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CAREX AUSTROALPINA BECHERER, A NEW SOUTHEASTERN-ALPINE SPECIES FOR THE FLORA OF SLOVENIA, AND *VIOLA PYRENAICA* RAMOND EX DC., SECOND RECORD FOR THE FLORA OF THE JULIAN ALPS

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ABSTRACT

Carex austroalpina *(*Carex ferruginea *subsp.* austroalpina*) and* Viola pyrenaica *are reported from the Krn Mts. in the Julian Alps (Southeastern Calcareous Alps).* C. austroalpina*, a southeastern-Alpine species is new for the flora of Slovenia. The two localities in the Krn Mts. are at the easternmost range of their distribution area. The record of* V. pyrenaica *in the Krn Mts. is the second for the flora of Slovenia (the Julian Alps) after nearly half a century. The phytosociological characteristics of the sites are given. Both findings are of significant importance for further phytogeographical assessment of the Southeastern Calcareous Alps.*

Key words: flora, *Carex austroalpina, Viola pyrenaica*, phytogeography, Julian Alps, Slovenia

CAREX AUSTROALPINA BECHERER, UNA NUOVA SPECIE ALPINA SUD-ORIENTALE NELLA FLORA SLOVENA, E *VIOLA PYRENAICA* RAMOND EX DC., SECONDA REGISTRAZIONE NELLA FLORA DELLE ALPI GIULIE

SINTESI

L'autore presenta un resoconto sulle specie Carex austroalpina *(*Carex ferruginea *subsp.* austroalpina*) e* Viola pyrenaica*, scoperte sul massiccio del Monte Nero (Alpi Giulie, Alpi calcaree sud-orientali). La* C. austroalpina*, specie alpina sud-orientale, è una novità nella flora slovena. Per quanto riguarda la loro diffusione, entrambi i siti si estendono all'estremità orientale del massiccio. Per la flora della Slovenia (Alpi Giulie), è appena la seconda volta che viene individuata la specie* V. pyrenaica*, dopo quasi cinquant'anni. Sono illustrate le caratteristiche fitosociologiche di entrambi i luoghi di crescita. La scoperta è di straordinaria importanza nella prosecuzione del censimento fitogeografico delle Alpi calcaree meridionali.*

Parole chiave: flora, *Carex austroalpina, Viola pyrenaica*, fitogeografia, Alpi Giulie, Slovenia

INTRODUCTION

The phytogeographical peculiarities of the flora and vegetation of the Southeastern Calcareous Alps (Julian Alps, Kamnik Alps and the Karavanke Mountains) have been known to botanists for a long time. In comparison to other Alpine regions they are characterised by a significant number of conservative, progressive, absolute and relative endemic species, southern-, south-eastern-Alpine, north-Illyrian and Illyrian (Illyricoid) species (see Engler, 1901; Mayer, 1946, 1960a, 1960b; Merxmüller, 1952, 1953, 1954; Wraber, 1970a, 1970b, 1995a). According to Pawlowski (1970), the Southeastern Calcareous Alps are floristically the second richest region of the entire Alps. The particularity and originality of its flora are to be attributed to the Alps' specific origin as a result of the historical, geographical and ecological peculiarities of the area. Conservative endemic taxa (*e.g. Campanula zoysii, Cerastium julicum, Cerastium subtriflorum, Festuca laxa, Moehringia villosa, Saxifraga tenella*…), taxonomically clearly isolated and therefore probably dating to the Tertiary period, occur at present in a typical refuge area (*e.g.* Tribsch & Schönswetter, 2003), although the problem of estimating the age or origin of aforementioned species is questionable (for *M. villosa* see Dakskobler, 2000). This is presumably due to the fact that certain parts of the Southeastern Calcareous Alps lay near or even outside the extreme border of glaciation during the Pleistocene period and that these taxa were able to survive in the unglaciated areas or recolonise newly ice-free districts. Other taxonomically isolated and therefore old endemic taxa could include the remnants of the once broader distribution of the same (*e.g. Aquilegia bertolonii, Artemisia atrata*…) or later separated (during the Pleistocene period) ancestor taxa (*e.g.* vicariant taxa *Festuca laxa – F. dimorpha*, *Gentiana froelichii* ssp. *froelichii – G. f.* ssp. *zenariae*, *Gentiana lutea* ssp. *vardjanii – G. l.* ssp. *lutea*…) (see also Wraber, 1990, 1995a). The splitting of the distribution area of originally more widely distributed taxa, which could be purely geographical and/or ecological (silicicolous and calcareous flora), and their subsequent isolation led to numerous endemic taxa. The aim of the paper is to evaluate new findings from the phytosociological and phytogeographical points of view.

