

A NEW SUBASS. OF DINARIC ALTIMONTANE BEECH FOREST
RANUNCULO PLATANIFOLII-FAGETUM MARINČEK ET AL. 1993
 VAR. GEOGR. *CALAMINTHA GRANDIFLORA* MARINČEK 1996
SESLERIETOSUM AUTUMNALIS FROM Mt. SNEŽNIK

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ABSTRACT

A new, the most thermophilous subassociation *Ranunculo platanifolii-Fagetum* Marinček et al. 1993 var. geogr. *Calamintha grandiflora* Marinček 1996 *seslerietosum autumnalis* subass. nova is described. Its differential species are: *Sesleria autumnalis*, *Carex alba*, *Cirsium erisithales* and *Sorbus aria*.

Key words: beech forests, *Ranunculo platanifolii-Fagetum*, *Sesleria autumnalis*, Mt. Snežnik, Slovenia

INTRODUCTION

The first to phytosociologically research beech forests in the altimontane belt of Mt. Snežnik and elsewhere in the Dinaric area of Slovenia were V. Tregubov and G. Tomažič. In the beginning V. Tregubov incorporated them in the association *Fagetum subalpinum* Ht. 1938 (1957: 48-49); later on they were denominated *Adenostylo glabrae-Fagetum praealpino-dinaricum* Tregubov 1962 in internal expert reports (Smole, 1988: 25). In 1983 Marinček classified them in the association *Fagetum altimontanum dinaricum*. By the same name he presented them also in the monographic review of beech forests in Slovenia (Marinček 1987: 97-101). According to the Code of Phytosociological Nomenclature (Barkmann et al., 1987), Marinček and his associates (1993: 129) incorporated the altimontane beech forests of the Illyrian floral province into the association *Ranunculo platanifolii-Fagetum* Marinček et al. 1993. Marinček (1996: 199) described the Dinaric form of this association as a geographical variant by the name of *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora* Marinček 1996. In the period between 1970 and 1990 he gathered comprehensive phytosociological material on this geo-

graphical variant which is still in manuscript. On the basis of more than a hundred relevés he classified several subassociations. One of them is also a sub-association with *Sesleria autumnalis*, which is dealt with in this article.

METHODS

The vegetation was described according to the standard Central European method (Braun-Blanquet, 1964). We organized the relevés into a phytosociological table applying the methods of hierarchical classification. For this purpose we transformed combined estimations of cover and frequency with combined transformation as proposed by van der Maarel (1979).

As the subassociation *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora seslerietosum* is physiognomically and ecologically rather similar to the association *Sesleria autumnalis-Fagetum* (Ht.) M. Wraber ex Borhidi 1963, we made a comparison to one of its forms, namely to the geographical variant *Sesleria autumnalis-Fagetum* (Ht.) M. Wraber ex Borhidi 1963 var. geogr. *Phyteuma scheuchzeri* Dakskobler 1997 (mscr.) from the high karst plateaus of Otlica and Nanos.

The comparison included also a typical subassociation of the Dinaric altimontane beech forests (*Ranunculo platanifolii-Fagetum* Marinček *et al.* 1993 var. geogr. *Calamintha grandiflora* Marinček 1996 *ranunculetosum* Marinček 1997, mscr.). We compared the syntaxa enumerated, applying the method of Principal Coordinates Analysis = Metric Multidimensional Scaling. The measure for clustering was dissimilarity coefficient 1-similarity ratio. In numerical processing, classification and ordination the computer program package SYN-TAX 5.0 (Podani, 1993) was applied.

We refer to Trpin & Vreš (1995) and Marinček *et al.* (1992) for the nomenclature of plant species and vegetation units, and to Martinčič (1968) for the nomenclature of mosses.

RESULTS

Ecological Conditions

The subassociation *Ranunculo-Fagetum* var. geogr. *Calamintha grandiflora seslerietosum autumnalis* thrives on sunny slopes of Mt. Snežnik and its wider surroundings known as a distinctive Karst environment. However, the relief is not as diversified as this is the case by the majority of the subassociations of the association *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora*. Gentle to moderately steep slopes prevail, passing at spots to steeper ridges with more strongly expressed surface stoniness. Due to predominant dolomite parent material, the surface stoniness is weak in general.

