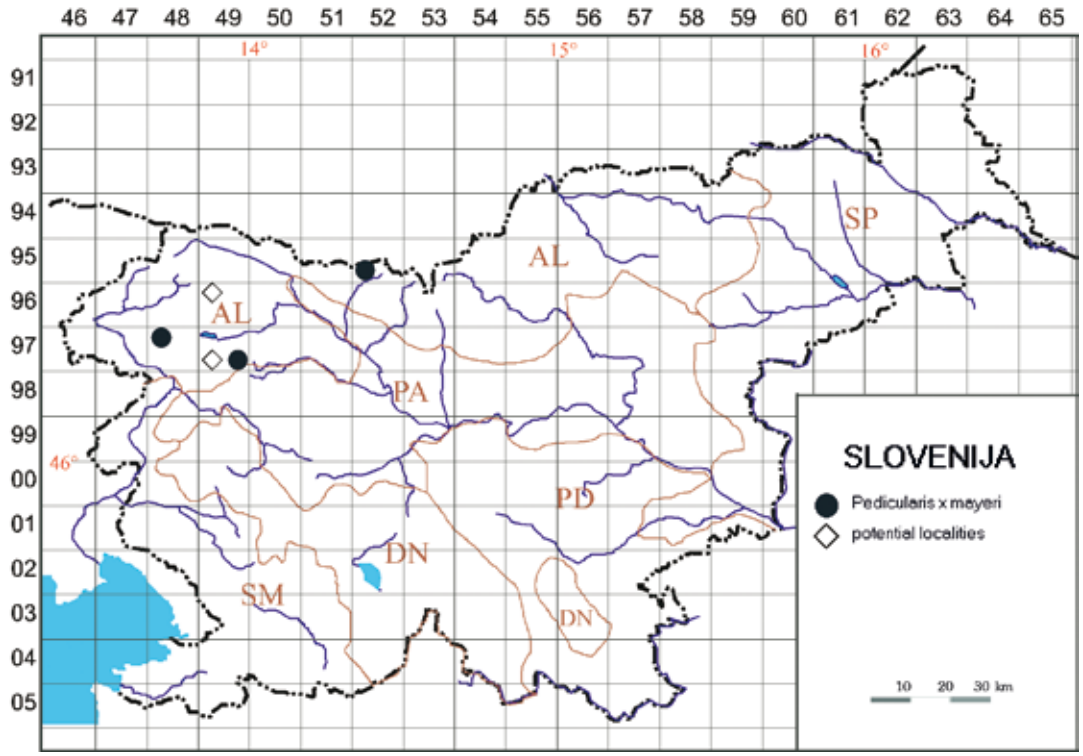

Figure 6. Distribution of the hybrid *Pedicularis* × *mayeri* and its potential localities at the sites in Slovenia, where *Pedicularis julica* and *P. rostratocapitata* occur together.

Figure 7. *Pedicularis* × *mayeri* on the type locality (Julian Alps: west of Mt. Črna Prst, on sunny slopes of Mt. Četrt close to the Vrata pass, 1730 m a.s.l. 12. 7. 2016. (Photo B. Vreš).

rupestris s. lat., *Caricetum mucronatae* s. lat., *Dryadetum octopetalae* s. lat.). There are only few localities, where both species occur within the same community (Fig. 6, also see Surina 2005). We found only ten relevés like that in the FloVegSi database, nine from the Slovenian and one from the Italian part of the Julian Alps (Mt. Iof Fuart / Viš), at altitudes ranging between 1600 m and 2000 m, on stony subalpine-alpine grasslands. Most of these relevés are classified into the association *Ranunculo hybridi-Caricetum sempervirentis*, only one of them into a scree community with dominating *Anemone baldensis* and *Doronicum grandiflorum*. *P. julica* does not normally occur on alpine swards with dominant *Carex firma* and *P. rostratocapitata* is unlikely to be found on sites with better-developed soils.

The hybrid *Pedicularis* × *mayeri* (Figs 7–8) is a new endemic taxon in the Julian Alps and the Karavanke / Karawanken (Karavanks / Karawanks). One of three known localities is in the

Figure 8. *Pedicularis* × *mayeri* on stony subalpine grasslands on Mt. Vrh Škrli east of Mt. Mahavšček above the Tolminka Valley, 1760 m a.s.l. 11. 7. 2016. (Photo I. Dakskobler).

immediate vicinity of a highly frequented mountain trail connecting Mt. Črna Prst with Mts. Rodica and Vogel, and it is therefore potentially threatened despite the very steep slope.