MATERIAL AND METHODS

Floristical and phytosociological research was performed in the Krn Mts., Julian Alps (Southeastern Calcareous Alps). The phytosociological characteristics of the growth sites were established by applying the sigmatistic phytosociological method (Braun-Blanquet, 1964). The nomenclature source for ferns and flowering plants was the Register of the Flora of Slovenia (Trpin & Vreš, 1995) and for syntaxa Feoli Chiapella & Poldini (1993) and Grabherr *et al.* (1993). The collected specimens are stored at the Herbarium of the Scientific Research Centre of Slovenian Academy of Sciences and Arts (ZRC), where the research was carried out.

RESULTS AND DISCUSSION

Carex austroalpina Becherer

We found *Carex austroalpina (Carex ferruginea* subsp. *austroalpina)* at two localities in the Julian Alps. At the first site (rel. 1, see Appendix), which is located on the southern slope of the Mt. Lemež at 1,730 m a.s.l., it grows in a stand that probably belongs to the association *Centaureetum rhaponticae* s. lat. There are only a few specimens of *C. austroalpina* in the stand.

In the second locality (rel. 2), between the mountains of Veliki and Mali Šmohor at 1,925 m a.s.l., we found a few specimens of *C. austroalpina* in the stand of the association *Ranunculo hybridi-Caricetum sempervirentis*. Because of the phytogeographical position of the southern Julian Alps (especially the Krn and Tolmin-Bohinj Mts.), the finding of *C. austroalpina* in the Krn Mts. is not entirely unexpected. Botanists (*e.g.* E. Mayer and H. Kunz) have actually spent decades searching for the species, but unfortunately with no luck (E. Mayer, *pers. comm.*). The localities on Mt. Lemež and between the Mts. of Veliki and Mali Šmohor are the only known sites as far as the Slovene Calcareous Alps (Fig. 1) are concerned, whereas the species was reported from the westernmost parts of the Julian Alps (see Poldini, 2002).

From the sinsystematical and phytogeographical point of view, the taxon *C. austroalpina* is of great significance for an assessment of the south- and south-eastern subalpine and alpine grasslands *("Seslerio-Semperviretum*" s. lat.). Sutter (1962) treated it as a characteristic and differential species of the alliance *Caricion austroalpinae* (Pignatti & Pignatti, 1975; Feoli Chiapella & Poldini, 1993). The associations of the alliance *Caricion austroalpinae*, which in contrast to the postglacial associations of the alliance *Seslerion coeruleae*, probably survived the glacial area at more or less the same sites in which they can be found today (Pignatti & Pignatti, 1975), include a high number of characteristic, mostly endemic species. The occurrence of *C. austroalpina* in the Krn Mts. (and thus Julian Alps) additionally confirms the placement of these stands in the south-eastern Alpine alliance *Caricion austroalpinae*.

Viola pyrenaica Ramond ex DC.

Viola pyrenaica grows on the south-eastern slope of Škrbina pass between Mts. Lemež and Debeljak (the Krn Mts., the Julian Alps), at an altitude of 1,500 m a.s.l. (rel. 3). It is very common in stands of the association *Avenastro parlatorei-Festucetum calvae*.