The subassociation *Ranunculo-Fagetum* var. geogr. *Calamintha grandiflora seslerietosum* thrives at an altitude of 1170 to 1330 metres. Most frequently it is found at an altitude of 1200 to 1260 metres. At lower altitudes it is in direct contact with the association *Seslerio-Fagetum*. At higher altitudes the subassociation described does not border directly to Dinaric sub-Alpine beech forests - *Polysticho lonchitis-Fagetum* (l. Horvat, 1938) Marinček *et al.* 1993 var. geogr. *Allium victorialis* Marinček 1996 - between both communities mentioned there is more or less wide zone of typical subassociation of altimontane Dinaric beech forests - *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora ranunculetosum*.

Stands described thrive in explicitly sunny aspects.

The climate of Mt. Snežnik is one of the most humid in Slovenia. In the period from 1961 to 1990 the average annual precipitation was 2738 mm. The precipitation is relatively constantly distributed all over the year with the explicit maximum in November (383 mm) and minimum in July (132 mm) (Zupančič, 1995). Air humidity is very high, annually on an average over 80%. Average annual temperature ranges from 4.5 to 6 °C (Mekinda-Majaron, 1995). Heavy snowfalls are fre-

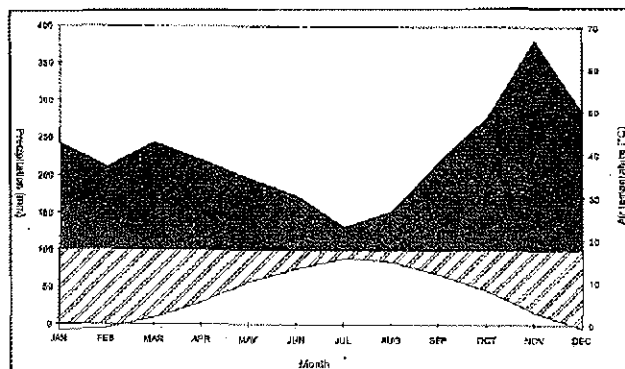


Fig. 1: Climatic Diagram (Zupančič, 1995; Mekinda-Majaron, 1995) - Gomance 1961-1990, according to Walter *et al.* (1964).

Sl. 1: Diagram klimatskih sprememb (Zupančič, 1995; Mekinda-Majaron, 1995) - Gomance 1961-1990, po Walterju *et al.* (1964).

quent, and in shady areas the snow does not melt till high spring. Vegetation period lasts for about five months, from the middle of May till the middle of October.

The community described thrives mostly on dolomite limestone, more rarely on limestone. Shallow to medium deep mull rendzina is very skeletal, especially on dolomite limestone.

Profile Description (Prus, 1997):

Location: the Mt. Snežnik, under the peak Maverski vrh, inclination 25°, southern aspect, 1230 m a.s.l.

O1 - 2 to 0, dry grass, litter consisting of beech leaves, sharply borders to A1.

A1 - 0 to 11, 7,5 YR 3/2 (dark brown), granular structure, well expressed, aggregate very stable, humose to very humose, roots very dense, individual skeleton up to 5 cm big, soft, brittle, dry to fresh.

A2 - 11 to 25 cm, 7,5 YR 3/2, (little less dark brown), sub-angular (blocky) structure, well expressed, aggregate very stable, sandy-silty-loamy texture, 25% skeleton of size from 5 to 10 cm, soft, brittle, dry to fresh, a little less humose, roots very dense, biologically active,

AC - 25 to 43 cm, 7,5 YR, 4/4, (between dark brown and brown), sub-angular (blocky) structure, well expressed, aggregate very stable, up to 70% of skeleton of size up to 20 cm, dry to fresh, soft, loose, medium humose, roots not dense.

Structure and Floristic Composition

Forests of the subassociation *seslerietosum autumnalis* are young crops in the transition to timbers and young timbers, from 15 to 25 m high. *Fagus sylvatica* predominates, being rarely accompanied by *Acer pseudoplatanus*. *Abies alba* was registered only once. We

can notice loose sabre-shape form of trees, the consequence of high snow which often does not melt till the end of May.

