RIVERINE FORESTS IN THE UPPER SOČA VALLEY (THE JULIAN ALPS, WESTERN SLOVENIA)

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Abstract
Riverine forests (willow stands and groves) along the upper course of the Soča River in western Slovenia were researched applying the standard Central-European phytosociological method (Braun-Blanquet 1964). After processing 52 relevés applying the hierachical classification and ordination method (PCoA) we determined two subassociations of the association *Salicetum albae* Issler 1926 (alliance *Salicion albae* Soó 1930): *-myosotidetosum* I. Kárpáti ex Soó 1958 and *-leucojetosum verni* Šilc, Čušin & Dakskobler 2004 subass. nova and two syntaxa from the alliance *Alnion incanae* Pawłowski in Pawłowski & Wallisch 1928: *Lamio orvalae-Salicetum eleagni* nom. prov. and *Alnetum incanae* Lüdi 1921 var. geogr. *Anemone trifolia* Müller & Görs 1958 forma *Galanthus nivalis* f. nova. As a specific successional stage (subassociation *-caricetosum albae,* differentiated by the species *Tilia cordata, Carex alba* and *Carpinus betulus*) we classified into the latter syntaxon also the stands which thrive on sites that are only rarely (occasionally) still flooded and where hydromorphic soil traverses into automorphic. Even regarding its floristic composition this community is transitional between the forests from the alliance *Alnion incanae* and the forests from the alliance *Erythronio-Carpinion.*

Izvleček
Po standardni srednjeevropski fitocenološki metodi (Braun-Blanquet 1964) smo raziskali obrečne gozdove (vrbovja in loge) ob zgornjem teku reke Soče v zahodni Sloveniji. Po obdelavi 52 fitocenoloških popisov s hierarhično klasifikacijo in ordinacijsko metodo glavnih koordinat (PCoA) smo ugotovili dve subasociaciji asociacije *Salicetum albae* Issler 1926 (zveza *Salicion albae* Soó 1930): *-myosotidetosum* I. Kárpáti ex Soó 1958 in *-leucojetosum verni* Šilc, Čušin & Dakskobler 2004 subass. nova in dva sintaksona iz zveze *Alnion incanae* Pawłowski in Pawłowski & Wallisch 1928: *Lamio orvalae-Salicetum eleagni* nom. prov. in *Alnetum incanae* Lüdi 1921 var. geogr. *Anemone trifolia* Müller & Görs 1958 forma *Galanthus nivalis* f. nova. V slednji sintakson smo kot posebno razvojno obliko (subasociacijo *-caricetosum albae*, razlikujejo jo vrste *Tilia cordata, Carex alba* in *Carpinus betulus*) uvrstili tudi sestoje, ki uspevajo na rastiščih, ki so le redko (občasno) še poplavljena in kjer hidromorfna tla prehajajo v avtomorfna. Tudi po floristični sestavi je to prehodna združba med gozdovi iz zveze *Alnion incanae* in gozdovi iz zveze *Erythronio-Carpinion.*

Key words: riverine forest, *Salicion albae, Alnion incanae, Erythronio-Carpinion*, synsystematics, the Soča River, western Slovenia
Ključne besede: obrečni gozd, *Salicion albae, Alnion incanae, Erythronio-Carpinion*, sinsistematika, reka Soča, zahodna Slovenija

1. INTRODUCTION

The Soča River is one of the best preserved Alpine rivers, above all its upper course from the source in the Trenta valley to the confluence with the Tolminka at the town of Tolmin. This part of the river is protected as a natural monument. Also supposed to be protected is its riparian belt, namely gravel sites, willow stands and riverine forests which overgrow the youngest river terraces that

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are up to a few metres above the present river level. The vegetation of riverine forests along the Soča and the Nadiža was studied by Gabrijel Tomažič (Robič & T. Wraber 2001: 15) in 1956 and 1957, but the report in which his research was collected was lost (Prof. D. Robič, verbal report 2002). More systematic research of this riparian vegetation started in the period between 1960 and 1970, at the time when the Trnovo and Kobarid power stations were being projected. Most studies at the time were conducted in the section between the towns of Bovec and Kobarid. Most noteworthy among the publications at the time was an article by T. Wraber (1966) and some professional papers in the journal Varstvo narave (Protection of Nature), No. 2–3 (1965), but most of the studies were not published and are only available in experts' detailed reports. In the same form, an interdisciplinary study Watershed of the Soča River, The Soča Development Project (Černilogar et al. 1991, 1993) was made, in which forest stands along the Soča were studied by I. Mlekuž. Several comparable vegetation studies conducted along the Nadiža River in the Breginjski kot were made in the last few years (Šilc & Čušin 2000, Čušin 2001, 2002, and currently in print is also an article on vegetation of gravel sites of the Upper Soča Valley – Čušin & Šilc 2004). In 2001 we started, systematically and phytosociologically to research the forest stands along the Soča between the Trenta valley and Most na Soči, as well as similar stands along the lower course of the Idrijca River. Our research included riparian willow stands (forest stands of grey willow near the villages of Soča, Žaga, Srpenica and Ladra, stands with predominating white willow near Tolmin) and mixed forest stands of grey willow, grey alder, European ash-tree and other deciduous trees (mountain elm, sycamore maple, small-leaved lime, pedunculate oak, hornbeam), which indicate a syndynamic connection (link) with forests of oaks and hornbeam (*Querco-Carpinetum* s. lat.). These, however, have long ago been cleared and transformed into agricultural land (fields and today mostly cultivated meadows). These forest stands are mostly young, having been formed in the last fifty years from former pastures or land where willow rods were being acquired (the vicinity of Tolmin). Occasionally, and without plan, quality trees (hard and valuable broad-leaved species) are cut down here. These stands are in some places also more systematically managed with thinning (Srpenica, Žaga, some places around Tolmin).

2. METHODS

In conducting our research we applied the standard Central-European phytosociological method (Braun-Blanquet 1964, Dierschke 1994). Relevés were made in spring (April, May), as the early spring flora in these stands is the richest in the number of species and is therefore diagnostically important. They were repeated in the summer (when in certain parts anthropophytes predominate). When arranging the relevés into tables and comparing them with the stands of similar syntaxa we used the hierarchical classification and ordination method Principal Coordinates Analysis (Metric Multidimensional Scaling) – PCoA (using the programme package SYN-TAX, Podani 1993, 2001). On final arrangement of relevés in Table 2 we combined the results obtained with numerical methods with the classic arrangement based on diagnostic species. Nomenclature source for the names of vascular plants is the Mala flora Slovenije (Martinčič & al. 1999). The nomenclature source for the names of mosses are Frahm & Frey (1992). With the names of syntaxa we follow Grass (1993), Wallnöfer & al. (1993), as well as Marinček & Čarni (2000). For lower syntaxonomical units of the association *Alnetum incanae* s. lat. we employed the principle of multidimensional division of vegetation units (W. Matuszkiewicz & A. Matuszkiewicz 1981, Schwabe 1985).

3. ECOLOGICAL DESCRIPTION OF THE RESEARCH AREA

The Upper Soča Valley from Trenta to Most na Soči can be divided into three sections. The section reaching from the spring in Trenta to the confluence with the Koritnica at Bovec is most Alpine. In this part the Soča runs mostly down a narrow valley, on entirely limestone terrain. There are more extensive alluvia near the village of Soča, downstream from the confluence with the Lepenica, at about 430 m a.s.l., which are at least partly (along the still predominating initial willow stands, *Salicetum incano-purpureae* Sillinger 1933) overgrown with forest stands of grey willow with addition of spruce. The second section is between the confluence with the Koritnica and ravine at Trnovo. Extensive gravel sites in this section are at the village of Čezsoča, downstream from the confluence with the right tributary Koritnica and the left tributary Slatenik (Slatenk), at about 360 m a.s.l. It is here

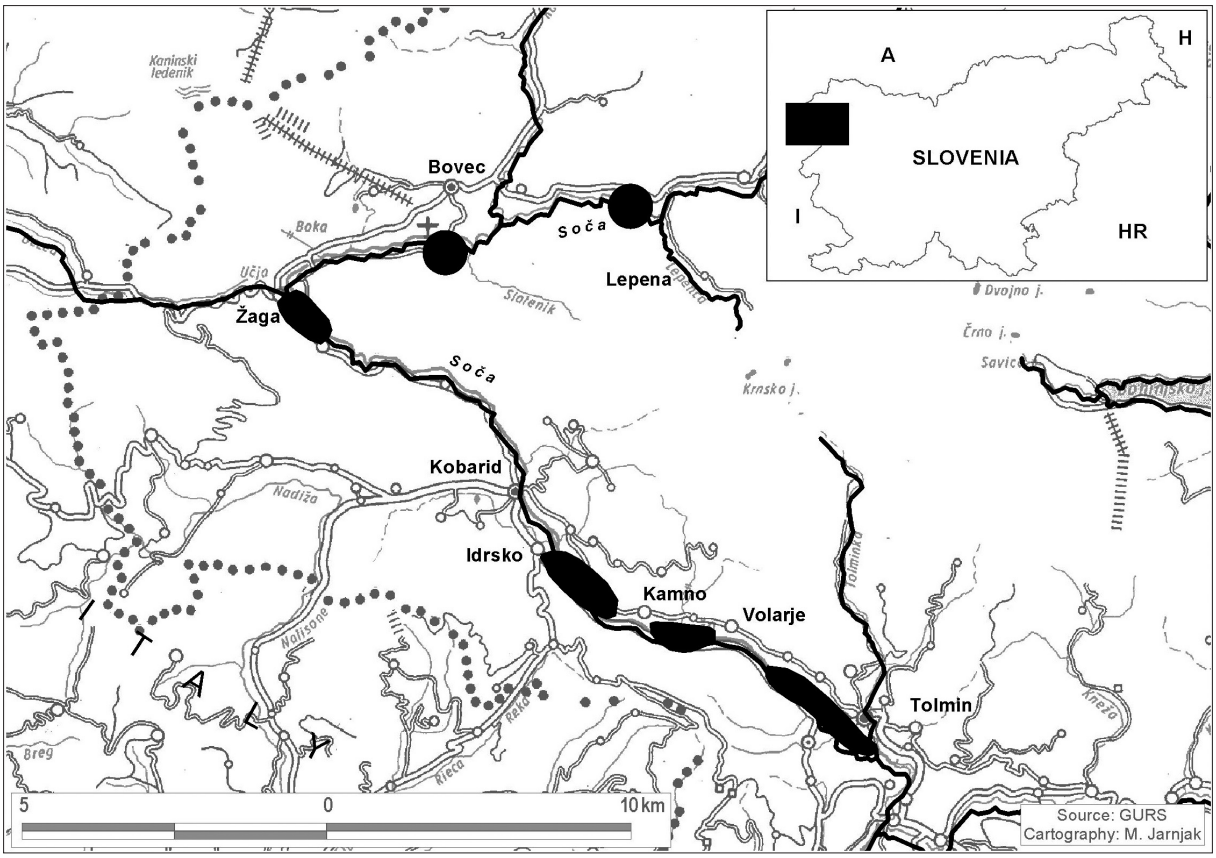

Figure 1: Research area at the upper course of the Soča River between the village of Soča and the town of Tolmin
Slika 1: Raziskovano območje ob zgornjem teku reke Soče med vasjo Soča in Tolminom

also that limestone gravel prevails, although the Koritnica and Slatenik carry clay and marl gravel stones as well. The gravel sites are overgrown with initial willow stands (*Salicetum incano-purpureae*), with mixed riparian stands of grey willow, grey alder and other deciduous trees, whereas on slighty more developed soil that is more rarely exposed to flooding, mixed stands of Scotch pine (*Pinus sylvestris*), spruce (*Picea abies*) and deciduous trees (*Alno incanae-Pinetum sylvestris* Poldini 1984) grow. Due to the windbreakage in autumn 2002 (November, 16) and salvage fellings which followed, these stands are very open**,** their natural structure is destabilized (deciduous trees are likely to prevail in the succession). There are extensive gravel sites also near the village of Žaga (at the confluence with the Učja) and between Žaga and Srpenica (where the Soča is joined by the torrent Sušec which flows from the slopes of the Stol ridge) at about 330 m a.s.l. For the most part they are overgrown with stands of grey willow and riparian stands of grey alder and European ash-tree. The climate in the upper course of the Soča River is mostly Alpine, but there is a considerable sub-Mediterranean impact. Ogrin (1996) classifies it into the moderate continental climate of western and southern Slovenia (typical of which is a sub-Mediterranean rainfall regime – with its peak in the months of October and November). Rainfall there is rather abundant: Lepena (480 m) – 3018 mm, Bovec (452 m) – 2735 mm and Žaga (353 m) – 3018 mm (in the period between 1961 and 1990) and evenly distributed throughout the year, with the peak in the autumn months (October, November) – B. Zupančič (1995: 12, 126, 360). Temperature conditions can be described only for the measure station in Bovec (452 m). Average yearly temperature measured here in the period of 1961–1990 was 9.2 °C (interpolated value), the coldest month was January (–0.7 °C), and the warmest July (18.7 °C) – Mekinda - Majaron (1995: 35).

At the town of Kobarid, where the Soča exits the gorge between the Stol and the Polovnik ridge, the river flows over a wide plain with more or less extensive gravel sites on both embankments (at about 200 m a.s.l.) all the way to Tolmin or the conflu-

ence with the Tolminka (at about 160 m a.s.l.). The gravel itself is composed of limestone, but the left tributaries (Kozjak, Ročica, Volarja) carry with them also marl and clay material. Mixed stands of grey willow and grey alder prevail, mixed stands of these two species and other deciduous trees (European ash-tree, small-leaved lime and in places also hornbeam and pedunculate oak), whereas in the vicinity of Tolmin there are also stands with predominating white willow. This part of the Soča Valley has a slightly warmer and less humid climate. Average rainfall in the period of 1961–1990 in Kobarid (263 m) was 2699 mm, and in Tolmin (180 m) 2243 mm (B. Zupančič 1995: 99, 311). Average yearly temperature in Tolmin in the period of 1961–1990 was 10.6 °C (interpolated value), the coldest month was Jauary (0.6 °C) and the warmest month July (20.0 °C) – Mekinda - Majaron (1995: 122). Ogrin (1996) classifies also the Kobarid and Tolmin region into the moderate continental climate of western and southern Slovenia.

