

ARUNCO-SALICETUM CAPREAE – WHERE IS ITS SYNTAXONOMICAL POSITION?

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Abstract

Presented study is focused on the syntaxonomical revision and correct classification of the associations *Arunco-Salicetum capreae* and *Filipendulo-Salicetum capreae*. The associations were described by Hadač et al. (1969) from the Dolina Siedmich prameňov Valley in the Belianske Tatry Mts. The association *Arunco-Salicetum capreae* was emended by Šomšák (1986) by including the new subassociation from the Slovenské rudohorie Mts. Hadač et al. (1969) and Šomšák (1986) preliminarily ordered these associations within the class *Quercus-Fagetea*, order *Fagetalia*, and alliance *Alnion incanae*. Later authors (Mucina & Maglocký 1985, Jarolímek & Šibík 2008) ordered them into two different classes. We used numerical analyses (hierarchical clustering and detrended correspondence analysis) of 1056 relevés from floristically and ecologically similar syntaxonomical units to classify the associations within higher syntaxa and to find out whether there is a reason to distinguish two associations from such a small geographic area. Based on the analysis results we merged both studied associations into one association *Arunco vulgaris-Salicetum capreae* Hadač et al. ex Petrášová et Jarolímek, ass. nova, which we ordered to the suballiance *Alnenion glutinoso-incanae*.

Key words: *Salix caprea*-communities, *Alnenion glutinoso-incanae*, riparian willow communities, syntaxonomy, numerical classification, Belianske Tatry Mts.

Izvlček

V raziskavi smo se osredotočili na sintaksonomsko revizijo in pravilno uvrstitev asociacij *Arunco-Salicetum capreae* in *Filipendulo-Salicetum capreae*. Asociaciji so opisali Hadač et al. (1969) v dolini Dolina Siedmich prameňov v gorovju Belianske Tatry. Asociacijo *Arunco-Salicetum capreae* je emendiral Šomšák (1986) z vključitvijo nove subasociacije z gorovja Slovenské rudohorie. Hadač et al. (1969) in Šomšák (1986) so preliminarno uvrstili te asociacije v razred *Quercus-Fagetea*, red *Fagetalia* in zvezo *Alnion incanae*. Kasneje so jih različni avtorji (Mucina & Maglocký 1985, Jarolímek & Šibík 2008) uvrstili v različna razreda. Za uvrstitev asociacij v višje sintaksone smo uporabili numerične analize (hierarhično kopičenje in korespondenčno analizo z odstranjenim trendom) 1056 vegetacijskih popisov floristično in ekološko podobnih sintaksonov. Želeli smo tudi ugotoviti ali je smiselno ločevati dve asociaciji na tako majhnem geografskem območju. Na osnovi rezultatov analiz smo združili obe asociaciji v *Arunco vulgaris-Salicetum capreae* Hadač et al. ex Petrášová et Jarolímek, ass. nova, ki smo jo uvrstili v podzvezo *Alnenion glutinoso-incanae*.

Ključne besede: združbe s *Salix caprea*, *Alnenion glutinoso-incanae*, obvodna vrbovja, sintaksonomija, numerična klasifikacija, Belianske Tatry.

1. INTRODUCTION

Based on six phytosociological relevés, Hadač et al. (1969) provisionally described two new associations from the Dolina Siedmich prameňov Valley in the Belianske Tatry Mts: *Arunco-Salicetum capreae* Hadač et al. 1969 ass. prov., and *Filipendulo-Salicetum capreae* Hadač et al. 1969 ass. prov.

According to the description, the associations represent riparian willow shrub stands along both banks of the Hlboký potok Stream, on limestone substrate. Localities are situated in the altitudes from 1100 to 1200 m a.s.l. Shrub layer is dominated by *Salix caprea*. Species *Salix silesiaca*, *Sorbus aucuparia*, *Acer pseudoplatanus*, and *Picea abies* are also common. Dense herb layer is species rich,

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consisting of 30–40 species. Mesophilous species, typical for hardwood floodplain forests (*Carex remota*, *Circaea lutetiana*, *Festuca gigantea*, *Geranium phaeum*, *Ranunculus auricomus*, *Stachys sylvatica*), are accompanied with montane species, e.g. *Arunco vulgaris* (syn. *Arunco sylvestris*), *Chaerophyllum hirsutum*, *Epilobium alpestre*, *Gentiana asclepiadea*, *Geranium sylvaticum*, *Rosa pendulina*. Close to the alluvium of Hlboký potok Stream, where the steep terrain begins, other forests communities of the Dolina Siedmich prameňov Valley dominate – spruce forests closely below the subalpine zone of *Pinus mugo*. Forests of the alliance *Tilio-Acerion* are present only in fragments in the studied area. In the closest neighbourhood of *Arunco-Salicetum capreae* and *Filipendulo-Salicetum capreae* in the alluvium of Hlboký potok Stream there are present also other riparian communities of the alliances *Petasion officinalis* and *Adenostylian alliariae* and in the upper part of the valley the spring communities of the alliance *Cratoneurion commutati*.

Hadač et al. (1969, 1987) ordered both analysed associations to the class *Quercu-Fagetea*, order *Fagetalia*, and alliance *Alnion incanae*. The alliance *Alnion incanae* comprises two suballiances, *Almenion glutinoso-incanae* and *Ulmenion*, but Hadač et al. (1969) didn't classify the associations at suballiance level. Both studied associations were described with provisional names, and each of them is documented only by three relevés. As a main difference between the associations authors state the different size of skeleton in the substrate, gravel for *Filipendulo-Salicetum capreae* and boulders for *Arunco-Salicetum capreae*.

There are no other forest communities belonging to the alliance *Alnion incanae*, in other parts of the Dolina Siedmich prameňov Valley.

Šomšák (1986) classified other eight relevés to the association *Arunco-Salicetum capreae*. These relevés originate from the eastern part of the Slovenské rudohorie Mts with slightly different ecological conditions. Localities are situated on steep banks around the river Hnilec with nutrient poor substrate on granite bedrock. Altitude of the localities varies from 580 to 810 m a.s.l. Šomšák (1986) agreed with classification of this association within the alliance *Alnion incanae*; however, the author did not mention classification at the suballiance level. He also suggested dividing the association *Arunco-Salicetum capreae* into two subassociations, based on the differences in species composition, caused by different ecological conditions. Both authors recommended future

verification of the preliminary classification of both associations proposed by Hadač.

There are no other relevés classified into the above-mentioned associations, in the Slovak national relevé database (CDF, Hegedúšová 2007).

To these days, classification of the studied associations within higher syntaxa was not resolved. Until present time they were classified within three different higher taxonomical units (*Alnion incanae*, *Betulo-Alnetea viridis* and *Ulmenion*).

The association *Arunco-Salicetum capreae* was not reported from any other parts of the Carpathians, either in Poland (Matuszkiewicz 2008) or Romania (Coldea 1991, Sanda et al. 1999) or from the Alps (Mucina et al. 1993, Šilc & Čarni 2012). Communities with similar physiognomy are in the Carpathians classified within the class *Betulo-Adenostyletea* Br.-Bl. 1948, the association *Saliceto-Alnetum viridis* Colic et al. 1962 in Romania and *Pulmonario-Alnetum viridis* Pawl. et Wal. 1949 in Poland. In the Alps, similar vegetation is classified within the class *Betulo carpaticae-Alnetea viridis* Rejmánek in Huml et al. 1979, alliance *Alnion viridis* Schnyder 1930 (Grabher & Mucina 1993, Šilc & Čarni 2012). Floristic composition of all these communities is different from the associations *Arunco-Salicetum capreae* and *Filipendulo-Salicetum capreae*.

Aims of our study are (1) to verify the recent occurrence of the associations *Filipendulo-Salicetum capreae* and *Arunco-Salicetum capreae*, and sample communities in original localities for better description of these associations, (2) to verify the rationales for distinguishing of the two associations from relatively small geographic area and similar ecological conditions, (3) to propose the classification of the associations within higher syntaxa.

2. METHODS

Four new relevés were sampled in 2012 following the standard procedures of the Zürich-Montpellier school (Braun-Blanquet 1964; Westhoff 1973) on the plot area at least 16 m², what is the smallest plot area used by Hadač et al. (1969). This type of vegetation forms relatively small isolated patches along the stream. In the largest patches of the studied communities we used plots of size up to 50 m². New Braun-Blanquet cover-abundance scale was used (Westhoff 1973). Handheld GPS

device (GARMIN Oregon 550t) was used to record coordinates of the plots. Study area includes the territory of the Dolina Siedmich prameňov Valley, especially alluvium of the Hlboký potok Stream, in the central part of the Belianske Tatry Mts. Localities of relevés were selected according to descriptions of Hadač et al. (1969) as close to the original plots as possible based on the present vegetation structure.

Numerical classification was based on the dataset of 1324 relevés from the Slovak national database (CDF, Hegedúšová 2007) ordered by authors to the suballiances *Ulmion* (359 rel.) and *Alnenion glutinoso-incanae* (305 rel.), the alliance *Adenostylin* (315 rel.), and the class *Betulo carpaticae-Alnetea viridis* (59 rel.), including 18 relevés of the studied associations (Hadač et al. 1969 – 6 rel., Šomšák 1986 – 8 rel., 4 own recent relevés).

Data were stored in TURBOVEG database (Hennekens & Schaminée 2001) and processed in JUICE program (Tichý 2002). Species records from different layers were merged and mosses were excluded from the dataset. Hierarchical clustering in SYN-TAX 2000 software (Podani 2001) was used for numerical classification. We used several clustering algorithms (beta-flexible method with $\beta = -0.25$, UPGMA, WPGMA) and (di)similarity coefficients (Similarity ratio, Ružička's coefficient and Euclidean distance) to find a stable linkage of studied relevés with higher taxonomical units. DCA analysis using CANOCO software (Ter Braak & Šmilauer 2002) was used to describe the variability inside the studied associations and to show their position within related higher syntaxa.

Phytosociological table (Table 1) was made to describe the differences between groups of relevés assigned into the studied associations (Hadač's, Šomšák's and present relevés) and to explain internal association variability. Two synoptic tables with frequencies and fidelities, calculated using the JUICE program (Tichý 2002), were prepared to determine differential species ($\phi > 25$) separately for each higher syntaxon and for the studied associations. Fisher's exact test ($P < 0.005$) was used for eliminating the fidelity value of species with a non-significant pattern of occurrence (Chytrý et al. 2002, Chytrý et al. 2007). To shorten synoptic tables (Table 2, Table 3) "other taxa" with frequency lower than 20% in any column were excluded. Nomenclature of taxa follows Marhold et al. (1998). Nomencla-

ture of syntaxa follows Jarolímek et al. (2008). The new association name was created according to the International Code of Phytosociological Nomenclature (Weber et al. 2000).

The following abbreviations were used for assignment of species to the higher syntaxa and for non herbal layers in the tables (Table 1, Table 2, Table 3): aa – *Adenostylin alliariae*, AG – *Alnetea glutinosae*, ai – *Alnenion glutinoso-incanae*, BA – *Betulo carpaticae-Alnetea viridis*, EA – *Epilobietea angustifolia*, MA – *Molinio-Arrhenatheretea*, MB – *Molinio-Betuletea pubescens*, QF – *Quercu-Fagetea*, RP – *Rhamno-Prunetea*, S – shrub layer, ss – *Sambuco-Salicion caprae*, T – tree layer, VP – *Vaccinio-Piceetea*.

3. RESULTS

During vegetation season 2012 we sampled all possible areas in the Dolina Siedmich prameňov Valley with compact willow shrub layer covering area larger than 2 by 2 meters and we recorded four phytosociological relevés, which belong to the studied associations. The riparian vegetation described by Hadač et al. (1969) is still present in the Dolina Siedmich prameňov Valley. However, the small areas of the shrub formations occupy recently (in 2012) different places than in the 1969.

Six Hadač's and four recent relevés together contain 126 species. In total 61 species (48.4%) were present in the older relevés and are still present in the recent communities. In total 38 species (30.2%) have disappeared from the nowadays communities and 27 species (21.4%) are new in four recent relevés. Typical forest species, e.g. *Athyrium filix-femina*, *Myosotis sylvatica*, *Paris quadrifolia*, *Dentaria glandulosa*, *Pulmonaria obscura* prevail among the species that disappeared. On the other hand, many species that are new to the communities are more typical for the alliance *Adenostylin*, e.g. *Cicerbita alpina*, *Ribes alpinum*, *Senecio hercynicus*, *Tanacetum corymbosum*. It is apparent, that during the last 40 years the association *Arunco-Salicetum caprae* became more similar to other supramontane communities of the Dolina Siedmich prameňov Valley.

