

Association *Amelanchiero ovalis-Pinetum mugo* in northwestern Slovenia

Asociacija *Amelanchiero ovalis-Pinetum mugo* v severozahodni Sloveniji

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Abstract: We conducted a phytosociological study of dwarf pine stands on torrential fans and glacial material (moraine, till) in cirques of several Alpine valleys (Tolminka, Moznica) and on steep, shady erosion slopes (Struje above the Zadlaščica valley) in the belt of montane beech forests in the Julian Alps. Based on comparisons with similar communities in northern Italy we classified these stands into the association *Amelanchiero-Pinetum mugo* and into the new geographical variant with *Rhamnus fallax*. Floristically slightly similar dwarf pine stands in the altimontane and subalpine belts on sunny slopes of the Tolmin-Bohinj Mts. are classified into the new variant *Rhodothamno-Pinetum mugo typicum* var. *Genista radiata*.

Keywords: phytosociology, synsystematics, *Amelanchiero-Pinetum mugo*, *Rhodothamno-Pinetum mugo*, Natura 2000, Julian Alps, Slovenia

Izvleček: Fitocenološko smo preučili ruševje, ki uspeva na hudourniških vršajih in ledeniškem gradivu (morena, til) v krnicah nekaterih alpskih dolin (Tolminka, Moznica) in na strmih osojnih erozijskih pobočjih (Struje nad dolino Zadlaščice) v pasu montanskih bukovih gozdov v Julijskih Alpah in ga na podlagi primerjav s podobnimi združbami v severni Italiji uvrstili v asociacijo *Amelanchiero-Pinetum mugo* in v novo geografsko varianto z vrsto *Rhamnus fallax*. Floristično nekoliko podobno ruševje v altimontanskem in subalpinskem pasu na prisojnih pobočjih Tolminsko-Bohinjskih gora uvrščamo v novo varianto *Rhodothamno-Pinetum mugo typicum* var. *Genista radiata*.

Ključne besede: fitocenologija, sinsistematika, *Amelanchiero-Pinetum mugo*, *Rhodothamno-Pinetum mugo*, Natura 2000, Julijske Alpe, Slovenija

Introduction

In terms of phytosociology, dwarf pine stands in Slovenia have been extensively studied. In the last ten years, Zupančič and colleagues (Zupančič et al. 2004, 2006, 2007, Zupančič and Žagar 2007, Zupančič 2007, 2013) presented with analytical

tables the following syntaxa at the rank of association: *Hyperico grisebachii-Pinetum mugo*, *Rhodothamno-Rhododendretum hirsuti* var. geogr. *Paederota lutea* = *Rhodothamno-Pinetum mugo* Zupančič et Žagar in Zupančič 2013 and *Sphagno-Pinetum mugo*. An analytical table of dwarf pine stands in the Slovenian Alps was published also

by Rozman (2008). Later on, we published a description of similar syntaxa (*Rhododendro hirsuti-Betuletum carpaticae*, *Rhodothamno-Pinetum mugo* var. *Alnus viridis* and var. *Peucedanum ostruthium*) – Dakskobler et al. (2012, 2013a,b). In the article on forest vegetation of the Bovec region (Dakskobler 2004: 28) we discussed also the association *Amelanchiero ovalis-Pinetum mugo*. This association was described by Minghetti in the province of Trentino in northern Italy. His first relevés were published in the excursion guide by F. Pedrotti in 1994 and a comprehensive account came out in an article published in 1996. He classified the colline-montane form of pioneer dwarf pine stands on talus and established screes with initial soils into this association. Minghetti made the relevés at the elevations ranging from 475 m to 850 m. His stands are differentiated from other forms of southern-Alpine dwarf pine communities by thermophilous species such as *Amelanchier ovalis*, *Viburnum lantana*, *Berberis vulgaris*, *Coronilla emerus*, *Cotinus coggygria*, *Fraxinus ornus* and *Ostrya crapinifolia*. Phytosociological tables of this association were later published also by Poldini and Vidali (1999) and Poldini et al. (2004), mainly on the basis of the relevés from the Carnian and western Julian Alps in Friuli (north-eastern Italy). Zupančič et al. (2006) classified the Friuli relevés into the syntaxon *Rhodothamno-Rhododendretum hirsuti* forma *Amelanchier ovalis* (= *Rhodothamno-Pinetum mugo* forma *Amelanchier ovalis*). According to them, these relevés characterise a transitional form between the stands of the association *Rhodothamno-Pinetum mugo* and *Amelanchiero-Pinetum mugo*, but are closer to the first rather than the latter. During our research in the Julian Alps (especially in the Tolmin region), as well as in the Karavanke Mts. (the Draga valley under Begunjščica) and in the Kamnik Alps (Jezerško – Makekova Kočna and Ravenska Kočna), we observed dwarf pine stands with characteristics very similar to the dwarf pine stands classified by Minghetti (ibid.) and Poldini et al. (ibid.) into the association *Amelanchiero-Pinetum mugo*, so we wanted to confirm the occurrence of this association in Slovenia with an analysis and comparison of our relevés with the already published relevés from northern Italy. For the time being, we have focused on the relevés from the Julian Alps (Figure 1), as we are still conducting

research into similar stands in the Karavanke Mts. and in the Kamnik Alps (Rozman in Dakskobler, in litt.). Similar *Pinus mugo* communities have been recorded and researched (but results not yet published) also in southern Carinthia in Austria (Franz, in litt.).

Methods

Dwarf pine stands in the Julian Alps were recorded applying the central-European phytosociological method (Braun-Blanquet 1964). Relevés were entered into the FloVegSi database (Seliškar et al. 2003). Combined cover-abundance values were transformed into ordinal values 1–9 (van der Maarel 1979). The relevés were mutually compared by means of hierarchical classification and two ordination methods: Principal Coordinates Analysis (PCoA, similarity ratio) and Non-metric Multidimensional Scaling (NMDS) with Goodman-Kruskal's γ coefficient; they were subsequently arranged into two analytical tables based on the results of the “(unweighted) average linkage” – UPGMA method, using Wishart's coefficient similarity ratio. SYN-TAX 2000 (Podani 2001) software package was used in these comparisons. The comparison of floristic composition of dwarf pine stands from the Julian Alps with dwarf pine stands from the association *Amelanchiero-Pinetum mugo* from northern Italy was also conducted by means of hierarchical classification (UPGMA, similarity ratio) and with the Principal Coordinates Analysis (PCoA, similarity ratio). Geoelemental, ecological and phytosociological designation of plant species follows the Flora alpina (Aeschmann et al. 2004a, b, c). Phytosociological groups (= groups of diagnostic species) were formed based on our own criteria, but with consideration of this source. The nomenclature source for the names of vascular plants is Martinčič et al. (2007), Martinčič (2003, 2011) for the names of mosses, Suppan et al. (2000) for the names of lichens, and Zupančič (2007, 2013) and Šilc and Čarni (2012) for the names of syntaxa.

Short ecological description of the study area

Dwarf pine stands were recorded in the southern and western part of the Julian Alps, in the elevation

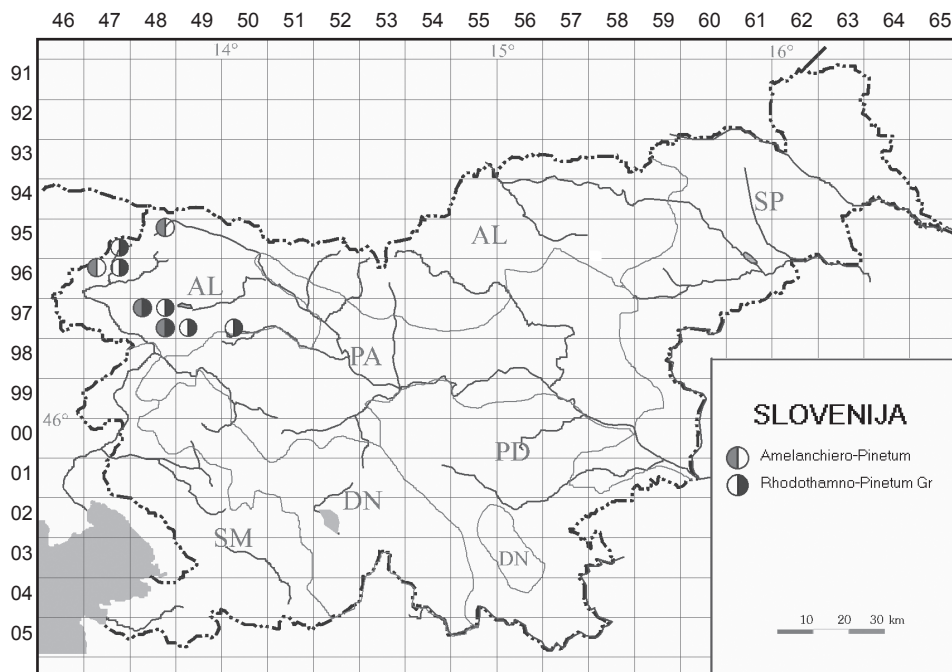


Figure 1: Approximate localities of the studied dwarf pine communities in the map of Slovenia
 Slika 1: Približna nahajališča preučevanih združb v rušja (*Pinus mugo*) na zemljevidu Slovenije

belt from 800 m to 2000 m. Most of the relevés were made in the Tolmin region (in the valleys of the Tolminka, the Zadlaščica, the Knežica and the Bača or on their slopes), under the ridge of the Tolmin-Bohinj Mts. from Dravh, Šoštar, Zovh (Rušni vrh), Črna prst, Hohkovbl (Matajurski vrh), Rodica, to Vogel, Žabijski Kuk, Tolminski Migovec and Mahavšček, as well as in the Bovec region (in the valleys of the Loška Koritnica, the Možnica, the Bala, Vrsnik and the Mlinarica); one relevé was made under the Stol ridge (Mali Muzec) and one relevé above the valley of Mala Pišnica near Kranjska Gora. The geological bedrock on relevé plots is limestone, dolomite, dolomite limestone, talus, torrential deposits and glacial material (till) – Buser (2009); the soil is initial, lithosol or shallow rendzina. The climate in the study area of the Julian Alps is humid, with mean annual precipitation exceeding 2000 mm, totalling about 2500 mm to 3000 mm and more in the Tolmin-Bohinj and Stol ridges (B. Zupančič 1995, 1998) and relatively warm, with the mean annual temperature of around

2 °C – 6 °C (Cegnar 1998) and with the snow cover duration of 100 to 150 days. Differences in the local climate are considerable, which is especially relevant for the relevés on shady aspects where the snow cover is long-lasting and the vegetation period short. Stands on sunny slopes and lower elevations (below 1000 m) occur in a warmer local climate and the snow in the areas where snow slides do not accumulate soon melts in the spring. The prevailing forest vegetation in the area is beech forest from the associations *Anemono-Fagetum*, *Homogyno sylvestris-Fagetum* and *Polysticho lonchitis-Fagetum*. Only sporadically (for example in Kožljak above the Tolminka valley and in Mala Pišnica valley) do researched stands occur also in contact with the stands of southern-Alpine black and (or) Scots pine association *Fraxino orni-Pinetum nigrae* (incl. subassociation *pinetosum sylvestris*). Most of the relevés were made in areas that have not been much affected by human activity, except for grazing of small ruminants in the past. A significant ecological factor are snow slides, in some

locations also raging torrents, earthquakes and related rockfall.