M. Wraber (1969) classified the Upper Soča Valley up to Tolmin into the Alpine phytosociological region of Slovenia, but Zupančič et al. (1989) classified its lower valley parts into the sub-Mediterranean-pre-Alpine district of the pre-Alpine subsector and southeastern sector of the Illyrian floral province.

Within the research area the Soča has a snow regime. The height of water level is above average between April and July, and reaches its peak in May. Autumn high water with its peak in November is short-term and hardly exceeds the average yearly discharge (flow rate of stream) (at Kobarid it is 34.1 l/s). Winter low water lasts from December until March, with its primary low in February, whereas the summer low water is limited to August (Bat in Bat & Skoberne 1998: 132). The Soča Valley up to the confluence with the Idrijca is an explicitly torrential region. It was determined that 14,500 m^3 of material per square kilometre is loosened from this region every year (Paulič 1995: 155).

4. RESULTS

4.1 Survey of vegetation units

Salicetea purpureae Moor 1958
Salicetalia purpureae Moor 1958
Salicion albae Soó 1930
Salicetum albae Issler 1926 *myosotidetosum* I. Kárpáti ex Soó 1958
Salicetum albae Issler 1926 *leucojetosum verni* Šilc, Čušin & Dakskobler 2004 subass. nova
Querco-Fagetea Br.-Bl. et Vlieger in Vlieger 1937
Fagetalia sylvaticae Pawłowski in Pawłowski et al. 1928
Alnion incanae Pawłowski in Pawłowski et Wallisch 1928
Lamio orvalae-Salicetum eleagni nom. prov.
Alnetum incanae Lüdi 1921 var. geogr. *Anemone trifolia* Müller & Görs 1958 forma *Galanthus nivalis* f. nova
-typicum
var. *Salix eleagnos*
var. *typica*
-caricetosum albae
var. *typica*
var. *Crocus napolitanus*

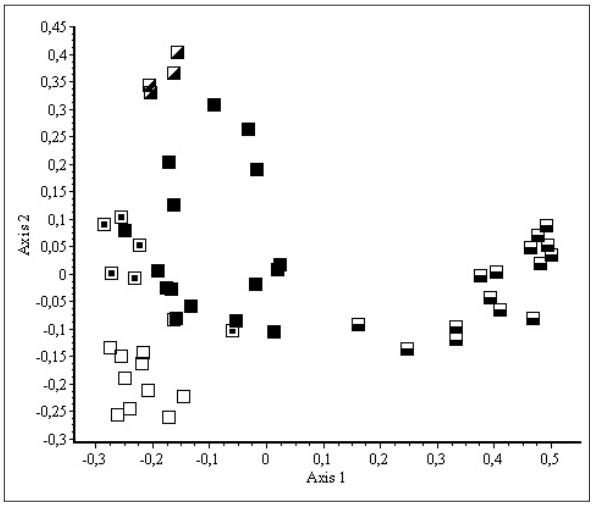

Figure 2: Two-dimensional scatter diagram of 52 relevés (PCoA, similarity ratio). ◒ – *Salicetum albae*, ◪ – *Lamio orvalae-Salicetum eleagni,* ■ – *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis typicum*, ▣ – *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis caricetosum albae* var. *typica,* □ *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis caricetosum albae* var. *Crocus napolitanus*

Slika 2: Dvorazsežni ordinacijski diagram popisnega gradiva (PCoA, similarity ratio). ◒ – *Salicetum albae*, ◪ – *Lamio orvalae-Salicetum eleagni,* ■ – *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis typicum*, ▣ – *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis caricetosum albae* var. *typica,* □ *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis caricetosum albae* var. *Crocus napolitanus*

4.2 *Salicetum albae*

So far, 52 relevés have been comparatively processed and four main groups have been determined applying the Principal Coordinates Analysis (Podani 1993, 2000) – Figure 2. Completely separated from others were the relevés of white willow stands which were made in the vicinity of Tolmin. These relevés were therefore arranged into Table 1 and compared to similar stands of white willow from other regions of Central Europe. This way we determined considerable differences as the relevés of white willow stands along the Soča are floristically a little different from other communities compared. The closest similarity was determined with the stands of white willow along the Tagliamento River in northeastern Italy (Lippert & al. 1995). We suppose that along the Soča thrive mostly those stands of white willow which, regarding their floristic composition and ecology, are a link in the syndynamic development from white willow stands to grey alder stands. Due to various regulations (e.g. regular gravel excavation and deepening of the riverbed), human impact on this development is rather strong, which is the cause for the drop in the underground water level. Apart from that, human impact is the cause of the lower frequency and duration of flooding. This is the reason why the soil in these stands, at least in comparison with the soils in a typical white willow stand, is drier and more developed. Only two relevés (No. 1 and 2) were classified into the subassociation *Salicetum albae* Issler 1926 *myosotidetosum* I. Kárpáti ex Soó 1958 after the comparisons were completed. These stands were found in concavities, where water is retained for a longer period. Other relevés are classified into a new subassociation *Salicetum albae* Issler 1926 *leucojetosum verni* Šilc, Čušin & Dakskobler 2004 subass. nova (*holotypus* is relevé No. 8 in Table 1). Its differential species are those which are common in contact forests of grey alder and European ash-tree, in hornbeam forests and (some of them) in beech forests (that is the species from the alliances *Alnion incanae* and *Erythronio-Carpinion*, order *Fagetalia* and class *Querco-Fagetea*): *Leucojum vernum, Galanthus nivalis, Corydalis cava, Anemone ranunculoides* and *Crocus napolitanus*. These geophytes are not usually found in white willow stands as their bulbs tend to rot due to high water level (comp. Grass 1993: 52). Phytogeographical differential species are *Lamium orvala* and *Anemone trifolia*. Similar syndynamic (transitional) forms in the successional sere from softwood to transitional forms and hardwood forests were, in relation to human impact, described also by other authors (Müller 1995, Gallandat & al. 1993, Uheričkova 1998).

Wildi (1989) found considerable changes of vegetation 40 years after the pioneer research conducted by Moor (1958). Due to altered site conditions (decrease in frequency and duration of flooding), new vegetational types of riverine forests occured. Among dominant species he determined a regression of the species of the genus *Salix* and an increase in abundance of the species *Fraxinus excelsior*, which has a wider ecological amplitude.

As an important reason for the excessive surface growth of grey alder stands, Müller (1995) mentions its good regenerational ability after felling. This way, the successional development in the direction of the stands from the association *Querco-Ulmetum* Issler 1926 terminates. Similarly, the stands of grey alder occur on the sites of the association *Salicetum albae* because they are less flooded. Grey alder stands (*Alnetum incanae* s. lat.) also spread along old riverbeds which are being deepened on account of erosion.

4.3 *Lamio orvalae-Salicetum eleagni* nom. prov. (*Alnion incanae*)

The other 37 relevés were arranged in Table 2. The relevés of grey willow stands found on gravel sites of the Soča near the village of Soča (downstream from the confluence with the Lepenica) are in the first four columns. In relatively unified pole stands (with largest diameters up to 30 cm and up to 18 m in tree height) grey willow (*Salix eleagnos*) completely prevails at the moment. Often, but mostly individually, there is also spruce (*Picea abies*), and occasionally European ash-tree (*Fraxinus excelsior*), mountain elm (*Ulmus glabra*), lime tree (*Tilia platyphyllos*) and hop hornbeam (*Ostrya carpinifolia*). Species of beech forests (order *Fagetalia sylvaticae* s. lat.) prevail in the herb layer, as well as the character species of the alliance *Alnion incanae*. However, we did not detect grey alder among them (possibly because of the soil conditions, lack of nutrients on limestone and dolomite gravel), which is why we provisionally treat these relevés as a specific successional stage *Lamio orvalae-Salicetum eleagni* nom. prov. (which is classified into the alliance *Alnion incanae*). These stands cannot be classified within the associaton *Salicetum incano-purpureae* Sillinger 1933, as was confirmed by the comparison of our relevés with the relevés of the ecologically most similar

mesophilous form *Salicetum incano-purpureae petasitetosum hybridi* (Šilc & Čušin 2000) Oriolo & Poldini 2002 (comp. Šilc & Čušin 2000, Oriolo & Poldini 2002, Čušin & Šilc 2004, submitted). Apart from the obvious differences in the composition of these stands as well as in soil conditions (in our case those are unified forest stands on comparatively better developed soil) there are huge differences also regarding floristic composition (with a considerably larger proportion of species of the alliances *Alnion incanae* and *Tilio-Acerion*, of the order *Fagetalia* and the class *Querco-Fagetea* in our stands, and with a considerably larger proportion of the species of the classes *Artemisietea, Galio-Urticetea, Molinio-Arrhenatheretea* in the stands of the compared subassociation). Even the simple floristic similarity according to Sørensen (1948) – with consideration of all the species, irrespective of their constancy – with the compared subassociation as described by Šilc and Čušin (2000) in the Nadiža valley reaches only about 45 %. These differences are even larger when considering mean coverage. For now, the stage described can be evaluated as a provisional association. Four relevés do not suffice for its typification, so further comparisons would be needed. Its diagnostic species are *Salix eleagnos*, *Picea abies* and *Lamium orvala*. Spruce is spontaneous in these stands and will probably prevail in the next stage, together with an admixture of hard and valuable broad-leaved tree species, in case of progressive succession (improvement of soil conditions) when grey willow will gradually disappear. Further development is likely to proceed in the direction of beech forest (*Anemono trifoliae-Fagetum* Tregubov 1962), which is the predominant community of this part of the Upper Soča Valley.

4.4 *Alnetum incanae* s. lat.

All other relevés are classified into the macroassociation *Alnetum incanae* s. lat. These relevés were made in almost the entire research region (from Čezsoča to Tolmin), which in terms of climate means in both slightly different parts of the Upper Soča Valley. Pole stands, whose diameters measure up to 30 (35) cm at breast height and which reach up to 20 (25) m in height, prevail. In the tree layer there is, together with the generally prevailing grey alder, also a good deal of grey willow, which was the edifier of the previous successional stage (*Salicetum eleagni* s. lat.). In certain parts European ash-tree (*Fraxinus excelsior*) has an almost equal share as grey alder and grey willow. More common among other species of the tree layer is mostly small-leaved lime (*Tilia cordata*). The shrub layer is lush, with a large proportion of *Cornus sanguinea* and *Coryllus avellana*, which is partly related to human impact (occasional felling, selection of valuable examples of hardwoods). In the lower shrub and herb layer *Rubus caesius* prevails. Geophytes (*Leucojum vernum, Galanthus nivalis, Ranunculus ficaria*, less often *Crocus napolitanus, Isopyrum thalictroides*, *Corydalis cava*) are characteristic for the early spring aspect. About a month later they are accompanied by the species *Paris quadrifolia, Anemone trifolia, A. ranunculoides, Dentaria pentaphyllos, Allium ursinum*. Common species of the late spring aspect are e.g. *Listera ovata, Stellaria nemorum* agg., *Adoxa moschatellina, Asarum europaeum, Galeobdolon flavidum, Cerastium sylvaticum, Brachypodium sylvaticum* and *Deschampsia cespitosa*, and above all some tall herbs, such as *Lamium orvala, Aegopodium podagraria, Lunaria rediviva, Aconitum lycoctonum* agg., *Chaerophyllum hirsutum*, *Angelica sylvestris, Ranunculus lanuginosus* and others. In autumn on certain more open surfaces anthropophytes predominate (*Solidago gigantea, Helianthus tuberosus*). In the moss layer *Plagiomnium undulatum* is always present. More common is also *Climacium dendroides*. Riverine stands of grey alder and other deciduous trees along the Soča have a rich and diverse flora: average number of species per relevé is 70, standard deviation (SD) is 9.6 and coefficient of variation is 13.7.