Shrub layer is not well developed. Mainly it consists of: beech regeneration, *Acer pseudoplatanus*, *Sorbus aria*, *Daphne mezereum*, *Lonicera alpigena* and *Rosa pendulina*.

Herb layer is given its basic character by the grasses *Sesleria autumnalis* and *Calamagrostis varia*, and sedge *Carex alba*.

Character species of the association *Ranunculo platanifolii-Fagetum*: *Ranunculus platanifolius* and *Adenostyles glabra* reach medium frequency and cover; nevertheless, together with species *Polygonatum verticillatum*, they well indicate altimontane character of the community described. Also character species of the geographical variant *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora*: *Calamintha grandiflora* and *Aremonia agrimonoides*, species which thrive best in the area of the Dinaric region, are very frequent.

Differential species of the subassociation *seslerietosum autumnalis*: *Sesleria autumnalis*, *Cirsium erithales*, *Carex alba* and *Sorbus aria*, character and differential species of order *Quercetalia pubescentis* indicate relatively warm site, very clearly differentiating the subassociation described from all other subassociations of the *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora*.

Mercurialis perennis, *Cyclamen purpurascens* and *Calamagrostis varia*, indicators of skeletal soils, also belong to the wide differential group. The last one appears as a facies in well lit places.

Character and differential species of the suballiance are not so frequent. *Saxifraga rotundifolia*, *Luzula sylvatica*, *Homogyne sylvestris*, *Polystichum lonchitis*, which have constant frequency in other subassociations of the *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora*, are completely absent. The species of the order *Adenostylectalia* also have low frequency in general. The absence of those species is not a consequence of a lower altitude, for the subassociation treated thrives approximately at the same altitude as other subassociations of the Dinaric altimontane forest, but a result of relatively warmer climate which is not favourable to formation of moder humus.

Character and differential species of the alliance *Aremonio-Fagion*: *Dentaria enneaphyllos*, *Cyclamen purpurascens*, *Vicia oroboides*, *Euphorbia carniolica*, *Hacquetia epipactis* and other reach high to medium frequency. We classified species *Rhamnus fallax* and *Isopyrum thalictroides* to the wider group of differential species of the alliance, too.

Character and differential species of the order *Fagetalia sylvaticae* are very frequent, with a note that explicitly mesophilous species, such as *Adoxa moschatellina*, *Actaea spicata*, *Geranium robertianum* and

some other, appear only as accidental species.

Acidophilous species, with the exception of shrub species *Rosa pendulina*, appear rarely, due to already stated reasons.

We did not study moss layer thoroughly, but while collecting phytosociological data we found the following mosses: *Ctenidium molluscum*, *Isoetecium myurum*, *Tortella tortuosa*, *Plagiothecium sylvaticum*.

Nomenclatural type of the *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora seslerietosum autumnalis* is relevé 2 in Phytosociological Table.

DISCUSSION

First we compared the subassociation *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora seslerietosum autumnalis* to the central subassociation of the association of altimontane Dinaric beech forests, *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora ranunculetosum platanifolii*. Comparison showed that the floristic composition of both subassociations is rather similar, especially regarding species of the alliance *Aremonio-Fagion* and order *Fagetalia sylvaticae*. They differ in frequency of the species of the suballiance *Saxifraga rotundifoliae-Fagenion*, above all. The subassociation *seslerietosum autumnalis*, which thrives at slightly lower altitudes, having somewhat thermophilous character due to prevailing sunny aspects, is lacking the species: *Saxifraga rotundifolia*, *Luzula sylvatica* and *Cicerbita alpina*, which are very frequent in the typical subassociation. In accordance with mesophilous nature of the central subassociation and great frequency of moder humus, there thrive moderately acidophilous species in its distribution area: *Oxalis acetosella*, *Picea abies* and *Abies alba*, both in the shrub layer, above all, and ferns: *Athyrium filix-femina*, *Polystichum aculeatum* and species *Aruncus dioicus* as the result of humid local climate of higher altitude. The subassociation *seslerietosum*, on the contrary, includes species of order *Quercetalia pubescentis* s. lat.: *Sesleria autumnalis*, *Carex alba* and *Sorbus aria*, in accordance with its moderately basophilous nature. Comparison of both subassociations showed that the floristic compositions of both communities differ a great deal, although not to such extent that they could be classified in two different associations.