These shrubs form small isolated patches on the alluvia along the Hlboký potok Stream and adjoin with riparian herb communities of the *Adenostylin* and *Petasition* alliances. Since they are rare in the studied area, it was possible to

make only 4 relevés, which are presented in the Table 1. These formations may look like a successional stage of any forest community, but even after more than 40 years there was no riparian forest community developed in the explored territory. Probably this successional stage is stable, blocked in the current form by the avalanches and climatic conditions connected with the high altitude.

Internal variability of the associations *Arunco-Salicetum capreae* and *Filipendulo-Salicetum capreae* is shown in the DCA diagram (Figure 1) and dendrogram (Figure 2). From both plots is apparent that the differences in species composition between the original relevés of the associations *Arunco-Salicetum capreae* Hadač et al. 1969 ass. prov. and *Filipendulo-Salicetum capreae* Hadač et al. 1969 ass. prov. are smaller than the variability of all relevés of the association *Arunco-Salicetum capreae* (Figure 1, Figure 2) and variability between relevés from 1969 and 2012 (Figure 1) as

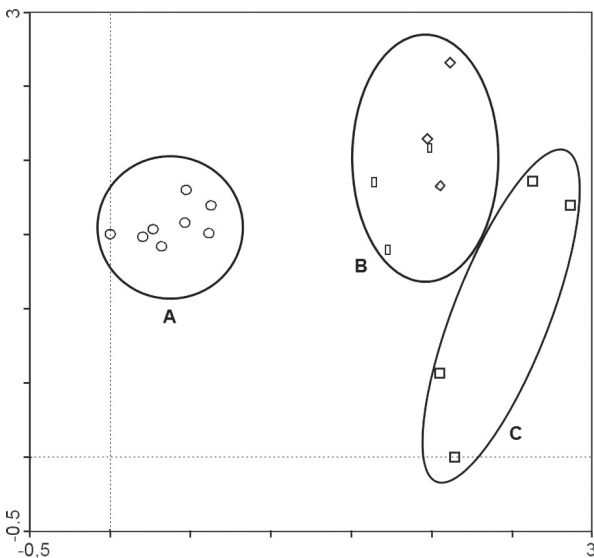


Figure 1: DCA diagram of 18 relevés originally assigned to the associations *Arunco-Salicetum capreae* and *Filipendulo-Salicetum capreae*. A – *Arunco-Salicetum capreae*, relevés from the Slovenské Rudohorie Mts (Šomšák 1986), B – *Arunco-Salicetum capreae* (□) and *Filipendulo-Salicetum capreae* (◇), relevés from the Belianske Tatry Mts (Hadač 1969), C – recent relevés of the association *Arunco-Salicetum capreae* from the Belianske Tatry Mts.

Slika 1: DCA diagram 18 popisov originalno uvrščenih v asociaciji *Arunco-Salicetum capreae* in *Filipendulo-Salicetum capreae*. A – *Arunco-Salicetum capreae*, popisi iz gorovja Slovenské Rudohorie (Šomšák 1986), B – *Arunco-Salicetum capreae* (□) in *Filipendulo-Salicetum capreae* (◇), popisi iz gorovja Belianske Tatry (Hadač 1969), C – novi popisi asociacije *Arunco-Salicetum capreae* iz gorovja Belianske Tatry Mts.

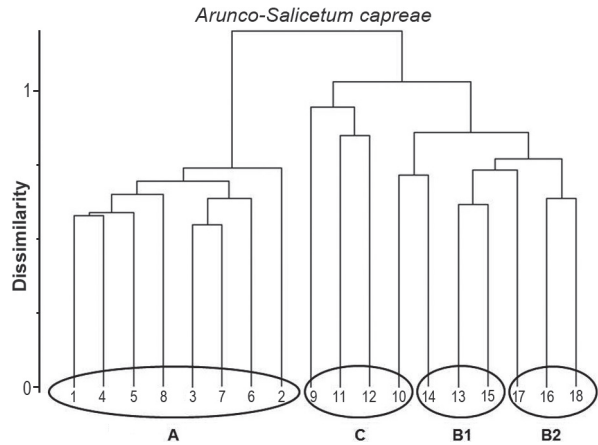


Figure 2: Dendrogram of 18 relevés assigned to the associations *Arunco-Salicetum capreae* and *Filipendulo-Salicetum capreae*. The dendrogram was made using beta-flexible method with $\beta = -0.25$ and Ružička's coefficient of similarity. A – *Arunco-Salicetum capreae* from the Slovenské Rudohorie Mts (Šomšák 1986), B1 – *Arunco-Salicetum capreae* from the Belianske Tatry Mts (Hadač 1969), B2 – *Filipendulo-Salicetum capreae* from the Belianske Tatry Mts (Hadač 1969), C – recent relevés of *Arunco-Salicetum capreae* from the Belianske Tatry Mts.

Slika 2: Dendrogram 18 popisov uvrščenih v asociaciji *Arunco-Salicetum capreae* in *Filipendulo-Salicetum capreae*. Dendrogram smo naredili z beta-fleksibilno metodo z $\beta = -0.25$ in koeficientom podobnosti po Ružički. A – *Arunco-Salicetum capreae* z gorovja Slovenské Rudohorie (Šomšák 1986), B1 – *Arunco-Salicetum capreae* z gorovja Belianske Tatry (Hadač 1969), B2 – *Filipendulo-Salicetum capreae* z gorovja Belianske Tatry (Hadač 1969), C – novi popisi asociacije *Arunco-Salicetum capreae* z gorovja Belianske Tatry.

well. Therefore, we propose to merge these two provisional units into one association:

Arunco vulgaris-Salicetum capreae Hadač et al. ex Petrášová et Jarolímek, ass. nov. hoc loco (Bas.: *Arunco-Salicetum capreae* Hadač et al. 1969 ass. prov. (Hadač et al. 1969: p. 259) (Art. 3b)

Incl. *Filipendulo-Salicetum capreae* Hadač et al. 1969 ass. prov. (Art. 3b), *Arunco-Salicetum capreae* Hadač et al. 1969 em. Šomšák 1986 (Art. 5), *Arunco-Salicetum capreae chrysanthemetosum rotundifolii* Šomšák 1986 (Art. 4a), *Arunco-Salicetum capreae typicum*) (Art. 4a)

Nomenclatural type: Hadač et al. (1969), p. 261, rel. 43, lectotype hoc loco.

All 18 relevés belonging to the association already recorded in Slovakia are presented in the Table 1; the lectotype is marked with asterisk (*).

Results of the DCA analysis of the large set of relevés from the related vegetation units show marginal position of the 18 studied relevés within

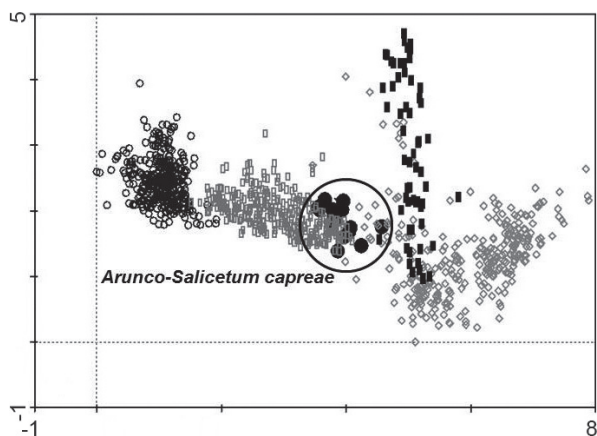


Figure 3: DCA ordination diagram of 1056 relevés shows close position of *Arunco-Salicetum capreae* (●) to *Alnenion glutinoso-incanae* (□), within the relevant higher syntaxa: *Adenostylylion* (◇), *Betulo-Alnetea viridis* (■), and *Ulmenion* (○).

Slika 3: DCA ordinacijski diagram 1056 popisov kaže skupen položaj asociacije *Arunco-Salicetum capreae* (●) do zveze *Alnenion glutinoso-incanae* (□), znotraj višjih sintaksonov: *Adenostylylion* (◇), *Betulo-Alnetea viridis* (■) in *Ulmenion* (○).

the alliance *Alnenion glutinoso-incanae* and transition to the *Adenostylylion* (Figure 3) with larger overlap with the first one. The relevés occur in one cluster of the hierarchical clustering together with relevés classified within the suballiance *Alnenion glutinoso-incanae* (Figure 4). The analysis show, that within the suballiance *Alnenion glutinoso-incanae*, *Alnetum incanae* is the most similar association to the *Arunco-Salicetum capreae*. The closest relevés in the dendrogram (Figure 4) are from the lower part of the Belianske Tatry Mts, from the surrounding parts of the Javorina village. Based on the results of hierarchical clustering and DCA analysis, we propose the classification of studied associations within the suballiance *Alnenion glutinoso-incanae*, and this decision is also supported by the synoptic table (Table 2). Results of hierarchical clustering (Figure 4) show the justifiability of including the association *Arunco-Salicetum capreae* into the association *Alnetum incanae*. The largest similarity between the studied relevés and the relevés from the association *Alnetum incanae* in the dendrogram is probably due to the fact that the relevés of the association *Alnetum incanae* originate from the adjacent parts of the Belianske Tatry Mts and therefore might be floristically similar. In the detailed view, there are significant differences in the physiognomy – while stands of the association *Arunco-Salicetum capreae* never contain tree layer, the stands of the

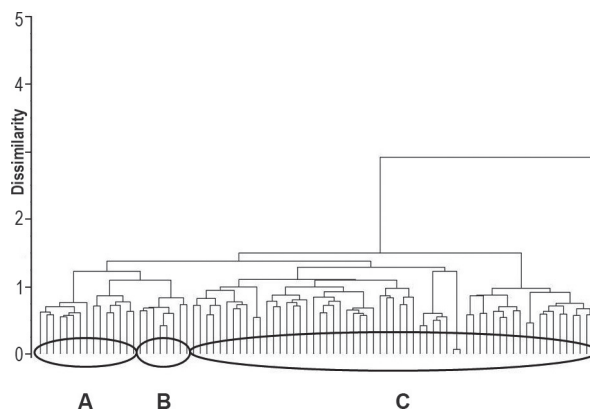


Figure 4: Left segment of the dendrogram of 1056 relevés used in numerical classification presenting the part with studied relevés and next standing association. Dendrogram was made using beta-flexible method with $\beta = -0.25$ and Ružička's coefficient of similarity. A – *Arunco-Salicetum capreae*, B – association *Alnetum incanae* from the Belianske Tatry Mts, C – association *Alnetum incanae* from the other regions of Slovakia.

Slika 4: Levi del dendrograma 1056 popisov, ki smo ga uporabili v numerični klasifikaciji predstavlja del obravnavanih popisov in sorodnih asociacij. Dendrogram smo naredili z beta-fleksibilno metodo z $\beta = -0.25$ in koeficientom podobnosti po Ružički. A – *Arunco-Salicetum capreae*, B – asociacija *Alnetum incanae* z gorovja Belianske Tatry, C – asociacija *Alnetum incanae* iz drugih območij na Slovaškem.

association *Alnetum incanae* always contain dense tree layer, dominated by *Alnus incana*. The considerable differences in the species composition between the associations are presented in the synoptic table (Table 3). Consequently we propose the classification into the suballiance *Alnenion glutinoso-incanae*, but as an individual association.

4. DISCUSSION

Presented study is focused on very rare or neglected type of vegetation, which was yet found just in two small different areas – Dolina Siedmich prameňov Valley and the alluvium of Hnilec River, and was so far documented only by 18 relevés. These facts make classification of the relevés problematic. Authors of the description of the associations, Hadač et al. (1969) and Šomšák (1986) proposed the classification based on the similarity of species composition within the alliance *Alnion incanae* without more exact classification on the suballiance level. Both authors marked the classification as provisional. Later au-

thors of the Lists of vegetation units of Slovakia proposed different classification of association without specific explanation.

On the national level, studied associations were ordered into the class *Betulo carpaticae-Alnetea viridis* in the first List of syntaxonomical units of Slovakia (Mucina & Maglocký 1985). Class *Betulo-Alnetea viridis* includes subalpine communities of deciduous shrubs. Studied community contains several species typical for this class (*Daphne mezereum*, *Rosa pendulina*, *Salix silesiaca*), and numerous species of the alliance *Adenostylion*, which are frequent in *Betulo-Alnetea* communities. Also the shrub physiognomy is similar. However, floristic similarity is true only for the relevés from the Belianske Tatry Mts. Stands from the Slovenské rudohorie Mts are situated in lower altitudes, from 580 to 810 m a.s.l. and their floristic composition is different (Figure 3, 4).

