

Tab. 3: Chorological groups and coverage indices (I_c) of phanerogams in the association *Gentiano terglouensis-Caricetum firmae* in the Krn Mts. (the Julian Alps).**Tab. 3: Horološke skupine in indeksi pokrovnosti (I_c) fanerogamov v asociaciji *Gentiano terglouensis-Caricetum firmae* v Krnskem pogorju (Julijske Alpe).**

| Number of taxa / Σc_i | | | | | | | | | | | | | |
|-------------------------------|------------|------------|----------|----------|---------|----------|----------|-------|-------|----------|--------|--------|---------|
| koz-mop | cirkum-bor | paleo-temp | euro-sib | euro-asi | eurimed | arct-alp | alp-karp | europ | alp | med-mont | E-alp | N-ilir | end-mts |
| 2/2 | 9/31 | 1/1 | 4/7 | 8/37 | 1/2 | 23/148 | 3/24 | 8/54 | 10/54 | 42/219 | 13/100 | 11/40 | 12/55 |

Elyno-Seslerietea. Within the framework of the same class, we also recorded the largest number of endemic species in the association *Gentiano terglouensis-Caricetum firmae* (12; $I_c=55$); 11 species ($I_c=40$) belong to the Northern-Illyrian geoelement, 10 ($I_c=54$) to the Alpine, nine species to the Circumboreal geoelement ($I_c=31$), and eight each to the European ($I_c=54$) and European-Asian ($I_c=37$) geoelements. The number of species by geoelements and their coverage indices are shown in Table 3.

Distribution of the association and syntaxonomical position of the stands

Braun-Blanquet (1926) drew attention to the floristic and phytogeographic peculiarities of stands of the association *Caricetum firmae* s. lat. in the South Tyrolian Dolomites. He found that because of the presence of a larger number of endemic species (e.g., *Gentiana terglouensis*, *Sesleria sphaerocephala*, *Pedicularis rosea*, *P. rostrato-capitata*, *Achillea clavenae*, *Valeriana saxatilis*, *Potentilla nitida*, *Soldanella minima*, *Phyteuma sieberi*), they are well distinguished from central Alpine stands of the association and in the basic inventories of Aichinger (1933: Tab. 26 in 27) he proposed a Southeast-Alpine vicariant *Firmeto-Primuletum wulfenianae* Br.-Bl. 1933. The association was suitably described and typified by Wraber (1970) as *Gentiano terglouensis-Caricetum firmae* T. Wraber 1970, with an inventory that he surveyed on Mt. Jalovec at an altitude of 2600 m. Poldini & Feoli (1976) confirmed by phytogeographical and numerical analysis the association *Caricetum firmae* s. lat. in the South- and Southeastern Calcareous Alps in the context of a special, new association (*Gentiano terglouensis-Caricetum firmae*) or distinct phytogeographical race, in which they also took into account a synoptic table of respective association from the Julian Alps (39 unpublished relevés surveyed by T. Wraber).

The area of distribution of the association embraces the entire south-eastern Alps. The western boundary of the distribution area accords with the boundary of the alliance *Caricion austroalpinae*, in the Insubrian region (between the lakes Lago di Como and Lago Maggiore). The most south-easterly stands thrive in the Kamnik-Savinja Alps. In Austria, impoverished stands of the association have also been observed on Dobrač (in Grab-

herr et al., 1993). *Carex firma* stands extend to the Dinarides, all the way to Mt. Lička Plješivica (Horvat, 1930, 1952), and in the distribution area between Mts. Snežnik (SW Slovenia) and Trovrih (NW Croatia) they form a Dinaric vicariant *Edraiantho graminifolii-Caricetum firmae* Horvat (1930) 1934 (*Seslerion juncifoliae* Horvat 1930, *Seslerietalia juncifoliae* Horvat 1930), for which the presence of Illyrian and Dinaric or the absence of several Alpine species is characteristic.

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Appendix

Localities of relevés: Slovenia, Julian Alps, Krn mountains:

1. slope above the Zelena škrbina pass, on top of the gorge between Velika Montura and Velika Baba Mts. MTB: 9748/1, UTM: VM02; leg. & det.: B. Surina, 5.7.2002. 2. just below the summit of Velika Montura. MTB: 9748/1, UTM: VM02; leg. & det.: D. Stešević & B. Surina, 29.7.2003. 3. stony ridge above the Škedenj ridge. MTB: 9748/1, UTM: UM92; leg. & det.: I. Dakskobler & B. Surina, 8.8.2002. 4. the summit of Mt. Mali Šmohor. MTB: 9748/1, UTM: UM92; leg. & det.: B. Surina, 9.7.2002. 5. eastern slope of peak Palec. MTB: 9748/1, UTM: VM02; leg. & det.: I. Dakskobler & B. Surina, 8.8.2002. 6. Polovnik ridge, between the peaks Krasji vrh and Veliki vrh. MTB: 9747/2, UTM: UM92; leg. & det.: I. Dakskobler & B. Surina, 18.7.2003. 7. between Škofič and Rdeči rob Mts. MTB: 9748/1, UTM: UM92; leg. & det.: I. Dakskobler & B. Surina,