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References

Aeschimann D., Lauber K., Moser D. M. & Theurillat J. P. (2004): Flora alpina. Bd. 2: Gentianaceae–Orchidaceae. – Bern, Stuttgart, Wien: Haupt.

Braun-Blanquet J. (1964): Pflanzensoziologie. Grundzüge der Vegetationskunde. [3. Aufl.] – Wien, New York: Springer.

Dakskobler I. (2011): Novelities in the flora of western Slovenia (Primorska). – Hladnikia **27**: 3–25. [In Slovene]

Dakskobler I., Praprotnik N. & Wraber T. (2008): Mt. Črna Prst, its first botanical visitors and its floristic features. – Hladnikia **21:** 29–39. [In Slovene]

Ehrendorfer F. & Hamann U. (1965): Vorschläge zu einer floristischen Kartierung von Mitteleuropa. – Ber. Deutsch. Bot. Ges. **78**: 35–50.

Feoli Chiapella L. & Poldini L. (1993): Prati e pascoli del Friuli (NE Italia) su substrati basici. – Stud. Geobot. **13**: 3–140.

Fischer M. A., Oswald K. & Adler W. (2008): Exkursionsflora von Österreich, Liechtenstein und Südtirol. [3. Aufl] – Linz: Land Oberösterreich, Biologiezentrum der OÖ Landesmuseen.

Graf S. (1834): Über *Pedicularis hacquetii* Graf, eine neue Pflanzenspecies aus Ober-Krain. – Flora **17**: 40–42.

Hartl D. (1974): *Pedicularis* L. – In: Hegi G. [ed.]: Illustrierte Flora von Mittel-Europa 6(1): 261–315. – Berlin, Hamburg: Paul Parey.

Martinčič A., Wraber T., Jogan N., Podobnik A., Turk B., Vreš B., Ravnik V., Frajman B., Strgulc Krajšek S., Trčak B., Bačič T., Fischer M. A., Eler K. & Surina B. (2007): Mala flora Slovenije. Ključ za določanje praprotnic in semenk. Četrta, dopolnjena in spremenjena izdaja. – Ljubljana: Tehniška založba Slovenije.

Mayer E. (1961): *Pedicularis julica* E. Mayer spec. nov., eine bisher verkannte Art der südöstlichsten Kalkalpen. – Phyton **9**: 299–305.

Mayer E. (1971): Zur Bewertung und Benennung einiger europäischer *Pedicularis*-Sippen. – Österr. Bot. Z. **119**(1/3): 323–327.

Seliškar T., Vreš B. & Seliškar A. (2003): FloVegSi 2.0. Fauna, Flora, Vegetation and Paleovegetation of Slovenia. Computer programme for arranging and analysis of biological data. – Ljubljana: Jovan Hadži Institute of Biology SRC SASA.

Šilc U. & Čarni A. (2012): Conspectus of vegetation syntaxa in Slovenia. – Hacquetia **11**(1): 113–164.

Steininger H. (1887): Beschreibung der europäischen Arten des Genus *Pedicularis*. – Bot. Centralbl. **29**: 154–157.

Surina B. (2005): Subalpine and alpine vegetation of the Krn area in the Julian Alps. – Scopolia **57**: 1–122. [In Slovene]

Wraber T. (2006): 2 × Sto alpskih rastlin na Slovenskem. – Ljubljana: Prešernova družba.

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Appendix 1. Subalpine grasslands with *Pedicularis* × *mayeri* in the southern Julian Alps.