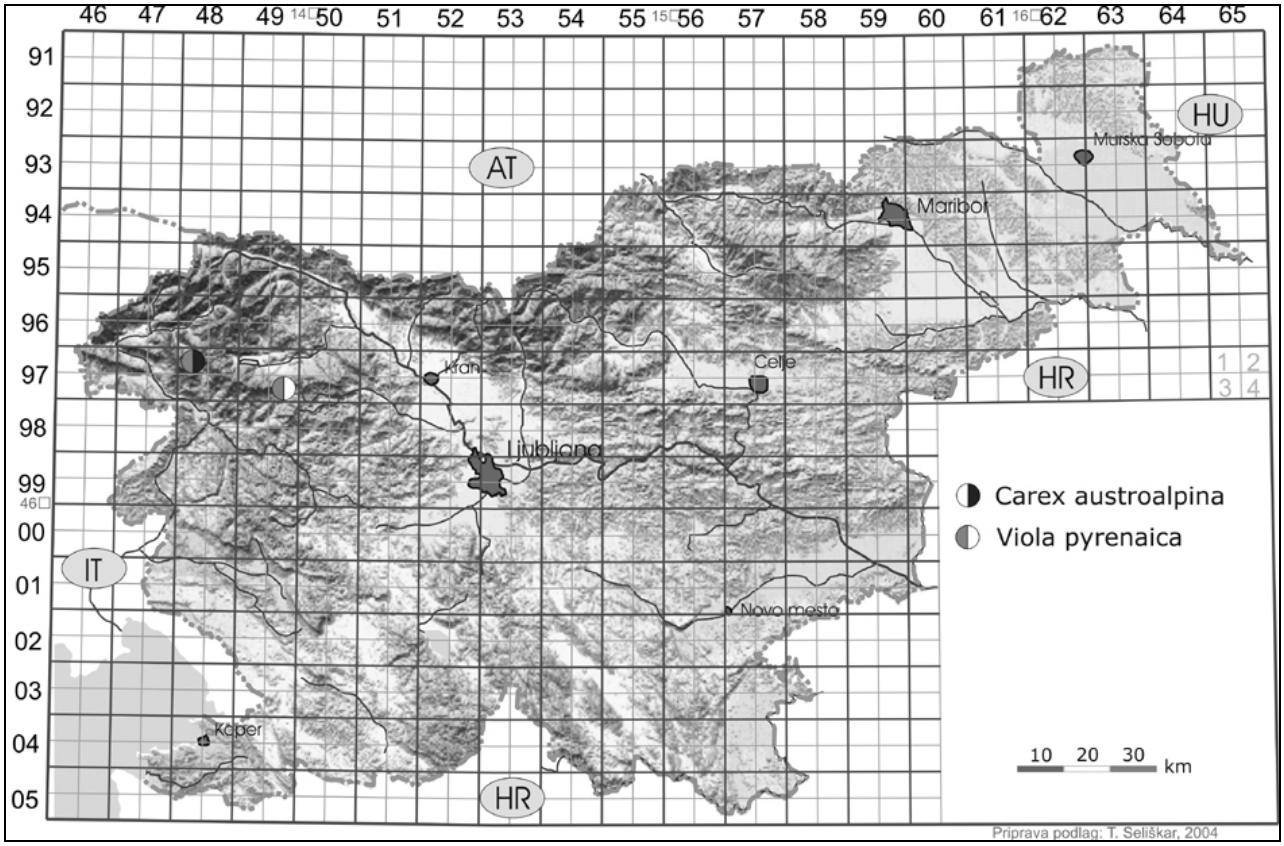

Fig. 1: Distribution map of** Carex austroalpina **and** Viola pyrenaica **in Slovenia.
Sl. 1: Razširjenost vrst** Carex austroalpina **in** Viola pyrenaica **v Sloveniji.

To date, the locality in the vicinity of Mt. Črna prst (southern ridge of the Julian Alps, MTB: 9749/4) was the only known locality in the Julian Alps (Mayer, 1954). The occurrence of *V. pyrenaica* on the Škrbina pass is the second record for the Julian Alps after nearly half a century. In 2004, Dakskobler (2004, 2005) found some new localities of the species in western Slovenia. In the neighbouring region of Carinthia, botanists have observed it in the valleys of Ziljska dolina (in the vicinity of Šmohor) and Labotska dolina (Mayer, 1954). Its currently known distribution (unpublished data of Dakskobler are not included) in Slovenia is shown in figure 1.

There is a clear indication that not only the flora of the Southeastern Calcareous Alps (*e.g.* the Julian Alps) but also the flora of the southernmost ridge of the Julian Alps itself (the Mt. Breginjski Stol) is of a unique historical and phytogeographical origin (Mayer, 1960b; Wraber, 1970b, 2001). Such an assumption is based on the area of distribution of more than 20 species of various geoelements that occur only on the southernmost ridge of the Julian Alps, some of them also in the Kamnik Alps and the Karavanke Mts. but not (or more sparely) in the central part of the Julian Alps, *e.g. Aconitum angustifolium, Aquilegia bertolonii, Arabis pauciflora, Athamantha turbith, Centaurea haynaldii* subsp. *julica, Cortusa matthioli, Eryngium alpinum, Gentiana froelichii* ssp. *froelichii,*[1] *Gentiana lutea* ssp. *vardjanii, Geranium argenteum, Horminum pyrenaicum, Moehringia villosa, Papaver alpinum* ssp. *victoris, Pedicularis elongata* ssp. *julica, Pimpinella alpina, Primula wulfeniana, Saxifraga exarata* ssp. *atropurpurea, Scorzonera rosea, Stemmacantha rhapontica, Thlaspi kerneri, Trifolium noricum* and others. In the same sense, recent findings of *Viola cornuta* on the Mt. Lemež and its vicinity (the Julian Alps) could be of phytogeographical significance, although its indigenous origin in the Southeastern Calcareous Alps has not been fully proven (Surina & Vreš, 2003; Wraber, 1995b).