Phytosociological descriptions of grey alder stands (*Alnetum incane* s. lat.) in Central and in part also in Southeastern Europe are found in articles and works of numerous authors (see e.g. Pawłowski & al. 1928, Aichinger & Siegrist 1930, Aichinger 1933, J. & M. Bartsch 1940**,** Oberdorfer 1953, Moor 1958, Müller & Görs 1958**,** Trinajstić 1973, Dierschke 1984, Schwabe 1985, T. Müller 1992, Wallnöfer, Mucina & Grass 1993 and in lists of literature quoted in these publications). Moor (1958), for example, proposed division of grey alder stands into two associations: *Calamagrostio-Alnetum incanae* Moor 1958 in Alpine valleys and *Equiseto-Alnetum incanae* Moor 1958 in Alpine foothills, where rivers leave the mountains and spread onto hills and lowlands. Comparison of our material with Moor's scheme (Moor 1958: 310) shows that in the stands of grey alder we can find the species which characterize the first association (*Picea abies, Salix eleagnos, Carex alba*) as well as those which characterize the second association (*Ranunculus ficaria, Anemone ranunculoides, Chrysosplenium alternifolium* etc.). Also

important for us is the Müller & Görs treatise (1958), as there is a detailed geographical division of the association *Alnetum incanae* based on material published by then. In their article, with consideration of Aichinger's relevés from the Karavanke mountains, the south-Alpine geographical variant (Rasse, race) with the differential species *Cantaurea dubia* (=*C. nigrescens*), *Knautyia drymeia, Anemone trifolia* and *Cyclamen purpurascens* is excluded for the first time. A thorough monographic study of grey alder communities in Europe was published by Angelika Schwabe (1985). She classifies grey alder stands in Central Europe into the (macro)association *Alnetum incanae* Lüdi 1921 and subdivides it into several geographical races, altitudinal forms and site types (subassociations). According to her scheme (Schwabe 1985: 285, 287) the studied community would be classified into the Alpine geographical race, a territorial form of Southeastern Alps, submontane form (differential species *Cornus sanguinea, Ligustrum vulgare, Clematis vitalba, Viburnum lantana, Ranunculus ficaria, Anemone ranunculoides*) and into at least two site types (*-typicum* and *-caricetosum albae*). The grey alder community in the Soča Valley definitely has certain floristic features which differentiate it from the so far described communities of this species within Central Europe. It is differentiated by a group of species distributed mostly in southeastern Europe (in the Southeastern Alps, the northwestern Dinaric mountains, partly in the whole Mediterranean-montane belt), character species of the alliances *Erythronio-Carpinion* and *Aremonio-Fagion*: *Galanthus nivalis, Primula vulgaris, Helleborus odorus, Crocus napolitanus, Ornithogalum pyrenaicum, Lamium orvala, Anemone trifolia, Knautia drymeia, Helleborus niger, Cyclamen purpurascens, Cardamine trifolia, Isopyrum thalictroides* etc., as well as (although more rarely and individually) by some sub-Mediterranean species, such as *Ostrya carpinifolia* and *Fraxinus ornus*. More than ecologically (syndynamic relationship with the forests of hornbeam and partly with beech forests), these species characterize the studied community in terms of phytogeography above all. Certain of the above mentioned species can be found also in the grey alder communities in southern Carinthia (comp. e.g. Aichinger & Siegrist 1930, Aichinger 1933, Franz 1990, 1991, Egger & al. 2002) in northeastern Italy (Lippert & al. 1995), species *Galanthus nivalis* in riverine stands along the Danube east of Linz (Wallsee) – Wendelberger-Zelinka 1952 (quoted after Müller & Görs 1958: 134) and in the region of Kočevsko in southern Slovenia (*Alnetum incanae* Lüdi 1921 var. geogr. *Scopolia carniolica* Accetto 1996) – Accetto (1996), but no longer (or hardly ever) in northern Croatia in the Drava River basin – *Equiseto-Alnetum incanae* (M. Moor 1958) Trinajstić 1973 (Trinajstić 1973).

An extensive and detailed comparison with grey alder stands around Slovenia and in Central Europe, for the moment still to be executed, would be required for an adequate synsystematic classification of the stands studied (studies of similar forest stands in Slovenia are for the most part still being conducted, and there are relatively few publications, see e.g. M. Wraber 1960: 84–85 and Accetto 1996). If we follow the scheme of Müller & Görs (1958: 134) and Angelika Schwabe (1985: 285–287) we can treat these stands as a submontane form of southeastern-Alpine-northern-Illyrian geographical variant of the (macro)association *Alnetum incanae* s. lat., that is *Alnetum incanae* Lüdi 1921 var. geogr. *Anemone trifolia* Müller & Görs 1958 forma *Galanthus nivalis* f. nova. Nomenclatural type, *holotypus*, of the new form it is relevé No. 15 in Table 2. At the same time, this is the nomenclatural type, *lectotypus*, of the geographical variant *Anemone trifolia*, as in the Aichinger's relevés (1933) used by Müller & Görs (1958: 134) to describe the south-Alpine geographical variant, the species *Anemone trifolia* is present only in the stands with prevailing spruce. Even Aichinger and Siegrist (1930) did not detect it in the riverine forests of grey alder along the Drava (which are also classified into this geographical variant on account of other differential species). Differential species of the southeast-Alpine geographical variant are above all *Anemone trifolia* and *Lamium orvala* (according to Müller & Görs 1958 and Schwabe 1985 also *Knautia drymeia, Cyclamen purpurascens* and *Centaurea nigrescens*). Both are mostly distributed in the Southeastern Alps and in the northern part of the Dinaric mountains (comp. e.g. Trinajstić 1992). The first, *Anemone trifolia*, characterizes our community mainly chorologically, and the second, *Lamium orvala*, also ecologically. Although it is characteristic for mesophilous submontane and montane beech forests [*Lamio orvalae-Fagetum* (Ht. 1938) Borhidi 1963], as well as for communities of valuable deciduous trees (*Polysticho setiferi-Acerenion pseudoplatani* Borhidi et Kevey 1996 = *Lamio orvalae-Acerenion* Marinček 1990) of the northwestern part of the Illyrian floral province, it is just as common on forest edges and in certain (semi)ruderal communities. Jelem (1979, we quote after Wallnöfer & al. 1993: 95) writes about its diagnostic significance for the grey alder

stands in limestone and dolomite regions of the southern Alps. Franz (1990: 29–30) even published a description (with only one relevé) of a new subassociation *Alnetum incanae lamietosum orvale* Franz 1990 in southern Carinthia in Austria. Comparatively, this relevé is floristically impoverished, which means that our stands definitely cannot be classified within this subassociation. The geographical variant described by Accetto (1996), *Alnetum incanae* var. geogr. *Scopolia carniolica*, includes grey alder stands of the utmost borderline (Dinaric) form of the (macro)association *Alnetum incanae* s. lat. According to the only relevé published so far, these stands differ considerably from our community, even as far as its sites are concerned. *Scopolia carniolica* was not noticed in riverine forests along the Soča, but we have found it in riverine forests in the Idrijca valley (relevé 6 in Table 2).

Differential species of the submontane form are *Galanthus nivalis, Ranunculus ficaria, Anemone ranunculoides, Veratrum nigrum* and *Crocus napolitanus*. Those are the species which do not usually thrive in montane forms of grey alder communities (such forms are mentioned for Slovenia by M. Wraber 1960: 84–85 among others).

In terms of sites, two subassociations are differentiated in the studied community:

-*typicum* (relevés 5–20, nomenclatural type, *holotypus*, is relevé No. 15 in Table 2) and

-*caricetosum albae*, which means a successional stage with *Tilia cordata, Carex alba* and *Carpinus betulus*, which indicate a transition between forests of *Alnion incanae* and *Erythronio-Carpinion* alliances (the latter will be treated separately in the following chapter, its nomenclatural type, *holotypus*, is relevé 24 in Table 2). The typical subassociation is furthermore subdivided into the more initial variant (var. *Salix eleagnos*), where usually grey willow still prevails in the tree layer (relevés 5–10 in Table 2) and into the more developed form (var. *typica*), with the usually predominating grey alder in the tree layer (relevés 11–20 in Table 2).

4.5 Successional stage *Alnetum incanae caricetosum albae*

Stands of the last 17 relevés in Table 2 (relevés 21–37) grow on sites which are only rarely (occasionally) still flooded, where the underground water level is lower and hydromorphic soil is becoming automorphic. Even the entire floristic composition indicates transitional communities between forests from the alliance *Alnion incanae* and the forests from the alliance *Erythronio-Carpinion*. A certain similarity was established between these stands with those from the associations *Helleboro nigri-Carpinetum* Marinček in Wallnöfer, Mucina & Grass 1993 and *Carici albae-Carpinetum betuli* Čušin 2002. Hornbeam is regularly present there, but only individually (abundance/dominance values r, +, rarely 2). *Tilia cordata* is most abundant in the tree layer, *Fraxinus excelsior* is rather common, in places also *Salix eleagnos* and *Alnus incana*, and on a few locations near Tolmin also *Quercus robur*. Timber stands (with diameters at breast height of 30 to 40 cm, pedunculate oak also 50 cm) which reach up to 20 (25) m in height prevail. With few differences, the predominating species in the shrub and herb layer are similar to those in the typical grey alder community, *Alnetum incanae typicum*. Relevés of these stands were compared to the relevés of the earlier mentioned associations (Marinček 1979, Čušin 2002) and with the relevés of the typical grey alder community (columns 5–20 in Table 2). With classification (complete linkage clustering, similarity ratio) treated stands show an even greater similarity to the typical stands of grey alder than to the hornbeam stands. Applying the Principal Coordinates Analysis (PCoA), considering the same measure of dissimilarity (1-similarity ratio), we obtained a two-dimensional scatter diagram which gives a good picture of the transitional position of the studied stands between the communities of grey alder (*Alnetum incanae* s. lat.) and hornbeam communities (Figure 3). Also on account of the abundant presence of character species, differential species and constant companions of the forests from the alliance *Alnion incanae*, they are temporarily still classified into the association *Alnetum incanae* s. lat., as a specific subassociation -*caricetosum albae*, which is most likely a successional stage towards the initial (pioneer) community of hornbeam, very similar to that described by Čušin (2002) along the Nadiža River in Breginjski kot (*Carici albae-Carpinetum betuli* Čušin 2002). In the stands of the stage studied, all diagnostic species of this association (*Carex alba, Leucojum vernum, Veratrum nigrum*) are presented with a rather high frequency, the same is true also for character species of the alliance *Erythronio-Carpinion* (Ht. 1938) Marinček in Wallnöfer, Mucina & Grass 1993**.** The proportion and number of the species from the alliance *Alnion incanae* and class *Salicetea purpureae* is similar as in the other stands of the association *Alnetum incanae* s. lat., although mean coverage of grey alder and grey wil-

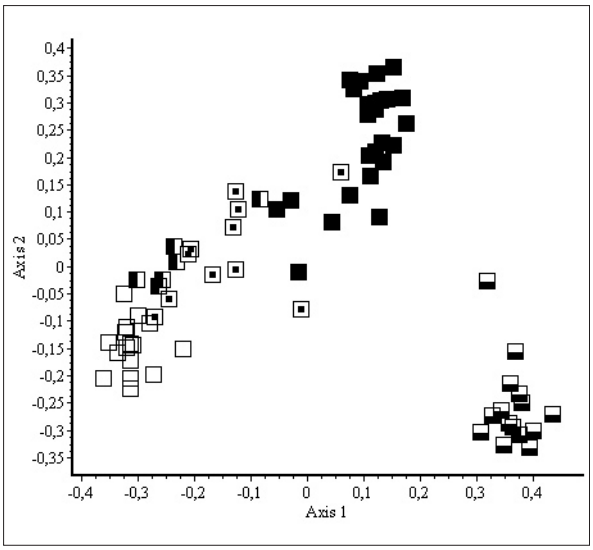

Figure 3: Two-dimensional scatter diagram of the stands of the syntaxa ◒ – *Helleboro nigri-Carpinetum* (Marinček 1979), ■ – *Carici albae-Carpinetum* (Čušin 2002), ▣ – *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis caricetosum albae* var. *Crocus napolitanus,* ◧ – *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis caricetosum albae* var. *typica,* □ – *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis typicum*

Slika 3: Dvorazsežni ordinacijski diagram sestojev sintaksonov ◒ – *Helleboro nigri-Carpinetum* (Marinček 1979), ■ – *Carici albae-Carpinetum* (Čušin 2002), ▣ – *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis caricetosum albae* var. *Crocus napolitanus,* ◧ – *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis caricetosum albae* var. *typica,* □ – *Alnetum incanae* var. geogr. *Anemone trifolia* forma *Galanthus nivalis typicum*

low in these stands is much higher, and mean coverage of hornbeam much smaller. Our classification of the studied stands into the subassociation *Alnetum incanae caricetosum albae* is further founded on the fact that similar transitional forms towards communities from other alliances have been determined by other researchers of grey alder forests, e.g. Moor 1958: *Calamagrostio-Alnetum incanae caricetosum albae* and Müller & Görs 1958: 109 (*Alnetum incanae caricetosum albae*, connection with the stands of the association *Carici albae-Tilietum cordatae* Müller & Görs 1958). Apart from that, in the scheme of multidimensional division of grey alder forests in the region of the Alps this subassociation is already mentioned with submontane form of the territorial form of northern foothills of the Alps (Gebietsausbildung des nördlichen Alpenvorlandes) – Schwabe (1985: 287).

Within the southeastern-Alpine geographical variant (*Alnetum incanae* var. geogr. *Anemone trifolia*) the subassociation -*caricetosum albae* is described as new. Its differential species are *Tilia cordata, Carex alba* and *Carpinus betulus*, and with a slightly larger proportion than in other stands there are also some more thermophilous species which are diagnostically important (such as *Ostrya carpinifolia* and *Berberis vulgaris*). Two variants have been distinguished. In the tree layer of the more initial (typical) variant (relevés 21–26, *holotypus* is relevé No. 24) grey willow and grey alder are still common. Stands of this variant connect the stands of the subassociation -*caricetosum albae* (relevés 21–37) with the stands of the typical subassociation (relevés 5–20). In the stands of the more developed form on automorphic soil (relevés 27–37, var. *Crocus napolitanus*, *holotypus* is relevé No. 35 in Table 2) small-leaved lime prevails in the tree layer and hornbeam is relatively common in this layer as well. Among all of the studied stands these are the most similar to the stands of hornbeam communities, above all to the stands of the association *Carici albae-Carpinetum betuli* and some of relevés could probably be joined also to this association as an alternative (e.g. at least relevé No. 37 in Table 2, see also Fig. 3). We would also like to point out a considerable ecological and relative floristic similarity (similar composition of tree and shrub layer, entire floristic similarity according to Sørensen is about 45 %) of these stands with the stands classified by Müller and Görs (1958: 117–119, 157–160) in southern Germany (Würtembergischen Oberland) into the association *Carici albae-Tilietum cordatae* (alliance *Carpinion* Issler 1931).

