

PHYTOSOCIOLOGICAL ANALYSIS OF ALPINE SWARDS WITH DOMINANT *SALIX SERPILLIFOLIA* IN THE JULIAN ALPS (NW SLOVENIA, NE ITALY)

FITOCENOLOŠKA ANALIZA ALPINSKIH TRAT S PREVLAJUJOČO TIMIJANOVOLISTNO VRBO (*SALIX SERPILLIFOLIA*) V JULIJSKIH ALPAH (SEVEROZAHODNA SLOVENIJA, SEVEROVZHODNA ITALIJA)

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Dedicated to the late Professor Tone Wraber (1938–2010), on occasion of his 80th birthday

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ABSTRACT

Phytosociological analysis of alpine swards with dominant *Salix serpillifolia* in the Julian Alps (NW Slovenia, NE Italy)

In the alpine belt of the Julian Alps (Mts. Kukova Špica, Triglav, Pihavec, Razor, Jalovec, Mangart and Lopa) we conducted a phytosociological analysis of swards on ledges, ridges and rock faces with dominant *Salix serpillifolia*. These sites are typically relatively moist and the snow cover there is usually very persistent, despite their location on or just below ridges. In terms of species composition the studied community is transitional between snow-bed communities of the order *Arabidetalia caeruleae* and communities of windward ridges from the alliance *Oxytropido-Elynion* that we classify into the class *Elyno-Seslerietea*. Based on the analysis of proportions of diagnostic species we classify the studied community into the alliance *Oxytropido-Elynion* and into the new eastern-Alpine association *Gentiano pumilae-Salicetum serpillifoliae*. In the article we also provide a slightly modified phytosociological table of another alpine community in the Julian Alps, *Crepido terglouensis-Potentilletum nitidae*.

Key words: alpine swards, phytosociology, synsystematics, *Salix serpillifolia*, *Oxytropido-Elynion*, *Crepido terglouensis-Potentilletum nitidae*, Julian Alps, Slovenia, Italy

IZVLEČEK

Fitocenološka analiza alpskih trat s prevladujočo timijanovolistno vrbo (*Salix serpillifolia*) v Julijskih Alpah (severozahodna Slovenija, severovzhodna Italija)

V alpskem pasu Julijskih Alp (Kukova špica, Triglav, Pihavec, Razor, Jalovec, Mangart in Lopa) smo fitocenološko preučili združbo blazinastih trat na policah, grebenih in v ostentjih, kjer prevladuje vrsta *Salix serpillifolia*. Značilnost teh rastišč je, da so razmeroma vlažna in se na njih kljub legi na grebenih ali tik pod njimi navadno precej dolgo zadržuje snežna odeja. Po vrstni sestavi je preučena združba prehodna med združbami snežnih dolinic iz reda *Arabidetalia caeruleae* in združbami vetrovnih grebenov iz zveze *Oxytropido-Elynion*, pri čemer to zvezo uvrščamo v razred *Elyno-Seslerietea*. Preučeno združbo na podlagi analize deležev diagnostičnih vrst uvrščamo v zvezo *Oxytropido-Elynion* in v novo vzhodnoalpsko asociacijo *Gentiano pumilae-Salicetum serpillifoliae*. V članku objavljamo tudi nekoliko popravljeno fitocenološko tabelo še ene alpske združbe Julijskih Alp, *Crepido terglouensis-Potentilletum nitidae*.

Ključne besede: alpinska trata, fitocenologija, sinsistematika, *Salix serpillifolia*, *Oxytropido-Elynion*, *Crepido terglouensis-Potentilletum nitidae*, Julijske Alpe, Slovenija, Italija

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1 INTRODUCTION

Salix serpillifolia is an Alpine-Illyrian species, character species of alpine grasslands of windy ridges with naked rush from the class *Carici rupestris-Kobresietea bellardii* (AESCHIMANN et al. 2004a: 462). It occurs also in chasmophytic communities, communities of moist screes and snow beds. It is one of few woody plants that can grow also in the nival belt (LEUSCHNER & ELLENBERG 2017: 370). In Slovenia, this willow occurs on moist gravel and swards in the (altimontane), subalpine and alpine belts in the Julian Alps, the Karavanke Mts., the Kamnik-Savinja Alps and on the Trnovski Gozd Plateau (Figure 1). The lowest it has been reported from until now was in two deep sinkholes under Mt. Veliki Golak on the Trnovski Gozd Plateau: in Kraljeva Kamra to the east of the mountain at 1,295 m a.s.l. and in a sinkhole to the north of the mountain, at 1,350 m a.s.l. (leg. & det. I. Dakskobler, 18. 7. 2001, herbarium LJS), and the highest under the peak of Mt. Škrlatica, at 2,750 m a.s.l. (det. I. Dakskobler, 19. 8. 2009). It occurs also in the stands of the following associations: *Caricetum ferrugineae* s. lat. (*Saxifraga aizoidis*-*Caricetum ferrugineae*, *Horminio pyrenaici*-*Caricetum ferrugineae*), *Ranunculo hybridi*-*Caricetum*

sempervirentis, *Gentiano terglouensis*-*Caricetum firmae*, *Salici retusae*-*Geranietum argentei* (inc. subass. *salicetosum serpillifoliae*), *Dryado-Rhododendretum chamaecisti*, *Heliospermo-Rhododendretum hirsuti*, *Homogyno discoloris*-*Salicetum retusae*, *Seslerio sphaerocephalae*-*Dryadetum octopetalae*, *Caricetum rupestris*, *Saussureo-Caricetum rupestris*, *Caricetum curvulae* s. lat., *Achilleo clavennae*-*Elynetum myosuroidis*, *Siversio-Nardetum strictae*, *Homogyno alpinae*-*Vaccinietum gaultherioidis*, *Salicetum herbaceae*, *Papaveri julici*-*Thlaspietum rotundifolii*, *Papaveri kernerii*-*Thlaspietum kernerii*, *Saxifraga carniolicae*-*Cerastietum uniflorae*, *Saxifraga paniculatae*-*Caricetum fuliginosae*, *Potentilletum nitidae*, *Crepido terglouensis*-*Potentilletum nitidae*, *Seslerio sphaerocephalae*-*Saxifragetum paniculatae* nom. prov., *Potentillo clusianae*-*Campanuletum zoysii*, *Arabidetum caeruleae*, *Papaveretum rhaetici*, *Rhododendro-Laricetum* (WIKUS 1960, T. WRABER 1972, HADERLAPP 1982, E. PIGNATTI & S. PIGNATTI 1985, 2014, 2016, POLDINI & MARTINI 1993, BUFFA & SBURLINO 2001, SURINA 2005, DAKSKOBLER 2011, DAKSKOBLER & SURINA 2017a, b, DAKSKOBLER & ZUPAN 2017).

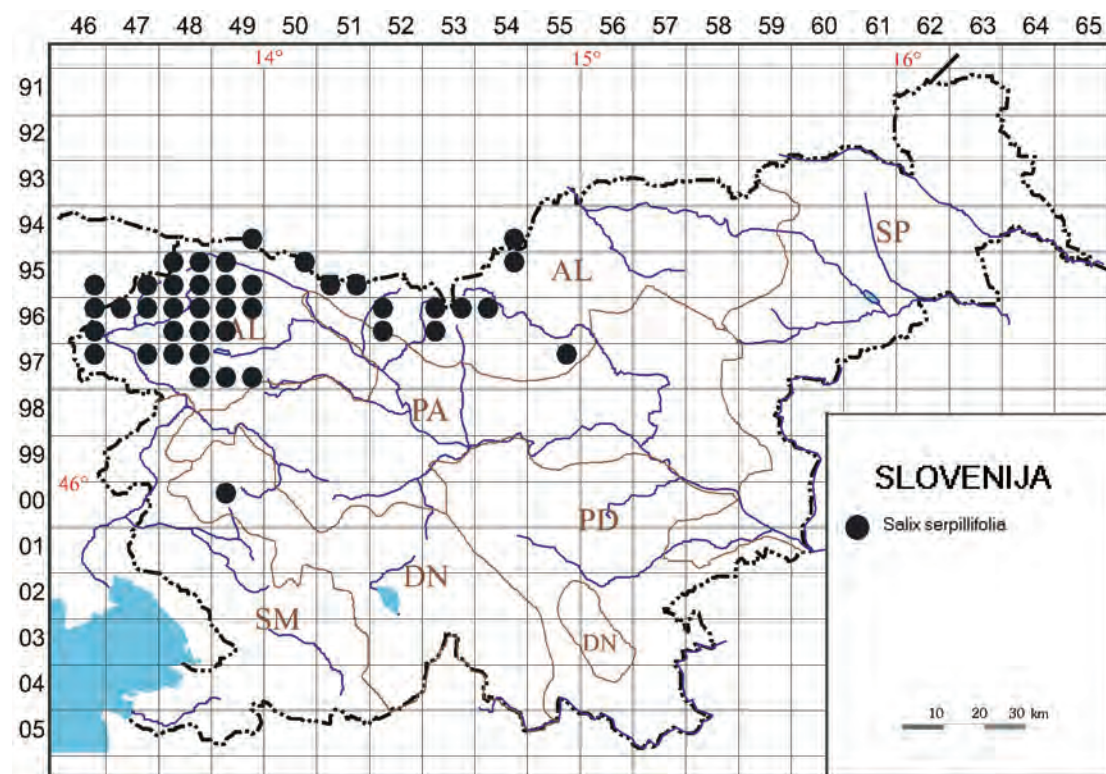


Figure 1: Distribution of *Salix serpillifolia* in Slovenia

Slika 1: Razširjenost timijanovolistne vrbe (*Salix serpillifolia*) v Sloveniji

In our previous research into alpine vegetation we did not discuss in more detail the swards with dominant *Salix serpyllifolia* that we found on slightly moist sites on ridges or immediately under them on several high summits in the Julian Alps. Other authors (GRABHERR & MUCINA 1993, ENGLISCH 1999, E. PIGNATTI & S. PIGNATTI 2014, 2016) do not report similar communities in other parts of the Southern, Southeastern and