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[1] In the Julian Alps as *Gentiana froelichii* subsp. *zenariae*.

Appendix

Relevé 1

Locality: Slovenia, the Julian Alps, the Krn Mts., southern slope of Mt. Lemež; MTB: 9748/1, UTM: UM92, *elevation*: 1,730 m a.s.l.; *exposition*: SE; *inclination*: 25^0; *releve area*: 25 m^2, *herb cover*: 100 %, *leg. et det.*: B. Surina, *date*: 26.6.2002: *Stemmacantha rhapontica* 2, *Achillea distans* 1, *Betonica alopecuros* 1, *Bromus erectus* 1, *Carduus carduelis* 1, *Centaurea triumfettii* 1, *Festuca nigrescens* 1, *Galium lucidum* 1, *Helianthemum grandiflorum* 1, *Koeleria eriostachya* 1, *Lotus corniculatus* 1, *Phleum pratense* 1, *Senecio doronicum* 1, *Acinos alpinus* +, *Aconitum angustifolium* +, *Anthoxanthum odoratum* +, *Anthyllis vulneraria* ssp. *alpestris* +, *Aster alpinus* +, *Buphthalmum salicifolium* +, ***Carex austroalpina*** +, *Carex ferruginea* +, *C. ornithopoda* +, *C. sempervirens* +, *Cerastium strictum* +, *Chaerophyllum villarsii* +, *Dactylis glomerata* +, *Fetsuca calva* +, *Galium anisophyllum* +, *Genista radiata* +, *Heracleum austriacum* ssp. *siifolium* +, *Hippocrepis comosa* +, *Laserpitium peucedanoides* +, *Lathyrus occidentalis* +, *Leucanthemum* cf. *maximum* +, *Lilium carniolicum* +, *Myosotis alpestris* +, *Phyteuma orbiculare* +, *Pimpinella alpina* +, *Potentilla crantzii* +, *Primula veris* ssp. *columnae* +, *Prunella grandiflora* +, *Pulsatilla alpina* +, *Ranunculus nemororsus* +, *Scabiosa lucida* +, *Sesleria albicans* +, *Silene nutans* +, *Thymus alpigenus* +, *Trollius europaeus* +.

Relevé 2

Localitiy: Slovenia, the Julian Alps, the Krn Mts., between the Mts. Veliki Šmohor and Mali Šmohor; MTB: 9748/1, UTM: UM92, *elevation*: 1,925 m a.s.l.; *exposition*: SE; *inclination*: 20^0; *releve area*: 30 m^2, *herb cover*: 90 %, *leg. et det.*: B. Surina, *date*: 26.6.2002. *Ranunculo hybridi-Caricetum sempervirentis*: *Carex sempervirens* 5, *Sesleria albicans* 3, *Genista radiata* 2, *Helianthemum grandiflorum* 2, *Erica carnea* 1, *Gentiana clusii* 1, *Helianthemum alpestre* 1, *Hieracium sylvaticum* 1, *H. villosum* 1, *Laserpitium peucedanoides* 1, *Pulsatilla alpina* 1, *Achillea clavenae* +, *Anthyllis vulneraria* ssp. *alpestris* +, *Aposeris foetida* +, *Astrantia bavarica* +, *Bartsia alpina* +, *Betonica alopecuros* +, ***Carex austroalpina*** +, *Carlina acaulis* ssp. *symplex* +, *Galium anisophyllum* +, *Gentiana verna* +, *Gypsophila repens* +, *Heliosperma alpestre* +, *Heracleum austriacum* ssp. *siifolium* +, *Knautia longifolia* +, *Leontopodium alpinum* +, *Lotus corniculatus* +, *Pedicularis rostrato-capitata* +, *Phyteuma orbiculare* +, *Polygala alpestris* +, *Ranunculus hybridus* +, *Saxifraga paniculata* +, *Senecio abrotanifolius* +.