5. CONCLUSIONS

Conducting our phytosociological research of forest stands on gravel sites of the Soča along its upper course from Trenta to the confluence with the Tolminka we determined interesting successional stages, from pioneer communities of grey willow in the spring part (near the village of Soča), to initial and transitional communities of white willow near Tolmin. These initial and transitional forest stages are successionaly connected to the presently predominating forest type of riverine forests along the upper Soča, the grey alder community with a significant proportion of *Fraxinus excelsior* and *Tilia cordata* (*Alnetum incanae* s. lat.). Further development, when natural conditions allow and where it is not

obstructed by human impact, leads into hornbeam (in places also pedunculate oak) forests. Recent mixed stands of *Tilia cordata* and *Fraxinus excelsior*, with a small addition of *Alnus incana* and *Salix eleagnos* (remnants from previous, more initial successional stage) as well as *Carpinus betulus* and occasionally *Quercus robur* (indicators of the following, mature successional stage, in our case most likely climax forest of plain belt, *Querco-Carpinetum* s. lat., that is no longer preserved in the Soča Valley today, as it had long ago been cleared for fields and meadows) undeniably exhibit such development. As the Soča with its gravel sites has an exceptional natural value even according to the European standards, its riverine forest stands should be evaluated in the same manner. This means, however, that their development is to be left in the largest extent to natural processes, whereas human intervention should be allowed only in so far as these measures emphasise their conservation role (even in relation to contact non-forest surfaces and people's homes).

6. POVZETEK

Obrečni gozdovi v Zgornjem Posočju (Julijske Alpe, zahodna Slovenija)

Leta 2001 smo začeli načrtno fitocenološko popisovati gozdne sestoje ob Soči med Trento in Mostom na Soči (slika 1) in podobne sestoje ob spodnjem teku reke Idrijce v zahodni Sloveniji. V raziskave smo vključili obrečna vrbovja (gozdne sestoje sive vrbe pri vaseh Soča, Žaga, Srpenica in Ladra, sestoje s prevladujočo belo vrbo pri Tolminu) in mešane gozdne sestoje sive vrbe, sive jelše, velikega jesena in drugih listavcev (gorski brest, gorski javor, lipovec, dob, beli gaber), ki kažejo na sindinamsko (sukcesijsko) povezanost z gozdovi hrastov in belega gabra, ki pa so v tem delu Posočju v glavnem že zelo dolgo izkrčeni v kmetijske površine (njive in v današnjem času predvsem gojene travnike). Ti gozdni sestoji so v glavnem mladi, nastali v zadnjih petdesetih letih iz nekdanjih pašnikov ali površin, kjer so pridobivali vrbovo šibje (okolica Tolmina). Pri urejanju popisov v tabele in pri primerjavah s sestoji podobnih sintaksonov smo si pomagali s hierarhično klasifikacijo in ordinacijsko metodo glavnih koordinat (uporabljali smo programski paket SYN-TAX, Podani 1993, 2001). Pri dokončni razvrstitvi popisov v tabeli 2 smo rezultate numeričnih metod kombinirali s klasično ureditvijo na osnovi diagnostičnih vrst. Z obdelavo 52 fitocenoloških popisov z ordinacijsko metodo glavnih koordinat smo ugotovili štiri glavne skupine (slika 2).

Prvo, njeni sestoji uspevajo na pogosto poplavljenih obrečnih tleh, v širšem smislu uvrščamo v belo vrbovje (*Salicetum albae* Issler 1926), v njej pa smo ločili dve podskupini. Sestoje v ulekninah, kjer se voda zadržuje dalj časa, smo uvrstili v subasociacijo *Salicetum albae* Issler 1926 *myosotidetosum* I. Kárpáti ex Soó 1958. Ob Soči pa zdaj v glavnem uspevajo sestoji bele vrbe, ki so po svoji floristični sestavi in ekologiji člen v sindinamskem razvoju od belega vrbovja k sivemu jelševju. Na ta razvoj precej vpliva človek z raznimi regulacijskimi posegi (npr. pogostim kopanjem proda in poglabljanjem struge), kar povzroči nižanje podtalne vode in zmanjšuje frekvence in trajanja poplavljanja. Zaradi tega so tla v teh sestojih, vsaj v primerjavi s tlemi v tipičnem belem vrbovju, bolj suha in razvitejša. V zeliščni plasti so pogosti geofiti in nekatere »fagetalne« vrste. Te sestoje uvrščamo v novo subasociacijo *Salicetum albae* Issler 1926 *leucojetosum verni* Šilc, Čušin & Dakskobler 2004 subass. nova (nomenklaturni tip, *holotypus,* je fitocenološki popis št. 8 v tabeli 1). Njene razlikovalnice so vrste *Leucojum vernum, Galanthus nivalis, Corydalis cava, Anemone ranunculoides* in *Crocus napolitanus.*

V drugi skupini so štirje popisi (tabela 2, popisi 1–4) z dominantno sivo vrbo (in skromno primesjo drugih drevesnih vrst, še največ je smreke), ki smo jih naredili pri vasi Soča (dolvodno od Lepene). Teh sestojev ne moremo uvrstiti v asociacijo *Salicetum incano-purpureae* Sillinger 1933, kar je potrdila tudi primerjava naših popisov s popisi ekološko še najbolj podobne mezofilne oblike *Salicetum incano-purpureae petasitetosum hybridi* (Šilc & Čušin 2000) Oriolo & Poldini 2002 (prim. Šilc & Čušin 2000, Oriolo & Poldini 2002, Čušin & Šilc 2004, v tisku), zato jih začasno obravnavamo kot razvojni stadij *Lamio orvalae-Salicetum eleagni* nom. prov. (uvrščamo ga v zvezo *Alnion incanae* Pawłowski in Pawłowski et Wallisch 1928). Za tipiziranje nove asociacije so štirje popisi premalo, potrebne bi bile še nadaljnje primerjave. Njene diagnostične vrste so *Salix eleagnos, Picea abies* in *Lamium orvala.* Smreka je v teh sestojih spontana in bo v primeru progresivnega razvoja (izboljšanje talnih razmer), ko bo siva vrba postopno izginila, v naslednji sukcesijski stopnji najbrž, ob primesi trdih in plemenitih listavcev, prevladovala. Nadaljnji razvoj pa bi verjetno šel v smeri bukovega gozda (*Anemono trifoliae-Fagetum* Tregubov 1962), ki je prevladujoča združba tega dela Zgornjega Posočja.

Preostale sestoje (popisi 5–37 v tabeli 2) uvrščamo v makroasociacijo *Alnetum incanae* s. lat.

V njih prevladujejo siva jelša (*Alnus incana*) in siva vrba (*Salix eleagnos*) z občasno precejšnjo primesjo velikega jesena (*Fraxinus excelsior*) in ponekod lipovca (*Tilia cordata*). Nedvomno ima združba sive jelše v dolini Soče določene floristične posebnosti, po katerih se razlikuje od doslej opisanih podobnih združb v srednji in jugovzhodni Evropi. Zanjo je razlikovalna skupina vrst, ki jih sicer uvrščamo med značilnice in razlikovalnice zvez *Erythronio-Carpinion* in *Aremonio-Fagion*: *Galanthus nivalis, Primula vulgaris, Helleborus odorus, Crocus napolitanus, Ornithogalum pyrenaicum, Lamium orvala, Anemone trifolia, Knautia drymeia, Helleborus niger, Cyclamen purpurascens, Cardamine trifolia, Isopyrum thalictroides* idr., pa tudi (čeprav bolj redko in s posamičnimi primerki) nekatere submediteranske vrste, npr. *Ostrya carpinifolia* in *Fraxinus ornus*. Te vrste preučevano sivo jelševje bolj kot ekološko (sindinamska povezanost z gozdovi belega gabra in deloma bukovjem) označujejo predvsem fitogeografsko (t. i. geografske razlikovalne vrste).

Ob upoštevanju členitev, ki so jih objavili Müller & Görs (1958: 134) in Schwabe (1985: 285–287), preučevane sestoje uvrščamo v submontansko formo jugovzhodnoalpsko-severnoilirske geografske variante (makro)asociacije *Alnetum incanae* s. lat., torej *Alnetum incanae* Lüdi 1921 var. geogr. *Anemone trifolia* Müller & Görs 1958 forma *Galanthus nivalis* f. nova. Nomenklaturni tip, *holotypus*, nove forme je popis št. 15 v tabeli 2. To je obenem tudi nomenklaturni tip, *lectotypus*, geografske variante *Anemone trifolia*, saj je v popisih Aichingerja (1933), ki sta jih uporabila Müller & Görs (1958: 134) za opis južnoalpske geografske rase vrsta *Anemone trifolia* navzoča le v sestojih s prevladujočo smreko, prav tako je nista zapisala Aichinger in Siegrist (1930) v logih sive jelše ob Dravi (ki jih, zaradi ostalih razlikovalnih vrst, prav tako še uvrščamo v to geografsko varianto). Razlikovalnici nove geografske variante sta predvsem vrsti *Anemone trifolia* in *Lamium orvala* (Müller & Görs 1958 in Schwabe 1985 navajajo tudi vrste *Knautia drymeia, Cyclamen purpurascens* in *Centaurea nigrescens*), razlikovalnice submontanske forme pa vrste *Galanthus nivalis, Ranunculus ficaria, Anemone ranunculoides, Veratrum nigrum* in *Crocus napolitanus*. V rastiščnem smislu v obravnavani združbi razlikujemo dve subasociaciji, tipično (popisi 5–20) in subasociacijo *-caricetosum albae*. Tipično subasociacijo nadalje členimo v inicialnejšo varianto (var. *Salix eleagnos*), kjer je v drevesni plasti navadno še prevladujoča siva vrba (*Salix eleagnos*) – popisi 5–10 v tabeli 2, in razvitejšo, tipično varianto, z navadno prevladujočo sivo jelšo v drevesni plasti – popisi 11–20 v tabeli 2.

Sestoji zadnjih 17 popisov v tabeli 2 (popisi 21–37) uspevajo na rastiščih, ki so le redko (občasno) še poplavljena, na njih je nivo podtalnice nižji, hidromorfna tla prehajajo v avtomorfna. V drevesni plasti je najbolj obilen lipovec (*Tilia cordata*), precej pogost je veliki jesen, ponekod še vedno siva vrba in siva jelša, pri Tolminu na nekaj krajih tudi dob (*Quercus robur*). Beli gaber je v njih prisoten redno, a le posamično (ocena r, +, redko 2).

Tudi celotna floristična sestava kaže na prehodne združbe med gozdovi iz zveze *Alnion incanae* in gozdovi iz zveze *Erythronio-Carpinion*. Ugotavljamo določeno podobnost teh sestojev s sestoji asociacij *Helleboro nigri-Carpinetum* Marinček in Wallnöfer, Mucina & Grass 1993 in *Carici albae-Carpinetum betuli* Čušin 2002**.** Začasno jih, tudi zaradi razmeroma obilne prisotnosti značilnic, razlikovalnic in stalnih spremljevalk gozdov iz zveze *Alnion incanae*, še uvrščamo v asociacijo *Alnetum incanae*, kot posebno subasociacijo *-caricetosum albae*. Takšno uvrstitev dodatno utemeljujemo tudi z dejstvom, da so podobne prehodne oblike k združbam iz drugih zvez ugotavljali že drugi raziskovalci gozdov sive jelše, npr. Moor 1958 (*Calamagrostio-Alnetum incanae caricetosum albae*) in še posebej Müller & Görs 1958: 109 (*Alnetum incanae caricetosum albae*, stik s sestoji asociacije *Carici albae-Tilietum cordatae* Müller & Görs 1958) in je ta subasociacija v shemi večrazsežne členitve gozdov sive jelše v alpskem območju navedena že pri submontanski formi območne oblike severnega alpskega prigorja (Gebietsausbildung des nördlichen Alpenvorlandes) – Schwabe (198 : 287). Znotraj submontanske forme jugovzhodnoalpske geografske variante (*Alnetum incanae* var. geogr. *Anemone trifolia* f. *Galanthus nivalis*) je subasociacija *-caricetosum albae* opisana kot nova. Njene razlikovalnice so vrste *Tilia cordata, Carex alba* in *Carpinus betulus*, z nekoliko večjim deležem kot v ostalih sestojih pa so diagnostično pomembne tudi nekatere bolj termofilne vrste (npr. *Ostrya carpinifolia* in *Berberis vulgaris*). Razlikujemo dve varianti. V bolj inicialni (tipični) varianti (popisi 21–26, nomenklaturni tip, *holotypus*, je popis št. 24) sta v drevesni plasti še pogosti siva vrba in siva jelša. Sestoji te variante povezuje sestoje subasociacije *-caricetosum albae* (popisi 21–37) s sestoji tipične subasociacije (popisi 5–20). V sestojih bolj razvite oblike na avtomorfnih tleh (popisi 27–37, var. *Crocus napolitanus*, nomenklaturni tip, *holotypus*, je popis št. 34 v tabeli 2) v drevesni plasti navadno prevladuje lipovec, razme-

roma pogost je v tej plasti tudi beli gaber. Ti sestoji so med vsemi preučenimi sestoji najbolj podobni sestojem združb belega gabra, predvsem sestojem asociacije *Carici albae-Carpinetum betuli*, ki jo je Čušin (2002) opisal v bližnjem Breginjskem kotu in alternativno bi bilo nekaj popisov najbrž mogoče priključiti tudi k tej asociaciji (vsaj npr. popis št. 37 v tabeli 2, glej tudi sliko 3). Določeno ekološko in relativno floristično podobnost (podobna sestava drevesne in grmovne plasti, celotna floristična podobnost po Sørensenu je okoli 45 %) kažejo tudi s sestoji, ki sta jih Müller & Görs (1958: 117–119, 157–160) v južni Nemčiji (Würtembergischen Oberland) uvrstila v asociacijo *Carici albae-Tilietum cordatae* (zveza *Carpinion* Issler 1931).