Eastern Alps. Only in ENGLISCH et al. (1993: 315) there is a note on a *Salix serpyllifolia* community, which belongs to *Seslerietalia albicantis*, and in ENGLISCH (1999: 179) a note on a *Salix serpyllifolia* form of the association *Crepidetum terglouensis* Seibert 1977. We therefore collected our relevés and classified them into a syntaxonomic system based on the phytosociological analysis.

2 METHODS

Alpine communities with dominant *Salix serpyllifolia* in the Julian Alps were studied applying the Braun-Blanquet method (BRAUN-BLANQUET 1964). In the FloVegSi database (Fauna, Flora, Vegetation and Paleovegetation of Slovenia) of the Jovan Hadži Institute of Biology at ZRC SAZU (T. SELIŠKAR, VREŠ et al. SELIŠKAR 2003) we found a total of 26 relevés of subalpine and alpine swards where *Salix serpyllifolia* was one of dominant species. They were arranged into a working table based on hierarchical classification. We transformed the combined cover-abundance values with numerical values (1–9) according to van der MAAREL (1979). Numerical comparisons were performed with the SYN-TAX 2000 program package (PODANI 2001). The relevés were compared by means of (unweighted) average linkage method – UPGMA, using Wishart's similarity ratio.

In the first step we found a homogenous group of 13 relevés with dominant *Salix serpyllifolia*, which were made in the alpine belt of the Julian Alps. In Tone Wraber's manuscript collection kept by the Botanical Garden of the University of Ljubljana we found only four relevés of alpine swards from the Mangart ridge with dominant *Salix serpyllifolia* and compared them with our selected relevés. Due to their obvious similarity they were incorporated into the phytosociological table which we subsequently arranged and analysed by groups of diagnostic species.

The nomenclature source for the names of vascular plants is the Mala flora Slovenia (MFS – MARTINČIČ et al. 2007). The nomenclature of Flora alpina – *Sesleria caerulea* was used for the taxon *Sesleria caerulea* subsp. *calcaria* (MFS) and the nomenclature of Vascu-

lar flora of Friuli Venezia Giulia (POLDINI, ORIOLO et VIDALI 2002) for the taxon *Achillea clavennae*. We used the name *Salix serpyllifolia* (the nomenclature of MFS and Flora alpina) instead of the name *Salix serpyllifolia* (TRPIN & VREŠ 1995: 80, DAKSKOBLER & ZUPAN 2017). Ros et al. (2013) are the nomenclature source for the names of mosses and SUPPAN et al. (2000) for the names of lichens. Prof. Andrej Martinčič determined the collected mosses. For the names of syntaxa we follow GRABHERR & MUCINA (1993), ORIOLO (2001), THEURILLAT (2004), ŠILC & ČARNI (2012), E. PIGNATTI & S. PIGNATTI (2014) and MUCINA et al. (2016). In the classification of species into phytosociological groups (groups of diagnostic species) we mainly refer to the Flora alpina (AESCHIMANN et al. 2004a, b). The geographic coordinates of relevés are determined according to the Slovenian geographic coordinate system D 48 (5th zone) on the Bessel ellipsoid and with Gauss-Krüger projection.

All of the relevés discussed in this article were made in the Julian Alps. The geological bedrock is mainly calcareous, limestone, dolomite limestone, sporadically interlayered with more silicate rocks, marlstone, claystone and chert (BUSER 2009). The studied community occurs on initial soils (lithosols) and shallow rendzinas on limestone and dolomite (LOVRENČAK 1998, VIDIC et al. 2015). The climate is montane, with mean annual precipitation of 2,500 mm to 3,000 mm (ZUPANČIČ 1998) and mean annual air temperature of -2 °C to 0 °C (CEGNAR 1998). The studied community is associated with specific sites which have usually longer average periods of snow cover than the surrounding sites.

3. RESULTS AND DISCUSSION

3.1 Review of the studied syntax, with types of newly described communities

Elyno-Seslerietea Br.-Bl. 1948

Seslerietalia coeruleae Br.-Bl. in Br.-Bl. et Jenny 1926

Oxytropido-Elynion myosuroidis Br.-Bl. 1950

Gentiano pumilae-Salicetum serpillifoliae T. Wraber ex Dakskobler ass. nov. hoc loco, the nomenclature type, *holotypus*, is relevé 8 in Table 2.

Justification: Tone Wraber was the first to find alpine stands with dominant *Salix serpillifolia* under Mt. Mangart and made four relevés. One of them is also the nomenclature type of the new association. Although he cannot be considered co-author of this paper due to his passing eight years ago, I attribute to him the first authorship of the association validly described below (WEBER, MORAVEC & THEURILLAT 2000, Recommendation 46D).

Thlaspietalia rotundifoliae Br.-Bl. 1948

Arabidetalia caeruleae Rübel ex Br.-Bl. 1948

Arabidion caeruleae Br.-Bl. in Br.-Bl. & Jenny 1926

Ranunculo traunfellneri-Salicetum serpillifoliae nom. prov.

Thlaspietalia rotundifoliae Br.-Bl. in Br.-Bl. et Jenny 1926

Thlaspion rotundifoliae Jenny-Lips 1930

Crepido terglouensis-Potentilletum nitidae Dakskobler & Zupan 2017

3.2 Alpine stands with dominant *Salix serpillifolia* in the Julian Alps

We extracted our relevés of subalpine-alpine communities with dominant *Salix serpillifolia* from FloVegSi database and compared them by means of hierarchical classification (Figure 2).

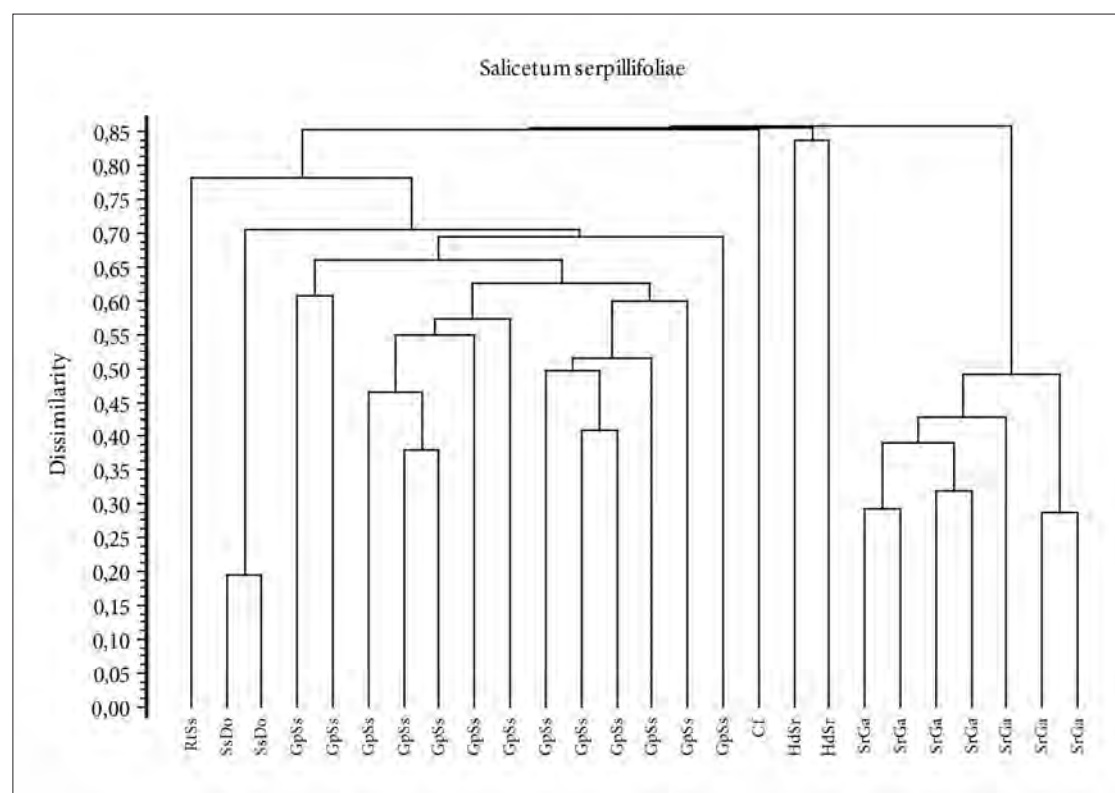


Figure 2: Dendrogram of stands with dominant *Salix serpillifolia* in the Julian Alps, UPGMA, 1- similarity ratio