12.6.2002. **8.** north-eastern slope of Mt. Krnčica. MTB: 9747/2, UTM: UM92; leg. & det.: B. Surina, 23.7.2003. **9.** ridge of Mt. Škofič above Gorenja Lašca. MTB: 9748/1, UTM: UM92; leg. & det.: I. Dakskobler & B. Surina, 15.7.2003. **10.** north-eastern slope of Mt. Lopatnik. MTB: 9747/2, UTM: UM92; leg. & det.: B. Surina, 22.7.2003. **11.** north-western slope of Mt. Krnčica (the vegetation was overgrazed by sheep). MTB: 9747/2, UTM: UM92; leg. & det.: B. Surina, 23.7.2003. **12.** ridge between Krn and Srednji vrh Mts. MTB: 9747/2, UTM: UM92; leg. & det.: B. Surina, 22.8.2003. **13.** rocky ledge on south-western slope of Mt. Krnčica by »via ferrata« from Vratca pass to the summit of Mt. Krnčica (remnants from World War I.). MTB: 9747/2, UTM: UM92; leg. & det.: B. Surina, 23.7.2003. **14.** rocky grassland on north-western slope of Mt. Rdeči rob. MTB: 9748/1, UTM: UM92; leg. & det.: I. Dakskobler & B. Surina, 15.7.2003. **15.** Polovnik ridge, gorge in the ridge of peak Veliki vrh. MTB: 9747/1, UTM: UM82; leg. & det.: I. Dakskobler & B. Surina, 18.7.2003. **16-18.** Polovnik ridge, gorge in the ridge of peak Veliki vrh. MTB:

9747/1, UTM: UM82; leg. & det.: I. Dakskobler & B. Surina, 18.7.2003. **19.** Planina Duplje pasture, scree above the lake at Planina Duplje beneath the paths from Koča pri Krnskih jezerih mountain chalet to Lepoče. MTB: 9748/1, UTM: UM92; leg. & det.: B. Surina, 24.6.2002. **20-21.** Gorenja Lašca. MTB: 9748/1, UTM: UM92; leg. & det.: I. Dakskobler & B. Surina, 8.8.2002. **22.** Peak Mali Peski, northwest from the monument. MTB: 9748/1, UTM: UM92; leg. & det.: B. Surina, 30.8.2002. **23.** western slope of Mt. Vrh nad Peski, above Batogniška škrbina pass. MTB: 9748/1, UTM: UM92; leg. & det.: D. Stešević & B. Surina, 30.7.2003. **24.** Peak Škofič. MTB: 9748/1, UTM: UM92; leg. & det.: B. Surina, 30.8.2002. **25.** Gorenja Lašca, scree below the path from Mt. Veliki Peski to Lašca pasture. MTB: 9748/1, UTM: UM92; leg. & det.: I. Dakskobler & B. Surina. **26-27.** ridge between the peaks Mali Peski and Škofič. MTB: 9748/1, UTM: UM92; leg. & det.: B. Surina, 30.8.2002. **28.** Peak Škofič, pass between Lašca and Peski. MTB: 9748/1, UTM: UM92; leg. & det.: B. Surina, 30.8.2002.

ZDRUŽBA *GENTIANO TERGLOUENSIS-CARICETUM FIRMAE* T. WRABER 1970 V KRNSKEM POGORJU (JULIJSKE ALPE)

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POVZETEK

Prispevek obravnava fitocenološke in okoljske razmere čvrstega šašja (*Caricetum firmae* s. lat.) v Krnskem pogorju (Julijske Alpe). Pri raziskavah, kjer smo uporabljali sigmatistično (srednjeevropsko) metodo (Braun-Blanquet, 1964), smo fitocenološke popise najprej razvrstili v diagnostične skupine in jih kasneje potrdili s pomočjo računalniškega programa SYN-TAX oziroma z metodo hierarhične klasifikacije (Podani, 1993). Za mero različnosti smo uporabljali komplement koeficienta "similarity ratio". Večinoma smo uporabljali metodo minimalnega porasta vsote kvadratov ostanka (Minimization of increase of error sum of squares - MISSQ), metodo kopičenja na osnovi najbolj oddaljenega sosedu (Farthest neighbour-Complete linkage clustering) ter ordinacijsko metodo (Principal coordinates analysis - PCoA). Če se je izkazalo za potrebno in smiselno, smo preučevane sestoje členili na nižje enote. Pri primerjavi življenjskih oblik s pomočjo numerične analize smo po predhodno opravljeni linearni transformaciji ocen pokrovnosti za posamezne taksoni (van der Maarel, 1979: $r=1$, $+2$, $1=3$, $2=5$, $3=7$, $4=8$, $5=9$) izračunali tudi indeks pokrovnosti (I_c , Lausi et al., 1982) in delež pokrivanja vsakega taksona v okviru popisa oziroma celotne asociacije ($D_{\%}$). Skupine diagnostičnih vrst smo ob upoštevanju več avtorjev oblikovali po lastnih kriterijih. Floristično sestavo sestojev smo analizirali tudi po horoloških skupinah in Raunkiaerovih bioloških oblikah. Pri tem smo se ravnali po Atlasu flore Furlanije-Julijske krajine (Poldini, 1991), imena praprotnic in semenk pa navajamo po Registru flore Slovenije (Trpin & Vreš, 1995) ter Mali flori Slovenije (Martinčič et al., 1999).

Sestoji s prevladujočo vrsto *Carex firma* poraščajo vetrovom izpostavljena rastišča na vršnih predelih gora v subalpskem in alpskem pasu. Ponekod jih najdemo na izrazito hladnih rastiščih na manjši nadmorski višini. Po predhodnih primerjavah s podobnimi sestoji iz jugovzhodnih apneniških Alp smo jih uvrstili v asociacijo *Gentiano tergloouensis-Caricetum firmae* T. Wraber 1970. Sestoje te asociacije, v primerjavi s sestoji centralno-alpske (*Caricetum firmae* Gams 1936), zaznamuje obstoj večjega števila endemitov in južno- oziroma jugovzhodnoalpskih vrst.