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Figure 4: Riverine forests on terraces of the Soča between the villages of Žaga and Srpenica. (Photo by I. Dakskobler)
Slika 4: Obrečni gozdovi na terasah Soče med Žago in Srpenico. (Foto I. Dakskobler)

Figure 5: *Salicetum albae myosotidetosum*, southern from the town of Tolmin, spring aspect. (Photo by B. Čušin)
Slika 5: *Salicetum albae myosotidetosum*, južno od Tolmina, spomladanski aspekt. (Foto B. Čušin)

Figure 6: *Salicetum albae leucojetosum verni*, western from the town of Tolmin, spring aspect. (Photo by B. Čušin)
Slika 6: *Salicetum albae leucojetosum verni*, zahodno od Tolmina, spomladanski aspekt. (Foto B. Čušin)

Figure 7: *Alnetum incanae*, under the village of Volarje on right Soča bank, spring aspect. (Photo by B. Čušin)

Slika 7: *Alnetum incanae*, pod vasjo Volarje na desnem bregu Soče, spomladanski aspekt. (Foto B. Čušin)

Figure 8: Mixed riverine forest (*Alnetum incanae caricetosum albae* var. *Crocus napolitanus*) with dominant *Fraxinus excelsior*, near Tolmin, spring aspect. (Photo by B. Čušin)

Slika 8: Mešan obrečni gozd (*Alnetum incanae caricetosum albae* var. *Crocus napolitanus*) z velikim jesenom pri Tolminu, spomladanski aspekt. (Foto B. Čušin)

Table 1: Riverine stands of the association *Salicetum albae* in the Soča Valley (the Julian Alps, western Slovenia)

	Number of relevé			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
	Relevé area (m²)			200	300	400	100	300	400	400	400	400	200	400	400	300	400	400		
	Altitude in m			160	155	150	160	158	160	160	160	160	160	155	160	160	160	160		
	Cover in %:	Upper tree layer	E3b	60	70	80	60	80	80	70	60	80	70	80	70	70	80	70		
		Lower tree layer	E3a	5	10	5	5	10	10	20	20	10	10	20	20	20	10	30		
		Shrub layer	E2	0	10	10	20	10	30	20	40	30	5	20	40	30	30	30		
		Herb layer	E1	90	30	60	100	90	60	60	70	70	90	70	60	80	80	70		
		Moss layer	E0	/	/	5	/	10	5	10	10	10	50	5	50	5	30	30		
	Maximum height		m	/	22	25	/	26	25	25	24	28	24	25	24	28	25	26		
	Maximum diameter		cm	/	40	40	/	70	45	50	50	50	40	35	40	40	35	50		
	Month of taking relevé			8	4	4	8	8	4	4	4	4	8	4	4	4	4	4		
	Number of species			22	41	34	22	35	44	54	64	42	18	38	57	58	50	72		
	Character and differential species of the association																		Pr.	Fr.
GU	*Alliaria petiolata*		E1	.	+	+	.	+	1	+	1	.	+	+	+	+	+	.	11	73
MA	*Deschampsia cespitosa*			+	+	+	.	1	+	.	+	.	.	.	+	+	+	r	10	67
QF	*Brachypodium sylvaticum*			.	.	+	.	+	+	+	+	.	.	.	+	+	.	+	8	53
SM	*Stellaria media* agg.			.	.	.	.	.	+	+	.	.	1	.	.	.	+	.	4	27
AI	*Circaea lutetiana*			.	.	.	.	+	.	+	.	.	.	+	.	.	.	.	3	2
	Differential species of lower syntaxa																			
	subass. *myosotidetosum*																			
B	*Bidens frondosus*		E1	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	2	13
B	*Persicaria hydropiper*			+	3	.	.	.	.	.	.	.	.	.	.	.	.	.	2	13
MA	*Agrostis stolonifera*			1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	2	13
MA	*Valeriana dioica*			.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	2	13
PM	*Galium palustre*			.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7
MA	*Lythrum salicaria*			.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7
MA	*Myosotis scorpioides*			.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	subass. *leucojetosum verni*																			
F2	*Leucojum vernum*		E1	.	.	.	+	1	.	+	+	2	+	2	1	+	1	1	11	73
EC	*Galanthus nivalis*			.	.	r	+	+	.	+	+	+	+	.	1	1	1	1	11	73
QF	*Anemone ranunculoides*			.	.	.	+	+	.	.	+	+	.	.	1	1	+	1	8	53
F2	*Corydalis cava*			.	.	.	.	.	+	r	+	+	.	.	+	+	+	.	7	47
EC	*Crocus napolitanus*			.	.	.	.	.	.	.	+	+	+	+	.	+	+	+	7	47
	Salicion albae																			
	Solidago gigantea		E1	.	+	1	2	4	1	2	2	4	1	.	2	1	.	.	11	73
	Humulus lupulus		E3a	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	2	13
	Humulus lupulus		E2b	.	.	.	.	.	.	+	+	.	+	+	+	.	.	+	6	7	47
	Humulus lupulus		E2a	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	2		
	Humulus lupulus		E1	.	.	+	.	.	.	+	.	.	+	1	.	+	+	.		6	4
	Calystegia sepium		E2a	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.		1	7
	Calystegia sepium		E1	+	.	.	1	+	+	+	.	+	.	.	.	+	.	.		7	47
SP	***Salicetea purpureae***																			
	Salix alba		E3b	4	4	5	4	4	5	4	4	5	4	5	4	4	5	4	15	15	1
	Salix alba		E3a	+	+	.	.	.	+	+	.	+	1	+	+	+	+	1	11		
	Salix eleagnos		E3b	.	.	.	.	.	+	+	.	.	.	.	.	.	.	r	3	4	27
	Salix eleagnos		E3a	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	2		
	Salix purpurea		E2b	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.		2	13
AI	***Alnion incanae***																			
	Rubus caesius		E2a	+	+	+	2	1	3	3	2	2	1	+	2	3	2	2		15	1
	Chaerophyllum hirsutum		E1	+	+	+	.	1	+	1	1	+	1	1	1	+	1	1		14	93
	Aegopodium podagraria		E1	.	.	+	1	1	1	1	1	1	1	1	1	1	1	1		13	87
	Angelica sylvestris			.	+	+	+	+	+	+	+	+	+	.	.	+	+	r		12	8

	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
	Filipendula ulmaria	E1	+	+	.	+	+	.	.	+	+	+	+	+	+	+	+		12	8
	Equisetum arvense		.	+	+	+	.	+	1	1	+	.	+	+	.	+	r		11	73
	Cirsium oleraceum		.	+	.	+	+	+	+	+	.	.	+	+	+	+	r		11	73
	Cardamine amara		2	1	2	.	+	1	2	+	+	+	1	.	.	.	.		10	67
	Impatiens noli-tangere		3	+	+	.	1	+	+	+	+	1	+	.	.	.	.		10	67
	Ranunculus repens		2	1	1	.	+	.	+	+	.	+	+	.	+	r	.		10	67
	Alnus incana	E3b	.	.	+	.	.	.	+	1	.	.	+	+	+	+	1	8	10	67
	Alnus incana	E3a	.	+	.	.	.	.	+	+	+	.	+	1	+	1	1	9		
	Alnus incana	E2b	.	+	.	.	.	.	+	.	+	.	.	.	.	.	.	3	4	27
	Alnus incana	E2a	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	3		
	Chrysosplenium alternifolium	E1	+	.	.	+	.	+	.	+	.	1	.	+	.	2	.		7	47
	Caltha palustris		.	+	+	.	+	.	.	.	.	.	+	+	.	+	r		7	47
	Listera ovata		.	.	.	.	.	.	.	+	+	.	+	+	+	+	+		7	47
	Ranunculus auricomus s.lat.		.	+	.	.	.	.	.	+	.	.	.	1	1	+	+		6	4
	Veratrum album		.	.	.	.	+	.	.	+	+	.	+	.	.	+	+		6	4
	Parietaria officinalis		.	+	.	.	+	+	+	.	+	.	+	.	.	.	.		6	4
	Viburnum opulus	E2a	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	6	4
	Viburnum opulus	E2b	.	+	.	.	+	.	.	+	+	.	.	.	.	.	+	5		
	Alnus glutinosa	E3a	.	+	.	+	1	.	.	.	.	.	.	.	.	.	.	3	4	27
	Alnus glutinosa	E3b	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1		
	Alnus glutinosa	E2b	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.		1	7
	Aconitum lycoctonum ssp. *vulparia*	E1	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.		2	13
	Cardamine impatiens		.	.	.	.	.	.	+	+	.	.	.	.	.	.	.		2	13
	Colchicum autumnale		.	.	.	.	.	.	.	.	.	.	.	r	+	.	.		2	13
	Scirpus sylvaticus		+	+	.	.	.	.	.	.	.	.	.	.	.	.	.		2	13
	Stellaria nemorum agg.		.	.	.	.	.	.	.	+	.	.	.	.	.	.	+		2	13
	Festuca gigantea		.	.	.	.	.	.	.	.	.	.	+	.	.	.	.		1	7
TA	***Tilio-Acerion***																			
	Arum maculatum	E1	+	.	.	+	+	+	.	.	1	+	.	+	1	1	+		10	67
	Lunaria rediviva		.	.	.	.	.	+	+	+	+	.	+	.	+	.	+		7	47
	Adoxa moschatellina		.	.	.	.	.	+	+	+	.	.	.	.	+	1	+		6	4
	Galeopsis speciosa		.	1	.	+	+	.	.	.	.	.	+	.	.	.	.		4	27
	Ulmus glabra	E3a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r		1	7
	Ulmus glabra	E2b	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.		1	7
	Acer pseudoplatanus	E2b	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.		1	7
	Acer pseudoplatanus	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+		1	7
EC	***Erythronio-Carpinion***																			
	Primula vulgaris	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+		2	13
	Helleborus odorus		.	.	.	.	.	.	.	.	.	.	.	+	+	.	.		2	13
AF	***Aremonio-Fagion***																			
	Lamium orvala	E1	.	.	.	.	.	+	+	+	+	.	.	1	+	+	1		8	53
	Anemone trifolia		.	.	.	.	.	.	.	+	.	.	.	+	1	+	1		5	33
	Isopyrum thalictroides		.	.	.	.	.	.	.	.	.	.	.	+	.	.	+		2	13
	Helleborus niger		.	.	.	.	.	.	.	.	.	.	.	.	.	.	r		1	7
	Cyclamen purpurascens		.	.	.	.	.	.	.	.	.	.	.	.	.	.	+		1	7
	Cardamine trifolia		.	.	.	.	.	.	.	.	.	.	.	.	+	.	.		1	7
F	***Fagetalia sylvaticae***																			
	Sambucus nigra	E2b	.	.	+	+	1	2	1	2	1	+	.	1	1	1	+	12	12	8
	Sambucus nigra	E2a	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1		
	Ranunculus lanuginosus	E1	.	.	+	.	.	+	+	+	+	+	+	+	+	+	+		11	73
	Fraxinus excelsior	E3b	.	.	.	+	.	.	.	.	.	.	.	+	.	+	+	4	6	4
	Fraxinus excelsior	E3a	.	.	.	.	.	.	+	+	.	.	.	+	.	.	+	4		
	Fraxinus excelsior	E2a	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7	47
	Fraxinus excelsior	E2b	.	+	.	+	+	.	.	+	.	.	.	.	.	+	+	6		
	Asarum europaeum	E1	.	.	.	.	+	.	.	+	+	.	.	+	+	.	+		6	4
	Salvia glutinosa		.	.	.	.	.	.	.	+	+	.	.	+	+	+	.		5	33
	Heracleum sphondylium		.	.	+	.	.	.	+	.	.	.	.	+	+	+	.		5	33