Slika 2: Dendrogram popisov sestojev s prevladujočo timijanovolistno vrbo (*Salix serpillifolia*) v Julijskih Alpah, UPGMA, komplement Wishartovega koeficienta podobnosti

Legend / Legenda: RtSs *Ranunculo traunfellneri-Salicetum serpillifoliae* nom. prov., SsDo *Seslerio sphaerocephalae-Dryadetum octopetalae*, GpSs *Gentiano pumilae-Salicetum serpillifoliae*, Cf *Caricetum ferrugineae* s. lat., HdSe *Homogyno discoloris-Salicetum retusae*, SrGa *Salici retusae-Geranium argentei salicetosum serpillifoliae*

The results show that some of the relevés are floristically different, including the relevé of a moist scree in the hollow of Matajurc under the summit of Matajurski Vrh in the Southern Julian Alps (Table 1), which we classify into the provisionally described association *Ranunculo traunfellneri-Salicetum serpillifoliae* nom. prov. In terms of site conditions (a gravelly depression with persistent snow cover) and dominant species (*Salix serpillifolia*, *Ranunculus traunfellneri*, *Galium noricum*, *Moehringia ciliata* and *Salix waldsteiniana*) it belongs to the alliance *Arabidion caeruleae* and class *Thlaspietea rotundifolii*. However, a reliable syntaxonomic classification of this relevé will only be possible when we have found more similar stands. ENGLISH (1999: Table B) mentions a slightly similar community (*Salix serpillifolia*-*Ranunculus alpestris* community) for the Northeastern Alps, but it is also documented with only two relevés. Other different relevés belong to the syntaxa that have already been reported in the Julian Alps: *Seslerio sphaerocephalae-Dryadetum octopetalae* (DAKSKOBLER

& SURINA 2017a), *Homogyno discoloris-Salicetum retusae* (SURINA 2005), *Caricetum ferrugineae* s. lat. (SURINA 2005) and *Salici retusae-Geranietum argentei salicetosum serpillifoliae* (SURINA 2005, DAKSKOBLER 2011). A relatively homogeneous group of 13 relevés cannot be classified into any of so far described associations. *Salix serpillifolia* dominates in all these relevés which were made exclusively in the alpine belt. After we had conducted the first analysis we found four similar relevés from the Mangart ridge in Tone Wraber's manuscripts (he made at least one of them on the Italian side of the mountain), also with dominant *Salix serpillifolia*. We entered these four relevés into the FloVegSi database and compared them with the other 13 relevés (Figure 3).

Tone Wraber's Mangart relevés grouped with ours, indicating that we both inventoried the same community, although 20 years apart (his relevés are from 1983; his companion and assistant in the field was Andrej Podobnik). As no similar stands with dominant *Salix serpillifolia* in the alpine belt on calcareous bedrock

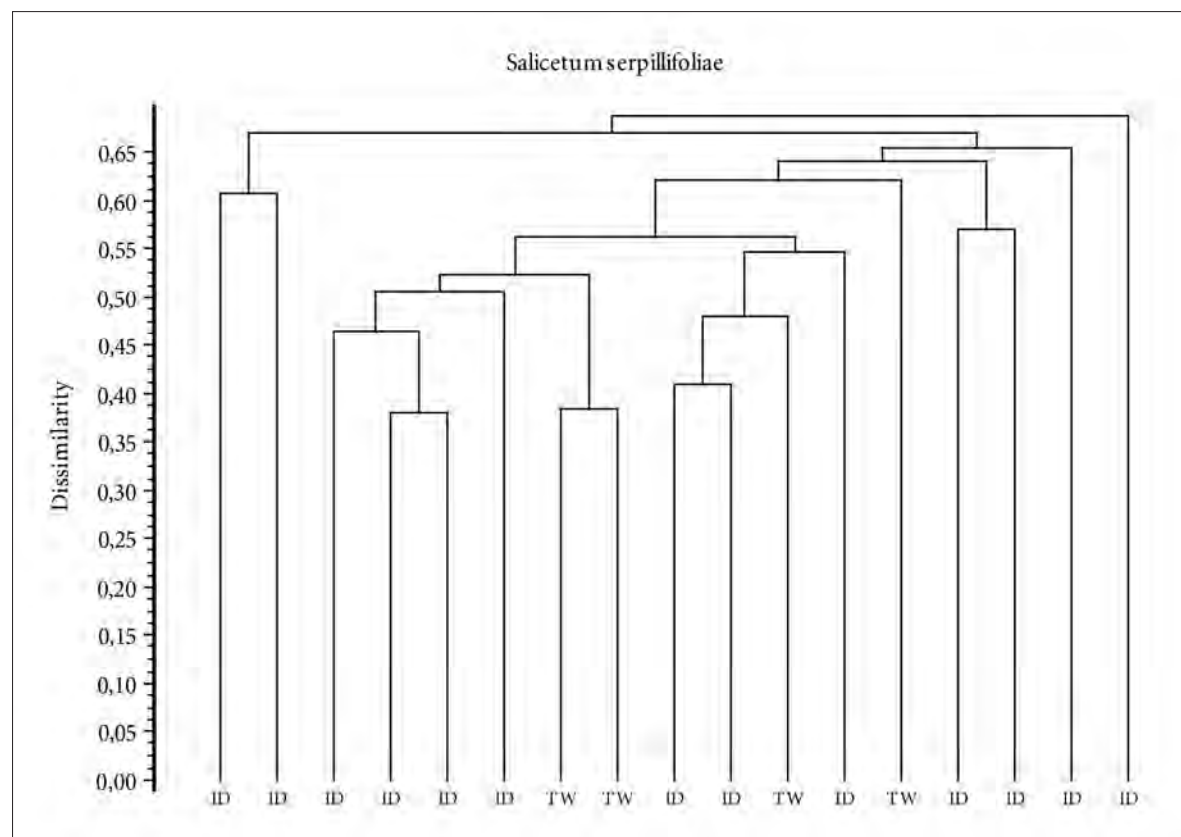


Figure 3: Dendrogram of stands with dominant *Salix serpillifolia* in the alpine belt of the Julian Alps, UPGMA, 1 - similarity ratio

Slika 3: Dendrogram sestojev s prevladujočo timijanovolistno vrbo (*Salix serpillifolia*) v alpskem pasu Julijskih Alp, UPGMA, komplement Wishartovega koeficienta podobnosti

Legend / Legenda: ID – relevés by Igor Dakskobler, TW – relevés by Tone Wraber

have been reported elsewhere in the Alps, we joined our 13 with Wraber's four relevés in Table 2 and described them as the new association *Gentiano pumilae-Salicetum serpillifoliae*. This association comprises alpine or cushion-like swards at elevations ranging from 2,350 to 2,650 m, on small ridge plateaus as well as on steep, slightly gullied and shady lee slopes just under summits, on sites with longer periods of snow cover than their surroundings. Such swards develop on very limited areas, measuring not more than 10 m² (Lopa, Jalovec, Razor, Plemenice and Zaplanja under Triglav), rarely (Pihavec, Mangart, Kukova Špica) on larger areas measuring up to 20 m². Figure 4 shows the current distribution of stands of the new association.