Relevé 3

Localitiy: Slovenia, the Julian Alps, the Krn Mts., between the Mts. Debeljak and Lemež; MTB: 9748/1, UTM: UM92, *elevation*: 1,500 m a.s.l.; *exposition*: SE; *inclination*: 20^0; *releve area*: 25 m^2, *herb cover*: 100 %, *leg. et det.*: B. Surina, *date*: 26.6.2002. *Avenastro parlatorei-Festucetum calvae*: *Festuca calva* 4, *Cerastium strictum* 1, *Helianthemum grandiflorum* 1, *Koeleria eriostachya* 1, *Pimpinella alpina* 1, *Primula veris* ssp. *columnae* 1, *Scabiosa lucida* 1, ***Viola pyrenaica*** 1, *Achillea distans* +, *Acinos alpinus* +, *Alchemilla cinerea* +, *A. fallax* +, *Carex digitata* +, *Centaurea triumfettii* +, *Dactylis glomerata* +, *Dianthus sylvestris* +, *Erica carnea* +, *Galium anisophyllum* +, *Galium lucidum* +, *G. sylvaticum* +, *Genista radiata* +, *Gymnadenia odoratissima* +, *Helictotrichon parlatorei* +, *Koeleria pyramidata* +, *Laserpitium siler* +, *Leucanthemum* cf. *maximum* +, *Ligusticum seguieri* +, *Lilium carniolicum* +, *L. martagon* +, *Lotus corniculatus* +, *Luzula luzuloides* +, *Myosotis alpestris* +, *Phleum pratense* +, *Polygonum viviparum* +, *Potentilla crantzii* +, *Prunella grandiflora* +, *Pulsatilla alpina* +, *Sesleria albicans* +, *Stemmacantha rhapontica* +, *Thesium alpinum* +, *Veronica chamaedrys* +.

CAREX AUSTROALPINA BECHERER, NOVA JUGOVZHODNA ALPSKA VRSTA V SLOVENSKI FLORI, IN *VIOLA PYRENAICA* RAMOND EX DC., DRUGI ZAPIS ZA FLORO JULIJSKIH ALP

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POVZETEK

V prispevku avtor podaja fitocenološko oznako rastišč vrst Carex austroalpina *(*Carex ferruginea *subsp.* austroalpina*) in* Viola pyrenaica *v Krnskem pogorju. Najdba južnoalpskega šaša (*C. austroalpina*) pomeni novo vrsto v flori Slovenije, najdba vrste* V. pyrenaica *pa šele drugo potrditev za Julijske Alpe in Slovenijo.*

Novi nahajališči južnoalpskega šaša (C. austroalpina) *na južnem pobočju Lemeža (9748/1, UM92) ter med Velikim in Malim Šmohorjem (9748/1, UM92) sta po današnjem vedenju najbolj proti vzhodu pomaknjeni v južnoalpskem arealu te vrste. Na južnem pobočju Lemeža, na nadmorski višini okrog 1730 m, uspeva v bolj ali manj vlagoljubnem sestoju visokih steblik. Sestoj smo začasno uvrstili v asociacijo* Centaureetum rhaponticae *s. lat. Med Velikim in Malim Šmohorjem smo primerke vrste* C. austroalpina *opazili v sestoju južnoalpskega vednozelenega šašja* (Ranunculo hybridi-Caricetum sempervirentis), *in sicer na nadmorski višini okrog 1925 m. Na obeh nahajališčih so primerki maloštevilni.*

Pirenejsko vijolico (V. pyrenaica) *smo opazili na jugovzhodnem pobočju Škrbine med Lemežem in Debeljakom (9748/1, UM92) na nadmorski višini okoli 1500 m. Precej obilno se pojavlja v sestoju asociacije* Avenastro parlatorei-Festucetum calvae. *Rastišče je bolj ali manj toploljubno in je nekakšen naraven sukcesijski prehod od meliščne vegetacije k traviščni.*

V sintaksonomskem oziru najdbi dodatno potrjujeta pravilnost umeščanja subalpinskih in alpinskih traviščnih asociacij v Jugovzhodnih Apneniških Alpah (Ranunculo hybridi-Caricetum sempervirentis, Avenastro parlatorei-Festucetum calvae, Centaureo julici-Laserpitietum sileris) *v južnoalpsko zvezo* Caricion austroalpinae, *medtem ko v fitogeografskem oziru prispevata k domnevi, da ima flora južnojulijskega loka (Tolminsko-Bohinjske gore in Krnsko pogorje) v primerjavi s floro osrednjih Julijskih Alp le nekoliko drugačno flornozgodovinsko preteklost.*

Ključne besede: flora, *Carex austroalpina, Viola pyrenaica*, fitogeografija, Julijske Alpe, Slovenija

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