	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
	Dentaria bulbifera	E1	.	.	.	.	.	.	+	+	.	.	.	.	+	.	+		4	27
	Symphytum tuberosum		.	.	.	.	.	.	.	.	.	.	.	+	+	.	+		3	2
	Viola reichenbachiana		.	.	.	.	.	.	.	.	.	.	.	+	.	.	+		2	13
	Senecio ovatus		.	.	.	.	.	.	.	+	.	.	.	.	.	.	r		2	13
	Dentaria pentaphyllos		.	.	.	.	.	.	.	.	.	.	.	.	+	.	+		2	13
	Carpinus betulus	E3b	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	1	1	7
	Carpinus betulus	E3a	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	1		
	Carpinus betulus	E2b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r		1	7
	Polygonatum multiflorum	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.		1	7
	Galeobdolon flavidum		.	.	.	.	.	.	.	+	.	.	.	.	.	.	.		1	7
	Galium laevigatum		.	.	.	.	.	.	.	.	.	.	.	+	.	.	.		1	7
	Tilia cordata	E3a	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.		1	7
	Tilia cordata	E2b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r		1	7
	Campanula trachelium	E1	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.		1	7
	Sambucus racemosa	E3b	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.		1	7
	Allium ursinum	E1	.	.	.	+	+	.	r	.	.	.	.	+	+	+	r		7	47
	Paris quadrifolia		.	.	.	+	.	.	.	.	+	.	.	+	+	.	+		5	33
PS	***Prunetalia spinosae***																			
	Cornus sanguinea	E3a	.	.	.	.	.	.	.	+	.	.	+	.	+	.	1	4	14	93
	Cornus sanguinea	E2b	.	+	+	1	+	1	+	1	+	+	1	2	1	+	2	14		
	Cornus sanguinea	E2a	.	.	.	.	.	.	.	+	+	.	+	+	+	+	1		7	47
	Euonymus europaeus	E2b	.	.	.	+	.	+	.	.	.	.	+	.	.	.	.	3	8	53
	Euonymus europaeus	E2a	.	.	.	.	.	+	.	+	.	.	+	+	+	+	+	7		
	Euonymus europaeus	E1	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.		2	13
	Ligustrum vulgare	E2b	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	2	5	33
	Ligustrum vulgare	E2a	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	3		
	Ligustrum vulgare	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.		1	7
	Crataegus monogyna	E3a	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.		1	7
	Crataegus monogyna	E2b	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	2	13
	Crataegus monogyna	E2a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1		
	Crataegus monogyna	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.		1	7
	Prunus spinosa	E2b	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.		1	7
	Clematis vitalba	E3a	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.		1	7
	Clematis vitalba	E2b	.	.	.	+	.	+	.	.	.	.	.	.	.	+	.	3	4	27
	Clematis vitalba	E2a	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1		
	Clematis vitalba	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.		1	7
QR	***Quercetalia roboris***																			
	Frangula alnus	E3a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+		1	7
	Frangula alnus	E2b	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.		3	2
QF	***Querco-Fagetea***																			
	Ranunculus ficaria	E1	2	.	+	+	1	1	1	1	2	+	2	1	1	2	2		14	93
	Cerastium sylvaticum		.	.	.	+	.	+	+	1	.	+	+	1	+	+	1		10	67
	Vinca minor		.	.	.	.	.	.	.	.	.	.	.	.	.	.	+		1	7
	Corylus avellana	E3a	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1		2	13
	Corylus avellana	E2b	.	.	.	.	.	.	.	+	.	.	.	+	.	1	1	4	6	4
	Corylus avellana	E2a	.	.	.	.	.	+	r	.	.	.	.	.	.	.	1	3		
	Hedera helix	E3a	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+		4	27
	Hedera helix	E2b	.	.	.	.	+	.	.	.	.	1	+	.	.	.	.		3	2
	Hedera helix	E1	+	.	+	+	+	.	.	+	+	.	+	.	+	+	+		10	67
	Veratrum nigrum		.	.	.	+	.	.	.	+	r	.	.	.	+	.	r		5	33
	Acer campestre	E3a	.	.	.	.	.	.	.	.	.	.	.	+	.	r	.		2	13
	Acer campestre	E2b	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1	4	27
	Acer campestre	E2a	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	3		
	Acer campestre	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.		1	7
	Lonicera xylosteum	E2a	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.		1	7
	Anemone nemorosa	E1	.	.	.	.	+	.	.	.	r	+	.	+	1	+	1		7	47
	Malus sylvestris	E3a	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.		1	7

	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
	Malus sylvestris	E2b	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	7	
AT	***Asplenietea trichomanis***																			
	Asplenium ruta-muraria	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	1	7	
	Asplenium trichomanes		.	.	.	.	r	.	.	.	.	.	.	.	.	.	r	2	13	
GU	***Galio-Urticetea***																			
	Petasites hybridus	E1	1	+	3	+	+	1	1	+	+	+	+	+	+	1	.	14	93	
	Urtica dioica		+	+	+	+	+	1	1	+	+	1	+	.	+	.	+	13	87	
	Glechoma hederacea		+	.	.	+	1	1	+	1	+	1	.	1	1	1	1	12	8	
	Galium aparine		+	.	+	+	.	1	+	1	+	1	+	.	.	+	+	11	73	
	Helianthus tuberosus		+	.	5	5	.	1	1	1	1	1	.	.	2	.	.	9	6	
	Geum urbanum		.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	3	2	
	Anthriscus sylvestris		+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	2	13	
	Rudbeckia laciniata		.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	2	13	
	Impatiens parviflora		.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7	
	Solanum dulcamara		.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	7	
	Lysimachia nummularia		.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	1	7	
	Lamium maculatum		.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	7	
	Galeopsis pubescens		.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	7	
PM	***Phragmiti-Magnocaricetea***																			
	Carex elata	E1	1	1	.	.	.	.	.	+	+	.	+	.	+	.	.	6	4	
	Phalaris arundinacea		1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	2	13	
	Phragmites australis		.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	2	13	
	Nasturtium officinale		.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7	
MA	***Molinio-Arrhenatheretea***																			
	Rumex obtusifolius	E1	+	+	+	.	.	+	+	+	.	.	.	.	.	.	.	6	4	
	Lycopus europaeus		1	+	+	.	1	.	.	+	.	.	.	.	.	.	.	5	33	
	Taraxacum officinale		.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	1	7	
O	**Other species**																			
	Myosoton aquaticum	E1	+	+	.	.	.	+	+	+	.	.	.	.	.	.	.	5	33	
	Hemerocallis fulva		.	.	.	.	+	.	.	.	.	.	.	.	+	+	+	4	27	
	Acer negundo	E3b	.	.	r	.	.	+	.	.	.	.	.	.	.	.	.	2	3	2
	Acer negundo	E3a	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	2		
	Acer negundo	E2b	.	.	.	.	.	+	+	.	.	.	.	.	.	.	r	3	4	27
	Acer negundo	E2a	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	2		
	Oxalis acetosella	E1	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+		2	13
	Ailanthus altissima	E3b	.	.	.	.	.	.	.	.	.	.	.	r	.	r	.		2	13
	Chelidonium majus	E1	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.		2	13
	Carex flacca		.	.	.	.	+	.	.	.	.	.	.	.	.	.	.		1	7
	Commelina communis		+	.	.	.	.	.	.	.	.	.	.	.	.	.	.		1	7
	Dactylorhiza maculata		.	.	.	.	.	.	.	r	.	.	.	.	.	.	.		1	7
	Galinsoga parviflora		+	.	.	.	.	.	.	.	.	.	.	.	.	.	.		1	7
	Juglans regia	E2b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r		1	7
	Thalictrum lucidum	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.		1	7
	Viscum album	E3a	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.		1	7
M	**Mosses**																			
	Plagiomnium undulatum	E0	.	.	.	.	.	+	+	.	.	.	.	.	1	2	3		5	33
	Mnium sp.	E0	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.		1	7
	Anomodon viticulosus	E0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+		1	7
	Brachythecium sp.	E0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+		1	7
	Neckera complanata	E0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+		1	7

Localities of relevés (all relevés 9848/1): 1, 10, 12: left bank of the river under Dolje; 2, 3, 6, 7, 11: Tolmin, under Brajda (left bank of the river); 4: Volče, Na dolgem (right bank of the river at the separation); 5, 15: Tolmin, Log (left bank of the river); 8, 9, 14: Volče, under sv. Danijel (right bank of the river); 13: Volče, right bank of the river under farm Perše.

Table 2: Riverine stands of the syntaxa *Lamio orvalae-Salicetum eleagni* nom. prov. **(A) and** *Alnetum incanae* var. geogr. *Anemone trifolia* f. *Galanthus nivalis* (*-typicum* **Ba, Bb,** *-caricetosum albae* **Ca, Cb**)

			A				Ba							Bb									Ca						Cb													
	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37			
	Relevé area (m²)		200	200	200	200	200	200	200	400	200	400	400	200	400	400	400	400	400	200	400	200	400	200	200	400	200	200	400	400	400	400	400	400	400	600	400	400	400			
	Altitude in m		430	430	430	430	150	175	360	330	360	190	190	330	160	330	160	160	180	180	160	180	200	330	330	330	360	360	200	200	180	220	180	180	190	160	160	160	160			
	Cover in %: Upper tree layer	E3b	70	70	70	80	60	70	70	60	70	70	60	90	70	70	70	60	70	70	80	80	80	70	80	70	80	80	70	70	80	80	90	70	80	70	80	80	80			
	Lower tree layer	E3a	10	10	10	10	20	10	10	20	10		10	10	20	10	10	30	30	30	10	10	10	20	10	20	10	10	30	30	20	10		30	20	30	20	20	10			
	Shrub layer	E2	60	60	30	30	60	60	50	70	50	70	50	50	40	60	60	50	30	60	60	60	50	30	30	60	40	30	40	30	40	30	60	40	30	30	20	30	40			
	Herb layer	E1	70	70	90	90	70	60	80	80	80	80	60	60	80	70	80	80	70	60	70	60	50	70	60	60	80	70	70	70	70	80	70	70	70	80	80	80	80			
	Moss layer	E0	30	20	10	20	5	5	10	10	5	20		5	10	5	10	10	5	10	10	5	30	5	5	5	5	5	5	5	10	5	10	20	5	10	5	10	10			
	Maximum diameter	cm	30	25	25	25	30	20	30	18	35	30	20	17	40	20	35	40	30	25	30	25	35	30	30	30	30	30	30	35	40	25	35	40	40	50	40	35	35			
	Maximum height	m	18	18	17	18	18	16	20	20	22	17	15	25	22	25	22	25	22	20	22	17	20	20	20	18	25	20	20	20	24	19	22	22	22	26	25	25	22			
	Month of taking relevé		5	5	5	5	5	4	5	5	5	4	3	5	4	5	4	4	3	4	5	3	4	5	5	5	5	5	4	3	4	3	4	4	4	5	5	5	5			
	Number of species		69	61	65	64	85	58	59	75	67	73	69	73	78	78	76	60	57	75	68	53	62	60	75	83	79	86	61	66	64	48	68	71	63	79	81	76	76			
																																										Pr.	Fr.
	Diagnostic species of the syntaxa																																										
SP	*Salix eleagnos*	E3b	4	4	4	4	1	4	4	3	3	4	2	r	1	1		2	3	2		1	3	2	+	2	3	2	2	2	2		1	1				+	1	31	32	86
SP	*Salix eleagnos*	E3a			+	+	1	+	+	+					1			+				+				+					+						+			12		
SP	*Salix eleagnos*	E2a																				+																			1	3
VP	*Picea abies*	E3b		1	+	1																										r	+	+	+			r	r	9	14	38
VP	*Picea abies*	E3a	+	1	1	1					r													+		+		+				+	+	1						11		
VP	*Picea abies*	E2b		1						+				+		+								+	+	+		+					+	+	+		r			12	17	46
VP	*Picea abies*	E2a		+	+					+													r	+			+		r			+								8		
VP	*Picea abies*	E1			+	+	+					+																+					+	+	+						8	22
AF	*Lamium orvala*	E1	3	1	1		+	1	2	2	1	1	1	2	1	1	+	+	+	+	1	1	+	+	1	2	1	+	+			+	+	+		+	+	1	2		33	89
AI	*Alnus incana*	E3b						+	+	1		+	2	2	2	3	4	1	3	3	3	4	+	1	+	2	1	1	1	2	+		r	+				r	1	27	29	78
AI	*Alnus incana*	E3a					1						+	1	+	+		+			+	+			+	+	+		+		r		+				r	+	+	17		
AI	*Alnus incana*	E2b						+														+						+												3	17	46
AI	*Alnus incana*	E2a					+						+	+		+	+	+		+				+		+				+	+		+	+					+	14		
AI	*Alnus incana*	E1					+							+				+	+		+								+	+									+		8	22
AF	*Anemone trifolia*	E1	+	+	1	+	+	+	+		1	1	+	1	+	1	+	+	1	1			+	1	+	1	1	1	+	+	1		1	1	+	1	1	1	1		33	89
EC	*Galanthus nivalis*	E1					r	+	1	+	+	+	+	+	1	+	1	2	2	1	1	1	+	+	+	+	1	1	2	1	1	1	+	1	+	1	2	1	+		33	89
F	*Tilia cordata*	E3b										+	+	+		1	+	1					2	3	1	1	+	2	3	2	2	1	1	1	3	3	3	2	1	23	27	73
F	*Tilia cordata*	E3a									+		+	+	r	1	+	+		+	+		+	+	+	+		+	3	+	1	+	1		+	+		1	+	24		
F	*Tilia cordata*	E2b		+			+			+						+						+			+	+	+	+		1	1		+	+		+	+	1	+	17	21	57
F	*Tilia cordata*	E2a								+			+		r	+					+	+	+		+	+		+			+			+		+		+		14		
F	*Tilia cordata*	E1														+								+	+								+		+		+	+			7	19
F	*Carpinus betulus*	E3b										r												+			+					+	+	2	2	+		+	+	10	17	46
F	*Carpinus betulus*	E3a											+	+									+	+					+	+	+	+	+		1	+	r	+		13		