The diagnostic species of the new association include, in addition to the dominant willow *Salix serpillifolia*, also *Carex capillaris*, *Gentiana pumila*, *Doronicum glaciale* and *Saxifraga paniculata*. The first three in particular are characteristic for slightly moist to wet sites, moist alpine swards, snow beds and headwaters. *Salix serpillifolia* and *Saxifraga paniculata* are indicative also of ridge positions and the contact with alpine chasmo-phytic communities. *Gentiana pumila* is an eastern-Alpine species, a character species of the alliance *Caricion ferrugineae* (AESCHIMANN et al. 2004b: 20) that charac-

terises the new association both in terms of ecology and chorology as an endemic community of the Eastern Alps. Its distribution area is significantly smaller than the distribution area of *Salix serpillifolia*. Composition by the groups of diagnostic species (Table 3) shows a higher proportion of species of subalpine-alpine grasslands (*Oxytropido-Elynion*, *Caricion firmae*, *Caricion ferrugineae*, *Seslerietalia coeruleae*, *Elyno-Seslerietea*) than of scree species (*Arabidetalia caeruleae*, *Thlaspietia rotundifolii*). In previous articles (DAKSKOBLER & SURINA 2017a, DAKSKOBLER & ZUPAN 2017) we classified *Salix serpillifolia* as a diagnostic species of snow-bed communities (*Arabidetalia caeruleae*). Phytosociologists (GRABHERR 1993, Theurillat in AESCHIMANN 2004a) consider it a diagnostic species of the class *Carici rupestris-Kobresietea bellardii*. It is our opinion that alpine communities of windward ridges in the Slovenian Alps belong to the special alliance *Oxytropido-Elynion*, but not to a special class *Carici rupestris-Kobresietea bellardii* (ORIOLO 2001, DAKSKOBLER & SURINA 2017a). If we take into account the dominant species it could be classified into this alliance based on the analysis of diagnostic species, but the new association could also be classified into the alliance *Caricion firmae* or even into the alliance *Arabidion caeruleae*. We therefore

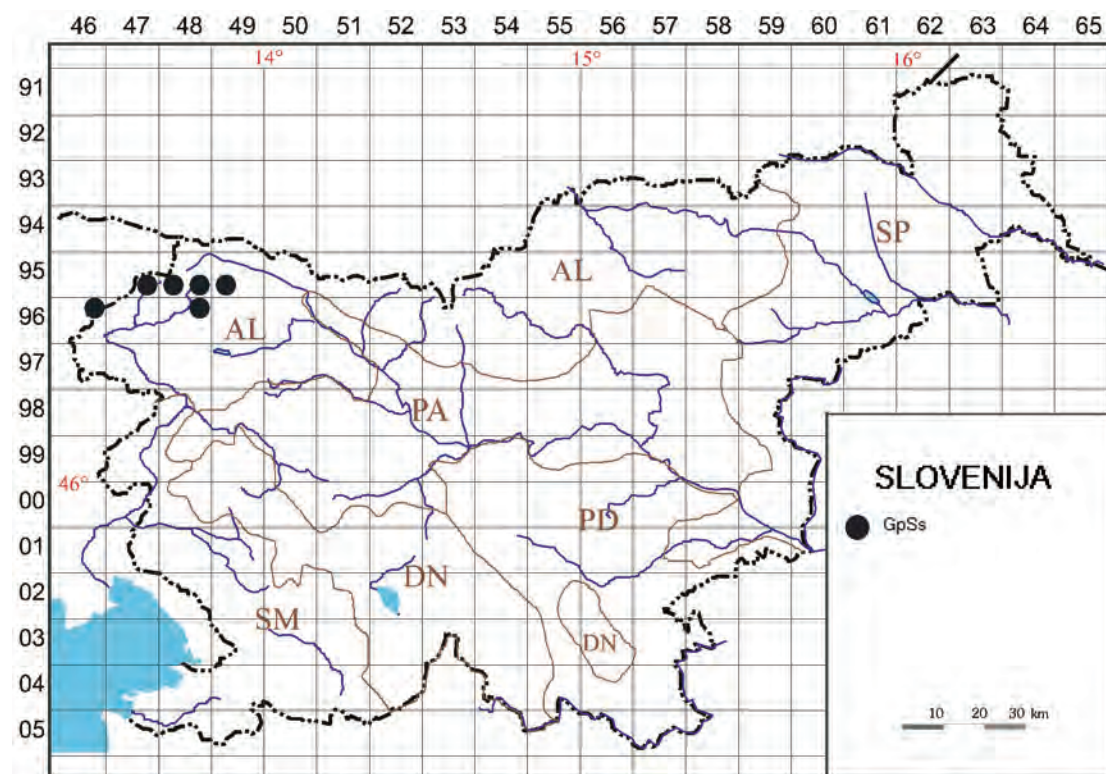


Figure 4: Distribution of stands of the association *Gentiano pumilae-Salicetum serpillifoliae* on the map of Slovenia
Slika 4: Razširjenost sestojev asociacije *Gentiano pumilae-Salicetum serpillifoliae* na zemljevidu Slovenije

described a special type of alpine vegetation with species characteristic for three groups of communities (snow beds, swards and windward ridges). In the Julian Alps we recently described another slightly similar community, association *Saxifraga paniculatae*-*Caricetum fuliginosae* (DAKSKOBLER & SURINA 2017a, Table 6). Two diagnostic species occur in both associations (*Salix serpillifolia* and *Saxifraga paniculata*). As many as 31 of 35 species recorded in the stands of this association occur also in the stands of the association *Gentiano pumilae*-*Salicetum serpillifoliae*, but floristic similarity between both compared syntaxa is only 45% (SØRENSEN 1948). The stands of the other association are much more species-rich (on average 24 species per relevé compared to an average of 12 species per relevé in the stands of the first association); they can cover slightly larger areas and more distinctly resemble alpine swards. Another decisive factor is the difference in the coverage of both dominant species (*Carex fuliginosa* / *Salix serpillifolia*) and in site ecology. The soil in the stands of the second association is more developed, in places rendzina. Nevertheless, these are two relatively similar and rare forms of alpine vegetation in the Julian Alps.

3.3 Corrected phytosociological table of the association *Crepido terglouensis*-*Potentilletum nitidae* (Dakskobler & Zupan 2017)

During the review of the herbarium material collected in the summer of 2016 we observed that a cushion-

forming plant that we recorded in several stands of the association *Crepido terglouensis*-*Potentilletum nitidae* on a plateau west of Mt. Triglav had been mis-determined. Two species were reported in field notes, *Minuartia cherlerioides* and *Arenaria ciliata*, but in our review of the herbarium material we could only find *Arenaria ciliata*. Consequently, we have to revise the diagnostic species of this association. They are *Potentilla nitida*, *Crepis terglouensis*, *Eritrichium nanum*, *Alyssum ovirense* and *Arenaria ciliata* (but not *Minuartia cherlerioides*). Below we provide a slightly modified phytosociological table (Table 4) without *Minuartia cherlerioides* (for which we have no supporting herbarium material) and a slightly different (irrelevant in terms of the syntaxonomic classification of the association) composition by groups of diagnostic species (Table 5). Everything else that has so far been reported for this association remains unchanged, including the dendrogram in Figure 4 (DAKSKOBLER & ZUPAN, *ibid.*). Despite misdetermination of one of the diagnostic species the description of the new association *Crepido terglouensis*-*Potentilletum nitidae* Dakskobler et Zupan 2017 does not require a formal correction (Article 43 – Correction of names due to taxonomic errors), because our error does not pertain to the species that gives the association its name (WEBER, MORAVEC et THEURILLAT 2000).

4 CONCLUSIONS

The alpine community with dominant *Salix serpillifolia* was first reported on the Mangart ridge by Tone Wraber (1983, manuscript collection kept by the Botanical Garden of the University of Ljubljana), who made four relevés at the time, but never published anything on the subject. We described a similar community under Mt. Lopa in the Kanin Mts., under Mt. Jalovec, on Mt. Pihavec, under Mt. Razor, on Plamenice and Zaplanja under Mt. Triglav and on Mt. Kukova Špica. Despite several differences between our relevés and Wraber's we had obviously studied the same community populating smaller or larger ridge plateaus or slightly gullied shady slopes with long snow cover. In addition to thyme-leaved willow the species that best characterise the new community include *Carex capillaris*, *Doronicum glaciale*, *Gentiana pumila* and *Saxifraga paniculata*. Similar willow communities have not

been reported elsewhere in the Southern and Eastern Alps, so we classified our stands into the new association *Gentiano pumilae*-*Salicetum serpillifoliae*. Presently, its stands remain specific for some of the highest summits of the Julian Alps, similarly to the stands of the association *Saxifraga paniculatae*-*Caricetum fuliginosae*, which are slightly similar in terms of species composition. So far, they have not been subject to significant human impact, although some of them are situated in the vicinity of well-frequented mountain paths (to Mt. Mangart and Mt. Jalovec). Potentially, they could be endangered by small cattle grazing. The species composition of the new community includes several species that are relatively rare in Slovenia, such as *Erigeron uniflorus*, *Antennaria carpatica*, *Gentiana orbicularis*, *Luzula spicata*, *Juncus jacquinii*, *Sesleria ovata*, *Omalotheca supina* (*Gnaphalium supinum*), *Sib-*

baldia procumbens, *Soldanella pusilla*, red-listed *Elyna myosuroides* (ANON. 2002), protected *Nigritella miniata* s. lat. (*N. rubra* s. lat., *N. hygrophila*) and *Primula au-*

ricula (ANON. 2004), and southeastern-Alpine endemic species *Cerastium subtriflorum*, *Saxifraga tenella* and *Saxifraga exarata* subsp. *carniolica*.