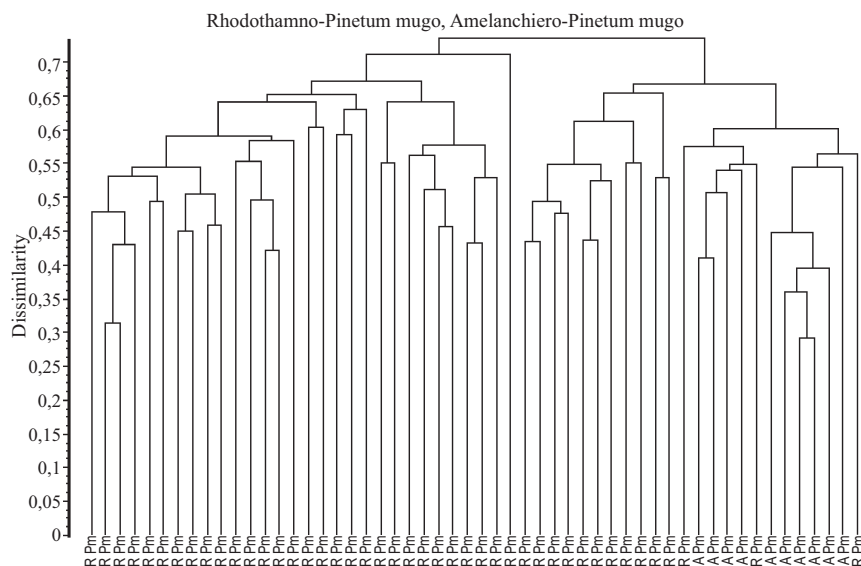


Figure 2: Dendrogram of relevés of dwarf pine stands in western and northwestern Slovenia (UPGMA, similarity ratio); Rpm *Rhodothamno-Pinetum mugo*, APm *Amelanchiero-Pinetum mugo*

Slika 2: Dendrogram popisov sestojev rušja (*Pinus mugo*) v zahodni in severozahodni Sloveniji (UPGMA, similarity ratio); Rpm *Rhodothamno-Pinetum mugo*, APm *Amelanchiero-Pinetum mugo*

Results and discussion

In hierarchical classification, 54 relevés of dwarf pine stands formed two larger groups (Figure 2). The second group (on the right) comprised also the stands classified, based on the site and floristic composition, into the association *Amelanchiero-Pinetum mugo*. On the basis of Figure 2 we made two analytical tables for this group of relevés (Tables 1 and 2) and included into them dwarf pine stands from Alpine valleys and those dwarf pine stands from the altimontane-subalpine belt that are the most floristically similar to them. The floristic composition of two of the syntaxa determined in this way was compared to the floristic composition of dwarf pine stands on the southern and partly western side of the Julian Alps and with two forms of the association *Amelanchiero-Pinetum mugo* from northern Italy (Minghetti 1996, Table 1, Poldini and Vidali 1999, Table 3). For the comparison we used our, still unpublished relevés originating from the same areas as the relevés of

the studied community. Previously published relevés by Zupančič et al. (2006) are generally more species-rich and less suitable for this comparison. We obtained a synthetic table with five columns and compared them with hierarchical classification and two-dimensional ordination (Figures 3 and 4).

Legend to Figures 3 and 4:

Rpm *Rhodothamno-Pinetum mugo* s. lat., Julian Alps, Dakskobler (in litt.)

RPmgr *Rhodothamno-Pinetum mugo* var. *Genista radiata*, Julian Alps (Table 2 in this article)

APm-JA *Amelanchiero-Pinetum mugo*, Julian Alps (Table 1, this article)

APm-Tr *Amelanchiero-Pinetum mugo*, Trentino, northern Italy (Minghetti 1996, Table 1)

APm-F *Amelanchiero-Pinetum mugo*, Friuli, northeastern Italy (Poldini and Vidali 1999, Table 3).

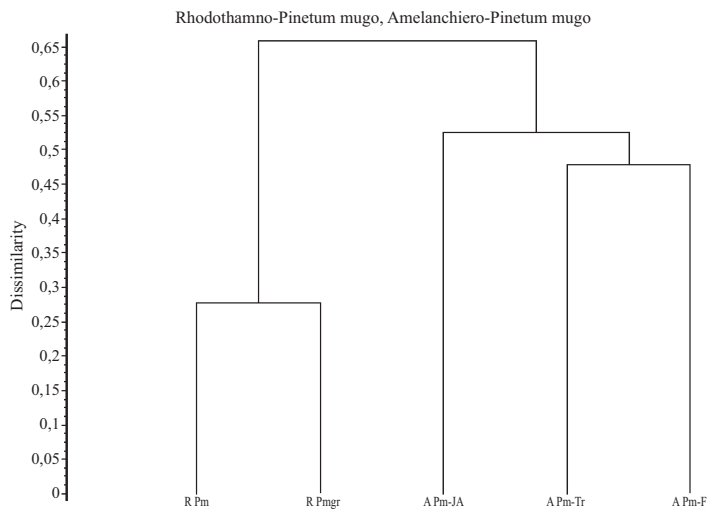


Figure 3: Dendrogram of dwarf pine stands from (north)western Slovenia and north Italy (UPGMA, similarity ratio)

Slika 3: Dendrogram ruševja iz (severo)zahodne Slovenije in severne Italije (UPGMA, similarity ratio)

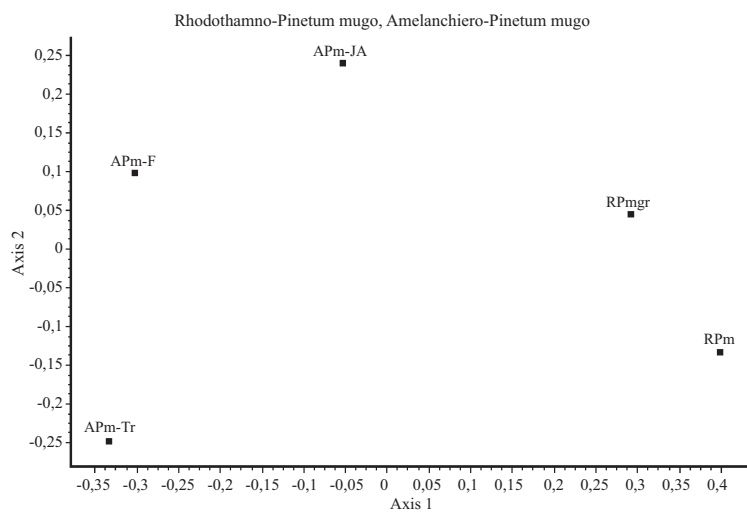


Figure 4: Two-dimensional scatter diagram of dwarf pine stands from (north)western Slovenia and northern Italy (PCoA, similarity ratio)

Slika 4: Dvorazsežni ordinacijski diagram ruševja iz severozahodne Slovenije in severne Italije (PCoA, similarity ratio)

The results corroborate the validity of our assumption that some forms of dwarf pine stands in cirques of the Slovenian Alps can be classified into the association *Amelanchiero ovalis-Pinetum mugo* as they are floristically more similar to other forms of this association from northern Italy known so far than to some more thermophilous forms of subalpine dwarf pine stands from the Julian Alps. Synthetic table (Table 3) and the analysis of the proportion of diagnostic species (Table 4) demonstrate certain differences and similarities between the compared syntaxa. Relevés of the association *Amelanchiero-Pinetum mugo* from the Julian Alps as compared to the relevés of the same association from northern Italy are specific in that some diagnostic species from the class *Rhamno-Prunetea* and order *Quercetalia pubescenti-petraeae* (for example *Viburnum lantana*, *Coronilla emerus*, *Cotinus coggygria*, *Quercus pubescens*, *Hierochloë australis*) and some diagnostic species from the class *Erico-Pinetea* (*Chamaecytisus purpureus*, *Daphne cneorum*, *Knautia ressmannii*) are absent. Absence of these diagnostic species makes them similar to some forms of subalpine dwarf pine stands from the association *Rhodothamno-Pinetum mugo*, which was established also by Zupančič et al. (2006). They are clearly differentiated from the stands of this association by *Amelanchier ovalis*, *Fraxinus ornus*, *Ostrya carpinifolia*, *Frangula alnus*, *Hieracium porrifolium*, *Leontodon incanus*, *Euphrasia cuspidata*, *Peucedanum oreoselinum*, *Vincetoxicum hirsutinaria*, *Teucrium montanum*, *Inula ensifolia*, and to a lesser extent also by some other species. The proportion of diagnostic species of basophilous pine forests (class *Erico-Pinetea*), thermophilous oak forests (order *Quercetalia pubescenti-petraeae*), dry grasslands (class *Festuco-Brometea*) and screes (class *Thlaspietea rotundifolii*) in the stands of the association *Amelanchiero-Pinetum mugo* from the Julian Alps is considerably higher than in the stands of dwarf pine stands from the association *Rhodothamno-Pinetum mugo*, while the proportion of diagnostic species of spruce forests (class *Vaccinio-Piceetea*) and species of tall herbs and subalpine shrubs (class *Mulgedio-Aconitetea*, *Betulo-Alnetea viridis*) is considerably smaller (Table 4).

The studied stands of the association *Amelanchiero-Pinetum mugo* comprise all four character species of the association *Rhodothamno-*

Pinetum mugo: *Rhodothamnus chamaecistus*, *Anemone trifolia*, *Laserpitium peucedanoides* and *Genista radiata*; this was expected because these species are characteristic of the southeastern-Alpine mountain region and occur also in other forest-scrub and grassland communities of the Julian Alps (for example in the stands of the beech association *Polysticho lonchitis-Fagetum* or in the stands of subalpine grasslands from the association *Ranunculo hybridi-Caricetum sempervirentis*). In this case, the entire species composition must be the decisive factor that justifies the classification into higher syntaxonomic units. Minghetti (1996) classified the association *Amelanchiero-Pinetum mugo* into the alliance *Berberidion*, and the order *Prunetalia spinosae* and class *Quercu-Fagetea*, Poldini et al. (2004) into the alliance *Erico-Fraxinion orn* Horvat 1950, order *Erico-Pinetalia* and class *Erico-Pinetea*. Zupančič (2007, 2013) classifies the association *Rhodothamno-Pinetum mugo* into the suballiance *Rhodothamno-Pinenion mugo* Zupančič 2013, into the alliance *Erico-Pinion mugo* Leibundgut 1948, into the order *Vaccinio-Piceetalia* and class *Vaccinio-Piceetea*. The analysis of diagnostic species (Table 4) demonstrated that classification of dwarf pine stands from the association *Amelanchiero-Pinetum mugo* in the Julian Alps into the class *Vaccinio-Piceetea* is not possible, so we classify this association into the suballiance *Helleboro nigri-Pinenion* Zupančič 2007, into the alliance *Fraxino orn-Pinion nigrae-sylvestris* (Horvat 1958) Zupančič 2007, into the order *Erico-Pinetalia* and class *Erico-Pinetea*. Based on the comparison with forms from northern Italy we selected as diagnostic for this association the species *Amelanchier ovalis*, *Fraxinus ornus*, *Ostrya carpinifolia*, *Hieracium porrifolium* and *Frangula alnus*. The listed species in conjunction with some other species indicate a pioneer form of dwarf pine stands in the belt of montane beech forest where extreme site conditions (steep slopes, stony and dry sites, initial soil) hinder progressive development into the prevailing neighbouring forest vegetation. Stands from the Slovenian part of the Julian Alps are described also as a new geographical variant *Amelanchiero-Pinetum mugo* var. geogr. *Rhamnus fallax* var. geogr. nov. (the nomenclature type, *holotypus*, is relevé No. 7 in Table 1). *Rhamnus fallax* is a Southeast-European

montane shrub, characteristic for Illyrian beech forests from the alliance *Aremonio-Fagion* and for stony sites. Its western distribution borderline is in the western foothills of the Julian Alps (Stol ridge) and its northernmost localities are in southern Carinthia in Austria (Dakskobler et al. 2013). The differential species of the new geographical variant are also southeastern-Alpine endemic taxa *Aconitum angustifolium* and *Centaurea haynaldii* subsp. *julica*. Stands of this new syntaxon were found at the elevation between 770 m and 1230 m, both on shady and sunny aspects, on very steep and mild slopes, always on shallow initial soils. Two variants are distinguished. Stands of the frigidophilous variant with *Carex firma* (differential species are also *Hylocomium splendens*, *Tofieldia calyculata*, *Salix appendiculata* and *Selaginella selaginoides*) were found on shady aspects, in the erosion area in Struje above the Zarobarska grapa gorge (the Zadlaščica valley) and in the Možnica valley. Stands of the thermophilous form, var. *Peucedanum oreoselinum* (differential species include *Fraxinus ornus*, *Viola hirta*, *Helleborus niger*, *Carduus crassifolius*, *Leucanthemum maximum* agg., *Vincetoxicum hirundinaria*, *Carex alba* and *Inula ensifolia*) occur mainly on sunny aspects and were recorded on glacial material (unconsolidated morain, till) in the gable of the Tolminka valley – Gnelice and in the Mala Pišnica valley. The dwarf pine stands from the Julian Alps that floristically most resemble the stands of the association *Amelanchiero-Pinetum mugo* are classified into the syntaxon *Rhodothamno-Pinetum mugo typicum* var. *Genista radiata*. *Genista radiata* is supposed to be a character species of the association *Rhodothamno-Pinetum mugo*, but its frequency in the phytosociological table with 113 relevés (Zupančič et al. 2006, Phyt. Table 1) is only 14 %, which means it is not widely distributed in Alpine dwarf pine stands in Slovenia. In our opinion, it characterises warmer sites on sunny slopes of the sub-Alpine belt. The differential species of the variant is also *Amelanchier ovalis*. In terms of phytogeography, the stands of the syntaxon *Rhodothamno-Pinetum mugo typicum* var. *Genista radiata* are characterised by the taxa *Centaurea haynaldii* subsp. *julica*, *Aconitum angustifolium*, *Anemone trifolia* and *Rhamnus fallax*, which differentiate them from similar dwarf pine stands elsewhere in the Eastern Alps. Relevés

were made at the elevation of 1230 m to 1690 m, mainly still in the belt of altimontane and subalpine beech stands (*Anemone trifoliae-Fagetum*, *Polysticho lonchitis-Fagetum*), on sunny slopes of the Tolmin-Bohinj Mts. (two relevés also in the Bovec area). The upper line of occurrence of stands of the association *Amelanchiero-Pinetum mugo* in the southern Julian Alps overlaps with the lower line of occurrence of the stands of the syntaxon *Rhodothamno-Pinetum mugo* var. *Genista radiata*.