				A						Ba								Bb								Ca								Cb								
	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37			
F	*Carpinus betulus*	E2b																		r	+			+								+	+	+	+					7	12	32
F	*Carpinus betulus*	E2a										+											+		+		+								+	+				6		
F	*Carpinus betulus*	E1					+																		+									+	+				+		5	14
EP	*Carex alba*	E1	+	+	2	2						+	r	+		+					+		2	4	+	1	1	2	1	+	1		3	+	4	2	1	+	+		25	68
	Differential species of the class																																									
SP	***Salicetea purpureae***																																									
	Salix alba	E3b					2										r	+		+	+	+																+	1	8	9	24
	Salix alba	E3a					+								1																									2		
	Salix purpurea	E3					+																				+														2	5
	Salix purpurea	E2b					1																				1														2	5
	Humulus lupulus	E3a						1							+																										2	5
	Humulus lupulus	E2b					+							+		+	+	+			+	1																		7	13	36
	Humulus lupulus	E2a						1		+			+		+	+					+																	+	+	8		
	Humulus lupulus	E1								+					+						+		r		+	+				+											7	19
	Galium aparine	E1								1		+			1		1																								4	11
	Stellaria media agg.	E1						+				1			+		+																								4	11
	Populus nigra	E3b					+								+																										2	5
	Valeriana dioica	E1																																				r			1	3
Al	***Alnion incanae***																																									
	Rubus caesius	E2a	2	1	2	3	4	3	2	1	4	2	+	2	1	1	2	1	1	2	2	4	+	r	2	2	3	3	+	2	1	+	1	+	+	1	1	1	2		37	100
	Aegopodium podagraria	E1	1	+	1		1	2	1	1	1	1	1	2	1	2	1	1	1	1	+	1	+	1	1	2	1	1	+	1	1	1	1	1		1	1	1	1		35	95
	Listera ovata	E1	+	1	1	1	+	+	+	+	+			+	r	1	+	1	+	+	1	+	1	+	1	1	+	1	1	+	+	+	1	+	1	1	+	1	1		35	95
	Brachypodium sylvaticum	E1	1	1	1	1	+	+			+		+	1		+	+	+	+	+	+		+	+	+	+	+	1		+	+	+		+	+	+	1	1	+		30	81
	Aconitum lycoctonum agg.	E1	+	1	1	1	+		+	+	1	+	+	+		+	+			+				+	1	1	1	1		+	+		+	1		+	+		+		26	70
	Angelica sylvestris	E1	1	1	+	+		+	+	+	+		+			+		+		+	+	+	+	+	+	+	+	+		+	+		+		+	+		+			26	70
	Deschampsia cespitosa	E1	1		+	+	+	+	+		+	+	+	+	r	+	+	+	+	+		+			+		+	+		+						+	+	+			24	65
	Chaerophyllum hirsutum	E1	1	+	+	+	1	+	1	+	+	+			+	+	+	+			1				+	+	+	+	+									+	+		22	59
	Viburnum opulus	E2b										+			+			+	+																					4	22	59
	Viburnum opulus	E2a					+				+				+	+			+	+	+	+	+		+	+			+	+	+		+	1		1	1	+	+	20		
	Viburnum opulus	E1										+	+	+				+						+					+		+					+					8	22
	Cirsium oleraceum	E1	+			+	+		+		+						+	+		+	1		r			+		+					+	+		+	+	1	1		18	49
	Stellaria nemorum agg.	E1	+	2	+				1	+	+	+		1	1	+	+	+	+		+				+	+	+														17	46
	Filipendula ulmaria	E1	+		+									+			+	+		+	1	+	+		+						+		+	+			r	+	+		16	43
	Cardamine impatiens	E1	+	1	+	+			+	+		+		+		+	r	+			+			+	+	+													+		16	43
	Veratrum album	E1						+							+		+	1	1	+	1		r							1				+		2	2	+	+		14	38
	Thalictrum aquilegiifolium	E1	+		+					+				+											+	+		+			+				r	+	+		r		12	32
	Parietaria officinalis	E1	1	+	+	+			+	+							+	+			+		r															+			11	30
	Ranunculus auricomus agg.	E1								+					+		+	+							+				+			1						+	+		9	24
	Chrysosplenium alternifolium	E1	+	1						2		+	+		+		+					+																			8	22
	Equisetum arvense	E1	+		+		1	+													+						+									r	+				8	22

Ranunculus repens	E1						+		+	+			+			+				+																				6	16
Colchicum autumnale	E1							+				+																						+	r	+				5	143
Festuca gigantea	E1	1		+				+	+	+																														5	14
Cardamine amara	E1														+	+			+	+																				4	11
Caltha palustris	E1	+																						+	+															3	8
Impatiens noli-tangere	E1							+	1	+																														3	8
Stachys sylvatica	E1					+			+																	+														3	8
Alnus glutinosa	E3b											+																												1	3
Chaerophyllum aureum	E1						+																																	1	3
Botrychium virginianum	E1				+																																			1	3
Carex remota	E1					+																																		1	3
Lysimachia vulgaris	E1					+																																		1	3
TA *Tilio-Acerion*																																									
Adoxa moschatellina	E1	+	1	+	+	+		1	1	+	1	1	1	1	1	1	1	1	1	+	1	+	+	+	+			+	+		+					+		1		28	76
Ulmus glabra	E3b	r			+			+		+		+								+						+	+	+	+	+	+	+	1		+		+	+	17	20	54
Ulmus glabra	E3a							+	+										+			+				+						+	+					+	8		
Ulmus glabra	E2b		+				+	+	+									+	1	+	+					+		+		+				+		+		+	14	26	70
Ulmus glabra	E2a	+		+		+							+				+		+	+		+				+	+	+	+	+		+	+	+	1	+	+	+	20		
Ulmus glabra	E1				+	+													+	+												+	1	+	+					8	22
Lunaria rediviva	E1	2	+	+	+		+	3	3	+	+	+	+	1	1	1	+	+			+			1	+	+	+			+								+		23	62
Arum maculatum	E1									+	+		+	+	+	+	+	1	+		+	r			+			r		+	+	+	+							17	46
Acer pseudoplatanus	E3b									1			r												+							+	+			r	+		7	9	24
Acer pseudoplatanus	E3a	r																														+					r	+	4		
Acer pseudoplatanus	E2b	+				+	+		+	+			+		+						r			+														r	10	10	27
Acer pseudoplatanus	E2a						+		+						+																								3		
Acer pseudoplatanus	E1				+	+	+	+		+			+									+	+		+	+	+					+	+							13	35
Aruncus dioicus	E1									+	+		+		+	+	+		+	+					+		+										1			11	30
Tilia platyphyllos	E3b	+			r					+													+			+	+												6	9	24
Tilia platyphyllos	E3a	r							+																	+							+		+				5		
Tilia platyphyllos	E2b		+										+																										2	6	16
Tilia platyphyllos	E2a	+													+																	+	+						4		
Tilia platyphyllos	E1	+				+																												r						3	8
Geranium robertianum	E1	+	1		1					+																	+													5	14
Acer platanoides	E3						+																																	1	3
Acer platanoides	E2b						1			r																													2	3	8
Acer platanoides	E2a					+	1			r																													3		
Acer platanoides	E1						+																							r		+	+							4	11
Hesperis candida	E1			+					+						+																									3	8
Galeopsis speciosa	E1								+		+				+																									3	8
Petasites albus	E1	+																								+	+													3	8
Corydalis solida	E1							+										+																						2	5
Euonymus latifolia	E2a																															+								1	3

			A				Ba							Bb									Ca						Cb														
	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37			
EC	***Erythronio-Carpinion***																																									
	Primula vulgaris	E1	+	+			+		+	+	+	+	1	+	+		+			+	+	+		1	+	+	+	+	+	1	1	1	+	+		+	+	1			28	76
	Helleborus odorus	E1					+					+	+	+	+		+		1	+	+				+	+	+		1	+	+	+	+			+	+	+	+		21	57
	Crocus napolitanus	E1					+	+					+		r	+	+	+	1	+	+								1	1	+	1		+	+	+	1	+	1		20	54
	Ornithogalum pyrenaicum	E1							+		+							+									+	+								+					6	16
AF	***Aremonio-Fagion***																																									
	Knautia drymeia	E1	+	+	+		+				+	+	+	+		+	+			+	+	+	1			1	+	1		+	+		2	1	+	1	1	+	+		26	70
	Helleborus niger	E1	+	+	+		r		+		+	+	+		+	+	+		+						+	+	+	1	+	+	+			+		r			+		22	59
	Cyclamen purpurascens	E1				+				+		+	+		+		+			+		+					+	+	+	+	+					+	+				15	41
	Cardamine trifolia	E1	+	+								+	+				+		+	+			+							+	+			1		+	+	+	+		15	41
	Isopyrum thalictroides	E1						+							+		+	+	+	+		+								+	+	1		+				+			12	32
	Dentaria enneaphyllos	E1						+			+		+		+				1		+	+								+		1							+		10	27
	Epimedium alpinum	E1																											1					+		+	3				4	11
	Rhamnus fallax	E2b		+					+																																2	4	11
	Rhamnus fallax	E2a	+						+	r																															3		
	Hacquetia epipactis	E1					+																						+	+											3	8
	Euphorbia carniolica	E1																		+																						1	3
	Omphalodes verna	E1																													+											1	3
	Scopolia carniolica	E1						+																																		1	3
	Geranium nodosum	E1					+																																			1	3
F	***Fagetalia sylvaticae***																																									
	Asarum europaeum	E1	+		+	+		+	1	+	1	1	1	1	+	1	+	+	1	1	1	1	1	1	1	1	1	1	+	1	1	+	1	1	1	1	1	1	1		35	96
	Paris quadrifolia	E1	+			+	+			+	1	1	+	1	+	1	+	1	+	1	1	+	+	+	1	1	+	+	1	+	1	+	1	1	1	1	1	1	1		33	89
	Galeobdolon flavidum	E1	1	1		1	+		+	+		+	+	+	+	+	+	+	1	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	1	+	+		32	86
	Fraxinus excelsior	E3b	1		1				+		1	+	+	3		2	+	1	1	1			+	+	3	2	2	2	+		1	4	+	1	+	2	2	3	2	28	30	81
	Fraxinus excelsior	E3a	+		+					+				+		1	+	1	+	1			+		1	+	+		+	+	1	+	3	+	+	1	1	1		23		
	Fraxinus excelsior	E2b	+	+		+	+	1	+	1		+		1	+	2	+	1	+	1	1	1	+		1	2		+		+	1		1				+				25	32	86
	Fraxinus excelsior	E2a					+	1		+	+	+		+		1	+	+	1	+	+	+		+		1	+	+	+	+	1				+	+			1	23		
	Fraxinus excelsior	E1	+		+	+	1		+	+				+		+		1			+			+	+	+	+					+	+		+	+	1			19	51
	Salvia glutinosa	E1		+		+	+				1	+	+	+	+	+	+	+	+	+	+		1	+	+	+	1	1	+	+	+	+	1	+	+	1	1	1	+		31	84
	Daphne mezereum	E2a	+	+	+	1	+			+	+		+	+	r	+			+	+			+	+	+	+	+	1	+	+	+		+	+	+	1	+	+	+		29	78
	Leucojum vernum	E1					+		1	1	1	+	1	+	1	1	2	1	2	1	1	+			1	1	1	1		2	1	+	+	+		+	+	1	+		28	76
	Mercurialis perennis	E1	+	+	+		+		+	+	1		+		+	+	+		+	+			+		+	1	1	1	+	+	+			+		+	+				24	65
	Viola reichenbachiana	E1			+	+	+						+	+	+	+	+		+	+				1	+	+	+	+	+	+	+			+		+	+	+	+		23	62
	Ranunculus lanuginosus	E1					+	+		+		1		+	+	1		1		+	1	+		+	1	+	r			+	+		+			+	+	+	+		22	59
	Polygonatum multiflorum	E1										+			r	+				+	+		+	+	+		+	+	+		+	+	+	1	1	1	+	+	+		20	54
	Allium ursinum	E1						1		1		+	r	+	+	+	+	+	1	1	+	+				+	+				2	1					+	+		+		20	54
	Sambucus nigra	E3a	+													r	+		1								+						1								6	16
	Sambucus nigra	E2b		+	+			+	1	1		+		+	+	+	1	1				1					+				r										14	20	54
	Sambucus nigra	E2a		+											+						+		+		+		+					+	+								8		

Sambucus nigra	E1				+																								+											2	5
Symphytum tuberosum	E1	+				+	1	+	+	+	+	+		+		+		+	+					1			+	+		+	1				1					18	49
Dentaria pentaphyllos	E1							1		+	+	+	+	+	+	+		+	+					+		1	+	+	+		1		+							17	46
Fagus sylvatica	E3b									+			r											+		+	+		+	+			+				r	+	10	16	43
Fagus sylvatica	E3a			r						r				r	r								+	1	+		+		+				+		+		+	+	13		
Fagus sylvatica	E2b						+						+	+									+	+		+			+	+			+			+			10	17	46
Fagus sylvatica	E2a			+		+													r				+		+			+				+	+		+				9		
Fagus sylvatica	E1			+	+														r				+									+								5	14
Pulmonaria officinalis	E1					+		+		+					+			+	+			+			+	+		+	+	+	+	+	+			+				16	43
Melica nutans	E1	+		1	+						+		+		+								+	+	+	+	+							+		+				13	35
Dentaria bulbifera	E1					+	+				+	+	+	+	+	+	+	+		+	+			+																13	35
Prunus avium	E3b														+									+					+	r	+					r			6	12	32
Prunus avium	E3a															+	+		+	+					+				+						r				7		
Prunus avium	E2b														+																+							r	3	5	14
Prunus avium	E2a												+											+							+								3		
Prunus avium	E1					+																	+			+	+		+					+	+					7	19
Senecio ovatus	E1															+			r	+		r	+						+				+	+	+	+	+			11	30
Euphorbia dulcis	E1										+															+	+		+			+	+	+	1	1	+	+		11	30
Heracleum sphondylium	E1	+	+				+		+								+				+				+							+		+	r					10	27
Dryopteris filix-mas	E1		+		+										r		+									+												+		6	16
Corydalis cava	E1					+						r		1	+			1			+																			6	16
Actaea spicata	E1														+				+						+					+			+					+		6	16
Mycelis muralis	E1	+			+								+										+		+	+														6	16
Galium laevigatum	E1			+																			+			+								+	+					5	14
Campanula trachelium	E1		+																	+		+												+						4	11
Lathyrus vernus	E1			+											+																					+				3	8
Carex sylvatica	E1					+		+								+																								3	8
Phyllitis scolopendrium	E1																		+												+				r					3	8
Luzula nivea	E1		+																						+															2	5
Euphorbia amygdaloides	E1																									+	+													2	5
Neottia nidus-avis	E1																											r												1	3
Sanicula europaea	E1																																			r				1	3
Scrophularia nodosa	E1						+																																	1	3
Lilium martagon	E1							+																																1	3
Laburnum alpinum	E2a					+																																		1	3
Festuca altissima	E1					+																																		1	3
PS *Prunetalia spinosae*																																									
Cornus sanguinea	E3a	+	+	+	+					+		+	+	1	+	+	+		1	1			+		+	+	1		+											18	49
Cornus sanguinea	E2b	2	2	+	1	2	1	2	1	1	+	+	2	2	1	1	1	+	1	2	1	2	1	1	1	2	1	1	1	1	+	1	1	+			1	2	35	37	100
Cornus sanguinea	E2a	1	2	1	2	1	+	1	1	1	1	+	1	+	1	+	1	1	1	1		2	1	1	1	1	1	+	1	1	+		+	+	+	+	+	1	35		
Ligustrum vulgare	E2b											+		+	1										+	+													5	29	78
Ligustrum vulgare	E2a					+		+	+			+	+	1	+	+	1	+	+		+	+	1	+	1	1	1	+	1	1	1	1	+	+	+	+	+	1	29		