5 POVZETEK

Timijanovolistna vrba (*Salix serpillifolia*) je alpsko-ilirska vrsta, značilna za vlažna gručnata pobočja in alpske trate. V Sloveniji uspeva v (altimontanskem), subalpinskem in alpskem pasu v Julijskih Alpah, Karavankah, Kamniško-Savinjskih Alpah in v Trnovskem gozdu. Najnižje smo jo do sedaj našli v dveh globokih vrtačah pod Velikim Golakom v Trnovskem gozdu: v Kraljevi kamri vzhodno od te gore na nadmorski višini 1295 m in v vrtači severno od te gore, na nadmorski višini 1350 m, najvišje pa pod vrhom Škrlatice, na nadmorski višini 2750 m. S fitocenološko analizo po srednjeevropski metodi in primerjavo 30 popisov iz subalpskega in alpskega pasu v Julijskih Alpah (od tega smo štiri popise našli v rokopisni zapuščini Tonea Wraberja), kjer je ta vrsta ena izmed prevladujočih, smo opisali novo asociacijo *Gentiano pumilae-Salicetum serpillifoliae* T. Wraber ex Dakskobler ass. nov. Vanjo uvrščamo alpske trate oz. blazinaste trate na nadmorski višini od 2350 m do 2650 m, na manjših grebenskih uravninah in tudi na strmih nekoliko užlebljenih in zavetrnih osojnih pobočjih tik pod vrhovi, na krajih, kjer se navadno sneg zadržuje dalj časa kot na okoliških stičnih površinah. Takšne trate smo našli na zelo majhnih površinah od nekaj do deset kvadratnih metrov (Lopa, Razor, Jalovec, Plemenice in Zaplanja pod Triglavom), ponekod (Mangart, Pihavec, Kukova špica) tudi na večjih površinah do 20 m². Diagnostične vrste nove asociacije so *Salix serpillifolia*, *Carex capillaris*, *Gentiana pumila*, *Doronicum glaciale* in *Saxifraga paniculata*. Večinoma so značilne za nekoliko vlažna do mokra rastišča, vlažne alpske trate, snežne dolinice in povirja, timijanovolistna vrba in grozdasti kamnokreč (*Saxifraga paniculata*) pa označujeta tudi grebenko lego in stik z alpskimi združbami skalnih razpok. Nizki svišč (*Gentiana pumila*) je vzhodnoalpska vrsta, značilnica zveze *Caricion ferrugineae*, ki novo asociacijo označuje ekološko in horološko, kot endemično združbo Vzhodnih Alp. Sestava po skupinah diagnostičnih vrst kaže na večji delež vrst subalpsko-alpskih travišč (*Oxytropido-Elynonion*, *Caricion firmae*, *Caricion ferrugineae*, *Seslerietalia coeruleae*, *Elyno-Seslerietea*) kot pa meliščnih vrst (*Arabidetalia caeruleae*, *Thlaspietalia rotundifoliae*). Novo asociacijo uvrščamo v zvezo *Oxytropido-Elynonion*, red *Seslerietalia*

coeruleae in razred *Elyno-Seslerietea*. Mogoča je tudi uvrstitev v zvezo *Caricion firmae* in, če timijanovolistno vrbo uvrščamo med značilnice rastja snežnih dolin, tudi v zvezo *Arabidetalia caeruleae* in v razred *Thlaspietalia rotundifoliae*. Po vrstni sestavi so sestojem novo opisane asociacije nekoliko podobni sestoji asociacije *Saxifraga paniculatae-Caricion fuliginosae*, ki prav tako uspevajo na majhnih površinah v alpskem pasu Julijskih Alp. Razlika med njima je v stopnji zastiranja prevladujočih vrst, v številu vrst na popisno ploskev, v zgradbi in velikosti sestojev, v talnih razmerah. Človek na razvoj in ohranitev preučene združbe za zdaj še nima bistvenega vpliva, čeprav so nekateri njeni sestoji v bližini precej obiskanih planinskih poti (na Mangart in Jalovec). Deloma jih lahko ogroža tudi pašna drobnica. V vrstni sestavi nove združbe so tudi nekatere v Sloveniji razmeroma redke vrste, kot so *Eriogon uniflorus*, *Antennaria carpatia*, *Gentiana orbicularis*, *Luzula spicata*, *Juncus jacquinii*, *Sesleria ovata*, *Omalotheca supina* (*Gnaphalium supinum*), *Sibbaldia procumbens*, *Soldanella pusilla*, vrsta iz rdečega seznama *Elyna myosuroides*, zavarovani vrsti *Nigritella miniata* s. lat. (sin. *N. rubra* s. lat., po naši določitvi takson *N. hygrophila*) in *Primula auricula* ter jugovzhodnoalpski endemiti *Cerastium subtriflorum*, *Saxifraga tenella* in *Saxifraga exarata* subsp. *carniolica*.

V tem članku objavljamo tudi nekoliko popravljenno fitocenološko tabelo asociacije *Crepido terglouensis-Potentilletum nitidae*. Ob pregledu herbarijskega gradiva, nabranega poleti 2016, smo ugotovili napačno določitev blazinaste rastline, ki smo jo popisali v nekaterih njenih sestojih na planoti zahodno od Triglava. V terenskih beležnicah sta bili napisani dve vrsti *Minuartia cherlerioides* in *Arenaria ciliata*, pregled herbarijskega gradiva pa kaže na prisotnost le ene vrste, *Arenaria ciliata*. Zaradi tega smo popravili diagnostične vrste te asociacije, ki so *Potentilla nitida*, *Crepis terglouensis*, *Eritrichium nanum*, *Alyssum ovirense* in *Arenaria ciliata* (in ne *Minuartia cherlerioides*). Kljub napačni določitvi ene izmed diagnostičnih vrst opis nove asociacije *Crepido terglouensis-Potentilletum nitidae* Dakskobler et Zupan 2017 ne potrebuje formalne korekcije, saj se naša napaka ne nanaša na vrsti, po katerih se nova asociacije imenuje.

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Photos 5–15: Photo / Foto: I. Dakskobler



5 Typical sites of the stands of the association *Gentiano pumilae-Salicetum serpillifoliae*, above Gulce between Kukova Špica and Škrnatarica

5 Tipična rastišča sestojev asociacije *Gentiano pumilae-Salicetum serpillifoliae* nad prevalom Gulce med Kukovo špico in Škrnatarico



6 Typical sites of the stands of the association *Gentiano pumilae*-*Salicetum serpillifoliae*, Zaplanja under Triglav
6: Tipična rastišča sestojev asociacije *Gentiano pumilae*-*Salicetum serpillifoliae*, Zaplanja pod Triglavom



7 Detail of the stand of the association *Gentiano pumilae*-*Salicetum serpillifoliae*, Kukova Špica
7 Detajl sestoja asociacije *Gentiano pumilae*-*Salicetum serpillifoliae*, Kukova špica



8 Two details of the stand of the association *Gentiano pumilae-Salicetum serpillifoliae*, with *Salix serpillifolia*, *Arenaria ciliata*, *Doronicum glaciale*, *Saxifraga paniculata*, *Plemenice* under Triglav

8 Dva detajla sestoja asociacije *Gentiano pumilae-Salicetum serpillifoliae* z vrstami *Salix serpillifolia*, *Arenaria ciliata*, *Doronicum glaciale* in *Saxifraga paniculata*, *Plemenice* pod Triglavom



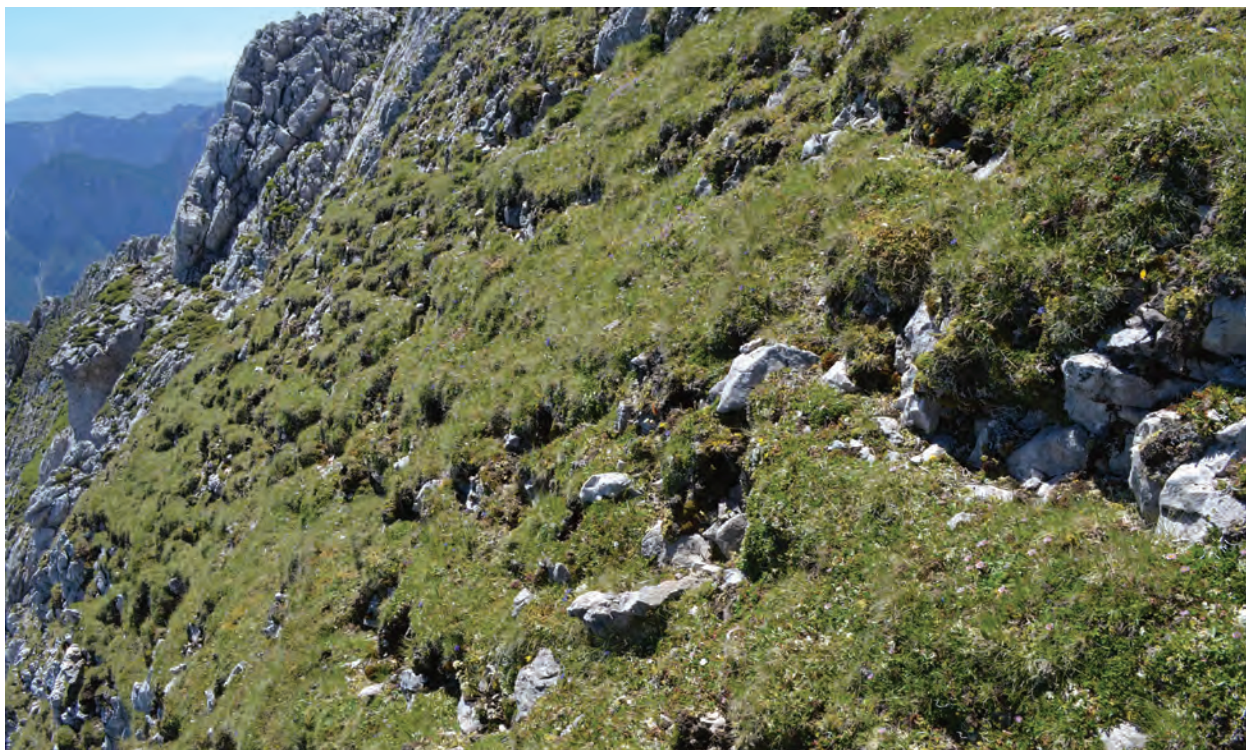
9 Typical sites of the association *Gentiano pumilae-Salicetum serpillifoliae*, Kukova Špica