Conclusions

The phytosociological analysis of dwarf pine stands in the southern and partly also in the central Julian Alps revealed a group of similar phytocoenoses that are differentiated by thermophilous species which are very rare in the subalpine and in the lower alpine belt. Dwarf pine stands in the Julian Alps that grow on warm aspects in cirques of Alpine valleys or on very steep, eroded dolomite slopes in the belt of montane beech forests can be classified, based on their floristic composition, into the association *Amelanchiero ovalis-Pinetum mugo*. They are a long-term pioneer stage on extreme sites where natural factors, erosion and snow slides, inhibit the development into the beech forest. While they do not comprise all diagnostic species of this association that was described in northern Italy, the frequent occurrence of *Amelanchier ovalis*, *Fraxinus ornus*, *Ostrya carpinifolia*, *Hieracium porrifolium* and *Frangula alnus* clearly differentiates them from the dwarf pine stands from the association *Rhodothamno-Pinetum mugo* that is widely distributed in the Julian Alps, as well as from their most thermophilous form *Rhodothamno-Pinetum mugo typicum* var. *Genista radiata*. Stands of the association *Amelanchiero-Pinetum mugo* have for now been described in the valleys of the Tolminka, Zadlaščica, Možnica and Mala Pišnica, but have also been detected in the Draga valley under Begunjščica in the western Karavanke and in the valleys of Ravenska Kočna and Makekova Kočna in the Jezersko region in the Kamnik Alps. They belong to a habitat type of Community interest (4070*). Their stands comprise also some endemic, protected or rare and endangered species (Anon.

2002, 2004), such as *Centaurea haynaldii* subsp. *julica*, *Aconitum angustifolium*, *Arctostaphylos uva-ursi*, *Epipactis atrorubens*, *E. helleborine*, *Platanthera bifolia*, *Gymnadenia odoratissima*, *G. conopsea*, *Convallaria majalis*, *Primula wulfeniana* and *Gentiana chusii*. In these stands, dwarf pines sometimes occur as trees (Gnelice in the gable of the Tolminka valley), but are still determined as taxon *Pinus mugo* subsp. *mugo*.

Synsystematic classification of the studied communities into higher units is as follows:

Class: *Erico-Pinetea* Horvat 1959

Order: *Erico-Pinetalia* Horvat 1959

Alliance: *Fraxino orni-Pinion nigrae-sylvestris* Zupančič 2007 (synonym *Fraxino orni-Ericion* Horvat 1959 = *Erico-Fraxinion orni* Horvat 1959)

Suballiance: *Helleboro nigri-Pinenion* (Horvat 1959) Zupančič 2007

Association: *Amelanchiero-Pinetum mugo* Minghetti in Pedrotti 1994

var. geogr. *Rhamnus fallax* var. geogr. nova
var. *Carex firma*

var. *Peucedanum oreoselinum*

Class: *Vaccinio-Piceetea* Br.-Bl. et al. 1939 em. Zupančič (1976) 1980

Order: *Junipero-Pinetalia* Boşcaiu 1971

Alliance: *Erico-Pinion mugo* Leibundgut 1948

Suballiance: *Rhodothamno-Pinenion mugo* Zupančič 2013

Association: *Rhodothamno-Pinetum mugo* Zupančič et Žagar in Zupančič 2013
typicum Zupančič, Žagar et Culiberg 2006
var. *Genista radiata* var. nov.

Alpah uspeva na toplih legah v krmicah alpskih dolin ali na zelo strmih narušenih dolomitnih pobočjih v pasu montanskih bukovih gozdov, lahko na podlagi njegove floristične sestave uvrstimo v asociacijo *Amelanchiero ovalis-Pinetum mugo*. Je dolgozrajen pionirski stadij na skrajnih rastiščih, kjer naravni dejavniki, erozija in snežni plazovi, onemogočajo razvoj v bukov gozd. V njem sicer ne uspevajo vse diagnostične vrste te v severni Italiji opisane asociacije, a pogosta prisotnost vrst *Amelanchier ovalis*, *Fraxinus ornus*, *Ostrya carpinifolia*, *Hieracium porrifolium* in *Fragula alnus* ga dobro razlikuje od v Julijskih Alpah splošno razširjenega ruševja iz asociacije *Rhodothamno-Pinetum mugo*, tudi od njegove najbolj toploljubne oblike *Rhodothamno-Pinetum mugo typicum* var. *Genista radiata*. Sestoje asociacije *Amelanchiero-Pinetum mugo* smo za zdaj popisali v dolinah Tolminke, Zadlaščice, Možnice in Male Pišnice, opazili pa smo jih tudi v dolini Drage pod Begunjščico v zahodnih Karavankah in v Ravenski in Makekovi Kočni na Jezerskem v Kamniških Alpah. Sodiijo v prednostni evropsko varstveno pomemben habitatni tip (4070*). V njegovih sestojih uspevajo tudi nekatere endemične, zavarovane ali redke in ogrožene vrste (Anon. 2002, 2004), kot so *Centaurea haynaldii* subsp. *julica*, *Aconitum angustifolium*, *Arctostaphylos uva-ursi*, *Epipactis atrorubens*, *E. helleborine*, *Platanthera bifolia*, *Gymnadenia odoratissima*, *G. conopsea*, *Convallaria majalis*, *Primula wulfeniana* in *Gentiana chusii*. Rušje ima ponekod v teh sestojih drevesno vzrast (Gnelice v zatrepu doline Tolminke), a ga še vedno uvrščamo v takson *Pinus mugo* subsp. *mugo*.

Povzetek

Fitocenološka analiza ruševja v južnih in deloma osrednjih Julijskih Alpah je pokazala na skupino podobnih fitocenoov, ki jih razlikujejo toploljubne vrste, ki so v subalpskem in spodnjem alpskem pasu zelo redke. Ruševje, ki v Julijskih

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Appendix:

Tables 1 to 4

Number of relevé (Zaporedna številka popisa)		1	2	3	4	5	6	7	8	9	10			
Coordinate GK X (D-48) m		5118445	5118484	5138347	5126127	5148545	5125382	5125261	5125362	5125358	5125195			
Diagnostic species of the association (Diagnostične vrste asociacije)												Pr.	Fr.	
EP	<i>Pinus mugo</i>	E2b	5	3	4	4	4	4	4	4	4	10	100	
EP	<i>Pinus mugo</i>	E2a	.	+	+	.	.	1	.	.	.	+	4	40
EP	<i>Amelanchier ovalis</i>	E2	+	1	1	+	+	1	1	+	2	10	100	
TR	<i>Hieracium parvifolium</i>	E1	.	r	1	+	+	1	+	+	r	9	90	
QP	<i>Fraxinus ornus</i>	E3a	.	.	.	.	1	.	+	.	.	2	20	
QP	<i>Fraxinus ornus</i>	E2b	.	.	+	.	.	1	1	2	2	1	7	70
QP	<i>Fraxinus ornus</i>	E2a	.	.	.	.	+	1	1	1	1	1	6	60
QP	<i>Fraxinus ornus</i>	E1	.	.	.	.	+	.	.	.	+	1	3	30
QP	<i>Ostrya carpinifolia</i>	E3a	.	1	.	.	r	.	+	.	.	3	30	
QP	<i>Ostrya carpinifolia</i>	E2b	r	1	r	+	.	+	.	.	+	7	70	
QP	<i>Ostrya carpinifolia</i>	E2a	.	.	.	+	.	+	+	.	+	5	50	
QF	<i>Frangula alnus</i>	E2	.	.	+	.	+	.	r	.	.	+	4	40
Differential species of the geographical variant (Razlikovalne vrste geografskih variant)														
AF	<i>Rhamnus fallax</i>	E2b	.	.	.	+	.	1	+	.	+	+	5	50
AF	<i>Rhamnus fallax</i>	E2a	.	.	.	+	.	+	+	+	.	1	5	50
MuA	<i>Aconitum angustifolium</i>	E1	.	.	.	r	.	+	.	.	.	.	2	20
ES	<i>Centaurea haynaldii</i> subsp. <i>julica</i>	E1	.	.	.	.	.	.	.	+	+	.	2	20
Differential species of lower units (Razlikovalne vrste nižjih enot)														
ES	<i>Carex firma</i>	E1	+	+	2	.	.	.	.	.	.	3	30	
ML	<i>Hylocomium splendens</i>	E0	+	+	+	.	.	.	.	.	.	3	30	
SCF	<i>Tofieldia calyculata</i>	E1	+	.	+	.	.	.	.	.	.	2	20	
SCF	<i>Selaginella selaginoides</i>	E1	r	.	+	.	.	.	.	.	.	2	20	
BA	<i>Salix appendiculata</i>	E2a	+	.	+	.	.	.	.	.	.	2	20	
FB	<i>Peucedanum oreoselinum</i>	E1	.	.	.	.	1	1	1	1	1	1	6	60
TG	<i>Viola hirta</i>	E1	.	.	.	.	+	+	+	.	+	+	5	50
ES	<i>Leucanthemum maximum</i> agg.	E1	.	.	.	.	.	+	+	+	+	+	5	50
ES	<i>Carduus crassifolius</i>	E1	.	.	.	r	+	+	.	+	.	+	5	50
AF	<i>Helleborus niger</i>	E1	.	.	.	.	1	+	+	+	.	.	4	40
FB	<i>Teucrium montanum</i>	E1	.	.	.	.	1	.	+	+	.	+	4	40
EP	<i>Carex alba</i>	E1	.	.	.	.	.	+	.	+	+	.	3	30
TG	<i>Vincetoxicum hirundinaria</i>	E1	.	.	.	.	.	.	+	+	.	+	3	30
FB	<i>Inula ensifolia</i>	E1	.	.	.	.	.	.	+	.	+	+	3	30
EP	<i>Erico-Pinetea</i>													
	<i>Erica carnea</i>	E1	2	2	3	4	4	2	3	4	3	4	10	100
	<i>Calamagrostis varia</i>	E1	1	2	+	1	1	1	+	2	2	1	10	100
	<i>Polygala chamaebuxus</i>	E1	1	1	1	+	1	1	1	1	2	1	10	100
	<i>Asperula aristata</i>	E1	+	+	+	+	+	+	+	+	+	1	10	100
	<i>Rhododendron hirsutum</i>	E2a	1	2	2	1	.	1	r	2	2	.	8	80
	<i>Rubus saxatilis</i>	E1	+	+	.	.	+	1	1	1	1	1	8	80