In publication aimed at alpine vegetation of Slovakia (Kliment 2007) author mentioned associations *Arunco-Salicetum capreae* and *Filipendulo-Salicetum capreae* in a short comment within chapter concerned with the class *Betulo-Alnetea viridis*. Author considered inclusion of the associations into the class *Betulo-Alnetea viridis* as incorrect and proposed to order them following original classification of Hadač et al. (1969) and Šomšák (1986) to the alliance *Alnion incanae*.

In the latest List of vegetation units (Jarolímeček & Šibík 2008) both associations are classified within the alliance *Alnion incanae* and the suballiance *Ulmenion*.

Later, large differences in floristic composition and ecological conditions between mentioned associations and other associations of the suballiance *Ulmenion* were found within the study focused on syntaxonomical revision of hardwood floodplain forests of Slovakia (Petrášová & Jarolímeček 2012). A great number of typical montane species are present in the communities of the associations, e.g. *Aconitum variegatum*, *Aruncus vulgaris*, *Chaerophyllum hirsutum*, *Chrysosplenium alternifolium*, *Dentaria glandulosa*, *Epilobium alpestre*, *Gentiana asclepiadea*, *Prenanthes purpurea*, *Rosa pendulina*, *Salix silesiaca*. Following the results of numerical classification (hierarchical clustering and DCA analysis) authors proposed exclusion of *Filipendulo-Salicetum capreae* and *Arunco-Salicetum capreae* from the suballiance *Ulmenion* (Petrášová & Jarolímeček 2012).

Based on the similarity of shrub layers, classification of the associations within the alliance

Sambuco-Salicion might seem like a good solution, but there are many important differences. Communities of *Sambuco-Salicion* represent successional stages of forest communities on glades from lowlands to montane altitudes (Jarolímeček et al. 1997). The studied associations never developed to the forest communities and are documented only from higher altitudes (more than 580 m a.s.l. in the Slovenské rudohorie Mts and more than 1100 in the Belianske Tatry Mts). Relevés of the association *Arunco-Salicetum capreae* are extremely species rich, herb layer consists of 30–40 species and contains many diagnostic species of *Alnion incanae*, *Adenostylion* and *Betulo carpaticae-Alnetea viridis*, which are not present in the *Sambuco-Salicion* communities, e.g. *Aconitum variegatum*, *Chrysosplenium alternifolium*, *Crepis paludosa*, *Epilobium alpestre*, *Gentiana asclepiadea*, *Geranium phaeum*, *G. sylvaticum*, *Geum rivale*, *Luzula sylvatica*, *Ranunculus lanuginosus*, *Rumex alpestris*, *Salix silesiaca*, and *Veratrum album*.

Our results show the inclusion into the alliance *Alnion incanae* as correct, but into the suballiance *Ulmenion* as unsuitable (Fig. 1), as proposed authors in the syntaxonomical revision of the suballiance (Petrášová & Jarolímeček 2012). The synoptic table (Table 2) also shows that diagnostic species of the suballiance *Ulmenion* are not present in the studied relevés.

Presented study confirmed the originally suggested classification within the alliance *Alnion incanae* (Hadač et al. 1969, Šomšák 1986) and specified the classification into the suballiance level, within the suballiance *Almenion glutinoso-incanae*.

5. ACKNOWLEDGEMENT

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Table 1: Association *Arunco-Salicetum capreae*.
Tabela 1: Asociacija *Arunco-Salicetum capreae*.

Number of relevés: 18

1. *Filipendulo-Salicetum capreae* (Hadač 1969, p. 258); 2. *Arunco-Salicetum capreae* (Hadač 1969, p. 261)
 3. *Arunco-Salicetum capreae* (Šomšák 1986, Tab. 1); 4. *Arunco-Salicetum capreae* (Petrašová, Jarolímek 2012, ined.);
 * nomenclatural type: Hadač (1969), p. 261, rel. 43, lectotype.

		1			2			3								4				F(%)		
		0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0		0	0
		5	6	7	8	9	0	1	2	3	4	5	6	7	8	1	2	3	4			
Shrub layer																						
EA	<i>Salix caprea</i>	2	1	2	+	1	+	1	1	+	1	+	1	1	+	+	+	+	1	100		
EA, VP	<i>Rubus idaeus</i>	1	2	+	.	.	.	1	.	.	1	+	1	.	+	.	.	.	.	44
VP	<i>Picea abies</i>	.	.	+	.	.	.	.	.	+	+	.	1	+	+	.	.	1	1	44
VP, BA	<i>Sorbus aucuparia</i>	.	+	+	1	1	+	1	+	1	39	
VP	<i>Lonicera nigra</i>	+	.	1	2	.	+	.	+	.	.	.	+	33	
QF	<i>Lonicera xylosteum</i>	+	+	.	+	+	1	+	33	
BA	<i>Salix silesiaca</i>	.	1	.	+	+	.	.	.	.	.	.	.	.	.	+	1	+	.	33
RP	<i>Populus tremula</i>	r	1	.	r	r	.	+	+	33	
BA	<i>Rosa pendulina</i>	1	.	1	1	+	1	28	
ai	<i>Alnus incana</i>	+	1	1	+	.	.	.	+	28	
ss	<i>Sambucus racemosa</i>	.	+	+	+	.	17	
	<i>Betula pendula</i>	1	.	.	.	+	+	.	17	
QF	<i>Acer pseudoplatanus</i>	r	4	1	.	17	
VP	<i>Abies alba</i>	r	.	.	.	+	11	
AG, MB	<i>Frangula alnus</i>	r	6	
Diagnostic taxa of the association Arunco-Salicetum capreae																						
	<i>Chamerion angustifolium</i>	+	+	.	+	.	.	.	1	1	1	+	.	1	1	+	.	+	+	67		
ai	<i>Aruncus vulgaris</i>	.	.	+	1	1	+	+	1	1	+	+	1	1	+	.	.	.	.	67
QF	<i>Dentaria glandulosa</i>	1	1	+	.	.	+	.	.	+	1	.	r	+	1	.	.	.	.	50
BA	<i>Rosa pendulina</i>	.	+	.	.	1	.	1	.	1	1	+	1	+	+	.	.	.	.	50
ss	<i>Sambucus racemosa</i>	.	.	.	+	.	.	+	r	+	+	1	+	+	+	.	.	.	.	50
VP	<i>Prenanthes purpurea</i>	.	.	.	+	.	.	r	.	+	+	+	1	.	+	.	.	.	1	44		
VP, BA	<i>Sorbus aucuparia</i>	+	.	+	+	.	1	1	+	.	.	.	+	1	44	
aa	<i>Valeriana excelsa</i> ssp. <i>sambucifolia</i>	.	.	+	.	1	.	.	r	.	.	.	.	r	.	+	.	+	+	39
QF	<i>Adoxa moschatellina</i>	1	.	1	.	.	+	.	.	+	+	.	1	.	.	.	.	.	.	33
	<i>Cimicifuga europaea</i>	.	.	+	1	1	+	.	.	.	.	.	.	.	.	.	.	.	1	28
EA	<i>Stachys alpina</i>	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	+	1	28
QF	<i>Actaea spicata</i>	.	.	.	.	.	+	.	1	.	.	.	+	.	.	.	.	.	+	22
Diagnostic taxa of the suballiance																						
<i>Alnion glutinoso-incanae</i>																						
	<i>Aegopodium podagraria</i>	1	1	+	+	.	2	.	1	1	1	+	.	1	+	.	+	4	1	78		
	<i>Athyrium filix-femina</i>	.	1	2	+	1	+	+	1	1	+	+	1	1	.	.	.	.	.	67
	<i>Chaerophyllum hirsutum</i>	+	1	1	.	.	.	.	1	.	+	+	.	.	+	4	1	1	.	56
	<i>Stellaria nemorum</i>	1	2	.	.	+	.	.	.	.	.	.	1	+	.	4	1	.	.	39
	<i>Luzula sylvatica</i>	1	.	+	r	.	+	.	.	.	.	.	.	.	.	.	.	+	+	33
	<i>Silene dioica</i>	+	.	.	+	1	+	.	.	.	.	.	.	.	.	+	+	.	.	33
	<i>Ranunculus repens</i>	.	.	.	.	.	.	+	+	1	.	+	.	+	.	.	+	.	.	33
	<i>Ranunculus lanuginosus</i>	+	.	+	1	.	+	.	.	.	.	.	.	.	.	.	.	+	.	28
	<i>Crepis paludosa</i>	+	.	.	2	.	.	.	+	.	.	.	.	.	r	+	.	.	.	28
	<i>Petasites albus</i>	.	.	.	+	.	1	.	.	+	.	.	+	1	.	.	.	.	.	28

		1			2			3								4							
		0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0		
		5	6	7	8	9	0	1	2	3	4	5	6	7	8	1	2	3	4				
	<i>Cardaminopsis halleri</i>	2	.	+	.	2	.	.	.	.	.	.	.	.	.	.	.	.	1	.	22	
	<i>Myosotis scorpioides</i> agg.	+	+	+	+	22
	<i>Thalictrum aquilegiifolium</i>	.	+	+	+	.	17
	<i>Ranunculus platanifolius</i>	+	+	.	11
	<i>Anthriscus nitidus</i>	1	6
	<i>Caltha palustris</i>	1	6
	<i>Glechoma hederacea</i>	+	.	.	.	6
	Diagnostic taxa of the class <i>Quercio-Fagetea</i>																						
	<i>Asarum europaeum</i>	+	+	2	+	1	1	.	1	+	+	1	+	+	.	.	.	4	1	.	.	78	
	<i>Dryopteris filix-mas</i>	2	+	+	+	2	+	.	.	.	.	1	1	+	+	.	.	4	1	.	.	67
	<i>Galeobdolon luteum</i> agg.	1	.	2	+	1	.	.	r	.	+	.	+	.	.	.	+	1	.	.	.	50	
	<i>Galium schultesii</i>	+	.	+	.	.	+	.	.	+	.	.	1	.	.	.	+	+	+	1	.	50	
	<i>Paris quadrifolia</i>	+	+	+	+	.	1	.	.	+	.	.	.	+	+	.	.	.	.	.	.	44
	<i>Mycelis muralis</i>	.	.	.	.	.	.	r	+	+	+	+	+	+	+	.	.	.	.	.	.	44
	<i>Epilobium montanum</i>	.	.	.	+	+	+	.	+	+	.	.	r	r	.	.	.	.	.	.	.	39
	<i>Pulmonaria obscura</i>	.	.	+	+	1	+	.	.	.	+	.	+	.	.	.	.	.	.	.	.	33
EA	<i>Rubus hirtus</i> s. lat.	.	.	.	.	.	.	2	+	+	2	+	.	2	.	.	.	.	.	.	.	33
	<i>Lamium maculatum</i> agg.	.	1	.	+	.	.	.	.	.	.	.	.	.	.	.	1	1	1	.	.	28
	<i>Impatiens noli-tangere</i>	.	.	.	.	.	.	.	+	.	.	+	+	1	+	.	.	.	.	.	.	28
	<i>Tithymalus amygdaloides</i>	.	.	.	+	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.	.	22
	<i>Phyteuma spicatum</i>	.	.	.	.	1	.	r	.	.	.	+	.	r	.	.	.	.	.	.	.	22
	<i>Hylotelephium maximum</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	22
	<i>Bromus benekenii</i>	2	.	.	+	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17
	<i>Campanula trachelium</i>	+	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	17
	<i>Ribes uva-crispa</i>	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	17
QF	<i>Acer pseudoplatanus</i>	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	17
	<i>Mercurialis perennis</i>	.	.	.	+	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	17
MB	<i>Potentilla erecta</i>	.	.	.	.	.	.	+	.	.	.	+	.	r	.	.	.	.	.	.	.	17
	<i>Rosa canina</i> agg.	.	.	.	.	.	.	+	.	.	.	r	.	.	+	.	.	.	.	.	.	17
MA	<i>Campanula patula</i>	.	.	.	.	.	.	.	1	+	.	+	.	.	.	.	.	.	.	.	.	17
	<i>Lupinus polyphyllus</i>	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	17
	<i>Ribes alpinum</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	+	1	.	17
	<i>Pyrethrum corymbosum</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	17
	<i>Campanula persicifolia</i>	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	r	.	.	.	11
	<i>Aquilegia vulgaris</i>	.	.	.	.	.	.	.	r	.	.	.	+	.	.	.	.	.	.	.	.	11
	<i>Poa nemoralis</i>	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	11
	<i>Lunaria rediviva</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	11
	<i>Astrantia major</i>	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
	<i>Lilium martagon</i>	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
	<i>Viola reichenbachiana</i>	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
	<i>Cardamine impatiens</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	6
	<i>Scrophularia nodosa</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	6
RP	<i>Populus tremula</i>	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
	Diagnostic taxa of the alliance <i>Adenostylien</i>																						
	<i>Gentiana asclepiadea</i>	.	.	+	2	1	1	1	.	1	1	1	+	1	1	.	.	.	+	1	.	72	
	<i>Chrysosplenium alternifolium</i>	+	2	+	.	1	.	.	.	.	1	.	.	+	.	.	2	+	.	.	.	44
	<i>Geranium phaeum</i>	+	1	+	.	+	.	.	.	+	.	.	+	.	.	.	+	+	.	.	.	44	
	<i>Epilobium alpestre</i>	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	+	+	+	.	.	39
	<i>Aconitum variegatum</i>	+	.	1	.	+	1	.	.	.	.	.	.	.	.	.	+	+	.	.	.	33
	<i>Carduus personata</i>	.	1	.	.	.	.	.	r	.	.	r	+	.	.	.	1	+	.	.	.	33