9 Tipična rastišča, kjer se pod vrhom Kukove špice pojavljajo sestoji asociacije *Gentiano pumilae-Salicetum serpillifoliae*



10 Two stands of the association *Gentiano pumilae-Salicetum serpillifoliae*, Kukova Špica

10 Dva sestoja asociacije *Gentiano pumilae-Salicetum serpillifoliae* tik pod vrhom Kukove špice



11 Typical sites and stands of the association *Gentiano pumilae-Salicetum serpillifoliae*, Kukova Špica
11 Tipična rastišča in sestoji asociacije *Gentiano pumilae-Salicetum serpillifoliae* tik pod vrhom Kukove špice



12 Typical sites and stands of the association *Gentiano pumilae-Salicetum serpillifoliae*, Zaplanja under Triglav
12 Tipično rastišče in sestoj asociacije *Gentiano pumilae-Salicetum serpillifoliae*, Zaplanja pod Triglavom



13 *Gentiana pumila*, together with *Carex ornithopodoides* and *Erigeron uniflorus*, Kukova Špica

13 Nizki svišč (*Gentiana pumila*) skupaj z vrstama *Carex ornithopodoides* in *Erigeron uniflorus* pod vrhom Kukove špice



14 *Doronicum glaciale*, one of the diagnostic species of the association *Gentiano pumilae-Salicetum serpillifoliae* (together with *Silene acaulis* and *Saxifraga paniculata*)

14 Ledeniški divjakovec (*Doronicum glaciale*), ena izmed diagnostičnih vrst asociacije *Gentiano pumilae-Salicetum serpillifoliae* (skupaj z vrstama *Silene acaulis* in *Saxifraga paniculata*)



15 *Nigritella miniata* s. lat. (perhaps taxon *N. hygrophila*), one of the protected species in the stand of the association *Gentiano pumilae-Salicetum serpillifoliae*, Zaplanja under Triglav
15 Rdeča murka (*Nigritella miniata* s. lat., morda takson *N. hygrophila*), ena izmed zavarovanih vrst, ki rastejo v sestojih asociacije *Gentiano pumilae-Salicetum serpillifoliae*, Zaplanja pod Triglavom



16 *Gentiana pumila*. Photo / Foto: Peter Strgar

Table 1 (Preglednica 1): *Ranunculo traunfellneri-Salicetum serpillifoliae* nom. prov.

Number of relevé (Zaporedna številka popisa)		1
Database number of relevé (Delovna številka popisa)		202447
Elevation in m (Nadmorska višina v m)		1690
Aspect (Lega)		NE
Slope in degrees (Nagib v stopinjah)		25
Parent material (Matična podlaga)		Gr
Soil (Tla)		Li
Stoniness in % (Kamnitost v %)		20
Cover of herb layer in % (Zastiranje zeliščne plasti v %):	E1	80
Cover of moss layer in % (Zastiranje mahovne plasti v %)	E0	2
Number of species (Število vrst)		23
Relevé area (Velikost popisne ploskve)	m ²	2
Date of taking relevé (Datum popisa)		7/30/2003
Locality (Nahajališče)		Matajurc
Quadrant (Kvadrant)		9749/3
Coordinate GK Y (D-48)	m	414890
Coordinate GK X (D-48)	m	5121119
Diagnostic species of syntaxon (Diagnostične vrste sintaksona)		
OE <i>Salix serpillifolia</i>	E1	4
AC <i>Ranunculus traunfellneri</i>	E1	1
AC <i>Galium noricum</i>	E1	1
AC <i>Arabidion caeruleae</i>, <i>Arabidetalia caeruleae</i>		
<i>Rumex nivalis</i>	E1	+
<i>Soldanella alpina</i>	E1	+
<i>Taraxacum alpinum</i> agg.	E1	+
TR <i>Thlaspietea rotundifolii</i>		
<i>Moehringia ciliata</i>	E1	1
<i>Achillea atrata</i>	E1	+
<i>Armeria alpina</i>	E1	+
<i>Athamanta cretensis</i>	E1	+
<i>Cerastium carinthiacum</i>	E1	+
<i>Festuca nitida</i>	E1	+
<i>Thlaspi kernerii</i>	E1	+
PC <i>Potentilletalia caulescentis</i>		
<i>Campanula cochleariifolia</i>	E1	+
<i>Valeriana elongata</i>	E1	+
<i>Valeriana saxatilis</i>	E1	+
ES <i>Elyno-Seslerietea</i>		
<i>Pedicularis rostratocapitata</i>	E1	+
<i>Myosotis alpestris</i>	E1	+
PaT <i>Poo alpinae-Trisetetalia</i>		
<i>Leontodon hispidus</i>	E1	+
<i>Poa alpina</i>	E1	+
BA <i>Betulo-Alnetea</i>		
<i>Salix waldsteiniana</i>	E1	1
<i>Viola biflora</i>	E1	+
ML Mosses (Mahovi)		
<i>Tortella tortuosa</i>	E0	+