Number of relevé (Zaporedna številka popisa)		1	2	3	4	5	6	7	8	9	10	Pr.	Fr.	
	<i>Bupthalmum salicifolium</i>	E1	.	+	+	1	+	.	1	1	1	1	8	80
	<i>Molinia arundinacea</i>	E1	.	+	+	.	+	+	3	2	2	1	8	80
	<i>Genista radiata</i>	E2a	.	+	.	1	.	1	1	2	2	2	7	70
	<i>Rhodothamnus chamaecistus</i>	E1	+	+	1	.	+	+	.	1	.	6	60	
	<i>Allium ericetorum</i>	E1	+	.	+	r	.	+	r	.	.	5	50	
	<i>Leontodon incanus</i>	E1	.	.	.	+	1	+	+	.	+	5	50	
	<i>Epipactis atrorubens</i>	E1	.	.	.	+	+	+	+	.	+	5	50	
	<i>Euphrasia cuspidata</i>	E1	r	r	1	.	.	+	.	.	.	4	40	
	<i>Arctostaphylos uva-ursi</i>	E1	+	.	.	+	1	.	.	.	.	3	30
	<i>Cirsium erisithales</i>	E1	.	+	.	+	+	.	.	.	1	3	30	
	<i>Cotoneaster tomentosus</i>	E2a	.	.	+	.	r	.	.	+	.	3	30	
	<i>Pinus sylvestris</i>	E2	.	.	r	.	.	.	.	.	+	2	20
	<i>Salix eleagnos</i>	E2b	.	.	+	.	.	.	.	.	+	2	20
	<i>Rhamnus saxatilis</i>	E1	.	.	.	+	+	.	.	.	.	2	20
	<i>Aster amellus</i>	E1	.	.	.	.	.	+	.	.	+	2	20
	<i>Pinus nigra</i>	E2b	.	.	r	.	.	.	.	.	.	1	10
	<i>Daphne striata</i>	E1	.	.	.	+	.	.	.	.	.	1	10
	<i>Carex ornithopoda</i>	E1	.	.	.	r	.	.	.	.	.	1	10
	<i>Crepis slovenica</i>	E1	.	.	.	.	.	+	.	.	.	1	10
	<i>Gymnadenia odoratissima</i>	E1	.	.	.	.	.	+	.	.	.	1	10
VP	Vaccinio-Piceetea													
	<i>Solidago virgaurea</i>	E1	.	.	.	+	.	1	+	1	1	1	6	60
	<i>Picea abies</i>	E2b	r	.	.	.	1	10
	<i>Picea abies</i>	E2a	r	.	+	.	+	r	.	.	+	5	50	
	<i>Picea abies</i>	E1	.	.	.	r	.	.	.	.	.	1	10
	<i>Valeriana tripteris</i>	E1	+	.	.	.	.	.	+	+	+	4	40
	<i>Rosa pendulina</i>	E2a	+	.	.	.	.	+	.	.	.	2	20
	<i>Clematis alpina</i>	E1	.	+	.	r	.	.	.	.	.	2	20
	<i>Hieracium sylvaticum</i>	E1	.	.	.	.	.	.	.	.	+	2	20
	<i>Pyrola rotundifolia</i>	E1	.	.	+	.	.	.	.	.	.	1	10
	<i>Larix decidua</i>	E2	.	.	r	.	.	.	.	.	.	1	10
	<i>Lonicera nigra</i>	E2a	.	.	.	.	.	+	.	.	.	1	10
QP	Quercetalia pubescenti-petraeae													
	<i>Sorbus aria</i>	E3a	.	.	.	.	.	.	1	.	.	1	10
	<i>Sorbus aria</i>	E2b	+	1	+	1	+	1	1	1	1	+	10	100
	<i>Sorbus aria</i>	E2a	.	.	+	+	.	.	+	.	1	4	40	
	<i>Sorbus aria</i>	E1	+	+	1	3	30
	<i>Convallaria majalis</i>	E1	1	1	.	+	+	+	+	+	+	8	80	
	<i>Mercurialis ovata</i>	E1	.	.	.	1	.	.	.	.	.	1	10
	<i>Melittis melissophyllum</i>	E1	.	.	.	.	+	.	.	.	.	1	10
	<i>Sorbus austriaca</i> s. lat.	E2b	.	.	.	.	.	+	.	.	.	1	10
QR	Quercetalia roboris													
	<i>Potentilla erecta</i>	E1	.	.	.	.	.	+	+	.	+	3	30
	<i>Betula pendula</i>	E2a	.	.	r	.	.	.	.	.	.	1	10
AF	Aremonio-Fagion													
	<i>Cyclamen purpurascens</i>	E1	+	1	+	+	1	1	+	+	+	9	90	
	<i>Anemone trifolia</i>	E1	.	+	+	.	.	+	1	.	.	4	40	
FS	Fagetalia sylvaticae													
	<i>Mercurialis perennis</i>	E1	.	+	.	r	.	+	r	+	.	5	50	
	<i>Melica nutans</i>	E1	.	+	+	.	.	.	+	.	+	4	40	
	<i>Epipactis helleborine</i>	E1	r	.	.	+	.	+	.	.	.	3	30	
	<i>Fagus sylvatica</i>	E3a	+	+	.	.	.	.	.	.	.	2	20
	<i>Fagus sylvatica</i>	E2	r	+	.	.	.	+	.	.	.	3	30	
	<i>Laburnum alpinum</i>	E2	.	+	+	.	1	.	.	.	.	3	30

Number of relevé (Zaporedna številka popisa)		1	2	3	4	5	6	7	8	9	10	Pr.	Fr.
	<i>Lonicera alpigena</i>	E2a	.	+	.	.	.	+	.	.	.	2	20
	<i>Acer pseudoplatanus</i>	E1	.	.	+	+	.	.	.	.	.	2	20
	<i>Daphne mezereum</i>	E2a	.	.	.	+	.	+	.	.	.	2	20
	<i>Galium laevigatum</i>	E1	.	.	.	.	.	+	.	.	.	1	10
	<i>Viola reichenbachiana</i>	E1	.	.	.	.	.	.	r	.	.	1	10
QF	Quercu-Fagetea												
	<i>Platanthera bifolia</i>	E1	.	.	+	.	.	.	.	+	+	3	30
	<i>Cephalanthera longifolia</i>	E1	.	.	.	.	.	.	r	.	.	1	10
SSC	Sambuco-Salicion capreae												
	<i>Rubus idaeus</i>	E2a	.	.	.	+	.	.	.	.	.	1	10
	<i>Sorbus aucuparia</i>	E2b	+	+	+	.	.	.	.	+	.	4	40
	<i>Sorbus aucuparia</i>	E2a	.	.	.	+	+	+	+	.	.	4	40
	<i>Sorbus aucuparia</i>	E1	+	.	+	.	.	.	.	+	.	3	30
BA	Betulo-Alnetea												
	<i>Salix glabra</i>	E2	+	1	1	2	r	1	+	1	+	10	100
	<i>Sorbus chamaemespilus</i>	E2a	.	.	.	.	.	+	.	.	.	1	10
TG	Trifolio-Geranietea												
	<i>Laserpitium siler</i>	E1	.	.	+	r	.	.	+	.	+	5	50
	<i>Anthericum ramosum</i>	E1	.	.	+	.	+	.	.	.	.	2	20
	<i>Polygonatum odoratum</i>	E1	.	.	.	1	+	.	.	.	.	2	20
FB	Festuco-Brometea												
	<i>Carlina acaulis</i>	E1	.	+	.	.	+	+	+	.	+	6	60
	<i>Carex humilis</i>	E1	r	+	.	+	2	.	+	.	.	5	50
	<i>Gentianella ciliata</i>	E1	.	.	+	.	.	.	+	.	.	2	20
	<i>Linum viscosum</i>	E1	.	.	.	+	.	.	.	+	.	2	20
	<i>Teucrium chamaedrys</i>	E1	.	.	.	+	.	.	.	.	+	2	20
	<i>Centaurea bracteata</i>	E1	.	.	.	.	.	+	+	.	.	2	20
	<i>Gymnadenia conopsea</i>	E1	.	.	.	.	.	.	.	+	+	2	20
	<i>Thesium linophyllum</i>	E1	.	+	.	.	.	.	.	.	.	1	10
	<i>Linum catharticum</i>	E1	.	.	1	.	.	.	.	.	.	1	10
	<i>Galium lucidum</i>	E1	.	.	.	.	+	.	.	.	.	1	10
	<i>Hippocrepis comosa</i>	E1	.	.	.	.	.	r	.	.	.	1	10
	<i>Prunella grandiflora</i>	E1	.	.	.	.	.	+	.	.	.	1	10
	<i>Brachypodium rupestre</i>	E1	.	.	.	.	.	.	.	+	.	1	10
	<i>Euphorbia cyparissias</i>	E1	.	.	.	.	.	.	.	.	+	1	10
ES	Elyno-Seslerietea												
	<i>Laserpitium peucedanoides</i>	E1	1	+	+	1	+	+	+	+	+	10	100
	<i>Betonica alopecurus</i>	E1	+	+	+	1	1	1	+	+	+	9	90
	<i>Globularia cordifolia</i>	E1	.	.	+	+	1	+	+	+	1	8	80
	<i>Sesleria caerulea</i> subsp. <i>calcaria</i>	E1	1	2	1	+	.	.	+	1	+	7	70
	<i>Dryas octopetala</i>	E1	.	r	1	.	.	+	.	+	+	6	60
	<i>Carex mucronata</i>	E1	+	+	+	.	+	.	.	.	+	5	50
	<i>Phyteuma orbiculare</i>	E1	+	.	+	+	.	.	.	.	+	4	40
	<i>Thesium alpinum</i>	E1	.	.	+	.	.	.	.	+	.	2	20
	<i>Thymus praecox</i> subsp. <i>polytrichus</i>	E1	.	.	.	.	.	+	.	.	+	2	20
	<i>Primula wulfeniana</i>	E1	r	.	.	.	.	.	.	.	.	1	10
	<i>Gentiana clusii</i>	E1	r	.	.	.	.	.	.	.	.	1	10
	<i>Bartsia alpina</i>	E1	.	.	+	.	.	.	.	.	.	1	10
	<i>Linum julicum</i>	E1	.	.	+	.	.	.	.	.	.	1	10
	<i>Ranunculus hybridus</i>	E1	.	.	+	.	.	.	.	.	.	1	10
	<i>Senecio abrotanifolius</i>	E1	.	.	+	.	.	.	.	.	.	1	10
	<i>Euphrasia salisburgensis</i>	E1	.	.	.	+	.	.	.	.	.	1	10

Number of relevé (Zaporedna številka popisa)		1	2	3	4	5	6	7	8	9	10	Pr.	Fr.
	<i>Helianthemum grandiflorum</i>	E1	.	.	.	+	.	.	.	.	.	1	10
	<i>Scabiosa lucida</i> subsp. <i>stricta</i>	E1	.	.	.	.	+	.	.	.	.	1	10
	<i>Acinos alpinus</i>	E1	.	.	.	.	+	.	.	.	.	1	10
	<i>Rhinanthus aristatus</i>	E1	.	.	.	.	.	+	.	.	.	1	10
	<i>Pimpinella alpina</i>	E1	.	.	.	.	.	.	r	.	.	1	10
MA	Moliniio-												
	Arrhenatheretea												
	<i>Lotus corniculatus</i> s. lat.	E1	.	.	.	.	+	+	.	1	+	1	50
TR	Thlaspietea rotundifolii												
	<i>Campanula cespitosa</i>	E1	+	1	1	1	+	+	+	.	+	+	9 90
	<i>Aquilegia einseleana</i>	E1	+	.	1	+	.	+	+	+	.	+	7 70
	<i>Biscutella laevigata</i>	E1	.	.	+	.	+	+	+	+	.	.	6 60
	<i>Petasites paradoxus</i>	E1	.	.	.	r	.	+	.	2	+	+	5 50
	<i>Hieracium bifidum</i>	E1	.	.	+	.	r	+	.	+	.	.	4 40
	<i>Achnatherum calamagrostis</i>	E1	.	.	1	.	.	.	.	.	.	+	2 20
	<i>Valeriana montana</i>	E1	.	.	.	.	.	+	.	.	+	.	2 20
	<i>Adenostyles glabra</i>	E1	r	.	.	.	.	.	.	.	.	.	1 10
	<i>Gypsophila repens</i>	E1	.	.	1	.	.	.	.	.	.	.	1 10
	<i>Astrantia carniolica</i>	E1	.	.	+	.	.	.	.	.	.	.	1 10
	<i>Rumex scutatus</i>	E1	.	.	.	.	.	+	.	.	.	.	1 10
AT	Asplenietea trichomanis												
	<i>Valeriana saxatilis</i>	E1	+	+	1	+	.	+	+	+	+	+	9 90
	<i>Potentilla caulescens</i>	E1	r	.	.	.	+	.	.	.	.	.	2 20
	<i>Saxifraga burseriana</i>	E1	.	.	+	.	r	.	.	.	.	.	2 20
	<i>Paederota lutea</i>	E1	+	.	.	.	.	.	.	.	.	.	1 10
	<i>Saxifraga squarrosa</i>	E1	+	.	.	.	.	.	.	.	.	.	1 10
	<i>Saxifraga crustata</i>	E1	.	.	+	.	.	.	.	.	.	.	1 10
	<i>Rhamnus pumilus</i>	E1	.	.	.	.	.	.	+	.	.	.	1 10
O	Other species (Druge vrste)												
	<i>Juniperus communis</i>	E2	+	+	.	.	1	.	+	.	.	.	4 40
	<i>Orobancha</i> sp.	E1	.	.	.	.	.	+	.	.	.	.	1 10
ML	Mosses and lichens (Mahovi in lišaji)												
	<i>Ctenidium molluscum</i>	E0	+	.	.	+	.	+	+	+	+	+	7 70
	<i>Tortella tortuosa</i>	E0	+	.	.	r	+	+	.	+	+	.	6 60
	<i>Scleropodium purum</i>	E0	.	.	+	.	1	.	+	.	+	.	4 40
	<i>Neckera crispa</i>	E0	+	+	.	.	.	.	.	.	+	.	3 30
	<i>Rhytidiadelphus triquetrus</i>	E0	+	.	+	.	.	.	.	.	.	.	2 20
	<i>Schistidium apocarpum</i>	E0	.	.	+	.	.	+	.	.	.	.	2 20
	<i>Dicranum</i> sp.	E0	+	.	.	.	.	.	.	.	.	.	1 10
	<i>Fissidens dubius</i>	E0	.	+	.	.	.	.	.	.	.	.	1 10