		1			2			3								4								
		0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0			
		5	6	7	8	9	0	1	2	3	4	5	6	7	8	1	2	3	4					
	<i>Primula elatior</i>	2	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	28
	<i>Rumex alpestris</i>	2	.	.	.	.	.	.	1	.	.	.	.	+	.	.	.	.	.	1	+	.	.	28
	<i>Milium effusum</i>	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	+	.	28
	<i>Veratrum album</i> ssp. <i>lobelianum</i>	.	.	r	.	1	.	.	+	.	+	.	.	.	.	r	.	.	.	.	.	.	.	28
	<i>Geranium sylvaticum</i>	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	1	28
	<i>Petasites kablikianus</i>	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	17
	<i>Delphinium elatum</i>	.	.	+	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	17
	<i>Cicerbita alpina</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	4	.	11
	<i>Petasites hybridus</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	6
	<i>Athyrium distentifolium</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	6
	Diagnostic taxa of the class <i>Betulo-Alnetea viridis</i>																							
	<i>Daphne mezereum</i>	.	.	+	1	1	2	.	.	r	.	+	.	.	.	r	.	.	.	.	.	+	.	44
	<i>Salix silesiaca</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	6
	Other taxa																							
EA, VP	<i>Rubus idaeus</i>	.	.	.	+	1	+	1	1	+	1	+	1	1	+	.	.	.	.	4	+	+	1	83
	<i>Hypericum maculatum</i>	2	.	+	+	+	1	1	1	.	+	.	+	r	.	.	.	.	.	+	+	+	1	72
	<i>Senecio nemorensis</i> agg.	1	1	.	1	+	2	.	.	.	.	+	1	1	r	.	.	.	.	+	+	.	+	67
	<i>Calamagrostis arundinacea</i>	.	.	.	+	.	1	1	.	1	1	+	1	1	+	.	.	.	.	+	.	1	+	67
VP	<i>Picea abies</i>	.	.	.	+	.	+	+	+	+	+	+	1	+	.	.	.	.	.	+	.	+	.	61
	<i>Filipendula ulmaria</i>	1	1	+	+	2	.	.	1	.	+	.	.	.	.	.	.	.	.	+	1	.	1	56
	<i>Myosotis sylvatica</i>	1	.	1	1	1	+	+	+	.	+	+	+	.	.	.	.	.	.	.	.	.	.	56
	<i>Ajuga reptans</i>	+	.	1	1	.	.	.	+	.	+	+	+	+	.	.	.	.	.	+	1	.	.	56
	<i>Maianthemum bifolium</i>	+	.	.	.	.	+	+	1	1	+	1	+	1	+	.	.	.	.	.	.	.	.	56
	<i>Luzula luzuloides</i>	.	.	.	+	.	.	+	+	1	+	1	+	.	1	.	.	.	.	+	.	+	.	56
	<i>Galeopsis speciosa</i>	+	+	+	.	1	+	.	.	.	+	.	.	r	.	.	.	.	.	+	+	.	.	50
	<i>Urtica dioica</i>	.	2	+	.	+	.	.	.	.	+	.	.	1	+	.	.	.	.	+	+	1	.	50
	<i>Oxalis acetosella</i>	.	.	+	.	.	.	1	+	1	+	+	1	1	1	.	.	.	.	.	.	.	.	50
	<i>Fragaria vesca</i>	.	.	.	+	.	1	+	.	1	1	+	1	+	.	.	.	.	.	.	+	.	.	50
	<i>Geum rivale</i>	+	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	+	.	44
	<i>Geranium robertianum</i>	.	.	.	+	.	.	.	.	.	+	.	1	+	.	.	.	.	.	+	+	+	.	39
	<i>Polygonatum verticillatum</i>	.	.	.	r	1	.	.	+	.	+	.	.	.	+	.	.	.	.	+	.	+	.	39
EA	<i>Salix caprea</i>	.	.	.	.	.	.	+	.	1	.	.	r	r	.	.	.	.	+	.	+	+	39	
	<i>Leucanthemum rotundifolium</i>	+	+	1	2	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33
	<i>Dactylis glomerata</i> ssp. <i>slovenica</i>	+	.	+	+	.	2	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	33
	<i>Deschampsia cespitosa</i>	.	.	.	.	.	.	1	1	.	.	+	.	1	+	.	.	.	.	+	.	.	.	33
	<i>Alchemilla</i> sp.	2	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	28
QF	<i>Lonicera xylosteum</i>	.	.	.	+	.	.	.	+	.	1	+	1	.	.	.	.	.	.	.	.	.	.	28
	<i>Heracleum sphondylium</i>	.	.	.	.	+	.	.	.	+	.	+	.	.	+	.	.	.	.	.	.	.	+	28
	<i>Vaccinium myrtillus</i>	.	.	.	.	.	.	.	.	+	.	r	+	+	+	.	.	.	.	.	.	.	.	28
	<i>Tussilago farfara</i>	+	.	.	.	.	.	.	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	22
	<i>Hylotelephium argutum</i>	.	+	1	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22
	<i>Chaerophyllum aromaticum</i>	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	22
	<i>Veronica chamaedrys</i>	.	.	.	.	.	.	.	+	+	.	r	.	+	.	.	.	.	.	.	.	.	.	22
	<i>Digitalis grandiflora</i>	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	17
	<i>Cirsium erisithales</i>	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	17
	<i>Lysimachia nummularia</i>	.	.	.	.	.	.	1	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	17
	<i>Cruciata glabra</i>	.	.	.	.	.	.	.	+	.	1	+	.	.	.	.	.	.	.	.	.	.	.	17
VP	<i>Lonicera nigra</i>	.	.	.	.	.	.	.	+	.	.	1	.	+	.	.	.	.	.	.	.	.	.	17
	<i>Taraxacum</i> sp.	.	.	.	.	.	.	.	r	.	.	.	.	+	r	.	.	.	.	.	.	.	.	17

Taxa present in one or two relevés:

Abies alba E₁ + (8), *Agrostis stolonifera* + (2), *Angelica sylvestris* + (2), *Arabis alpina* + (1), *Botrychium lunaria* + (5), *Calamagrostis varia* 1 (8), *Cardaminopsis arenosa* + (1), *Carex sylvatica* + (8), *Cerintho alpina* ssp. *tatrica* + (9), *Clinopodium vulgare* 2 (8), + (10), *Corylus avellana* E₂ r (14), *Cruciata laevipes* 1 (12), + (17), *Deschampsia flexuosa* + (13, 17), *Dryopteris carthusiana* 1 (16), + (18), *Erysimum hungaricum* 1 (9), *Erysimum odoratum* + (1), *Geum urbanum* + (8), *Hesperis matronalis* ssp. *nivea* 1 (9), *Larix decidua* E₁ + (2, 8), *Lathyrus pratensis* + (8, 10), *Origanum vulgare* + (5), *Pimpinella major* ssp. *rubra* + (8), *Poa trivialis* + (4), *Ranunculus acris* r (11), + (18), *Roegneria canina* + (1), *Rumex obtusifolius* + (1), *Senecio hercynicus* + (3, 4), *Solidago virgaurea* + (1, 4), *Valeriana tripteris* 1 (8), *Vicia cracca* agg. + (1), *V. sepium* + (5, 10), *V. sylvatica* + (5).

Localities of relevés (Tab. 1)

1. Belianske Tatry Mts, Dolina siedmich prameňov Valley, longitude 20°16'38.8", latitude 49°13'23.8", ±10 m, 1170 m, JJZ (210°), slope 15°, plot 4×4 m, cover E₂ 50%, E₁ 100%, height E₂ 3.5 m, E₁ 85 cm, 12. 8. 2012, Mária Petrášová, Ivan Jarolímek.
2. Belianske Tatry Mts, Dolina siedmich prameňov Valley, longitude 20°16'40.2", latitude 49°13'20.8", ±30 m, 1167 m, JJZ (193°), slope 10°, plot 4×4 m, cover E₂ 85%, E₁ 90%, height E₂ 4.5 m, E₁ 90 cm, 12. 8. 2012, Mária Petrášová, Ivan Jarolímek.
3. Belianske Tatry Mts, Dolina siedmich prameňov Valley, longitude 20°16'40.0", latitude 49°13'24.5", ±30 m, 1220 m, JJZ (190°), slope 30°, plot 12×5 m, cover E₂ 80%, E₁ 90%, height E₂ 5 m, E₁ 15/90 cm, 13. 8. 2012, Mária Petrášová, Ivan Jarolímek.
4. Belianske Tatry Mts, Dolina siedmich prameňov Valley, longitude 20°16'38.4", latitude 49°13'25.2", ±20 m, 1219 m, JJV (157°), slope 35°, plot 5×10 m, cover E₂ 30%, E₁ 95%, height E₂ 4.5 m, E₁ 15/90 cm, 13. 8. 2012, Mária Petrášová, Ivan Jarolímek.

Table 2: Shortened synoptic table with percentage frequency and modified fidelity index *phi* coefficient. 1 – *Ulmenion* (359 rel.), 2 – *Arunco-Salicetum capreae* (18 rel.), 3 – *Alnenion glutinoso-incanae* (305 rel.), 4 – *Adenostylyon* (315 rel.), 5 – *Betulo carpaticae-Alnetea viridis* (59 rel.).

Tabela 2: Skrajšana sinoptična tabela s frekvenco v odstotkih in modificiranim indeksom navezanosti (*phi* coefficient). 1 – *Ulmenion* (359 rel.), 2 – *Arunco-Salicetum capreae* (18 rel.), 3 – *Alnenion glutinoso-incanae* (305 rel.), 4 – *Adenostylyon* (315 rel.), 5 – *Betulo carpaticae-Alnetea viridis* (59 rel.).

Syntaxon		1	2	3	4	5
	Layer					
Diagnostic taxa of the suballiance <i>Ulmenion</i>						
<i>Ulmus minor</i>	T	58 ^{72.5}	...	1^{...}	...	...
<i>Ulmus minor</i>	S	49 ^{64.4}	...	2^{...}	...	...
<i>Ulmus minor</i>		32 ^{52.3}	...	...	...	...
<i>Rubus caesius</i>		73 ^{71.9}	...	16 ^{...}	1 ^{...}	...
<i>Quercus robur</i>	T	51 ^{67.4}	...	...	...	...
<i>Quercus robur</i>	S	24 ^{43.7}	...	1^{...}	...	...
<i>Quercus robur</i>		19 ^{40.3}	...	...	...	...
<i>Brachypodium sylvaticum</i> QF		67 ^{64.5}	...	21^{...}	...	...
<i>Cornus sanguinea</i>	S	61 ^{63.5}	...	15^{...}	...	...
<i>Cornus sanguinea</i>		26 ^{41.3}	...	5^{...}	...	...
<i>Fraxinus angustifolia</i>	T	40 ^{58.6}	...	...	...	...
<i>Fraxinus angustifolia</i>	S	27 ^{48.1}	...	...	...	...
<i>Fraxinus angustifolia</i>		21 ^{42.1}	...	...	...	...
<i>Galium aparine</i>		62 ^{58.4}	...	26^{...}	...	...
<i>Acer campestre</i> QF	S	48 ^{54.5}	...	13^{...}	...	...