Comparison of the subassociation *seslerietosum autumnalis* to contact community *Seslerio-Fagetum* (Ht.) M. Wraber ex Borhidi 1963 is even more interesting. We compared a geographical variant of this association, namely *Seslerio-Fagetum* var. geogr. *Phyteuma scheuchzeri* Dakskobler 1997 (mscr.), described in the area of the Otlica and Nanos plateaus. In the initial period of the vegetation research of altimontane beech forests in the fifties, the subassociation *seslerietosum* was classified in the association *Seslerio-Fagetum* (Tomažič et Tre-

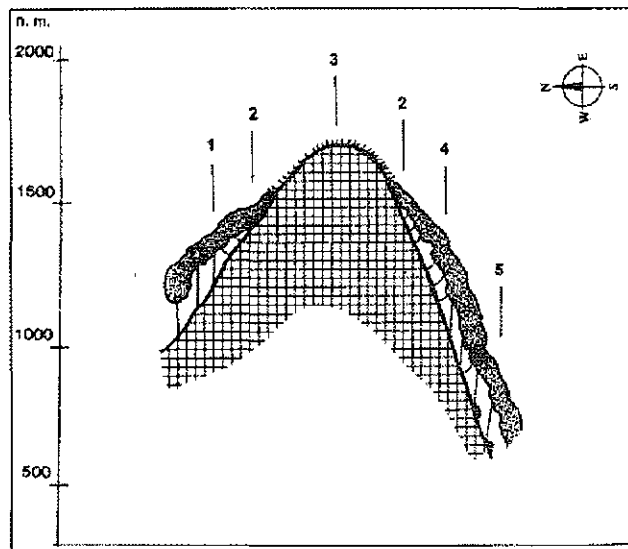


Fig. 2: Site of the subassociation *Ranunculo platanifolii-Fagetum Marinček et al. 1993 var. geogr. Calamintha grandiflora Marinček 1996 seslerietosum autumnalis*, according to Marinček (1987):

Sl. 2: Rastišče subasociacije *Ranunculo platanifolii-Fagetum Marinček et al. 1993 var. geogr. Calamintha grandiflora Marinček 1996 seslerietosum autumnalis*, po Marinčku (1987):

1. *Ranunculo platanifolii-Fagetum Marinček et al. 1993 var. geogr. Calamintha grandiflora Marinček 1996*,
2. *Polysticho lonchitis-Fagetum (l. Horvat, 1938) Marinček 1993 var. geogr. Allium victorialis Marinček 1996*,
3. *Pinetum mugii dinaricum*,
4. *Ranunculo platanifolii-Fagetum Marinček et al. 1993 var. geogr. Calamintha grandiflora Marinček 1996 seslerietosum autumnalis subass. nova*,
5. *Seslerio autumnalis-Fagetum (Ht.) M. Wraber ex Borhidi 1963*.

gubov, 1956). The comparison of the subassociation described and the association *Seslerio-Fagetum* showed rather great floristic differences between both syntaxa. The subassociation *Ranunculo-Fagetum* var. geogr. *Calamintha grandiflora seslerietosum* includes many species of the order *Adenostyletalia* s. lat.: *Adenostyles glabra*, *Ranunculus platanifolius*, *Polygonaum verticillatum*, *Phyteuma ovatum*, *Veratrum album*, *Senecio ovatus*, *Aconitum vulparia*, *Ribes petraeum*, which indicate, beside mesophility, also altimontane character of the community. Regarding the species of the alliance *Aremonio-Fagion* and order *Fagetalia sylvaticae* there are no essential differences between the syntaxa compared.

Present in the association *Seslerio-Fagetum* are thermophilous species of the suballiance *Ostryo-Fagenion*:

Asparagus tenuifolius, *Cornus mas*, *Euonymus verrucosa*, *Mercurialis ovata*, *Ostrya carpinifolia*, *Peucedanum austriacum*, *Fraxinus ornus* and order *Quercetalia pubescentis* s. lat.: *Arabis turrita*, *Campanula persicifolia*, *Lathyrus venetus*, *Melittis melissophyllum*, *Tanacetum corymbosum*, *Vincetoxicum hirundinaria*; order *Prunetalia spinosae* s. lat. *Clematis vitalba*, *Cornus sanguinea*, *Crataegus monogyna*, *Prunus mahaleb*, *Rhamnus cathartica*, *Viburnum lantana* and moderately thermophilous species of the class *Querco-Fagetea* s. lat.: *Hedera helix*, *Cephalanthera rubra*, *Corylus avellana*, *Cruciata glabra* and some other species which are completely absent in the subassociation *seslerietosum autumnalis*.