Legend - Legenda

A Limestone - apnenec

D Dolomite - dolomit

Gr Gravel - grušč

M Moraine (Till) - morena (til)

Re Rendzina - rendzina

Li Lithosols - kamnišče

Number of relevé (Zaporedna številka popisa)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.
Diagnostic species of the association (Diagnostične vrste asociacije)																	
EP	<i>Pinus mugo</i>	E2b	5	5	5	5	4	4	4	5	5	5	4	4	4	14	100
EP	<i>Rhododendron hirsutum</i>	E2a	1	2	+	2	+	2	1	+	.	+	+	2	2	.	12 86
ES	<i>Laserpitium peucedanoides</i>	E1	+	+	+	1	+	+	.	r	.	1	+	.	.	+	10 71
EP	<i>Rhodothamnus chamaecistus</i>	E1	.	+	r	+	.	+	.	.	.	.	.	1	+	.	6 43
Geographical differential species (Geografske razlikovalne vrste)																	
MuA	<i>Aconitum angustifolium</i>	E1	+	.	+	+	+	.	+	.	.	.	.	.	+	+	7 50
ES	<i>Centaurea haynaldii</i> subsp. <i>julica</i>	E1	.	.	+	+	+	+	+	+	.	.	.	.	.	+	7 50
AF	<i>Rhamnus fallax</i>	E2	.	.	.	.	1	r	+	.	1	.	.	.	.	.	4 29
AF	<i>Anemone trifolia</i>	E1	.	.	.	.	.	.	.	.	1	1	.	.	.	.	2 14
Differential species of the variant (Razlikovalne vrste variante)																	
EP	<i>Genista radiata</i>	E2a	1	.	+	+	+	+	+	.	1	+	.	r	3	11	79
EP	<i>Amelanchier ovalis</i>	E2a	.	.	.	.	r	.	.	.	.	.	+	+	.	.	3 21
VP	Vaccinio-Piceetea																
	<i>Picea abies</i>	E3a	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1 7
	<i>Picea abies</i>	E2b	.	+	+	r	.	+	r	+	.	+	.	+	.	+	9 64
	<i>Rosa pendulina</i>	E2a	.	.	1	+	1	+	+	2	.	+	.	.	.	.	8 57
	<i>Clematis alpina</i>	E2a	.	.	1	.	.	.	+	1	+	+	.	+	1	.	7 50
	<i>Larix decidua</i>	E2	r	r	.	r	.	.	.	.	.	.	.	.	.	+	4 29
	<i>Aposeris foetida</i>	E1	.	.	.	+	.	.	.	+	.	1	1	.	.	.	4 29
	<i>Vaccinium myrtillus</i>	E1	.	.	.	+	.	.	.	.	1	1	.	+	.	.	4 29
	<i>Vaccinium vitis-idaea</i>	E1	.	.	.	+	.	.	.	.	.	+	1	+	.	.	4 29
	<i>Lonicera caerulea</i>	E2a	.	.	.	.	.	.	+	1	1	+	.	.	.	.	4 29
	<i>Maianthemum bifolium</i>	E1	.	.	.	.	+	.	+	.	.	+	.	.	.	.	3 21
	<i>Lonicera nigra</i>	E2a	.	.	.	.	.	.	+	r	+	.	.	.	.	.	3 21
	<i>Valeriana tripteris</i>	E1	.	.	.	.	.	.	+	.	+	+	.	.	.	.	3 21
	<i>Solidago virgaurea</i>	E1	.	.	.	.	.	.	+	.	.	.	.	+	+	.	3 21
	<i>Larix decidua</i>	E3a	.	.	.	.	.	.	.	.	.	.	1	+	.	+	3 21
	<i>Dryopteris expansa</i>	E1	+	.	.	.	.	.	.	.	+	.	.	.	.	.	2 14
	<i>Pyrola rotundifolia</i>	E1	.	.	.	.	.	.	+	.	.	.	.	+	.	.	2 14
	<i>Abies alba</i>	E2a	.	.	.	.	.	r	.	.	.	.	.	+	.	.	2 14
	<i>Homogyne alpina</i>	E1	.	.	.	.	.	.	.	.	.	+	+	.	.	.	2 14
	<i>Luzula sylvatica</i>	E1	.	.	.	.	.	.	.	.	.	+	+	.	.	.	2 14
	<i>Veronica urticifolia</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1 7
	<i>Polystichum lonchitis</i>	E1	.	.	.	r	.	.	.	.	.	.	.	.	.	.	1 7
	<i>Calamagrostis villosa</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1 7
	<i>Luzula luzulina</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1 7
	<i>Hieracium murorum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1 7
	<i>Huperzia selago</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1 7
	<i>Lycopodium annotinum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1 7
	<i>Melampyrum sylvaticum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1 7
	<i>Homogyne sylvestris</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1 7
	<i>Dryopteris dilatata</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1 7
EP	Erico-Pinetea																
	<i>Erica carnea</i>	E1	1	2	2	2	2	2	1	+	.	+	+	2	2	3	13 93
	<i>Calamagrostis varia</i>	E1	2	2	1	1	.	1	1	1	1	1	+	+	1	+	13 93
	<i>Rubus saxatilis</i>	E1	.	.	.	1	1	+	1	+	+	+	+	1	1	1	11 79
	<i>Bupthalmum salicifolium</i>	E1	+	.	+	+	+	+	.	+	+	.	.	+	+	+	10 71
	<i>Polygala chamaebuxus</i>	E1	+	.	.	1	+	+	.	+	.	.	.	1	+	1	8 57
	<i>Cirsium erisithales</i>	E1	+	.	1	+	.	.	+	+	+	r	.	.	.	.	7 50

Number of relevé (Zaporedna številka popisa)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.	
	<i>Molinia arundinacea</i>	E1	.	.	.	+	.	.	.	.	.	+	.	.	1	2	4	29
	<i>Allium ericetorum</i>	E1	+	.	.	+	.	.	.	.	.	.	.	.	.	+	3	21
	<i>Chamaecytisus hirsutus</i>	E1	+	.	.	.	.	.	.	.	.	+	+	.	.	.	3	21
	subsp. <i>ciliatus</i>																	
	<i>Daphne striata</i>	E1	.	.	+	+	.	.	.	.	.	.	.	.	.	.	2	14
	<i>Asperula aristata</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	+	2	14
	<i>Carex ornithopoda</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	<i>Carex alba</i>	E1	.	.	.	.	r	.	.	.	.	.	.	.	.	.	1	7
	<i>Arctostaphylos uva-ursi</i>	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	7
	<i>Peucedanum austriacum</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	7
	subsp. <i>rablense</i>																	
	<i>Gymnadenia odoratissima</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
	<i>Epipactis atrorubens</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	7
	<i>Cotoneaster tomentosus</i>	E2a	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	<i>Pinus sylvestris</i>	E3a	.	.	.	.	.	.	.	.	.	.	.	.	.	r	1	7
AF	Aremonio-Fagion																	
	<i>Cyclamen purpurascens</i>	E1	1	1	1	+	1	+	1	+	1	+	1	1	1	.	13	93
	<i>Cardamine enneaphyllos</i>	E1	.	.	.	.	.	.	+	.	1	.	.	.	.	.	2	14
	<i>Knautia drymeia</i>	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
FS	Fagetalia sylvaticae																	
	<i>Mercurialis perennis</i>	E1	1	+	1	+	1	1	1	1	+	1	.	.	+	+	12	86
	<i>Galeobdolon flavidum</i>	E1	+	.	.	+	+	.	.	1	1	.	.	.	.	.	5	36
	<i>Daphne mezereum</i>	E2a	.	.	.	.	.	.	+	+	.	.	+	.	.	.	4	29
	<i>Lonicera alpigena</i>	E2a	.	.	.	.	+	.	+	1	.	.	.	.	.	.	4	29
	<i>Dryopteris filix-mas</i>	E1	.	.	+	+	.	.	.	+	+	.	.	.	.	.	4	29
	<i>Lilium martagon</i>	E1	.	.	.	+	.	.	.	+	.	.	.	+	.	.	3	21
	<i>Paris quadrifolia</i>	E1	.	.	.	.	+	.	.	+	+	.	.	.	.	.	3	21
	<i>Melica nutans</i>	E1	.	.	.	.	.	.	+	.	.	.	+	.	.	.	3	21
	<i>Galium laevigatum</i>	E1	+	+	.	.	.	.	.	.	.	.	.	.	.	.	2	14
	<i>Laburnum alpinum</i>	E2	.	.	.	.	.	.	.	r	.	.	.	+	.	.	2	14
	<i>Acer pseudoplatanus</i>	E1	.	.	.	r	.	.	.	.	.	.	.	.	.	.	1	7
	<i>Thalictrum aquilegifolium</i>	E1	.	.	.	.	r	.	.	.	.	.	.	.	.	.	1	7
	<i>Polygonatum multiflorum</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	7
	<i>Actaea spicata</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1	7
	<i>Symphytum tuberosum</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	7
	<i>Viola reichenbachiana</i>	E1	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	7
	<i>Epipactis helleborine</i>	E1	.	.	.	.	.	.	.	.	.	.	r	.	.	.	1	7
	<i>Fagus sylvatica</i>	E3a	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	7
	<i>Fagus sylvatica</i>	E2a	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	7
QP	Quercetalia pubescenti-petraeae																	
	<i>Sorbus aria</i>	E3a	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	<i>Sorbus aria</i>	E2b	.	.	+	.	+	+	1	.	.	.	+	+	1	+	8	57
	<i>Sorbus aria</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	7
	<i>Convallaria majalis</i>	E1	.	.	.	.	.	.	1	.	.	.	.	.	.	+	2	14
	<i>Sorbus austriaca</i> s. lat.	E2a	.	.	.	.	.	.	.	.	.	.	.	.	+	r	2	14
QF	Querco-Fagetea																	
	<i>Anemone nemorosa</i>	E1	.	.	.	+	.	.	+	+	.	.	.	+	.	.	4	29
	<i>Potentilla erecta</i>	E1	.	.	.	.	.	.	.	.	.	+	+	.	.	.	2	14
	<i>Carex digitata</i>	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	<i>Rosa glauca</i>	E2a	.	.	r	.	.	.	.	.	.	.	.	.	.	.	1	7
	<i>Hepatica nobilis</i>	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	7
	<i>Listera ovata</i>	E1	.	.	.	.	.	.	.	.	r	.	.	.	.	.	1	7
	<i>Viola riviniana</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
	<i>Corylus avellana</i>	E2a	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	7
	<i>Platanthera bifolia</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
SSC	Sambuco-Salicetea capreae																	
	<i>Sorbus aucuparia</i>	E2b	.	.	.	r	+	+	1	r	.	+	+	+	+	.	9	64