Syntaxon		1	2	3	4	5
<i>Acer campestre</i> QF		43 ^{33.4}	...	10^{...}	...	...
<i>Acer campestre</i> QF	T	36 ^{48.9}	...	7^{...}	...	...
<i>Geum urbanum</i>		68 ^{54.1}	6 ^{...}	40^{...}	...	...
<i>Populus alba</i>	T	31 ^{51.6}	...	...	...	...
<i>Populus alba</i>		13 ^{32.8}	...	...	...	...
<i>Populus alba</i>	S	5 ^{19.6}	...	...	...	...
<i>Polygonatum latifolium</i>		30 ^{50.1}	...	...	...	...
<i>Viola odorata</i>		30 ^{50.1}	...	1^{...}	...	...
<i>Circaea lutetiana</i>		43 ^{47.0}	...	18^{...}	...	...
<i>Viola reichenbachiana</i> QF		43 ^{46.7}	6 ^{...}	13^{...}	...	...
<i>Ligustrum vulgare</i>	S	31 ^{46.7}	...	4^{...}	...	...
<i>Ligustrum vulgare</i>		26 ^{42.7}	...	4^{...}	...	...
<i>Viola mirabilis</i>		25 ^{45.3}	...	...	1 ^{...}	...
<i>Torilis japonica</i>		25 ^{44.5}	...	1^{...}	...	...
<i>Dactylis polygama</i>		30 ^{43.9}	...	7^{...}	...	...
<i>Crataegus monogyna</i>	S	29 ^{42.2}	...	7^{...}	...	...
<i>Crataegus monogyna</i>		23 ^{41.8}	...	2^{...}	...	...
<i>Ulmus laevis</i>	T	21 ^{41.5}	...	...	...	...
<i>Ulmus laevis</i>	S	13 ^{32.4}	...	...	...	...
<i>Ulmus laevis</i>		3 ^{15.0}	...	...	...	...
<i>Euonymus europaeus</i> QF	S	33 ^{41.0}	...	13^{...}	...	...
<i>Euonymus europaeus</i> QF		26 ^{40.0}	...	7^{...}	...	...
<i>Sambucus nigra</i>	S	37 ^{40.9}	...	19^{...}	...	...
<i>Sambucus nigra</i>		14 ^{21.5}	...	10^{...}	...	...
<i>Fraxinus excelsior</i> QF	T	32 ^{40.7}	...	13^{...}	...	...
<i>Fraxinus excelsior</i> QF		24 ^{31.3}	...	13^{...}	...	...
<i>Fraxinus excelsior</i> QF	S	18 ^{21.2}	...	18 ^{20.4}	...	...
<i>Aristolochia clematitis</i>		20 ^{40.6}	...	...	...	...
<i>Arum alpinum</i>		21 ^{40.5}	...	1^{...}	...	...
<i>Pulmonaria officinalis</i>		34 ^{40.2}	...	16^{...}	...	...
<i>Moehringia trinervia</i>		21 ^{38.6}	...	2^{...}	...	...
<i>Crataegus laevigata</i>	S	26 ^{38.2}	...	8^{...}	...	...
<i>Crataegus laevigata</i>		6 ^{17.3}	...	2^{...}	...	...
<i>Acer tataricum</i>	S	18 ^{37.9}	...	1^{...}	...	...
<i>Acer tataricum</i>		6 ^{21.2}	...	...	...	...
<i>Alliaria petiolata</i>		32 ^{36.3}	...	18 ^{...}	1 ^{...}	...
<i>Robinia pseudacacia</i>	T	16 ^{36.2}	...	...	...	...
<i>Robinia pseudacacia</i>		10 ^{28.2}	...	...	...	...
<i>Robinia pseudacacia</i>	S	9 ^{27.4}	...	...	...	...
<i>Galeopsis pubescens</i>		22 ^{35.5}	...	6 ^{...}	1 ^{...}	...
<i>Humulus lupulus</i>		20 ^{34.5}	...	5^{...}	...	...
<i>Viola hirta</i> QF		21 ^{31.9}	...	...	...	8 ^{...}
<i>Lapsana communis</i>		20 ^{29.1}	...	10 ^{...}	1 ^{...}	...
<i>Tilia cordata</i>	T	11 ^{28.8}	...	1^{...}	...	...
<i>Tilia cordata</i>	S	10 ^{27.1}	...	1^{...}	...	...
<i>Tilia cordata</i>		8 ^{21.8}	...	1^{...}	...	...
<i>Ranunculus ficaria</i>		20 ^{27.1}	...	13^{...}	...	...
<i>Viburnum opulus</i>	S	18 ^{25.7}	...	11^{...}	...	...
<i>Viburnum opulus</i>		9 ^{16.3}	...	7^{...}	...	...

Syntaxon		1	2	3	4	5
<i>Campanula trachelium</i> QF		28 ^{25.4}	17 ⁻⁻⁻	10 ⁻⁻⁻	2 ⁻⁻⁻	2 ⁻⁻⁻
Diagnostic taxa of the association <i>Arunco-Salicetum capreae</i>						
<i>Salix caprea</i>	S	. ⁻⁻⁻	100 ^{80.8}	13 ⁻⁻⁻	. ⁻⁻⁻	25 ⁻⁻⁻
<i>Salix caprea</i>		. ⁻⁻⁻	39 ^{49.2}	8 ⁻⁻⁻	2 ⁻⁻⁻	. ⁻⁻⁻
<i>Salix caprea</i>	T	. ⁻⁻⁻	. ⁻⁻⁻	10 ^{28.3}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Aruncus dioicus</i>		. ⁻⁻⁻	67 ^{75.7}	3 ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Epilobium angustifolium</i>		. ⁻⁻⁻	67 ^{67.4}	1 ⁻⁻⁻	6 ⁻⁻⁻	8 ⁻⁻⁻
<i>Sambucus racemosa</i>		. ⁻⁻⁻	50 ^{64.0}	3 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Sambucus racemosa</i>	S	. ⁻⁻⁻	17 ⁻⁻⁻	6 ^{3.3}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Dentaria glandulosa</i> QF		. ⁻⁻⁻	50 ^{59.3}	9 ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Prenanthes purpurea</i> QF		. ⁻⁻⁻	44 ^{56.3}	3 ⁻⁻⁻	2 ⁻⁻⁻	2 ⁻⁻⁻
<i>Populus tremula</i>	S	2 ⁻⁻⁻	33 ^{51.2}	1 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Populus tremula</i>		4 ^{5.0}	6 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	2 ⁻⁻⁻
<i>Populus tremula</i>	T	4 ^{14.8}	. ⁻⁻⁻	2 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Maianthemum bifolium</i>		7 ⁻⁻⁻	56 ^{50.6}	13 ⁻⁻⁻	1 ⁻⁻⁻	10 ⁻⁻⁻
<i>Adoxa moschatellina</i>		. ⁻⁻⁻	33 ^{49.1}	1 ⁻⁻⁻	4 ⁻⁻⁻	. ⁻⁻⁻
<i>Dryopteris filix-mas</i> QF		1 ⁻⁻⁻	67 ^{47.5}	21 ⁻⁻⁻	10 ⁻⁻⁻	27 ⁻⁻⁻
<i>Sorbus aucuparia</i>		1 ⁻⁻⁻	44 ^{47.3}	15 ^{2.9}	3 ⁻⁻⁻	2 ⁻⁻⁻
<i>Sorbus aucuparia</i>	S	1 ⁻⁻⁻	44 ^{26.8}	8 ⁻⁻⁻	1 ⁻⁻⁻	58 ^{42.7}
<i>Sorbus aucuparia</i>	T	. ⁻⁻⁻	. ⁻⁻⁻	4 ^{18.5}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Cimicifuga europaea</i>		. ⁻⁻⁻	28 ^{47.0}	. ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Galeopsis speciosa</i>		11 ⁻⁻⁻	50 ^{45.6}	20 ^{5.4}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Lonicera nigra</i>	S	. ⁻⁻⁻	33 ^{44.5}	9 ^{1.2}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Lonicera nigra</i>		. ⁻⁻⁻	17 ⁻⁻⁻	15 ^{12.5}	1 ⁻⁻⁻	8 ⁻⁻⁻
<i>Mycelis muralis</i>		4 ⁻⁻⁻	44 ^{41.6}	25 ^{13.7}	2 ⁻⁻⁻	. ⁻⁻⁻
<i>Galium schultesii</i> QF		1 ⁻⁻⁻	50 ^{40.5}	14 ⁻⁻⁻	9 ⁻⁻⁻	19 ⁻⁻⁻
<i>Hylotelephium maximum</i>		. ⁻⁻⁻	22 ^{40.5}	. ⁻⁻⁻	1 ⁻⁻⁻	2 ⁻⁻⁻
<i>Luzula luzuloides</i>		. ⁻⁻⁻	56 ^{40.2}	6 ⁻⁻⁻	17 ⁻⁻⁻	32 ^{12.1}
<i>Myosotis sylvatica</i>		. ⁻⁻⁻	56 ^{40.2}	5 ⁻⁻⁻	11 ⁻⁻⁻	39 ^{20.2}
<i>Rubus hirtus</i> s. lat.		1 ⁻⁻⁻	33 ^{39.8}	15 ^{9.0}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Leucanthemum rotundifolium</i>		. ⁻⁻⁻	33 ^{38.2}	6 ⁻⁻⁻	12 ^{3.1}	. ⁻⁻⁻
<i>Stachys alpina</i>		. ⁻⁻⁻	28 ^{37.7}	. ⁻⁻⁻	2 ⁻⁻⁻	8 ⁻⁻⁻
<i>Valeriana sambucifolia</i>		. ⁻⁻⁻	39 ^{37.2}	5 ⁻⁻⁻	11 ⁻⁻⁻	12 ⁻⁻⁻
<i>Lonicera xylosteum</i> QF		6 ⁻⁻⁻	28 ^{37.1}	6 ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Lonicera xylosteum</i> QF	S	4 ⁻⁻⁻	33 ^{37.1}	16 ^{8.5}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Actaea spicata</i> QF		1 ⁻⁻⁻	22 ^{36.8}	5 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Epilobium montanum</i>		. ⁻⁻⁻	39 ^{29.0}	13 ⁻⁻⁻	10 ⁻⁻⁻	24 ^{8.9}
<i>Fragaria vesca</i>		7 ⁻⁻⁻	50 ^{27.9}	23 ⁻⁻⁻	6 ⁻⁻⁻	42 ^{19.2}
<i>Daphne mezereum</i>		. ⁻⁻⁻	44 ^{27.1}	25 ^{3.1}	5 ⁻⁻⁻	36 ^{16.4}
Diagnostic taxa of the suballiance <i>Alnenion glutinoso-incanae</i>						
<i>Alnus incana</i>	T	1 ⁻⁻⁻	. ⁻⁻⁻	65 ^{76.2}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Alnus incana</i>		. ⁻⁻⁻	. ⁻⁻⁻	30 ^{50.7}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Alnus incana</i>	S	. ⁻⁻⁻	28 ⁻⁻⁻	50 ^{47.7}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Caltha palustris</i>		2 ⁻⁻⁻	6 ⁻⁻⁻	65 ^{69.3}	3 ⁻⁻⁻	. ⁻⁻⁻
<i>Cardamine amara</i>		. ⁻⁻⁻	. ⁻⁻⁻	35 ^{53.6}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Cirsium oleraceum</i>		2 ⁻⁻⁻	. ⁻⁻⁻	34 ^{51.0}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Alnus glutinosa</i>	T	11 ⁻⁻⁻	. ⁻⁻⁻	39 ^{49.0}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Alnus glutinosa</i>	S	4 ⁻⁻⁻	. ⁻⁻⁻	16 ^{31.2}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Alnus glutinosa</i>		3 ⁻⁻⁻	. ⁻⁻⁻	10 ^{22.9}	. ⁻⁻⁻	. ⁻⁻⁻