Legend - Legenda

Gr Gravel - grušč

Li Lithosol - kamnišče

OE *Oxytropido-Elynion*

Table 2 (Preglednica 2): *Gentiano pumilae-Salicetum serpillifoliae* ass. nova

Number of relevé (Zaporedna številka popisa)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Database number of relevé (Delovna številka popisa)		219683	221118	219684	262410	262412	226600	270376	270377	267917	267921	270374	267922	270375	262407	262413	267915	241860
Author of the relevé (Avtor popisa)	ID	ID	ID	ID	ID	ID	ID	TW	TW	ID	ID	TW	ID	TW	ID	ID	ID	ID
Elevation in m (Nadmorska višina v m)		2390	2380	2390	2385	2375	2520	2560	2540	2426	2420	2627	2417	2630	2365	2370	2425	2570
Aspect (Lega)		NW	N	N	N	SSW	E	N	E	NE	E	N	NNE	N	NW	N	N	SE
Slope in degrees (Nagib v stopinjah)		2	10	5	5	10	25	15	30	5	45	5	45	15	5	10	35	30
Parent material (Matična podlaga)		A	A	A	DA	DA	DA	Gr	A	DA	DA	A	DA	A	DA	A	DA	DA
Soil (Tla)		Re	Li	Li	Li	Re	Li	Li	Re	Re	Re	Li	Re	Re	Re	Re	Re	Li
Stoniness in % (Kamnitost v %)		0	0	20	10	20	20	0	10	10	20	10	10	0	10	10	30	20
Cover of herb layer in % (Zastiranje zeliščne plasti v %):	E1	100	100	80	90	80	80	100	100	80	80	90	80	100	90	90	70	80
Cover of moss layer in % (Zastiranje mahovne plasti v %)	E0	.	5	.	.	.	10	.	.	5	10	.	.	.	.	.	20	.
Number of species (Število vrst)		18	34	14	16	20	33	20	32	25	27	15	27	31	23	17	38	25
Relevé area (Velikost popisne ploskve)	m ²	15	2	15	2	5	10	20	20	1	5	1	10	20	4	5	5	10
Date of taking relevé (Datum popisa)		8/26/2008	8/11/2004	8/26/2008	8/8/2016	8/8/2016	8/31/2009	9/8/1983	9/8/1983	7/17/2017	7/17/2017	9/8/1983	7/17/2017	9/8/1983	8/8/2016	8/8/2016	7/17/2017	8/24/2011
Locality (Nahajališče)		Pihavec	Lopa	Pihavec	Triglav-Plemenice	Triglav-Zaplanja	Razor	Mangart	Mangart	Kukova špica	Kukova špica	Mangart	Kukova špica	Mangart	Triglav-Plemenice	Triglav-Zaplanja	Kukova špica	Jalovec
Quadrant (Kvadrant)		9648/2	9646/2	9648/2	9648/2	9648/2	9548/4	9547/4	9547/4	9549/3	9549/3	9547/4	9549/3	9547/4	9648/2	9648/2	9549/3	9548/3
Coordinate GK Y (D-48)	m	408558	384589	408528	409956	410056	407537	397268	397283	412399	412398	397042	412393	397090	409881	410061	412414	398822
Coordinate GK X (D-48)	m	5139386	5137345	5139486	5138179	5138083	5141478	5144862	5144891	5145461	5145491	5144840	5145493	5144867	5138141	5138032	5145438	5142581
Diagnostic species of the association (Dijagnostične vrste asociacije)																		
OE <i>Salix serpillifolia</i>	E1	4	4	4	4	3	4	5	5	4	4	5	4	5	2	4	4	2
CD <i>Carex capillaris</i>	E1	+	+	1	+	.	+	1	1	1	1	1	2	+	1	.	+	14
DH <i>Doronicum glaciale</i>	E1	.	+	2	2	1	+	1	1	.	.	r	+	+	1	1	1	13
CF <i>Gentiana pumila</i>	E1	1	2	.	.	1	+	+	1	+	1	.	1	1	1	1	.	12
PC <i>Saxifraga paniculata</i>	E1	.	.	2	+	+	+	1	2	+	1	.	.	.	+	.	2	11
OE <i>Oxytropido-Elynion</i>																		
<i>Arenaria ciliata</i>	E1	.	.	.	+	+	.	1	1	+	+	.	1	1	+	.	1	11
<i>Erigeron uniflorus</i>	E1	.	.	.	+	1	1	.	+	1	2	1	+	1	.	.	+	10
<i>Lloydia serotina</i>	E1	.	.	.	.	.	.	.	.	.	+	.	1	+	.	.	+	4
<i>Carex atrata</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Antennaria carpatica</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	1
<i>Elyna myosuroides</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	1
CFir <i>Caricion firmae</i>																		
<i>Minuartia sedoides</i>	E1	+	.	2	.	1	1	.	1	+	+	+	+	+	.	.	+	12
<i>Silene acaulis</i>	E1	.	.	.	1	1	1	1	+	.	.	1	1	2	3	+	+	11
<i>Festuca quadriflora</i>	E1	2	+	1	.	.	1	1	.	1	1	.	3	1	.	.	2	10
<i>Veronica aphylla</i>	E1	1	1	.	.	+	+	.	.	1	1	1	.	1	.	+	+	10
<i>Helianthemum alpestre</i>	E1	.	+	.	.	+	+	.	+	1	2	+	1	.	+	3	.	10
<i>Carex firma</i>	E1	2	.	1	1	3	+	.	.	+	+	.	.	.	1	1	+	9
<i>Sesleria sphaerocephala</i>	E1	.	.	+	+	1	.	.	.	+	.	.	.	.	+	2	1	7

	Number of relevé (Zaporedna številka popisa)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Pr.	Fr.	
CF	<i>Pedicularis rostratocapitata</i>	E1	.	1	.	.	+	+	.	+	.	+	.	.	.	.	.	1	6	35	
	<i>Oxytropis neglecta</i>	E1	.	+	.	.	.	.	.	+	+	.	.	.	.	.	1	.	4	24	
	<i>Phyteuma sieberi</i>	E1	.	.	.	.	.	.	+	.	+	.	+	.	.	.	+	.	4	24	
	<i>Minuartia verna</i>	E1	.	.	.	.	.	.	+	+	.	+	.	.	.	.	+	.	4	24	
	<i>Dryas octopetala</i>	E1	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	.	3	18	
	<i>Saussurea pygmaea</i>	E1	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	1	3	18	
	<i>Gentiana terglouensis</i>	E1	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	2	12	
	<i>Saxifraga caesia</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	6	
	<i>Caricion ferrugineae</i>																				
	<i>Cerastium subtriflorum</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	6	
	SV	<i>Seslerietalia coeruleae</i>																			
	<i>Gentiana orbicularis</i>	E1	.	.	.	.	.	.	+	+	.	+	1	.	+	.	.	.	.	5	29
<i>Achillea clavennae</i>	E1	.	1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	3	18	
<i>Potentilla crantzii</i>	E1	.	.	.	.	.	+	.	+	.	.	.	.	1	.	.	.	.	3	18	
<i>Saxifraga exarata</i> subsp. <i>carniolica</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	2	12	
<i>Galium anisophyllum</i>	E1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	6	
<i>Nigritella miniata</i> s. lat. (<i>N. hygrophila</i>)	E1	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	1	6	
<i>Juncus monanthos</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	6	
ES	<i>Elyno-Seslerietea</i>																				
PaT	<i>Poa alpina</i>	E1	.	+	+	1	2	1	+	1	.	1	+	+	1	2	2	1	2	16	94
<i>Polygonum viviparum</i>	E1	1	1	1	+	1	1	1	2	1	1	.	1	1	.	+	1	+	15	88	
<i>Aster bellidiastrum</i>	E1	2	2	+	.	.	+	.	.	+	.	.	+	+	1	.	+	.	9	53	
<i>Myosotis alpestris</i>	E1	.	+	.	.	+	+	+	.	.	.	r	.	.	+	1	.	+	8	47	
<i>Selaginella selaginoides</i>	E1	+	+	.	.	.	.	.	1	.	.	.	1	1	1	.	.	.	6	35	
<i>Gentianella anisodonta</i>	E1	+	.	.	.	.	.	.	.	+	.	.	r	.	.	.	.	1	4	24	
<i>Homogyne discolor</i>	E1	.	1	.	.	.	.	.	.	.	.	.	.	2	2	.	.	.	3	18	
<i>Thymus praecox</i> subsp. <i>polytrichus</i>	E1	.	.	.	.	.	1	.	.	.	+	.	.	.	.	.	.	1	3	18	
<i>Agrostis alpina</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	1	.	.	.	+	3	18	
<i>Pedicularis verticillata</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	r	.	3	15	
<i>Sesleria caerulea</i>	E1	2	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	2	12	
<i>Anthyllis vulneraria</i> subsp. <i>alpestris</i>	E1	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	2	12	
<i>Euphrasia salisburgiensis</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	2	12	
<i>Bartsia alpina</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	6	
<i>Gentiana verna</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	6	
<i>Rhododendron hirsutum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	6	
<i>Alchemilla exigua</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	6	
JT	<i>Juncetea trifidi, Nardion strictae</i>																				
<i>Carex fuliginosa</i>	E1	.	.	.	.	.	.	1	1	.	.	.	.	+	+	.	.	+	5	29	
<i>Euphrasia minima</i>	E1	+	+	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	4	24	
NS	<i>Coeloglossum viride</i>	E1	.	1	.	.	+	.	.	.	.	.	.	.	1	.	.	.	3	18	
<i>Campanula scheuchzeri</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	2	12	
<i>Luzula spicata</i>	E1	.	+	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	2	12	
<i>Juncus jacquinii</i>	E1	.	.	.	.	.	.	.	1	.	.	.	.	2	.	.	.	.	2	12	
<i>Botrychium lunaria</i>	E1	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	+	2	12	
LV	<i>Loiseleurio-Vaccinietea, Vaccinio-Piceetea</i>																				
<i>Vaccinium gaultherioides</i>	E1	.	.	.	.	.	1	.	.	.	.	.	.	.	+	.	.	.	2	12	
VP	<i>Homogyne alpina</i>	E1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	6	
<i>Arctostaphylos alpinus</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	6	
VP	<i>Larix decidua</i>	E1	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	1	6	
AC	<i>Arabidetalia caeruleae (inc. Salicetea herbaceae)</i>																				
<i>Carex parviflora</i>	E1	.	.	.	1	1	+	+	+	+	.	.	1	+	1	1	.	1	11	65	
<i>Salix retusa</i>	E1	+	1	.	+	.	.	.	.	+	.	.	.	.	.	.	+	+	6	35	
<i>Ranunculus traunfellneri</i>	E1	.	1	.	+	.	.	.	1	.	.	.	.	.	.	+	+	.	5	29	
AA	<i>Trifolium pallescens</i>	E1	.	1	.	.	.	.	+	.	.	.	.	.	.	3	.	1	4	24	
<i>Carex ornithopodoides</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	+	+	.	.	+	4	24	
<i>Potentilla brauneana</i>	E1	1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	2	12	
DH	<i>Sesleria ovata</i>	E1	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	2	12	
<i>Galium noricum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	.	2	15	
AA	<i>Veronica alpina</i>	E1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	6	
SH	<i>Omalothea supina (Gnaphalium supinum)</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	6	
SH	<i>Alchemilla fissa</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	6	
SH	<i>Luzula alpinopilosa</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	6	