The comparison, carried out by the application of the PCoA method (Figure 3), revealed great floristic differences, clearly indicating that the subassociation belongs to the association *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora*.

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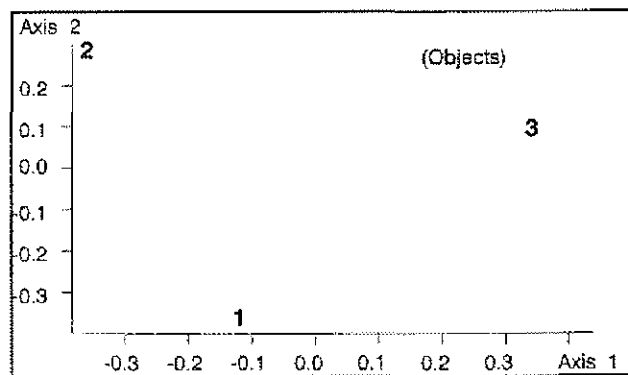


Fig. 3: Scatter Diagram of the associations:

Sl. 3: Diagram razpršenosti asociacij:

1. *Seslerio autumnalis-Fagetum (Ht.) M. Wraber ex Borhidi 1963 var. geogr. Phyteuma scheuchzeri Dakskobler 1997 (mscr.)*,
2. *Ranunculo platanifolii-Fagetum Marinček et al. 1993 var. geogr. Calamintha grandiflora Marinček 1996 seslerietosum autumnalis subass. nova*,
3. *Ranunculo platanifolii-Fagetum Marinček et al. 1993 var. geogr. Calamintha grandiflora Marinček 1996 ranunculetosum Marinček 1997 (mscr.)*.

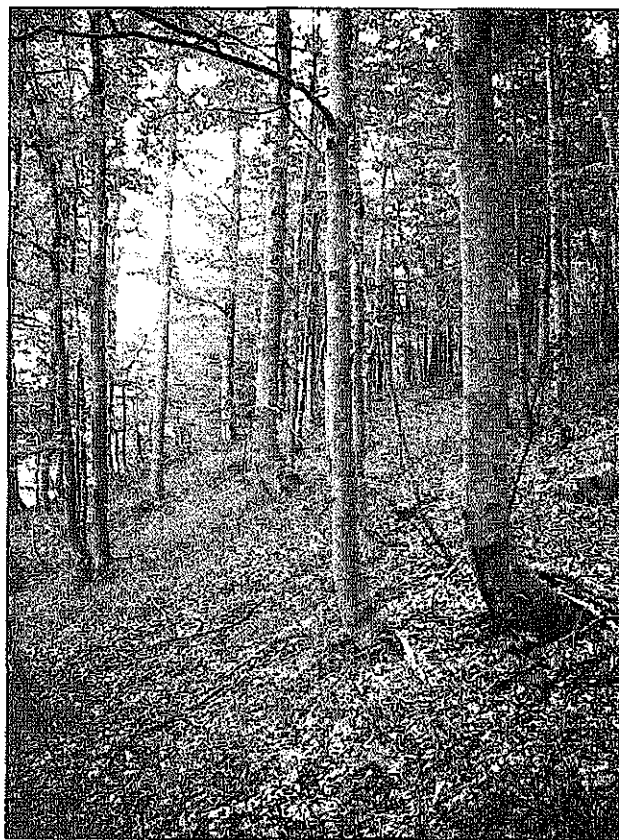


Fig. 4: Summer aspect of the association *Ranunculo platanifolii-Fagetum seslerietosum* on the slopes of Mt. Snežnik (Photo: U. Šilc).

Sl. 4: Poletni aspekt asociacije *Ranunculo platanifolii-Fagetum seslerietosum* na pobočjih Snežnika (Foto: U. Šilc).