Syntaxon	1	2	3	4	5
<i>Petasites hybridus</i>	.---	6---	32 ^{46.6}	1---	.---
<i>Equisetum palustre</i>	.---	.---	25 ^{45.5}	.---	.---
<i>Carex remota</i>	10---	.---	33 ^{43.1}	.---	.---
<i>Equisetum sylvaticum</i>	1---	.---	23 ^{42.8}	.---	.---
<i>Valeriana officinalis</i>	4---	.---	26 ^{41.2}	1---	.---
<i>Festuca gigantea</i>	20---	.---	35 ^{38.5}	1---	.---
<i>Dryopteris carthusiana</i>	1---	11---	31 ^{37.1}	3---	2---
<i>Lycopus europaeus</i>	5---	.---	21 ^{34.9}	.---	.---
<i>Myosotis palustris</i> agg.	3---	22---	45 ^{34.7}	2---	19---
<i>Lamium maculatum</i>	27---	28---	41 ^{25.8}	5---	.---
<i>Angelica sylvestris</i>	16---	6---	34 ^{33.9}	3---	2---
<i>Lysimachia vulgaris</i>	8---	.---	22 ^{33.3}	.---	.---
<i>Ranunculus repens</i>	11---	33---	42 ^{32.4}	1---	.---
<i>Agropyron caninum</i>	8---	6---	22 ^{22.3}	3---	7---
Diagnostic taxa of the alliance <i>Adenostylian alliariae</i>					
<i>Adenostyles alliariae</i>	.---	.---	2---	83 ^{69.4}	34---
<i>Ligusticum mutellina</i>	.---	.---	.---	63 ^{66.3}	14---
<i>Geum montanum</i>	.---	.---	.---	43 ^{60.1}	2---
<i>Gentiana punctata</i>	.---	.---	.---	41 ^{58.3}	2---
<i>Festuca picturata</i>	.---	.---	.---	41 ^{57.8}	2---
<i>Luzula alpinopilosa</i>	.---	.---	.---	37 ^{56.9}	.---
<i>Athyrium distentifolium</i>	.---	6---	.---	44 ^{55.5}	2---
<i>Persicaria bistorta</i>	.---	.---	1---	37 ^{53.6}	2---
<i>Rumex alpestris</i>	.---	28---	10---	71 ^{50.6}	24---
<i>Homogyne alpina</i>	.---	.---	3---	51 ^{48.2}	25---
<i>Veratrum album</i> ssp. <i>lobelianum</i>	.---	28---	9---	67 ^{46.9}	25---
<i>Doronicum austriacum</i>	.---	.---	10---	48 ^{46.8}	15---
<i>Aconitum napellus</i>	.---	.---	14---	41 ^{41.9}	8---
<i>Ranunculus platanifolius</i>	.---	11---	3---	40 ^{39.2}	12---
<i>Avenella flexuosa</i>	.---	.---	3---	23 ^{37.7}	2---
<i>Potentilla aurea</i>	.---	.---	1---	22 ^{37.3}	3---
<i>Cicerbita alpina</i>	.---	11---	2---	34 ^{36.3}	8---
Diagnostic taxa of the class <i>Betulo carpaticae-Alnetea viridis</i>					
<i>Salix silesiaca</i>	S	337 ⁶	1---	1---	98 ^{81.2}
<i>Salix silesiaca</i>	.---	6---	.---	3 ^{3.6}	.---
<i>Lathyrus vernus</i> QF	4---	.---	.---	2---	59 ^{68.7}
<i>Campanula serrata</i>	.---	.---	.---	11---	61 ^{66.3}
<i>Pimpinella major</i>	5---	6---	1---	8---	64 ^{63.6}
<i>Vicia sylvatica</i>	.---	6---	4---	1---	56 ^{62.9}
<i>Geranium sylvaticum</i>	.---	28---	2---	47 ^{14.4}	92 ^{61.1}
<i>Valeriana tripteris</i>	.---	6---	8---	11---	64 ^{60.9}
<i>Tanacetum clusii</i>	.---	.---	.---	1---	44 ^{60.9}
<i>Achillea millefolium</i>	.---	.---	1---	8---	51 ^{60.7}
<i>Festuca carpathica</i>	.---	.---	.---	10---	53 ^{60.6}
<i>Vicia cracca</i>	3---	6---	.---	1---	53 ^{60.4}
<i>Sesleria tatrae</i>	.---	.---	.---	5---	44 ^{57.8}
<i>Bupleurum longifolium</i>	.---	.---	.---	2---	41 ^{57.3}
<i>Laserpitium latifolium</i>	.---	.---	.---	2---	41 ^{57.3}
<i>Cortusa matthioli</i>	.---	.---	1---	7---	46 ^{57.1}

Syntaxon	1	2	3	4	5	
<i>Ranunculus tuberosus</i>	1 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	2 ⁻⁻⁻	41 ^{57.1}	
<i>Lilium martagon</i> QF	. ⁻⁻⁻	6 ⁻⁻⁻	1 ⁻⁻⁻	2 ⁻⁻⁻	46 ^{55.9}	
<i>Crepis mollis</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	7 ⁻⁻⁻	44 ^{55.9}	
<i>Leucanthemum margaritae</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	1 ⁻⁻⁻	36 ^{54.3}	
<i>Knautia maxima</i>	. ⁻⁻⁻	. ⁻⁻⁻	1 ⁻⁻⁻	2 ⁻⁻⁻	37 ^{53.8}	
<i>Campanula glomerata</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	1 ⁻⁻⁻	34 ^{53.2}	
<i>Cirsium erisithales</i>	. ⁻⁻⁻	17 ⁻⁻⁻	2 ⁻⁻⁻	8 ⁻⁻⁻	56 ^{53.1}	
<i>Helianthemum grandiflorum</i> s. lat.	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	1 ⁻⁻⁻	34 ^{52.5}	
<i>Rubus saxatilis</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	4 ⁻⁻⁻	36 ^{51.1}	
<i>Astrantia major</i> QF	. ⁻⁻⁻	6 ⁻⁻⁻	14 ⁻⁻⁻	11 ⁻⁻⁻	54 ^{49.6}	
<i>Cardamine pratensis</i>	4 ⁻⁻⁻	. ⁻⁻⁻	1 ⁻⁻⁻	1 ⁻⁻⁻	32 ^{47.3}	
<i>Luzula sylvatica</i>	. ⁻⁻⁻	33 ⁻⁻⁻	4 ⁻⁻⁻	22 ⁻⁻⁻	64 ^{46.0}	
<i>Galium fatrense</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	24 ^{44.6}	
<i>Allium victorialis</i>	. ⁻⁻⁻	. ⁻⁻⁻	1 ⁻⁻⁻	1 ⁻⁻⁻	25 ^{44.3}	
<i>Vaccinium myrtillus</i>	. ⁻⁻⁻	28 ⁻⁻⁻	8 ⁻⁻⁻	15 ⁻⁻⁻	58 ^{43.8}	
<i>Phyteuma orbiculare</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	2 ⁻⁻⁻	25 ^{43.5}	
<i>Saxifraga paniculata</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	3 ⁻⁻⁻	25 ^{42.8}	
<i>Cotoneaster integerrimus</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	20 ^{41.2}	
<i>Lotus corniculatus</i>	1 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	1 ⁻⁻⁻	20 ^{39.9}	
<i>Cardaminopsis arenosa</i>	. ⁻⁻⁻	6 ⁻⁻⁻	1 ⁻⁻⁻	6 ⁻⁻⁻	31 ^{39.3}	
<i>Silene vulgaris</i>	2 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	3 ⁻⁻⁻	24 ^{39.1}	
<i>Heracleum sphondylium</i>	19 ⁻⁻⁻	28 ⁻⁻⁻	18 ⁻⁻⁻	22 ⁻⁻⁻	66 ^{38.5}	
<i>Solidago virgaurea</i>	1 ⁻⁻⁻	11 ⁻⁻⁻	3 ⁻⁻⁻	22 ^{10.1}	37 ^{31.8}	
<i>Phleum hirsutum</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	2 ⁻⁻⁻	20 ^{38.1}	
<i>Scabiosa lucida</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	4 ⁻⁻⁻	20 ^{36.2}	
<i>Vaccinium vitis-idaea</i>	. ⁻⁻⁻	. ⁻⁻⁻	3 ⁻⁻⁻	1 ⁻⁻⁻	20 ^{36.1}	
<i>Poa nemoralis</i>	11 ⁻⁻⁻	11 ⁻⁻⁻	16 ⁻⁻⁻	8 ⁻⁻⁻	46 ^{35.3}	
<i>Calamagrostis varia</i>	. ⁻⁻⁻	6 ⁻⁻⁻	1 ⁻⁻⁻	5 ⁻⁻⁻	24 ^{32.8}	
<i>Saxifraga rotundifolia</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	11 ^{9.0}	22 ^{31.0}	
<i>Melica nutans</i> QF	9 ⁻⁻⁻	. ⁻⁻⁻	6 ⁻⁻⁻	2 ⁻⁻⁻	25 ^{30.8}	
<i>Digitalis grandiflora</i>	. ⁻⁻⁻	17 ⁻⁻⁻	5 ⁻⁻⁻	5 ⁻⁻⁻	31 ^{30.3}	
<i>Euphorbia amygdaloides</i> QF	1 ⁻⁻⁻	22 ⁻⁻⁻	14 ⁻⁻⁻	2 ⁻⁻⁻	36 ^{29.5}	
<i>Primula elatior</i> QF	. ⁻⁻⁻	28 ⁻⁻⁻	40 ^{9.9}	28 ⁻⁻⁻	58 ^{29.4}	
<i>Dryopteris dilatata</i>	. ⁻⁻⁻	. ⁻⁻⁻	4 ⁻⁻⁻	10 ^{4.7}	22 ^{29.1}	
<i>Polygonatum verticillatum</i>	1 ⁻⁻⁻	39 ^{21.7}	13 ⁻⁻⁻	10 ⁻⁻⁻	44 ^{28.0}	
Taxa common to the association <i>Arunco-Salicetum caprae</i> and suballiance <i>Alnenion glutinoso-incanae</i>						
<i>Filipendula ulmaria</i>		4 ⁻⁻⁻	56 ⁻⁻⁻	63 ^{36.5}	5 ⁻⁻⁻	20 ⁻⁻⁻
<i>Rubus idaeus</i>	S	. ⁻⁻⁻	44 ^{57.7}	5 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Rubus idaeus</i>		1 ⁻⁻⁻	83 ^{41.2}	60 ^{17.6}	23 ⁻⁻⁻	46 ⁻⁻⁻
<i>Asarum europaeum</i> QF		3 ⁻⁻⁻	78 ^{49.7}	50 ^{20.0}	1 ⁻⁻⁻	25 ⁻⁻⁻
<i>Aegopodium podagraria</i>		33 ⁻⁻⁻	78 ^{44.8}	62 ^{28.2}	3 ⁻⁻⁻	. ⁻⁻⁻
<i>Athyrium filix-femina</i>		2 ⁻⁻⁻	67 ^{41.6}	49 ^{22.4}	4 ⁻⁻⁻	22 ⁻⁻⁻
<i>Picea abies</i>		. ⁻⁻⁻	61 ^{55.5}	29 ^{14.2}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Picea abies</i>	S	. ⁻⁻⁻	44 ⁻⁻⁻	44 ^{34.1}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Picea abies</i>	T	. ⁻⁻⁻	. ⁻⁻⁻	39 ^{26.4}	. ⁻⁻⁻	54 ^{45.5}
<i>Chaerophyllum hirsutum</i>		1 ⁻⁻⁻	56 ⁻⁻⁻	63 ^{34.3}	29 ⁻⁻⁻	8 ⁻⁻⁻
<i>Galeobdolon luteum</i> agg. QF		2 ⁻⁻⁻	50 ^{37.5}	39 ^{23.8}	7 ⁻⁻⁻	2 ⁻⁻⁻
<i>Oxalis acetosella</i>		1 ⁻⁻⁻	50 ⁻⁻⁻	55 ^{33.3}	15 ⁻⁻⁻	8 ⁻⁻⁻
<i>Geranium phaeum</i>		. ⁻⁻⁻	44 ^{41.3}	28 ^{17.6}	3 ⁻⁻⁻	. ⁻⁻⁻