Number of relevé (Zaporedna številka popisa)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Pr.	Fr.
SH	<i>Sibbaldia procumbens</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	6
SH	<i>Soldanella pusilla</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	6
	<i>Saxifraga androsacea</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	6
TR	<i>Thlaspietalia rotundifolii</i>, <i>Thlaspietalia rotundifolii</i>																			
	<i>Saxifraga oppositifolia</i>	E1	.	.	1	+	.	.	+	+	.	.	.	1	.	.	.	+	6	35
	<i>Saxifraga sedoides</i>	E1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	+	.	3	18
	<i>Sedum atratum</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	2	12
MC	<i>Saxifraga aizoides</i>	E1	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	1	6
	<i>Achillea atrata</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	6
	<i>Linaria alpina</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	6
	<i>Poa minor</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	6
	<i>Taraxacum alpinum</i> agg.	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	6
	<i>Taraxacum</i> sp.	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	1	6
PC	<i>Potentilletalia caulescentis</i>																			
	<i>Festuca alpina</i>	E1	.	.	.	.	.	+	.	+	.	.	r	.	.	.	.	+	4	24
	<i>Potentilla nitida</i>	E1	.	.	+	.	.	.	.	.	.	.	r	.	.	.	.	+	3	18
	<i>Saxifraga tenella</i>	E1	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	2	12
	<i>Campanula cochleariifolia</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	8
	<i>Minuartia cherlerioides</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	8
	<i>Petrocallis pyrenaica</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	8
	<i>Eritrichum nanum</i>	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	8
	<i>Primula auricula</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	8
	<i>Asplenium viride</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	8
ML	Mosses and lichens (Mahovi in lišaji)																			
	<i>Tortella tortuosa</i>	E0	.	.	+	.	.	.	.	.	+	.	1	.	.	.	1	.	4	24
	<i>Distichium capillaceum</i> *	E0	.	+	.	.	.	+	.	.	.	.	+	.	.	.	1	.	4	24
	<i>Timmia norvegica</i> *	E0	.	1	.	.	.	1	.	.	.	.	.	.	.	.	1	.	3	18
	<i>Ditrichum flexicaule</i> *	E0	.	1	.	.	.	1	.	.	.	.	.	.	.	.	1	.	3	18
	<i>Sciuro-hypnum glaciale</i> *	E0	.	+	.	.	.	+	.	.	.	.	.	.	.	.	+	.	3	18
	<i>Vulpicida tubulosus</i>	E0	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	2	12
	<i>Thamnia vermicularis</i>	E0	.	.	.	.	.	.	.	.	1	.	.	.	.	.	+	.	2	12
	<i>Barbilophozia attenuata</i> *	E0	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	2	12
	<i>Cetraria islandica</i>	E0	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	6
	<i>Cetraria nivalis</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	6
	<i>Barbilophozia hatcheri</i> *	E0	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	6
	<i>Dicranum brevifolium</i> *	E0	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	6
	<i>Ortothecium rufescens</i>	E0	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	6
	<i>Callialaria curvicaulis</i> *	E0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	6
	<i>Mnium thomsonii</i> *	E0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	6

Legend - Legenda

ID Igor Dakskobler

TW Tone Wraber

A Limestone - apnenec

D Dolomite - dolomit

Gr Gravel - grušč

Li Lithosol - kamnišče

Re Rendzina - rendzina

Pr. Presence (number of relevés in which the species is presented) - število popisov, v katerih se pojavlja vrsta

Fr. Frequency in % - frekvenca v %

AA *Androsacion alpinae*CD *Caricetalia davallianae*SH *Salicetalia herbaceae*DH *Drabion hopeanae*NS *Nardion strictae*PAT *Poa alpinae-Trisetetalia*MC *Montio-Cardaminetalia*VP *Vaccinio-Piceetalia*

*det. Andrej Martinčič

Table 3: Groups of diagnostic species in the stands of the association *Gentiano pumilae-Salicetum serpillifoliae*
 Preglednica 3: Skupine diagnostičnih vrst v sestojih asociacije *Gentiano pumilae-Salicetum serpillifoliae*

Successive number (Zaporedna številka)	1
Number of relevés (Število popisov)	17
<i>Oxytropido-Elynion</i>	11,12
<i>Caricion firmae</i>	23,75
<i>Caricion ferrugineae</i>	3,22
<i>Seslerietalia coeruleae</i>	3,97
<i>Elyno-Seslerietea</i>	19,65
<i>Caricetalia davallianae</i>	3,43
<i>Juncetea trifidi, Nardion strictae</i>	4,97
<i>Loiseleurio-Vaccinietea, Vaccinio-Piceetea</i>	1,25
<i>Arabidetalia caeruleae</i> (inc. <i>Salicetea herbaceae</i>)	13,96
<i>Thlaspietalia rotundifolii, Thlaspietalia rotundifolii</i>	4,22
<i>Potentilletalia caulescentis</i>	6,94
Mosses and lichens (Mahovi in lišaji)	3,51
Total (Skupaj)	100

Number of relevé (Zaporedna številka popisa)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Pr.	Fr.
DH	<i>Sesleria ovata</i>	E1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7
TR3	<i>Thlaspietea rotundifolii</i>																	
	<i>Taraxacum alpinum</i>	E1	.	r	.	.	+	.	.	.	.	.	.	+	+	.	4	27
	<i>Saxifraga oppositifolia</i> s.str.	E1	+	.	.	.	+	.	.	.	.	.	.	.	.	.	2	13
	<i>Linaria alpina</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
	<i>Festuca nitida</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
PC	<i>Potentilletalia caulescentis</i>																	
	<i>Valeriana elongata</i>	E1	+	+	.	.	+	.	.	.	.	.	.	.	.	.	3	20
	<i>Festuca alpina</i>	E1	.	.	.	.	.	+	.	.	+	.	.	.	.	.	2	13
	<i>Campanula cochleariifolia</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	+	.	2	13
	<i>Saxifraga paniculata</i>	E1	.	.	.	.	.	.	.	.	.	.	.	1	.	+	2	13
	<i>Petrocallis pyrenaica</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	+	2	13
Cfir	<i>Caricion firmae</i>																	
	<i>Minuartia verna</i>	E1	1	.	+	+	.	.	+	1	.	.	.	+	+	.	7	47
	<i>Silene acaulis</i>	E1	+	2	+	1	+	.	.	.	.	.	.	.	.	.	5	33
	<i>Carex firma</i>	E1	1	+	1	1	1	1	.	.	.	1	.	.	.	.	7	47
	<i>Minuartia sedoides</i>	E1	1	2	+	1	.	.	+	.	.	.	.	+	.	.	6	40
	<i>Phyteuma sieberi</i>	E1	.	+	.	+	+	.	.	.	.	.	+	+	+	+	7	47
	<i>Sesleria sphaerocephala</i>	E1	.	.	.	.	+	+	+	.	.	+	.	+	.	.	5	33
	<i>Gentiana turgidula</i>	E1	.	1	.	.	+	+	.	.	.	.	.	.	+	.	4	27
	<i>Festuca quadriflora</i>	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	<i>Saussurea pygmaea</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	7
OE	<i>Oxytropido-Elynion</i>																	
	<i>Salix serpyllifolia</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	+	.	2	13
	<i>Erigeron uniflorus</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	7
	<i>Lloydia serotina</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	7
ES	<i>Elyno-Seslerietea</i>																	
PAT	<i>Poa alpina</i>	E1	+	+	+	+	.	+	.	.	.	.	+	.	+	.	7	47
	<i>Myosotis alpestris</i>	E1	+	.	.	.	.	.	.	.	.	.	+	+	+	+	5	33
	<i>Polygonum viviparum</i>	E1	+	.	.	1	+	+	+	.	.	.	.	+	.	.	6	40

Legend - Legenda

ID Igor Dakskobler

BZ Branko Zupan

TW Tone Wraber

Gr Gravel - grušč

Li Lithosol - kamnišče

Pr. Presence (number of relevés in which the species is presented) - število popisov, v katerih se pojavlja vrsta

Fr. Frequency in % - frekvenca v %

Re Rendzina - rendzina

PS *Physoplexido-Saxifragion petraeae*AA *Androsacion alpinae*CD *Caricetalia davallianae*SH *Salicetea herbaceae*DH *Drabion hoppeanae*PAT *Poa alpinae-Trisetetalia*

Table 5: Groups of diagnostic species in the stands of the association *Crepido terglouensis-Potentilletum nitidae* (small corrigendum of part of the Table 2 in Dakskobler & Zupan 2017)

Preglednica 5: Skupine diagnostičnih vrst v sestojih asociacije *Crepido terglouensis-Potentilletum nitidae* (majhen popravek dela Preglednice 2 v Dakskobler & Zupan 2017)

Successive number (Zaporedna številka)	1
Number of relevés (Število popisov)	15
<i>Arabidetalia caeruleae</i>	7,2
<i>Thlaspion rotundifolii</i>	16,27
<i>Thlaspietalia rotundifolii</i>	8,41
<i>Thlaspietea rotundifolii</i>	4,79
<i>Potentilletalia caulescentis</i>	20,52
<i>Caricion firmae</i>	25,95
<i>Oxytropido-Elynion</i>	6
<i>Elyno-Seslerietea</i>	10,85
Total (Skupaj)	100