Number of relevé (Zaporedna številka popisa)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.	
	<i>Primula auricula</i>	E1	.	.	.	.	+	.	.	.	.	.	+	.	.	2	14
	<i>Hieracium glaucum</i>	E1	.	.	.	r	.	.	.	.	.	.	.	.	.	1	7
	<i>Campanula zozysii</i>	E1	.	.	.	.	.	r	.	.	.	.	.	.	.	1	7
	<i>Cystopteris fragilis</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	.	1	7
	<i>Moehringia muscosa</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	1	7
	<i>Carex brachystachys</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	1	7
O	Other species (Druge vrste)																	
	<i>Juniperus communis</i>	E2a	+	.	.	.	r	.	.	.	.	.	+	.	.	3	21
ML	Mosses and lichens (Mahovi in lišaji)																	
	<i>Tortella tortuosa</i>	E0	.	1	+	+	+	+	+	.	+	.	+	.	.	9	64	
	<i>Ctenidium molluscum</i>	E0	.	+	.	+	+	+	+	+	.	.	1	.	.	8	57	
	<i>Fissidens dubius</i>	E0	.	+	.	.	+	+	.	.	+	.	.	.	.	5	36
	<i>Dicranum sp.</i>	E0	.	+	+	+	.	.	.	.	.	.	.	.	.	3	21
	<i>Hylocomium splendens</i>	E0	.	.	.	+	.	.	.	.	.	.	+	+	.	3	21
	<i>Homalothecium philippeanum</i>	E0	.	.	+	.	.	.	.	.	+	.	.	.	.	2	14
	<i>Schistidium apocarpum</i>	E0	.	.	.	.	.	.	+	.	+	.	.	.	.	2	14
	<i>Dicranum scoparium</i>	E0	.	.	.	.	.	.	.	1	.	.	.	+	.	2	14
	<i>Rhytidiadelphus triquetrus</i>	E0	.	.	.	.	.	.	.	.	.	.	.	+	2	2	14
	<i>Bazzania trilobata</i>	E0	.	.	.	.	.	.	.	.	.	.	.	+	+	2	14
	<i>Pleurozium schreberi</i>	E0	+	+	2	14
	<i>Cladonia sp.</i>	E0	.	.	.	.	+	.	.	.	.	.	.	.	.	1	7
	<i>Bryum capillare</i>	E0	.	.	.	.	+	.	.	.	.	.	.	.	.	1	7
	<i>Hypnum cupressiforme</i>	E0	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	<i>Neckera crispa</i>	E0	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	<i>Orthothecium rufescens</i>	E0	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7

Legend - Legenda

A Limestone - apnenec

D Dolomite - dolomit

Gr Gravel - grušč

M Moraine (Till) - morena (til)

Re Rendzina - rendzina

Li Lithosols - kamnišče

Table 3: Synoptic table of the associations *Rhodothamno-Pinetum mugo* and *Amelanchiero-Pinetum mugo*
Preglednica 3: Sintezna tabela asociacij *Rhodothamno-Pinetum mugo* in *Amelanchiero-Pinetum mugo*

Successive number (Zaporedna številka)		1	2	3	4	5	
Number of relevés (Število popisov)		39	14	10	13	9	
Sign for syntaxa (Oznaka sintaksonov)							
		Rpm	Rpmgr	APm-JA	APm-Tr	APm-F	
	Author (Avtor)	ID	ID	ID	MI	LP	
EP	<i>Erico-Pinetea</i>						
	<i>Pinus mugo</i>	E2b	100	100	100	100	
	<i>Rhododendron hirsutum</i>	E2a	97	86	80	69	22
	<i>Rubus saxatilis</i>	E1	74	79	80	85	33
	<i>Erica carnea</i>	E1	69	93	100	100	100
	<i>Calamagrostis varia</i>	E1	62	93	100	54	78
	<i>Rhodothamnus chamaecistus</i>	E1	62	43	60	.	33
	<i>Bupthalmum salicifolium</i>	E1	26	71	80	15	22
	<i>Genista radiata</i>	E1	26	79	70	.	22
	<i>Cirsium erisithales</i>	E1	26	50	30	.	.
	<i>Polygala chamaebuxus</i>	E1	21	57	100	100	100
	<i>Carex ornithopoda</i>	E1	15	7	10	.	.
	<i>Daphne striata</i>	E1	10	14	10	.	.

Successive number (Zaporedna številka)		1	2	3	4	5
	<i>Allium ericetorum</i>	E1	8	21	50	.
	<i>Chamaecytisus hirsutus</i> subsp. <i>ciliatus</i>	E1	8	21	.	46
	<i>Amelanchier ovalis</i>	E2	5	21	100	100
	<i>Asperula aristata</i>	E1	5	14	100	8
	<i>Aquilegia nigricans</i>	E1	3	.	.	.
	<i>Arctostaphylos uva-ursi</i>	E1	3	7	30	54
	<i>Cotoneaster tomentosus</i>	E2a	3	7	30	77
	<i>Epipactis atrorubens</i>	E1	3	7	50	23
	<i>Gymnadenia odoratissima</i>	E1	3	7	10	8
	<i>Pinus sylvestris</i>	E2	3	7	20	15
	<i>Carex alba</i>	E1	.	7	30	54
	<i>Peucedanum austriacum</i> subsp. <i>rablense</i>	E1	.	7	.	11
	<i>Euphrasia cuspidata</i>	E1	.	.	40	23
	<i>Leontodon incanus</i>	E1	.	.	50	.
	<i>Aster amellus</i>	E1	.	.	20	.
SP	<i>Salix eleagnos</i>	E2	.	.	20	.
	<i>Crepis slovenica</i>	E1	.	.	10	23
	<i>Pinus nigra</i>	E2	.	.	10	.
	<i>Rhamnus saxatilis</i>	E2	.	.	20	23
	<i>Chamaecytisus purpureus</i>	E1	.	.	.	77
	<i>Daphne cneorum</i>	E1	.	.	.	62
	<i>Aquilegia atrata</i>	E1	.	.	.	15
	<i>Polygala nicaeensis</i> subsp. <i>forojulensis</i>	E1	.	.	.	44
	<i>Knautia ressmanii</i>	E1	.	.	.	33
	<i>Bupleurum ranunculoides</i>	E1	.	.	.	11
	<i>Galium purpureum</i>	E1	.	.	.	11
VP	Vaccinio-Piceetea					
	<i>Rosa pendulina</i>	E2a	79	57	20	8
	<i>Clematis alpina</i>	E1	72	50	20	8
	<i>Vaccinium myrtillus</i>	E1	72	29	.	11
	<i>Vaccinium vitis-idaea</i>	E1	69	29	.	31
	<i>Picea abies</i>	E2	62	64	70	8
	<i>Lonicera caerulea</i>	E2a	59	29	.	.
	<i>Homogyne alpina</i>	E1	54	14	.	.
	<i>Valeriana tripteris</i>	E1	51	21	40	62
	<i>Solidago virgaurea</i>	E1	49	21	60	31
	<i>Lycopodium annotinum</i>	E1	46	7	.	.
	<i>Calamagrostis villosa</i>	E1	41	7	.	.
	<i>Larix decidua</i>	E2	41	43	10	8
	<i>Luzula sylvatica</i>	E1	36	14	.	.
	<i>Gymnocarpium dryopteris</i>	E1	36	.	.	.
	<i>Polystichum lonchitis</i>	E1	36	7	.	.
	<i>Oxalis acetosella</i>	E1	33	.	.	.
	<i>Aposeris foetida</i>	E1	31	29	.	.
	<i>Dryopteris expansa</i>	E1	28	14	.	.
	<i>Huperzia selago</i>	E1	28	7	.	.
	<i>Homogyne sylvestris</i>	E1	26	7	.	.
	<i>Dryopteris dilatata</i>	E1	26	7	.	.
	<i>Lonicera nigra</i>	E2a	23	21	10	.
	<i>Maianthemum bifolium</i>	E1	23	21	.	.
	<i>Phegopteris connectilis</i>	E1	23	.	.	.
	<i>Abies alba</i>	E2	18	14	.	.
	<i>Gentiana asclepiadea</i>	E1	15	.	.	.
	<i>Calamagrostis arundinacea</i>	E1	13	.	.	.
	<i>Hieracium sylvaticum</i>	E1	13	7	20	54
	<i>Luzula luzulina</i>	E1	10	7	.	.
	<i>Saxifraga cuneifolia</i>	E1	8	.	.	.
	<i>Melampyrum sylvaticum</i>	E1	5	7	.	11
	<i>Veronica urticifolia</i>	E1	5	7	.	.

Successive number (Zaporedna številka)		1	2	3	4	5
	<i>Listera cordata</i>	E1	5	.	.	.
	<i>Luzula luzuloides</i>	E1	5	.	.	.
	<i>Laserpitium krapfii</i>	E1	3	.	.	.
	<i>Luzula pilosa</i>	E1	3	.	.	.
	<i>Rhododendron ferrugineum</i>	E2a	3	.	.	.
	<i>Goodyera repens</i>	E1	.	.	8	.
QP	<i>Quercetalia pubescenti-petraeae</i>					
	<i>Sorbus aria</i>	E2	26	57	100	85 67
	<i>Convallaria majalis</i>	E1	13	14	80	62 .
	<i>Sorbus austriaca</i>	E2b	5	14	10	. .
	<i>Ostrya carpinifolia</i>	E2	.	.	90	85 44
	<i>Fraxinus ornus</i>	E2	.	.	70	92 44
	<i>Mercurialis ovata</i>	E1	.	.	10	. .
	<i>Melittis melissophyllum</i>	E1	.	.	10	. .
	<i>Coronilla emerus s. lat.</i>	E2	.	.	.	54 11
	<i>Hierochloë australis</i>	E1	.	.	.	54 11
	<i>Carex flacca</i>	E1	.	.	.	23 .
	<i>Cotynus coggygria</i>	E2	.	.	.	23 .
	<i>Quercus pubescens</i>	E2	.	.	.	15 .
QR	<i>Quercetalia roboris</i>					
	<i>Potentilla erecta</i>	E1	10	14	30	46 33
	<i>Melampyrum pratense s. lat.</i>	E1	3	.	.	. 33
	<i>Betula pendula</i>	E2	.	.	10	. .
	<i>Quercus petraea</i>	E2	.	.	.	. 11
AF	<i>Aremonio-Fagion</i>					
	<i>Cyclamen purpurascens</i>	E1	46	93	90	85 67
	<i>Cardamine enneaphyllum</i>	E1	36	14	.	. .
	<i>Anemone trifolia</i>	E1	15	14	40	15 33
	<i>Rhamnus fallax</i>	E2b	15	29	60	. .
	<i>Knautia drymeia</i>	E1	8	7	.	. .
	<i>Cardamine trifolia</i>	E1	8	.	.	. .
	<i>Helleborus niger</i>	E1	3	.	40	. .
AI	<i>Alnion incanae</i>					
	<i>Chrysosplenium alternifolium</i>	E1	8	.	.	. .
	<i>Frangula alnus</i>	E2	.	.	40	31 44
TA	<i>Tilio-Acerion</i>					
	<i>Acer pseudoplatanus</i>	E3a	5	.	.	. .
	<i>Acer pseudoplatanus</i>	E1	8	7	20	. 11
	<i>Thalictrum aquilegifolium</i>	E1	5	7	.	. .
	<i>Polystichum aculeatum</i>	E1	5	.	.	. .
	<i>Adoxa moschatellina</i>	E1	3	.	.	. .
FS	<i>Fagetalia sylvaticae</i>					
	<i>Mercurialis perennis</i>	E1	44	86	50	8 .
	<i>Melica nutans</i>	E1	33	21	40	. 11
	<i>Galeobdolon flavidum</i>	E1	31	36	.	. .
	<i>Daphne mezereum</i>	E2a	26	29	20	. .
	<i>Dryopteris filix-mas</i>	E1	26	29	.	. .
	<i>Lonicera alpigena</i>	E2a	23	29	20	8 .
	<i>Paris quadrifolia</i>	E1	21	21	.	. .
	<i>Lilium martagon</i>	E1	18	21	.	. .
	<i>Prenanthes purpurea</i>	E1	18	.	.	8 .
	<i>Epilobium montanum</i>	E1	13	.	.	. .
	<i>Galium laevigatum</i>	E1	13	14	10	. .
	<i>Actaea spicata</i>	E1	10	7	.	. .
	<i>Fagus sylvatica</i>	E3a	5	7	20	. .
	<i>Fagus sylvatica</i>	E2	10	7	30	8 .
	<i>Laburnum alpinum</i>	E2b	8	14	40	. 11
	<i>Symphytum tuberosum</i>	E1	8	7	.	. .
	<i>Carex sylvatica</i>	E1	3	.	.	. .