Syntaxon		1	2	3	4	5
<i>Chrysosplenium alternifolium</i>		1 ⁻⁻⁻	44 ⁻⁻⁻	47 ^{31.0}	12 ⁻⁻⁻	3 ⁻⁻⁻
<i>Impatiens noli-tangere</i>		6 ⁻⁻⁻	28 ⁻⁻⁻	60 ^{52.7}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Ranunculus lanuginosus</i>		. ⁻⁻⁻	28 ⁻⁻⁻	44 ^{39.6}	3 ⁻⁻⁻	2 ⁻⁻⁻
<i>Crepis paludosa</i>		1 ⁻⁻⁻	28 ⁻⁻⁻	40 ^{26.6}	9 ⁻⁻⁻	19 ⁻⁻⁻
Taxa common to the association <i>Arunco-Salicetum capreae</i> and class <i>Betulo carpaticae-Alnetea viridis</i>						
<i>Rosa pendulina</i>	S	. ⁻⁻⁻	28 ^{45.8}	2 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Rosa pendulina</i>		. ⁻⁻⁻	50 ^{34.8}	4 ⁻⁻⁻	3 ⁻⁻⁻	51 ^{35.8}
<i>Gentiana asclepiadea</i>		. ⁻⁻⁻	72 ^{42.9}	18 ⁻⁻⁻	25 ⁻⁻⁻	46 ^{14.6}
<i>Calamagrostis arundinacea</i>		. ⁻⁻⁻	67 ^{40.5}	9 ⁻⁻⁻	8 ⁻⁻⁻	64 ^{38.1}
<i>Hypericum maculatum</i>		. ⁻⁻⁻	72 ^{31.3}	6 ⁻⁻⁻	43 ^{1.1}	86 ^{45.7}
<i>Senecio nemorensis</i> agg.		. ⁻⁻⁻	39 ^{29.1}	8 ⁻⁻⁻	11 ⁻⁻⁻	27 ^{13.5}
<i>Paris quadrifolia</i> QF		8 ⁻⁻⁻	44 ^{26.6}	20 ⁻⁻⁻	6 ⁻⁻⁻	32 ^{11.9}
<i>Aconitum variegatum</i>		. ⁻⁻⁻	33 ^{25.1}	5 ⁻⁻⁻	6 ⁻⁻⁻	32 ^{23.5}
Diagnostic taxa of the class <i>Quercu-Fagetea</i>						
<i>Convallaria majalis</i>		45 ^{38.0}	. ⁻⁻⁻	1 ⁻⁻⁻	1 ⁻⁻⁻	37 ^{27.5}
<i>Glechoma hederacea</i>		48 ^{38.0}	6 ⁻⁻⁻	38 ^{24.9}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Stachys sylvatica</i>		47 ^{32.7}	. ⁻⁻⁻	56 ^{43.0}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Carex sylvatica</i>		31 ^{25.6}	6 ⁻⁻⁻	30 ^{24.5}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Polygonatum multiflorum</i>		19 ^{24.3}	. ⁻⁻⁻	8 ⁻⁻⁻	. ⁻⁻⁻	7 ⁻⁻⁻
<i>Scrophularia nodosa</i>		19 ^{23.1}	6 ⁻⁻⁻	10 ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Carpinus betulus</i>	T	13 ^{22.3}	. ⁻⁻⁻	8 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Carpinus betulus</i>	S	10 ^{16.6}	. ⁻⁻⁻	9 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Carpinus betulus</i>		7 ⁻⁻⁻	. ⁻⁻⁻	9 ^{15.4}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Corydalis cava</i>		8 ^{21.5}	. ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻	2 ⁻⁻⁻
<i>Corylus avellana</i>	S	24 ^{19.9}	6 ⁻⁻⁻	27 ^{24.5}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Corylus avellana</i>		6 ⁻⁻⁻	. ⁻⁻⁻	8 ⁻⁻⁻	. ⁻⁻⁻	3 ⁻⁻⁻
<i>Galium odoratum</i>		14 ^{19.4}	. ⁻⁻⁻	10 ⁻⁻⁻	. ⁻⁻⁻	2 ⁻⁻⁻
<i>Fallopia dumetorum</i>		5 ^{18.6}	. ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Quercus petraea</i>		4 ^{17.1}	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Quercus petraea</i>	T	3 ^{14.5}	. ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Anemone ranunculoides</i>		11 ^{15.0}	. ⁻⁻⁻	11 ^{15.2}	. ⁻⁻⁻	2 ⁻⁻⁻
<i>Milium effusum</i>		15 ⁻⁻⁻	28 ⁻⁻⁻	21 ⁻⁻⁻	48 ^{23.4}	24 ⁻⁻⁻
<i>Acer pseudoplatanus</i>	T	8 ⁻⁻⁻	. ⁻⁻⁻	11 ^{10.1}	. ⁻⁻⁻	14 ⁻⁻⁻
<i>Acer pseudoplatanus</i>		7 ⁻⁻⁻	17 ⁻⁻⁻	20 ^{18.3}	3 ⁻⁻⁻	. ⁻⁻⁻
<i>Acer pseudoplatanus</i>	S	6 ⁻⁻⁻	17 ⁻⁻⁻	14 ^{13.0}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Cardamine impatiens</i>		8 ⁻⁻⁻	6 ⁻⁻⁻	12 ^{14.7}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Acer platanoides</i>		4 ^{12.6}	. ⁻⁻⁻	2 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Acer platanoides</i>	S	3 ⁻⁻⁻	. ⁻⁻⁻	2 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Acer platanoides</i>	T	3 ^{14.2}	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Prunus avium</i>	T	3 ^{13.5}	. ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Prunus avium</i>		1 ⁻⁻⁻	. ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Prunus avium</i>	S	1 ⁻⁻⁻	. ⁻⁻⁻	3 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Ulmus glabra</i>	S	2 ⁻⁻⁻	. ⁻⁻⁻	5 ^{15.0}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Ulmus glabra</i>		1 ⁻⁻⁻	. ⁻⁻⁻	2 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Ulmus glabra</i>	T	1 ⁻⁻⁻	. ⁻⁻⁻	4 ^{14.6}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Isopyrum thalictroides</i>		2 ⁻⁻⁻	. ⁻⁻⁻	2 ⁻⁻⁻	. ⁻⁻⁻	15 ^{30.2}
<i>Salvia glutinosa</i>		2 ⁻⁻⁻	. ⁻⁻⁻	13 ^{29.5}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Sanicula europaea</i>		1 ⁻⁻⁻	. ⁻⁻⁻	4 ^{13.9}	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Dentaria bulbifera</i>		1 ⁻⁻⁻	. ⁻⁻⁻	4 ^{17.7}	. ⁻⁻⁻	. ⁻⁻⁻

Syntaxon	1	2	3	4	5
<i>Hordelymus europaeus</i>	1 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Ribes alpinum</i>	. ⁻⁻⁻	17 ^{30.2}	. ⁻⁻⁻	. ⁻⁻⁻	5 ⁻⁻⁻
<i>Ribes alpinum</i>	S	. ⁻⁻⁻	3 ^{14.5}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Campanula persicifolia</i>	. ⁻⁻⁻	11 ^{29.5}	1 ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻
<i>Phyteuma spicatum</i>	. ⁻⁻⁻	22 ⁻⁻⁻	7 ⁻⁻⁻	18 ^{4.4}	29 ^{18.8}
<i>Lunaria rediviva</i>	. ⁻⁻⁻	11 ⁻⁻⁻	1 ⁻⁻⁻	1 ⁻⁻⁻	. ⁻⁻⁻
<i>Mercurialis perennis</i>	. ⁻⁻⁻	6 ⁻⁻⁻	16 ^{25.4}	3 ⁻⁻⁻	. ⁻⁻⁻
<i>Stellaria holostea</i>	. ⁻⁻⁻	. ⁻⁻⁻	7 ^{23.1}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Fagus sylvatica</i>	S	. ⁻⁻⁻	6 ^{21.9}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Fagus sylvatica</i>	T	. ⁻⁻⁻	5 ^{20.6}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Fagus sylvatica</i>	. ⁻⁻⁻	. ⁻⁻⁻	6 ^{18.0}	1 ⁻⁻⁻	2 ⁻⁻⁻
<i>Lysimachia nemorum</i>	. ⁻⁻⁻	. ⁻⁻⁻	5 ^{20.6}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Veronica montana</i>	. ⁻⁻⁻	. ⁻⁻⁻	3 ^{15.4}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Euphorbia dulcis</i>	. ⁻⁻⁻	. ⁻⁻⁻	2 ^{13.6}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Dentaria enneaphyllos</i>	. ⁻⁻⁻	. ⁻⁻⁻	2 ^{8.4}	. ⁻⁻⁻	2 ⁻⁻⁻
<i>Melittis melissophyllum</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	14 ^{33.4}
Other taxa					
<i>Urtica dioica</i>	56 ^{7.9}	50 ⁻⁻⁻	77 ^{29.3}	14 ⁻⁻⁻	42 ⁻⁻⁻
<i>Geranium robertianum</i>	42 ^{17.8}	39 ⁻⁻⁻	45 ^{21.4}	5 ⁻⁻⁻	. ⁻⁻⁻
<i>Lysimachia nummularia</i>	31 ^{19.0}	17 ⁻⁻⁻	35 ^{25.4}	. ⁻⁻⁻	. ⁻⁻⁻
<i>Ajuga reptans</i>	26 ⁻⁻⁻	56 ⁻⁻⁻	50 ^{25.0}	2 ⁻⁻⁻	3 ⁻⁻⁻
<i>Deschampsia cespitosa</i>	19 ⁻⁻⁻	33 ⁻⁻⁻	52 ^{23.1}	24 ⁻⁻⁻	24 ⁻⁻⁻
<i>Clinopodium vulgare</i>	8 ⁻⁻⁻	11 ⁻⁻⁻	1 ⁻⁻⁻	4 ⁻⁻⁻	22 ^{22.0}
<i>Veronica chamaedrys</i>	5 ⁻⁻⁻	22 ⁻⁻⁻	7 ⁻⁻⁻	4 ⁻⁻⁻	5 ⁻⁻⁻
<i>Vicia sepium</i>	4 ⁻⁻⁻	11 ⁻⁻⁻	1 ⁻⁻⁻	5 ⁻⁻⁻	22 ^{23.7}
<i>Carduus personata</i>	4 ⁻⁻⁻	33 ⁻⁻⁻	23 ^{11.9}	10 ⁻⁻⁻	2 ⁻⁻⁻
<i>Geum rivale</i>	. ⁻⁻⁻	44 ⁻⁻⁻	40 ^{12.9}	20 ⁻⁻⁻	39 ^{11.4}
<i>Stellaria nemorum</i>	1 ⁻⁻⁻	39 ⁻⁻⁻	51 ^{30.0}	25 ⁻⁻⁻	8 ⁻⁻⁻
<i>Epilobium alpestre</i>	. ⁻⁻⁻	39 ^{29.1}	. ⁻⁻⁻	19 ^{2.7}	27 ^{13.5}
<i>Silene dioica</i>	1 ⁻⁻⁻	33 ⁻⁻⁻	12 ⁻⁻⁻	40 ^{26.7}	10 ⁻⁻⁻
<i>Dactylis glomerata</i>	. ⁻⁻⁻	33 ⁻⁻⁻	19 ^{6.5}	9 ⁻⁻⁻	10 ⁻⁻⁻
<i>Pulmonaria obscura</i>	1 ⁻⁻⁻	33 ⁻⁻⁻	17 ^{6.2}	4 ⁻⁻⁻	10 ⁻⁻⁻
<i>Senecio fuchsii</i>	. ⁻⁻⁻	28 ⁻⁻⁻	39 ^{22.4}	5 ⁻⁻⁻	32 ^{14.0}
<i>Petasites albus</i>	. ⁻⁻⁻	28 ⁻⁻⁻	20 ^{15.7}	3 ⁻⁻⁻	. ⁻⁻⁻
<i>Tussilago farfara</i>	. ⁻⁻⁻	22 ⁻⁻⁻	8 ^{1.6}	1 ⁻⁻⁻	3 ⁻⁻⁻
<i>Chaerophyllum aromaticum</i>	. ⁻⁻⁻	22 ⁻⁻⁻	19 ^{18.3}	1 ⁻⁻⁻	2 ⁻⁻⁻
<i>Hylotelephium argutum</i>	. ⁻⁻⁻	22 ⁻⁻⁻	2 ⁻⁻⁻	10 ^{6.5}	. ⁻⁻⁻
<i>Cardaminopsis halleri</i>	. ⁻⁻⁻	22 ⁻⁻⁻	1 ⁻⁻⁻	10 ^{6.7}	. ⁻⁻⁻
<i>Thalictrum aquilegifolium</i>	. ⁻⁻⁻	17 ⁻⁻⁻	19 ^{2.1}	19 ^{1.3}	34 ^{21.2}
<i>Senecio subalpinus</i>	. ⁻⁻⁻	. ⁻⁻⁻	8 ⁻⁻⁻	24 ^{24.3}	17 ⁻⁻⁻
<i>Calamagrostis villosa</i>	. ⁻⁻⁻	. ⁻⁻⁻	5 ⁻⁻⁻	52 ^{39.4}	44 ^{29.8}
<i>Soldanella carpatica</i>	. ⁻⁻⁻	. ⁻⁻⁻	. ⁻⁻⁻	47 ^{41.0}	36 ^{25.7}
<i>Viola biflora</i>	. ⁻⁻⁻	. ⁻⁻⁻	1 ⁻⁻⁻	46 ^{35.5}	46 ^{34.7}
Taxa occurred with frequency < 20 in one or two columns	139	22	154	90	68 ⁻⁻⁻

Table 3: Comparison of the most similar communities displayed in dendrogram (Fig. 4, cluster A, B). A – *Arunco-Salicetum capreae* (18 rel.), B – *Alnetum incanae* (from the Tatranská Javorina, 8 rel.).