NOVA SUBASOCIACIJA ALTIMONTANSKEGA BUKOVEGA GOZDA *RANUNCULO PLATANIFOLII-FAGETUM* MARINČEK ET AL. 1993 VAR. GEOGR. *CALAMINTHA GRANDIFLORA* MARINČEK 1996 *SESLERIETOSUM AUTUMNALIS* S SNEŽNIKA

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POVZETEK

Avtorja opisujeta novo subasociacijo *Ranunculo platanifoliae-Fagetum* var. *geogr. Calamintha grandiflora seslerietosum autumnalis*.

Dinarski altimontanski bukovi gozdovi so bili obravnavani kot samostojna asociacija že v šestdesetih letih. Gozdove te združbe, z imenom *Fagetum altimontanum dinaricum*, je temeljito preučil Marinček v obdobju 1970-1990. Pozneje so jih v skladu s kodeksom fitocenološke nomenklature preimenovali v *Ranunculo platanifolii-Fagetum* (Marinček et al., 1993).

V letu 1996 je skupaj z U. Šilcem popisal sestoje, ki so kot subasociacija *seslerietosum autumnalis* predstavljeni v tej razpravi.

Opisovana subasociacija *seslerietosum autumnalis* uspeva na prisojnih pobočjih Snežnika in njegove širše okolice. Prevladujejo položna do zmerno strma pobočja, ki tu in tam prehajajo v strmeje grebene z močnejše izraženo površinsko kamnitostjo. Subasociacija uspeva na nadmorski višini od 1170 do 1330 m. V nižjih legah neposredno prehaja v gozdove asociacije *Seslerietosum autumnalis-Fagetum*.

Klima širšega območja Snežnika je ena najbolj humidnih v Sloveniji. V obdobju od leta 1961 do 1990 je padlo povprečno 2738 mm padavin letno (Zupančič, 1995). Zračna vlaga je zelo visoka, povprečno prek 80%. Povprečne letne temperature so od 4,5 do 6 °C (Mekinda-Majaron, 1995).

Geološka podlaga so dolomitizirani apnenci. Tla so plitve do srednje globoke sprsteninaste rendzine.

V drevesni plasti bukev skoraj povsem prevladuje, redko ji je primešan gorski javor. Pokrovnost grmovne plasti je majhna. Med zelišči prevladuje vrsta *Sesleria autumnalis*, ki daje tem gozdovom značilen videz.

Diferencialne vrste subasociacije *seslerietosum autumnalis* so: *Sesleria autumnalis*, *Cirsium erisithales*, *Carex alba* in *Sorbus aria*. Te vrste (v širšem smislu značilnice in razlikovalnice reda *Quercetalia pubescentis*) nakazujejo relativno toplo krajevno klimo in zelo jasno ločijo subasociacijo *seslerietosum autumnalis* od drugih subasociacij združbe *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora*.

Primerjava floristične sestave opisane subasociacije s tipično subasociacijo visokogorskih dinarskih bukovih gozdov - *Ranunculo platanifolii-Fagetum* var. geogr. *Calamintha grandiflora ranunculetosum platanifolii* in z geografsko varianto *Seslerio-Fagetum* (Ht.) M. Wraber ex Borhidi 1963 var. geogr. *Phyteuma scheuchzeri Dakskobler 1997* (mscr.), z *Nanosa* in *Ollice*, je potrdila pripadnost opisane subasociacije *seslerietosum autumnalis altimontanskim* dinarskim bukovim gozdovom.

Ključne besede: bukovni gozdovi, *Ranunculo platanifolii-Fagetum*, *Sesleria autumnalis*, Snežnik, Slovenija

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PHYTOSOCIOLOGICAL TABLE: *Ranunculo platanifolii-Fagetum* Marinček et al. 1993 var. *geogr.* *Calamintha grandiflora* Marinček 1996 *seslerietosum autumnalis* subass. *nova*