Number of relevé		1	2
Number of relevé in FloVegSi database		257511	262085
Altitude in m		1730	1760
Aspect		S	SW
Slope in degrees		25–35	30
Parent material		DA	DA
Soil		Re	Re
Stoniness in %		20	10
Cover of herb layer in %	E1	90	90
Relevé area	m^2	40	20
Number of species		79	41
Date of taking relevé		17.07.2015	11.07.2016
Author of relevé		ID	ID
Locality		Četrt-Vrata	Vrh Škrli
Quadrant		9749/4	9748/1
Geographic coordinate Y (D48/G.-Kr.)	m	416995	403509
Geographic coordinate X (D48/G.-Kr.)	m	5121208	5126179
Caricion austroalpinae			
Laserpitium peucedanoides	E1	1	+
Carduus crassifolius	E1	+	+
Pedicularis julica	E1	+	+
Pedicularis × *mayeri*	E1	+	+
Pulsatilla alpina subsp. *austroalpina*	E1	+	+
Koeleria eriostachya	E1	1	.
Centaurea haynaldii subsp. *julica*	E1	+	.
Gentiana lutea subsp. *symphyandra*	E1	+	.
Heracleum austriacum subsp. *siifolium*	E1	+	.
Senecio abrotanifolius	E1	+	.
Caricion firmae			
Ranunculus hybridus	E1	1	+
Helianthemum alpestre	E1	+	+
Pedicularis rostratocapitata	E1	+	+
Carex firma	E1	.	+
Caricion ferrugineae			
Serratula tinctoria subsp. *macrocephala*	E1	+	.
Seslerietalia coeruleae			
Leucanthemum heterophyllum	E1	1	+
Leontopodium alpinum	E1	+	+
Ranunculus carinthiacus	E1	+	+
Carex mucronata	E1	1	.
Achillea clavennae	E1	+	.
Gentiana clusii	E1	+	.
Thesium alpinum	E1	+	.
Traunsteinera globosa	E1	r	.
Elyno-Seslerietea			
Carex sempervirens	E1	3	3
Sesleria caerulea subsp. *calcaria*	E1	3	3
Anthyllis vulneraria subsp. *alpestris*	E1	1	1
Betonica alopecuros	E1	1	+
Helianthemum nummularium subsp. *grandiflorum*	E1	1	1
Polygonum viviparum	E1	1	1
Phyteuma orbiculare	E1	+	1
Hieracium pilosum	E1	+	+
Polygala alpestris	E1	+	+
Scabiosa lucida subsp. *lucida*	E1	+	+
Thymus praecox subsp. *polytrichus*	E1	+	+
Lotus alpinus	E1	+	+
Linum alpinum subsp. *julicum*	E1	+	+
Aster bellidiastrum	E1	+	+
Bartsia alpina	E1	1	.
Campanula witasekiana	E1	+	.
Globularia cordifolia	E1	+	.
Hieracium villosum	E1	+	.

Cerastium strictum	E1	r	.
Gentiana verna	E1	r	.
× *Gymnigritella suaveolens*	E1	r	.
Astrantia bavarica	E1	.	1
Pedicularis verticillata	E1	.	1
Androsace villosa	E1	.	+
Galium anisophyllum	E1	.	+
Soldanella alpina	E1	.	+
Festuco-Brometea			
Gymnadenia conopsea	E1	1	+
Bromopsis transsilvanica	E1	1	.
Buphthalmum salicifolium	E1	+	.
Carex humilis	E1	+	.
Carlina acaulis	E1	+	.
Centaurea triumfettii	E1	+	.
Hippocrepis comosa	E1	+	.
Linum catharticum	E1	+	.
Orobanche gracilis	E1	+	.
Orchis mascula subsp. *speciosa*	E1	r	.
Linum catharticum	E1	r	.
Prunella grandiflora	E1	.	+
Trifolio-Geranietea			
Laserpitium siler	E1	+	.
Libanotis sibirica subsp. *montana*	E1	+	.
Lilium carniolicum	E1	+	.
Polygonatum odoratum	E1	+	.
Juncetea trifidi			
Botrychium lunaria	E1	+	.
Loiseleurio-Vaccinietea			
Juniperus sibirica	E1	+	.
Poo alpinae-Trisetetalia			
Trollius europaeus	E1	+	.
Potentilletalia caulescentis			
Bupleurum petraeum	E1	+	.
Primula auricula	E1	+	.
Valeriana saxatilis	E1	+	.
Thlaspietea rotundifolii			
Biscutella laevigata	E1	1	+
Heliosperma alpestre	E1	+	.
Minuartia austriaca	E1	+	.
Festuca nitida	E1	.	+
Hieracium bifidum	E1	.	+
Mulgedio-Aconitetea			
Veratrum album subsp. *lobelianum*	E1	.	+
Viola biflora	E1	.	+
Salix appendiculata	E2	.	+
Erico-Pinetea			
Erica carnea	E1	3	1
Carex ornithopoda	E1	+	+
Allium ericetorum	E1	1	.
Asperula aristata	E1	1	.
Chamaecytisus hirsutus	E1	1	.
Genista radiata	E1	1	.
Gymnadenia odoratissima	E1	+	.
Rhodothamnus chamaecistus	E1	r	.
Vaccinio-Piceetea			
Picea abies	E1	+	.
Fagetalia sylvaticae			
Cyclamen purpurascens	E1	+	.
Lilium martagon	E1	+	.
Mercurialis perennis	E1	+	.

DA Dolomite limestone
Re Rendzina
ID Igor Dakskobler