Tabela 3: Primerjava najbolj podobnih združb, prikazanih v dendrogramu (Slika 4, klaster A, B).

A – *Arunco-Salicetum capreae* (18 popisov), B – *Alnetum incanae* (iz Tatranske Javorine, 8 popisov).

Syntaxon		A	B
	Layer		
Differential taxa of the association <i>Arunco-Salicetum capreae</i>			
<i>Salix caprea</i>	S	100 ^{67.4}	38 ⁻⁻
<i>Asarum europaeum</i>		78 ⁻⁻	25 ⁻⁻
<i>Hypericum maculatum</i>		72 ⁻⁻	12 ⁻⁻
<i>Epilobium angustifolium</i>		67 ⁻⁻	. ⁻⁻
<i>Luzula luzuloides</i>		56 ⁻⁻	. ⁻⁻
<i>Ajuga reptans</i>		56 ⁻⁻	. ⁻⁻
<i>Rosa pendulina</i>		50 ⁻⁻	. ⁻⁻
<i>Rosa pendulina</i>	S	28 ⁻⁻	. ⁻⁻
<i>Dentaria glandulosa</i>		50 ⁻⁻	. ⁻⁻
<i>Galeobdolon luteum</i> agg.		50 ⁻⁻	12 ⁻⁻
<i>Galium schultesii</i>		50 ⁻⁻	12 ⁻⁻
<i>Galeopsis speciosa</i>		50 ⁻⁻	12 ⁻⁻
<i>Epilobium montanum</i>		39 ⁻⁻	. ⁻⁻
<i>Epilobium alpestre</i>		39 ⁻⁻	. ⁻⁻
<i>Salix silesiaca</i>	S	33 ⁻⁻	. ⁻⁻
<i>Rubus hirtus</i> s. lat.		33 ⁻⁻	. ⁻⁻
<i>Populus tremula</i>	S	33 ⁻⁻	. ⁻⁻
<i>Populus tremula</i>		6 ⁻⁻	. ⁻⁻
<i>Lonicera xylosteum</i>	S	33 ⁻⁻	. ⁻⁻
<i>Lonicera xylosteum</i>		28 ⁻⁻	. ⁻⁻
<i>Adoxa moschatellina</i>		33 ⁻⁻	. ⁻⁻
<i>Geranium sylvaticum</i>		28 ⁻⁻	. ⁻⁻
<i>Stachys alpina</i>		28 ⁻⁻	. ⁻⁻
<i>Cimicifuga europaea</i>		28 ⁻⁻	. ⁻⁻
<i>Actaea spicata</i>		22 ⁻⁻	. ⁻⁻
<i>Euphorbia amygdaloides</i>		22 ⁻⁻	. ⁻⁻
<i>Hylotelephium maximum</i>		22 ⁻⁻	. ⁻⁻
<i>Sambucus racemosa</i>	S	17 ⁻⁻	. ⁻⁻
Differential taxa of the association <i>Alnetum incanae</i>			
<i>Alnus incana</i>	T	. ⁻⁻	100 ^{100.0}
<i>Alnus incana</i>	S	28 ⁻⁻	75 ⁻⁻
<i>Alnus incana</i>		. ⁻⁻	75 ^{77.5}
<i>Urtica dioica</i>		50 ⁻⁻	100 ⁻⁻
<i>Geum rivale</i>		44 ⁻⁻	100 ⁻⁻
<i>Deschampsia cespitosa</i>		33 ⁻⁻	100 ⁻⁻
<i>Petasites hybridus</i>		6 ⁻⁻	100 ^{94.6}
<i>Carduus personata</i>		33 ⁻⁻	88 ⁻⁻
<i>Agropyron caninum</i>		6 ⁻⁻	88 ^{82.1}
<i>Primula elatior</i>		28 ⁻⁻	88 ⁻⁻
<i>Anthriscus nitidus</i>		6 ⁻⁻	88 ^{82.1}
<i>Leucanthemum rotundifolium</i>		33 ⁻⁻	75 ⁻⁻
<i>Valeriana sambucifolia</i>		39 ⁻⁻	75 ⁻⁻

Syntaxon		A	B
<i>Lamium maculatum</i>		28 ⁻⁻⁻	75 ⁻⁻⁻
<i>Astrantia major</i>		6 ⁻⁻⁻	75 ^{70.8}
<i>Caltha palustris</i>		6 ⁻⁻⁻	62 ⁻⁻⁻
<i>Angelica sylvestris</i>		6 ⁻⁻⁻	50 ⁻⁻⁻
<i>Adenostyles alliariae</i>		. ⁻⁻⁻	50 ⁻⁻⁻
<i>Equisetum palustre</i>		. ⁻⁻⁻	25 ⁻⁻⁻
<i>Cardamine amara</i>		. ⁻⁻⁻	25 ⁻⁻⁻
<i>Cirsium oleraceum</i>		. ⁻⁻⁻	25 ⁻⁻⁻
<i>Equisetum sylvaticum</i>		. ⁻⁻⁻	25 ⁻⁻⁻
Diagnostic taxa of the suballiance <i>Alnenion glutinoso-incanae</i>			
<i>Rubus idaeus</i>		83 ⁻⁻⁻	100 ⁻⁻⁻
<i>Aegopodium podagraria</i>		78 ⁻⁻⁻	62 ⁻⁻⁻
<i>Athyrium filix-femina</i>		67 ⁻⁻⁻	50 ⁻⁻⁻
<i>Filipendula ulmaria</i>		56 ⁻⁻⁻	75 ⁻⁻⁻
<i>Chaerophyllum hirsutum</i>		56 ⁻⁻⁻	38 ⁻⁻⁻
<i>Ranunculus repens</i>		33 ⁻⁻⁻	25 ⁻⁻⁻
<i>Crepis paludosa</i>		28 ⁻⁻⁻	75 ⁻⁻⁻
<i>Ranunculus lanuginosus</i>		28 ⁻⁻⁻	62 ⁻⁻⁻
<i>Impatiens noli-tangere</i>		28 ⁻⁻⁻	62 ⁻⁻⁻
<i>Myosotis palustris</i> agg.		22 ⁻⁻⁻	25 ⁻⁻⁻
<i>Dryopteris carthusiana</i>		11 ⁻⁻⁻	25 ⁻⁻⁻
Diagnostic taxa of the class <i>Quercu-Fagetea</i>			
<i>Milium effusum</i>		28 ⁻⁻⁻	75 ⁻⁻⁻
<i>Phyteuma spicatum</i>		22 ⁻⁻⁻	12 ⁻⁻⁻
<i>Acer pseudoplatanus</i>	T	. ⁻⁻⁻	25 ⁻⁻⁻
<i>Acer pseudoplatanus</i>	S	17 ⁻⁻⁻	38 ⁻⁻⁻
<i>Acer pseudoplatanus</i>		17 ⁻⁻⁻	75 ⁻⁻⁻
<i>Campanula trachelium</i>		17 ⁻⁻⁻	12 ⁻⁻⁻
<i>Ribes alpinum</i>		17 ⁻⁻⁻	. ⁻⁻⁻
<i>Campanula persicifolia</i>		11 ⁻⁻⁻	. ⁻⁻⁻
<i>Lunaria rediviva</i>		11 ⁻⁻⁻	. ⁻⁻⁻
<i>Carex sylvatica</i>		6 ⁻⁻⁻	25 ⁻⁻⁻
<i>Cardamine impatiens</i>		6 ⁻⁻⁻	12 ⁻⁻⁻
<i>Mercurialis perennis</i>		6 ⁻⁻⁻	12 ⁻⁻⁻
<i>Glechoma hederacea</i>		6 ⁻⁻⁻	. ⁻⁻⁻
<i>Scrophularia nodosa</i>		6 ⁻⁻⁻	. ⁻⁻⁻
<i>Corylus avellana</i>	S	6 ⁻⁻⁻	. ⁻⁻⁻
<i>Fagus sylvatica</i>	S	. ⁻⁻⁻	12 ⁻⁻⁻
<i>Stachys sylvatica</i>		. ⁻⁻⁻	12 ⁻⁻⁻
<i>Acer platanooides</i>		. ⁻⁻⁻	12 ⁻⁻⁻
<i>Veronica montana</i>		. ⁻⁻⁻	12 ⁻⁻⁻
Other taxa			
<i>Gentiana asclepiadea</i>		72 ⁻⁻⁻	50 ⁻⁻⁻
<i>Calamagrostis arundinacea</i>		67 ⁻⁻⁻	38 ⁻⁻⁻
<i>Aruncus dioicus</i>		67 ⁻⁻⁻	25 ⁻⁻⁻
<i>Dryopteris filix-mas</i>		67 ⁻⁻⁻	12 ⁻⁻⁻
<i>Picea abies</i>		61 ⁻⁻⁻	75 ⁻⁻⁻
<i>Maianthemum bifolium</i>		56 ⁻⁻⁻	25 ⁻⁻⁻
<i>Myosotis sylvatica</i>		56 ⁻⁻⁻	50 ⁻⁻⁻

Syntaxon		A	B
<i>Oxalis acetosella</i>		50	75
<i>Sambucus racemosa</i>		50	12
<i>Fragaria vesca</i>		50	12
<i>Rubus idaeus</i>	S	44	.
<i>Sorbus aucuparia</i>		44	25
<i>Mycelis muralis</i>		44	38
<i>Prenanthes purpurea</i>		44	12
<i>Picea abies</i>	S	44	62
<i>Geranium phaeum</i>		44	50
<i>Paris quadrifolia</i>		44	50
<i>Daphne mezereum</i>		44	38
<i>Chrysosplenium alternifolium</i>		44	62
<i>Sorbus aucuparia</i>	S	44	12
<i>Salix caprea</i>		39	38
<i>Polygonatum verticillatum</i>		39	50
<i>Geranium robertianum</i>		39	62
<i>Stellaria nemorum</i>		39	88
<i>Senecio nemorensis</i> agg.		39	88
<i>Dactylis glomerata</i> agg.		33	75
<i>Lonicera nigra</i>	S	33	50
<i>Pulmonaria obscura</i>		33	12
<i>Aconitum variegatum</i>		33	50
<i>Silene dioica</i>		33	25
<i>Luzula sylvatica</i>		33	50
<i>Rumex alpestris</i>		28	62
<i>Veratrum album</i> ssp. <i>lobelianum</i>		28	25
<i>Heracleum sphondylium</i>		28	50
<i>Vaccinium myrtillus</i>		28	.
<i>Petasites albus</i>		28	.
<i>Senecio fuchsii</i>		28	.
<i>Veronica chamaedrys</i>		22	.
<i>Tussilago farfara</i>		22	.
<i>Chaerophyllum aromaticum</i>		22	.
<i>Cardaminopsis halleri</i>		22	.
<i>Hylotelephium argutum</i>		22	38
<i>Lonicera nigra</i>		17	50
<i>Cirsium erisithales</i>		17	38
<i>Thalictrum aquilegifolium</i>		17	25
<i>Ribes uva-crispa</i>		17	25
<i>Poa nemoralis</i>		11	25
<i>Rumex obtusifolius</i>		6	38
<i>Valeriana tripteris</i>		6	38
<i>Senecio subalpinus</i>		.	38
<i>Mentha longifolia</i>		.	38
<i>Picea abies</i>	T	.	25
<i>Streptopus amplexifolius</i>		.	25
<i>Prunella vulgaris</i>		.	25
<i>Dryopteris dilatata</i>		.	25
Taxa occurred with frequency < 20 in one or two columns		38	23