Relevé no.		1	2	3	4	5	6	7	8	9	10				
Altitude - m		1260	1290	1250	1220	1200	1330	1190	1240	1170	1190				
Aspect		EES	W	S	SW	SW	S	S	S	S	S				
Slope - degrees		20	25	25	15	25	25	30	25	30	30				
Stoniness - %		30	20	/	20	30	10	15	/	5	/				
Area of relevé- m ²		400	400	400	400	400	400	400	400	400	400				
Cover - %	L														
Tree - A	A	90	80	90	90	90	90	90	90	90	80				
Shrub - B	Y	20	10	10	10	5	5	2	5	10	5				
Herb - C	E	70	90	90	80	10	70	80	70	50	50				
Moos - D	R	5	/	/	/	/	/	/	/	1	/				

Frequency (%)

CHARACTER AND DIFFERENTIAL SPECIES OF THE ASSOCIATION

<i>Ranunculus platanifolius</i>	C	1.1	1.1	+	+	1.1	+		1.1	+	+	90	53	
<i>Adenostyles glabra</i>	C	+	+				1.1	+2	+		+	60	74	4

CHARACTER SPECIES OF THE GEOGR. VAR. *CALAMINTHA GRANDIFLORA*

<i>Arenonia agrimonoides</i>	C	+	1.1		+	1.1	+2	+	+			70	58	92
<i>Calamintha grandiflora</i>	C				+2	+		+		+2	(+)	50	53	100

DIFFERENTIAL SPECIES OF SUBASSOCIATION *SESLERIETOSUM AUTUMNALIS*

<i>Sesleria autumnalis</i>	C	1.2	3.3	3.3	2.3	2.2	1.2	2.3	2.2	1.2	1.2	100		100
<i>Cirsium erisithales</i>	C	+	+2	+			+	+	+	1.2	+	80	16	
<i>Carex alba</i>	C	+2	+		+2		+2	+2	1.2	+2	+2	80		
<i>Sorbus aria</i>	B	+	+	+	+			+		+	+	70		87

SAXIFRAGO ROTUNDIFOLIAE-FAGENION

<i>Polygonatum verticillatum</i>	C	1.1	1.1	1.1	+	+2		+	+2	+	1.1	90	58	
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AREMONIO-FAGION

<i>Dentaria enneaphyllos</i>	C	1.1	1.1	1.1	1.1	1.1	2.2	1.1	1.1	2.2	2.2	100	74	79
<i>Cyclamen purpurascens</i>	C	+	+	+	+	+	+2	+	+	+	1.1	100		87
<i>Vicia oroboides</i>	C	+	1.1	+	+	+	+	+	+		+	90	21	
<i>Euphorbia carniolica</i>	C	+	+	+					+	+		50	16	
<i>Hacquetia epipactis</i>	C	+	+		+		+			+		50	11	4
<i>Cardamine trifolia</i>	C	+		+	+		+2					40	79	21
<i>Helleborus niger</i>	C		+						2.2	3.3	3.3	40	11	21
<i>Lamium orvala</i>	C			2.1		+2	+		+			40		29
<i>Aposeris foetida</i>	C			+	+				+			30		37
<i>Rhamnus fallax</i>	B									+2	+2	20	11	
<i>Isopyrum thalictroides</i>	C						+					10	11	

FAGETALIA SYLVATICAE

<i>Fagus sylvatica</i>	A	5.2	4.1	5.1	5.2	5.1	5.2	4.1	5.1	5.1	5.1	100	79	100
<i>Fagus sylvatica</i>	B	1.1	+	+	+	+	+2	+	+	1.1	1.1	100	79	92
<i>Fagus sylvatica</i>	C	1.1	+	+			+		+			50	53	25
<i>Daphne mezereum</i>	B	+	1.1	1.1	1.1	+	+	+	+	+	+	100	68	96
<i>Euphorbia amygdaloides</i>	C	+	+	+	+	+	1.1	+	+	+	+	100	47	67
<i>Heracleum sphondylium</i>	C	+	+	+	+	+	+	+2	+		+2	90	26	54
<i>Lonicera alpigena</i>	B	1.2	1.1		1.1	+	+	+	+	1.2	+2	90	26	46
<i>Mercurialis perennis</i>	C	1.1	1.1	+	1.1		2.2	2.2	1.1	1.1	1.1	90	58	87
<i>Dentaria bulbifera</i>	C			+	1.1	+	1.1		+	+2	+2	70	26	46
<i>Lilium martagon</i>	C	1.1	+	+	+	+		+2		+		70		
<i>Mycelis muralis</i>	C	+		+	+	+	+	+			+2	70	63	92
<i>Prenanthes purpurea</i>	C	1.1	1.1	+	+	+		+	+			70	58	79
<i>Acer pseudoplatanus</i>	A		+		1.1	+	+	+			+	60	58	8
<i>Acer pseudoplatanus</i>	B	1.1	+	+					+	+	+	60	63	25
<i>Acer pseudoplatanus</i>	C			+	+	+			+	+		40	63	58
<i>Lathyrus vernus</i>	C			+	+	+	+	+	+	+		60	32	92
<i>Euphorbia dulcis</i>	C	+				+	+		+2			40	11	67
<i>Polygonatum multiflorum</i>	C						+	+		1.1	+	40		58