Successive number (Zaporedna številka)		1	2	3	4	5
	<i>Luzula nivea</i>	E1	3	.	.	.
	<i>Myosotis sylvatica</i>	E1	3	.	.	.
	<i>Scrophularia nodosa</i>	E1	3	.	.	.
	<i>Viola reichenbachiana</i>	E1	3	7	10	23
	<i>Polygonatum multiflorum</i>	E1	.	7	.	.
	<i>Neottia nidus-avis</i>	E1	.	.	.	8
QF	Quercu-Fagetea					
	<i>Anemone nemorosa</i>	E1	38	29	.	.
	<i>Hepatica nobilis</i>	E1	5	7	.	8
	<i>Carex digitata</i>	E1	3	7	.	46
	<i>Corylus avellana</i>	E2a	3	7	.	15
	<i>Listera ovata</i>	E1	3	7	.	8
	<i>Platanthera bifolia</i>	E1	3	7	30	23
	<i>Ranunculus auricomus</i> agg.	E1	3	.	.	.
	<i>Viola riviniana</i>	E1	3	7	.	.
	<i>Cephalanthera longifolia</i>	E1	.	.	10	15
	<i>Lonicera xylosteum</i>	E2a	.	.	.	15
	<i>Carex montana</i>	E1	.	.	.	15
SSC	Sambuco-Salicion capreae, Epilobietea angustifolii					
	<i>Sorbus aucuparia</i>	E2	69	64	80	15
EA	<i>Rubus idaeus</i>	E2a	31	50	10	.
EA	<i>Fragaria vesca</i>	E1	10	14	.	.
EA	<i>Hypericum hirsutum</i>	E1	3	.	.	.
	<i>Salix caprea</i>	E2	.	.	.	23
RP	Rhamno-Prunetea					
	<i>Rosa canina</i> agg.	E2a	3	.	.	8
	<i>Rosa glauca</i>	E2a	3	7	.	.
	<i>Viburnum lantana</i>	E2	.	.	.	85
	<i>Berberis vulgaris</i>	E2	.	.	.	77
	<i>Prunus spinosa</i>	E2	.	.	.	15
	<i>Rhamnus catharticus</i>	E2	.	.	.	11
MuA	Mulgedio-Aconitetea					
	<i>Veratrum album</i>	E1	59	43	.	.
	<i>Polygonatum verticillatum</i>	E1	51	29	.	.
	<i>Viola biflora</i>	E1	51	14	.	8
	<i>Aconitum lycoctonum</i> subsp. <i>ranunculifolium</i>	E1	38	29	.	.
	<i>Geranium sylvaticum</i>	E1	38	14	.	.
	<i>Athyrium filix-femina</i>	E1	31	14	.	.
	<i>Aconitum angustifolium</i>	E1	26	50	20	.
	<i>Ranunculus platanifolius</i>	E1	18	7	.	.
	<i>Adenostyles alliariae</i>	E1	15	.	.	.
	<i>Saxifraga rotundifolia</i>	E1	13	.	.	.
	<i>Senecio cacaliaster</i>	E1	13	.	.	.
	<i>Allium victorialis</i>	E1	10	7	.	.
	<i>Chaerophyllum hirsutum</i>	E1	10	.	.	.
	<i>Chaerophyllum villarsii</i>	E1	8	7	.	.
	<i>Senecio ovatus</i>	E1	5	7	.	.
	<i>Heracleum montanum</i>	E1	8	.	.	.
	<i>Hypericum maculatum</i>	E1	8	.	.	.
	<i>Carduus personata</i>	E1	5	.	.	.
	<i>Cicerbita alpina</i>	E1	5	.	.	.
	<i>Doronicum austriacum</i>	E1	5	.	.	.
	<i>Geum rivale</i>	E1	5	.	.	.
	<i>Phyteuma ovatum</i>	E1	5	.	.	.
	<i>Crepis paludosa</i>	E1	3	.	.	.
	<i>Crepis pyrenaica</i>	E1	3	.	.	.

Successive number (Zaporedna številka)		1	2	3	4	5
	<i>Eryngium alpinum</i>	E1	3	.	.	.
	<i>Lathyrus occidentalis</i> var. <i>montanus</i>	E1	3	.	.	.
	<i>Myrrhis odorata</i>	E1	3	.	.	.
	<i>Peucedanum ostruthium</i>	E1	3	.	.	.
	<i>Pleurospermum austriacum</i>	E1	3	.	.	.
	<i>Poa hybrida</i> agg.	E1	3	.	.	.
	<i>Stellaria nemorum</i>	E1	3	.	.	.
	<i>Streptopus amplexifolius</i>	E1	3	.	.	.
BA	Betulo-Alnetea					
	<i>Salix glabra</i>	E2a	79	71	100	.
	<i>Salix appendiculata</i>	E2	74	64	20	.
	<i>Sorbus chamaemespilus</i>	E2	54	29	10	.
	<i>Juniperus sibirica</i>	E2a	36	29	.	11
	<i>Salix waldsteiniana</i>	E2a	31	7	.	.
	<i>Alnus viridis</i>	E2	28	.	.	.
	<i>Ribes alpinum</i>	E2a	13	21	.	.
TG	Trifolio-Geranietea					
	<i>Laserpitium siler</i>	E1	5	21	50	.
	<i>Thalictrum minus</i>	E1	5	14	.	.
	<i>Libanotis sibirica</i> subsp. <i>montana</i>	E1	3	7	.	.
	<i>Lilium carnioolicum</i>	E1	3	14	.	.
	<i>Origanum vulgare</i>	E1	3	7	.	.
	<i>Polygonatum odoratum</i>	E1	3	7	20	54
	<i>Viola hirta</i>	E1	3	14	50	8
	<i>Anthericum ramosum</i>	E1	.	7	20	46
	<i>Stachys recta</i> agg.	E1	.	7	.	.
	<i>Vincetoxicum hirundinaria</i>	E1	.	.	30	15
	<i>Lilium bulbiferum</i>	E1	.	.	.	8
FB	Festuco-Brometea					
	<i>Carlina acaulis</i>	E1	21	50	60	.
	<i>Bromus erectus</i> agg.	E1	8	21	.	.
	<i>Carex humilis</i>	E1	5	21	50	85
	<i>Prunella grandiflora</i>	E1	5	21	10	.
	<i>Avenula praeusta</i>	E1	3	7	.	.
	<i>Euphorbia cyparissias</i>	E1	3	7	10	.
	<i>Gentianella ciliata</i>	E1	3	.	20	.
	<i>Hippocrepis comosa</i>	E1	3	14	10	8
	<i>Koeleria pyramidata</i>	E1	3	.	.	.
	<i>Linum catharticum</i>	E1	3	.	10	.
	<i>Peucedanum oreoselinum</i>	E1	.	.	60	69
	<i>Inula ensifolia</i>	E1	.	.	30	.
	<i>Teucrium montanum</i>	E1	.	.	40	8
	<i>Centaurea jacea</i> agg. (<i>C. bracteata</i>)	E1	.	.	20	.
	<i>Gymnadenia conopsea</i>	E1	.	.	20	.
	<i>Linum viscosum</i>	E1	.	.	20	.
	<i>Teucrium chamaedrys</i>	E1	.	.	20	15
	<i>Thesium linophyllum</i>	E1	.	.	10	15
	<i>Brachypodium rupestre</i>	E1	.	.	10	.
	<i>Galium lucidum</i>	E1	.	.	10	31
	<i>Galium verum</i>	E1	.	.	.	23
	<i>Serratula nudicaulis</i>	E1	.	.	.	15
	<i>Dianthus monspessulanus</i>	E1	.	.	.	.
	<i>Genista sericea</i>	E1	.	.	.	11
ES	Elyno-Seslerietea					
	<i>Sesleria caerulea</i> subsp. <i>calcaria</i>	E1	69	86	70	100
	<i>Laserpitium peucedanoides</i>	E1	59	71	100	.
	<i>Betonica alopecurus</i>	E1	54	86	90	23
	<i>Carex sempervirens</i>	E1	36	57	.	.
	<i>Helianthemum grandiflorum</i>	E1	36	64	10	15

Successive number (Zaporedna številka)		1	2	3	4	5
<i>Aster bellidiastrum</i>	E1	31	14	.	46	.
<i>Carduus crassifolius</i> (inc. <i>C. defloratus</i>)	E1	31	64	50	8	11
<i>Thymus praecox</i> subsp. <i>polytrichus</i>	E1	28	50	20	.	.
<i>Phyteuma orbiculare</i>	E1	26	50	40	46	33
<i>Leucanthemum maximum</i> agg.	E1	23	50	50	.	22
<i>Pimpinella alpina</i>	E1	23	50	10	.	.
<i>Pulsatilla alpina</i>	E1	23	29	.	.	.
<i>Bartsia alpina</i>	E1	21	7	10	.	11
<i>Heliosperma alpestre</i>	E1	21	21	.	.	.
<i>Campanula witasekiana</i>	E1	18	14	.	.	.
<i>Galium anisophyllum</i>	E1	18	21	.	.	.
<i>Achillea clavinae</i>	E1	15	7	.	.	.
<i>Centaurea haynaldii</i> subsp. <i>julica</i>	E1	15	50	20	.	.
<i>Koeleria eriostachya</i>	E1	15	14	.	.	.
<i>Linum julicum</i>	E1	15	21	10	.	.
<i>Polygonum viviparum</i>	E1	15	.	.	.	.
<i>Senecio abrotanifolius</i>	E1	15	29	10	.	11
<i>Festuca calva</i>	E1	13	14	.	.	.
<i>Globularia cordifolia</i>	E1	13	29	80	38	67
<i>Carex ferruginea</i>	E1	10	.	.	31	.
<i>Carex mucronata</i>	E1	10	29	50	.	22
<i>Heracleum austriacum</i> subsp. <i>siifolium</i>	E1	10	7	.	.	.
<i>Hieracium villosum</i>	E1	10	7	.	.	.
<i>Juncus monanthos</i>	E1	10	.	.	.	.
<i>Globularia nudicaulis</i>	E1	8	14	.	.	.
<i>Helianthemum alpestre</i>	E1	8	7	.	.	.
<i>Knautia longifolia</i>	E1	8	14	.	.	.
<i>Leontopodium alpinum</i>	E1	8	7	.	.	.
<i>Scabiosa lucida</i> subsp. <i>lucida</i>	E1	8	14	.	.	.
<i>Serratula macrocephala</i>	E1	8	14	.	.	.
<i>Gentiana lutea</i> subsp. <i>symphyandra</i>	E1	5	14	.	.	.
<i>Dryas octopetala</i>	E1	5	7	60	.	22
<i>Euphrasia salisburgensis</i>	E1	5	7	10	.	.
<i>Helictotrichon parlatorei</i>	E1	5	7	.	.	.
<i>Carex firma</i>	E1	5	.	30	.	33
<i>Polygala alpestris</i>	E1	5	.	.	.	.
<i>Potentilla crantzii</i>	E1	5	.	.	.	.
<i>Ranunculus carinthiacus</i>	E1	5	.	.	.	.
<i>Primula wulfeniana</i>	E1	3	7	10	.	.
<i>Rhinanthus aristatus</i>	E1	3	7	10	.	.
<i>Ranunculus hybridus</i>	E1	3	.	10	.	.
<i>Scorzonera rosea</i>	E1	3	7	.	.	.
<i>Alchemilla alpigena</i>	E1	3	.	.	.	.
<i>Anemone narcissiflora</i>	E1	3	.	.	.	.
<i>Cerastium strictum</i>	E1	3	.	.	.	.
<i>Salix alpina</i>	E1	3	.	.	.	.
<i>Thesium alpinum</i>	E1	.	.	20	.	.
<i>Gentiana clusii</i>	E1	.	.	10	.	11
<i>Acinos alpinus</i>	E1	.	.	10	.	.
<i>Scabiosa lucida</i> subsp. <i>stricta</i>	E1	.	.	10	.	.
<i>Primula glaucescens</i>	E1	.	.	.	8	.
<i>Ranunculus montanus</i>	E1	.	.	.	.	11
JT <i>Junctea trifida</i>, <i>Loiseleurio-Vaccinietea</i>						
<i>Soldanella alpina</i>	E1	21	7	.	.	.
<i>Gentiana pannonica</i>	E1	5	.	.	.	.
LV <i>Empetrum hermaphroditum</i>	E1	5	.	.	.	.
LV <i>Arctostaphylos alpinus</i>	E1	5	.	.	.	.
LV <i>Vaccinium gaultherioides</i>	E1	3	.	.	.	.
OE <i>Carex atrata</i>	E1	3	.	.	.	.