		1	2	3	4	5	6	7	8	9	10			
Dryopteris filix-mas	C	+				+2				+		30	63	75
Ranunculus lanuginosus	C	+	+	+								30	42	12
Sorbus aucuparia	B	+	+								+	30	11	4
Festuca altissima	C					+	+					20	26	
Galeobdolon flavidum	C		+	+		1.1	1.1					40	68	37
Galium odoratum	C			+						+		20	32	57
Rubus idaeus	B	+		+								20	32	42
Actaea spicata	C	+										10	26	37
Adoxa moschatellina	C					+						10	5	
Carex pilosa	C		+									10		
Geranium robertianum	C					+						10	11	21
Melica nutans	C			+								10		29
Neottia nidus-avis	C										+	10	5	54
Paris quadrifolia	C								+			10	32	21
Sambucus nigra	B					+						10		
ADENOSTYLETALIA														
Phyteuma ovatum	C	+	1.1	+		+	1.1	+	+2	+	+2	90		
Veratrum album	C	+2	+	+	+	+	2.2		+			70	58	
Senecio ovatus	C	+		+		+2	+			+	+	60	58	50
Aconitum vulparia	C						1.1		+2			20		
Thalictrum aquilegifolium	C		+		+							20		
Ribes petraeum	B		+									10		
QUERCO-FAGETEA														
Anemone nemorosa	C	2.2	1.1	1.1	1.1	1.1	1.1	+2	1.1	1.1	1.1	100	79	83
Carex digitata	C		+2					+2		+		30		58
Fragaria moschata	C		+	+								20		
Lonicera xylosteum	B				+	+						20		79
Hepatica nobilis	C				+							10		62
VACCINIO-PICEETEA														
Rosa pendulina	B	1.1	1.1	+	+	+	+	+	+2		+	90	11	37
Maianthemum bifolium	C	+2	+		+				+		+	50	11	83
Valeriana tripteris	C	+	+			+						30	26	21
Gentiana asclepiadiadea	C	+	+									20	26	29
Luzula luzuloides	C			+			+					20	11	46
Rubus saxatilis	B		+2							+		20		
Veronica urticifolia	C	+	+									20	26	12
Abies alba	A								+			10	16	
Abies alba	C	+										10	21	
Clematis alpina	B		+									10		
Oxalis acetosella	C	1.1										10	68	
Picea abies	B		+									10	47	50
OTHER SPECIES														
Calamagrostis varia	C	2.3		+	1.2	1.2	2.3	2.3	1.2		+	80	21	54
Fragaria vesca	C				+		+	+		+	+	50	32	87
Galium laevigatum	C	+	+	+				+	+			50		
Dactylorhiza maculata														
subsp. maculata	C	+	+	+			+					40		
Verbascum nigrum	C			+					(+)			20		
Angelica sylvestris	C			+								10		
Convallaria majalis	C								+			10		87
Sambucus ebulus	B			+								10		
Sesleria albicans	C		2.2									10		
Taraxacum officinale	C		+									10		
Veronica chamaedrys	C										+	10		

* *Ranunculo platanifolii-Fagetum* Marinček et al. 1993 var. geogr. *Calamintha grandiflora* Marinček 1996 *ranunculetosum*

** *Seslerio autumnalis-Fagetum* (Ht.) M. Wraber ex Borhidi 1963 var. geogr. *Phyteuma scheuchzeri* Dakskobler 1997