Successive number (Zaporedna številka)		1	2	3	4	5
	<i>Parnassia palustris</i>	E1	21	7	.	8 22
	<i>Selaginella selaginoides</i>	E1	10	.	20	. 11
	<i>Pinguicula alpina</i>	E1	8	.	.	.
	<i>Tofieldia calyculata</i>	E1	5	.	20 23	11
	<i>Carex capillaris</i>	E1	3	.	.	.
	<i>Pinguicula vulgaris</i>	E1	.	.	.	22
CU	Calluno-Ulicetea					
	<i>Anthoxanthum odoratum</i>	E1	8	.	.	.
	<i>Genista germanica</i>	E1	.	.	15	11
	<i>Annenaria dioica</i>	E1	.	.	.	11
PaT	Poo alpinae-Trisetalia					
	<i>Campanula scheuchzeri</i>	E1	59	14	.	.
	<i>Poa alpina</i>	E1	10	.	.	.
	<i>Trollius europaeus</i>	E1	10	14	.	.
	<i>Festuca nigrescens</i>	E1	5	.	.	.
	<i>Cerastium fontanum</i>	E1	3	.	.	.
	<i>Crocus albiflorus</i>	E1	3	.	.	.
	<i>Polygonum bistorta</i>	E1	3	.	.	.
	<i>Ranunculus nemorosus</i>	E1	3	.	.	.
MA	Molinio-Arrhenatheretea					
	<i>Lotus corniculatus</i> s. lat.	E1	23	50	50	. 11
	<i>Angelica sylvestris</i>	E1	5	.	.	.
	<i>Deschampsia cespitosa</i>	E1	5	.	.	.
	<i>Trifolium pratense</i>	E1	5	.	.	.
	<i>Dactylis glomerata</i>	E1	3	.	.	.
	<i>Festuca rubra</i> agg.	E1	3	.	.	.
	<i>Galium mollugo</i> agg.	E1	3	.	.	.
TR	Thlaspietea rotundifolii					
	<i>Adenostyles glabra</i>	E1	33	21	10	.
	<i>Dryopteris villarii</i>	E1	21	.	.	.
	<i>Gymnocarpium robertianum</i>	E1	21	36	.	15 .
	<i>Campanula cespitosa</i>	E1	18	57	90	. 44
	<i>Festuca nitida</i>	E1	18	.	.	.
	<i>Valeriana montana</i>	E1	15	21	20	8 .
	<i>Campanula cochleariifolia</i>	E1	13	7	.	.
	<i>Astrantia carniolica</i>	E1	10	14	10	.
	<i>Petasites paradoxus</i>	E1	10	21	50	. 33
	<i>Rhodiola rosea</i>	E1	10	.	.	.
	<i>Biscutella laevigata</i>	E1	5	7	60	23 33
	<i>Saxifraga aizoides</i>	E1	5	.	.	.
	<i>Aquilegia einseleana</i>	E1	3	7	70	. 33
	<i>Saxifraga caesia</i>	E1	3	7	.	.
	<i>Rumex scutatus</i>	E1	3	.	10	.
	<i>Homogyne discolor</i>	E1	3	.	.	.
	<i>Salix retusa</i>	E1	3	.	.	.
	<i>Festuca laxa</i>	E1	3	.	.	.
	<i>Molopospermum peloponnesiacum</i>	E1	3	.	.	.
	subsp. <i>bauhinii</i>					
	<i>Trisetum argenteum</i>	E1	3	.	.	.
	<i>Cystopteris montana</i>	E1	3	.	.	.
	<i>Aquilegia bertolonii</i>	E1	.	7	.	.
	<i>Scrophularia juratensis</i>	E1	.	7	.	.
	<i>Hieracium porrifolium</i>	E1	.	.	90	. 33
	<i>Achnatherum calamagrostis</i>	E1	.	.	20	.
	<i>Hieracium bifidum</i>	E1	.	.	40	.
	<i>Gypsophila repens</i>	E1	.	.	10	.
	<i>Euphorbia triflora</i> subsp. <i>kernerii</i>	E1	.	.	.	44
	<i>Thesium rostratum</i>	E1	.	.	.	44
	<i>Centaurea dichroantha</i>	E1	.	.	.	11

Successive number (Zaporedna številka)		1	2	3	4	5
	<i>Asplenium viride</i>	E1	51	29	.	.
	<i>Valeriana saxatilis</i>	E1	46	50	90	8
	<i>Paederota lutea</i>	E1	36	21	10	.
	<i>Asplenium ruta-muraria</i>	E1	10	29	.	.
	<i>Cystopteris fragilis</i>	E1	10	7	.	.
	<i>Primula auricula</i>	E1	8	14	.	.
	<i>Saxifraga crustata</i>	E1	5	.	10	.
	<i>Campanula zoysii</i>	E1	3	7	.	.
	<i>Carex brachystachys</i>	E1	3	7	.	.
	<i>Hieracium glaucum</i>	E1	3	7	.	.
	<i>Moehringia muscosa</i>	E1	3	7	.	.
	<i>Potentilla caulescens</i>	E1	3	.	20	.
	<i>Cystopteris regia</i>	E1	3	.	.	.
	<i>Festuca stenantha</i>	E1	3	.	.	.
	<i>Saxifraga squarrosa</i>	E1	.	.	10	.
	<i>Saxifraga burseriana</i>	E1	.	.	20	.
O	Other species (Druge vrste)					
	<i>Juniperus communis</i>	E2b	8	21	40	31
	<i>Alchemilla</i> sp.	E1	5	.	.	.
	<i>Festuca</i> sp.	E1	5	.	.	.
	<i>Agrostis</i> sp.	E1	3	.	.	.
	<i>Ranunculus</i> sp.	E1	3	.	.	.
	<i>Saxifraga</i> sp.	E1	3	.	.	.
	<i>Hieracium</i> sp.	E1	3	.	.	.
	<i>Juglans regia</i>	E1	.	.	.	.
	<i>Orobancha</i> sp.	E1	.	.	10	.
ML	Mosses and lichens (Mahovi in lišaji)					
	<i>Tortella tortuosa</i>	E0	74	64	60	.
	<i>Ctenidium molluscum</i>	E0	54	57	70	54
	<i>Rhytiadelphus triquetrus</i>	E0	49	14	20	54
	<i>Dicranum scoparium</i>	E0	38	14	.	8
	<i>Hylocomium splendens</i>	E0	36	21	30	15
	<i>Fissidens dubius</i>	E0	26	36	10	.
	<i>Rhytiadelphus loreus</i>	E0	26	.	.	.
	<i>Polytrichum formosum</i>	E0	26	.	.	.
	<i>Dicranum</i> sp.	E0	21	21	10	.
	<i>Orthothecium rufescens</i>	E0	18	7	.	.
	<i>Schistidium apocarpum</i>	E0	13	14	20	.
	<i>Cladonia</i> sp.	E0	13	7	.	11
	<i>Bazzania trilobata</i>	E0	10	.	.	.
	<i>Pleurozium schreberi</i>	E0	10	14	.	38
	<i>Rhizomnium punctatum</i>	E0	8	.	.	.
	<i>Peltigera canina</i>	E0	8	.	.	.
	<i>Peltigera leucophlebia</i>	E0	8	.	.	.
	<i>Cladonia pyxidata</i>	E0	5	.	.	8
	<i>Conocephalum conicum</i>	E0	5	.	.	.
	<i>Mnium</i> sp.	E0	5	.	.	.
	<i>Sphagnum</i> sp.	E0	5	.	.	.
	<i>Homalothecium philippeanum</i>	E0	3	14	.	.
	<i>Neckera crispa</i>	E0	3	7	30	.
	<i>Hypnum cupressiforme</i>	E0	3	7	.	8
	<i>Scleropodium purum</i>	E0	3	.	40	85
	<i>Dicranum majus</i>	E0	3	.	.	.
	<i>Distichium capillaceum</i>	E0	3	.	.	.
	<i>Encalypta</i> sp.	E0	3	.	.	.
	<i>Mnium thomsonii</i>	E0	3	.	.	.
	<i>Plagiochila asplenoides</i>	E0	3	.	.	.
	<i>Plagiochila porelloides</i>	E0	3	.	.	.
	<i>Plagiothecium undulatum</i>	E0	3	.	.	.

Successive number (Zaporedna številka)		1	2	3	4	5
<i>Sanionia uncinata</i>	EO	3	.	.	.	.
<i>Bryum capillare</i>	EO	.	7	.	.	.

RPm *Rhodothamno-Pinetum mugo*, the Julian Alps (Julijske Alpe), Dakskobler (in litt.)

RPmgr *Rhodothamno-Pinetum mugo* var. *Genista radiata*, the Julian Alps (Julijske Alpe)

(Table 2, this article)

APm-JA *Amelanchiero-Pinetum mugo*, the Julian Alps (Julijske Alpe) (Table 1, this article)

APm-Tr *Amelanchiero-Pinetum mugo*, Trentino, northern Italy (Minghetti 1996, Table 1)

APm-F *Amelanchiero-Pinetum mugo*, Friuli, northeastern Italy (Poldini and Vidali 1999,

Table 3)

Table 4: Groups of diagnostic species in the stands of the associations *Rhodothamno-Pinetum mugo* and *Amelanchiero-Pinetum mugo* (relative frequencies)

Preglednica 4: Skupine diagnostičnih vrst v sestojih asociacij *Rhodothamno-Pinetum mugo* in *Amelanchiero-Pinetum mugo* (relativne frekvence)

Successive number (Zaporedna številka)	1	2	3	4	5
Number of relevés (Število popisov)	39	14	10	13	9
Sign for syntaxa (Oznaka sintaksonov)	RPm	RPmgr	APm-JA	APm-Tr	APm-F
Author (Avtor)	ID	ID	ID	MI	LP
<i>Erico-Pinetea</i>	11,51	19,07	27,34	32,51	35,62
<i>Vaccinio-Piceetea</i>	21,69	11,11	4,77	6,02	1,74
<i>Quercetalia pubescenti-petraeae</i>	0,82	1,75	6,79	13,62	5,81
<i>Aremonio-Fagion</i>	2,45	3,23	4,22	2,76	3,28
<i>Quercetalia roboris</i>	0,24	0,29	0,73	1,27	2,53
<i>Fagetalia sylvaticae</i>	6,51	7,47	5,32	1,74	1,08
<i>Quercu-Fagetea</i>	1,25	1,46	1,47	4,86	2,17
<i>Sambuco-Salicion capreae</i>	2,12	2,63	1,65	1,05	0,72
<i>Rhamno-Prunetea</i>	0,10	0,14	0	5,11	2,89
<i>Mulgedio-Aconitetea</i>	8,58	4,55	0,37	0,22	0
<i>Betulo-Alnetea</i>	5,91	4,55	2,39	0	2,92
<i>Trifolio-Geranietea</i>	0,43	2,02	3,12	3,62	3,25
<i>Festuco-Brometea</i>	1,01	2,90	7,52	7,43	9,39
<i>Elyno-Seslerietea</i>	16,00	22,24	14,68	8,70	13,07
<i>Junctea trifidi, Loiseleurio-Vaccinietea</i>	0,77	0,14	0	0	0
<i>Scheuchzerio-Caricetea fuscae</i>	0,87	0,14	0,73	0,86	2,17
<i>Calluno-Ulicetea</i>	0,14	0	0	0,41	0,72
<i>Poo alpinae-Trisetalia</i>	1,78	0,58	0	0	0
<i>Molinio-Arrhenatheretea</i>	0,87	1,03	0,92	0	0,36
<i>Thlaspietea rotundifolii</i>	3,81	4,36	8,81	1,27	9,03
<i>Asplenieta trichomanis</i>	3,47	3,66	2,94	0,22	1,44
Other species (Druge vrste)	0,53	0,43	0,92	0,86	1,44
Mosses and lichens (Mahovi in lišaji)	9,15	6,25	5,32	7,46	0,36
Total (Skupaj)	100,00	100	100	100	100