		A				Ba							Bb									Ca						Cb													
Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37			
Ligustrum vulgare	E1									+									+										+											3	8
Crataegus monogyna	E3a											+					+														+				1	1	+			6	16
Crataegus monogyna	E2b	+												+		+							+	+	+			+	+		+				1		1	1	12	24	65
Crataegus monogyna	E2a			+		+	+				+	+	+		+	+											r				1	1	+	+	+	+	+	1	17		
Crataegus monogyna	E1			+																		+	+	+														+		5	14
Euonymus europaeus	E3a																																				+			1	3
Euonymus europaeus	E2b											+		+			1											1		+	+	1	+				+		9	22	59
Euonymus europaeus	E2a					+	+					1	+		+	+			1	+					+		+	+	+	1	1	+	1	+	+	+			19		
Euonymus europaeus	E1										1			+			1		+	+				+				+	+		1	1	1	1	1	+	+	+		16	43
Berberis vulgaris	E2b			r																		+												+					3	13	35
Berberis vulgaris	E2a												+									+	+			+	r		+	+		+		1	+	+		+	12		
Berberis vulgaris	E1																						+																	1	3
Clematis vitalba	E3b																	+																					1	7	19
Clematis vitalba	E3a																+				+							+				1	+		+				6		
Clematis vitalba	E2b	+																				+									+					+	+		5	13	35
Clematis vitalba	E2a			+	+	+			+				+													+									+			1	8		
Clematis vitalba	E1								+														+	+	+							+	1	+	+	+	+			10	27
Rhamnus cathartica	E2b																																			r			1	7	19
Rhamnus cathartica	E2a		+																					+	+	+	+								+	+			7		
Rhamnus cathartica	E1												+										+														+			3	8
Viburnum lantana	E2b																		r											+		+							3	6	16
Viburnum lantana	E2a											+										+								+					+				4		
Prunus spinosa	E2a				+															+																	+	+		4	11
Cornus mas	E2b																							+								+					+			3	8
Rosa arvensis	E2																																				+			1	3
QP *Quercetalia pubescentis*																																									
(inc. *Trifolio-Geranietea*)																																									
Ostrya carpinifolia	E3b			+						r	r												1				+							+				+	7	20	54
Ostrya carpinifolia	E3a	r	+		+				+					r	+							+		r	+		+		+		+	r		+			r	r	16		
Ostrya carpinifolia	E2b			+																	r	+			+													r	5	5	14
Ostrya carpinifolia	E2a			+																																			1		
Fraxinus ornus	E3b																						+											r					2	6	16
Fraxinus ornus	E3a	r																				+	+				+									+			5		
Fraxinus ornus	E2b			+																			+				+								+				4	9	24
Fraxinus ornus	E2a	+	+	+	+	+																				+	+												7		
Fraxinus ornus	E1																										+													1	3
Clematis recta	E2	+	+	+	+		+																				+								1	+				8	22
Campanula rapunculoides	E1				+																	+	+		+		+						+			+				7	19
Sorbus aria	E3a																						+																	1	3
Sorbus aria	E2b			r																			+									+							3	4	11

Sorbus aria	E2a								r																														1		
Vincetoxicum hirundinaria	E1		+	+	+																					+															4	11
Polygonatum odoratum	E1		+	+						+																	+														4	11
Valeriana collina	E1		+		+																		+																		3	8
Primula veris subsp. *columnae*	E1		+																								+														2	5
Allium carinatum	E1							+																			+														2	5
Lilium carniolicum	E1																																	+							1	3
Melittis melissophyllum	E1																																	r							1	3
Peucedanum oreoselinum	E1																																	r							1	3
Ruscus aculeatus	E2a																																					r		1	3
Viola hirta	E1				+																																			1	3
Lilium bulbiferum	E1																										+														1	3
Laserpitium latifolium	E1				+																																			1	3
Thalictrum minus	E1				+																																			1	3
QR *Quercetalia roboris*																																									
Quercus robur	E3b																																	r	2	+				3	8
Quercus robur	E1																																		+	+	+			3	8
Frangula alnus	E3a													+	+				+						r															4	11
Frangula alnus	E2b								+		+				+					+																			4	7	19
Frangula alnus	E2a																+															+				+	+		4		
Melampyrum pratense	E1																																	+						1	3
QF *Querco-Fagetea*																																									
Corylus avellana	E3a									2	+	1		+		+	1	2	+				+			+	1		1	1		+	+		+	1	+	1		19	51
Corylus avellana	E2b			+	+	2		+	1	1	1	1	+	1	+	1	1	+	1	+	+		+	+	+	+		2		1	1	1	1	1	2	1	1	1	31	31	84
Corylus avellana	E2a			+		1										+							+	+		+				+	+			+	+	+			11		
Corylus avellana	E1																																				+			1	3
Lonicera xylosteum	E2b	+	1	+				1									+		1					+									+						8	29	78
Lonicera xylosteum	E2a	1	1	+	+	+			1	+	+		r		+				+	+		+	1	+	+	1	+	+		+	+	1	1	1	1	+		+	27		
Ranunculus ficaria	E1					+	+	1	1	1	+	+	+	1	1	1	2	1	+	1	1			1		+	+	+	+	+			+				+	+		25	68
Hepatica nobilis	E1	+	1	+	+			+	+		+	+	+		+	+		+	+			+	1	+	+		+	+	1		1	+	1		+	+				25	68
Hedera helix	E3a						1									+	1	+	+	+	+	1						+		+	+		+	1	1	1		+		16	43
Hedera helix	E2b					+																										+								2	5
Hedera helix	E1					1	+		+		+	+	+	+		+	+	+	+	+	+	1			+			+	+	+	+	1	+	1	+	1	1			25	68
Vinca minor	E1			2	3	+		+		+	+	1		+	+	+				+			1	1	+	1	+	2	1	1	2		+		1	+		+		24	65
Cerastium sylvaticum	E1	+						+		+	1	+	1	1	1	+	+	+		1	+			1	+	+		+	+				+		+		+	2		22	59
Anemone ranunculoides	E1					+	+				+	1	+	1		1	+	2	1	+	1							+	2		1	+	1	+	+		+			20	54
Carex digitata	E1		+		+	+	+			+		+	+						+			+		+		+	1	+		+			+	+	+	+	+			19	51
Veratrum nigrum	E1							r					+		+	+		+	+	+	1			+	+	+						+	+	+	+		+	+		17	46
Anemone nemorosa	E1					+						+		+		+		+	+	+	1							+	2	1	3	+				+		+		15	41
Acer campestre	E3b																	+																	+	+	+		4	8	22
Acer campestre	E3a																+											+	r			+			+	+	+		7		
Acer campestre	E2b								+													+										+	+	+				+	6	12	32

			A				Ba							Bb									Ca					Cb												
	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
	Acer campestre	E2a						+		+		+			r	+											+						+	+	+		+		+	11	
	Acer campestre	E1					+					+						+						+										+	+	+	+	+			9	24
	Viola riviniana	E1		+	+	+						+								+			1		+						+		1	+	+						11	30
	Viola mirabilis	E1										+									+							+	+				+	+	+						7	19
	Gagea lutea	E1													r				+	+		+							r								+				6	16
	Cruciata glabra	E1			+	1																		1											+						4	11
	Malus sylvestris	E3a																												r										1	3
	Lathraea squamaria	E1													r																									1	3
VP	***Vaccinio-Piceetea***																																								
	Oxalis acetosella	E1	+	2	1	1			+	+	+	+	+		+	+	+		+	1					+	1	+	+	1	+	+		+		+	+	+	+	1	26	70
	Abies alba	E2b																						+																1	2	5
	Abies alba	E2a																								+														1		
	Abies alba	E1																						+																	1	3
	Solidago virgaurea	E1																						+											+						2	5
	Maianthemum bifolium	E1																										+						+						2	5
	Aposeris foetida	E1		+																								+												2	5
	Veronica urticifolia	E1																									+													1	3
EP	***Erico-Pinetea***																																								
	Pinus sylvestris	E3b																						r																1	3
	Sesleria sp.	E1																																	+					1	3
	Carex ornithopoda	E1					+																																	1	3
A	***Adenostyletalia***																																								
	Myosotis sylvatica	E1	+	+		+		+		+	+	+		+		+							r	+	+	+		+											+	15	41
	Senecio nemorensis agg.	E1	+													+									+	1	+													5	14
	Aconitum degenii subsp. *paniculatum*	E1	+													+										+		+												4	11
	Lamium maculatum	E1		+						+		+			+																									4	11
	Athyrium filix-femina	E1							+	+																														2	5
	Crepis paludosa	E1							+																			+												2	5
	Myrrhis odorata	E1												+																										1	3
	Phyteuma ovatum	E1																								+														1	3
	Viola biflora	E1																									r													1	3
	Astrantia major	E1																										+												1	3
	Aconitum angustifolium	E1			+																																			1	3
	Telekia speciosa	E1							+																															1	3
	Saxifraga rotundifolia	E1	+																																					1	3
TR	***Thlaspietea rotundifolii***																																								
	Adenostyles glabra	E1	+	+																						+		+													4	11
	Petasites paradoxus	E1					+																					+					+								3	8
	Gymnocarpium robertianum	E1			+	+																																		2	5
	Astrantia carniolica	E1			+																																			1	3

AT ***Asplenietea trichomanis***																																									
Moehringia muscosa	E1		+	+	+																																					3	8
Cystopteris fragilis	E1									+																+																2	5
Cardaminopsis arenosa	E1				+					+																																2	5
GU ***Galio-Urticetea***																																									
Glechoma hederacea	E1	+	+	+				1	1	+	1	+		1		1	+	+	+	1	+	+				+		+	+				+		+		1	1		23	62
Solidago gigantea	E1					2			+		+	+	+	+			+	1	+	1	1	+										+					+	+		15	41
Urtica dioica	E1	+	1	+	+		+	+	1	+	+	+									+																			11	30
Geum urbanum	E1				+			+	+				+		+							+	+		+	+														9	24
Petasites hybridus	E1					1	+	+						+		+																					+			6	16
Alliaria petiolata	E1								1			+		1						+		+																		5	14
Helianthus tuberosus	E1						+													+																				2	5
Anthriscus sylvestris	E1								1			+																												2	5
O **Other species**																																									
Juglans regia	E3b																																			r			1	2	5
Juglans regia	E3a																			+																			1		
Juglans regia	E2b					+	+																			+	r												4	10	27
Juglans regia	E2a			+																				+										r	+	+			5		
Juglans regia	E1																							+													+			2	5
Fragaria vesca	E1	+		1	1																	+	+		+		+					+		+						9	24
Robinia pseudacacia	E3b																							+							+					+	+	+	5	9	24
Robinia pseudacacia	E3a						+									+																r			+	r	+		6		
Robinia pseudacacia	E2b					r					r	+	r																											4	11
Robinia pseudacacia	E1																																		+					1	3
Hemerocallis fulva	E1					+	+			+		+		+		+																			+		+			8	22
Ajuga reptans	E1	+				+													+							+	+								+					6	16
Dactylorhiza maculata	E1	+	+	+											r										+										r					6	16
Taraxacum officinale	E1																									+	+					+		r			+			5	14
Allium schoenoprasum	E1						+				+			+		+																								4	11
Allium sp.	E1								+																+									+						3	8
Geranium phaeum	E1							+	+	+																														3	8
Ornithogalum umbellatum	E1														+					+															r					3	8
Peucedanum verticillare	E1																					+										+		+						3	8
Viola sp.	E1						r			+																										r				3	8
Juniperus communis	E2b								r																														1	2	5
Juniperus communis	E2a																																	+					1		
Chelidonium majus	E1								1					r																										2	5
Erigeron annuus	E1									+			+																											2	5
Fallopia japonica	E2a								+	+																														2	5
Phalaris arundinacea	E1					+	+																																	2	5
Ribes sp.	E2a														r										r															2	5
Viscum album	E3a											+																+												2	5

			A				Ba							Bb									Ca						Cb												
	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
	Aethusa cynapium	E1																		1																				1	3
	Cardamine hirsuta	E1													r																									1	3
	Carex flacca	E1																															+							1	3
	Epilobium sp.	E1												+																										1	3
	Lycopus europaeus	E1					+																																	1	3
	Myosoton aquaticum	E1								+																														1	3
	Pimpinella major	E1																															+							1	3
	Poa trivialis	E1										+																												1	3
	Primula elatior	E1															r																							1	3
	Rubus fruticosus agg.	E2b													r																									1	3
	Veronica hederifolia	E1													+																									1	3
	Agropyron repens	E1	+																																					1	3
	Aesculus hippocastanum	E2			+																																		1	3
	Ribes nigrum	E2						+																																1	3
	Narcissus poeticus	E1						+																																1	3
	Equisetum variegatum	E1					+																																	1	3
	Symphytum officinale	E1					+																																	1	3
	Lonicera nitida	E2					+																																	1	3
M	**Mosses**																																								
	Plagiomnium undulatum	E0	3	3	2	3	+	+	1	1	+	2	2	1	+	1	1	+	+	1	+	1	3	+	+	+	+	+		+	+		+	2		+	1	1	1	34	92
	Climacium dendroides	E0				+						+	+				+			+		+	1						+		+	+		1	+		+			13	35
	Rhytidiadelphus triquetrus	E0	+	+	+	2																													+					5	14
	Eurhynchium striatum	E0																													+	+		+						3	8
	Conocephalum conicum	E0																							+	+														2	5
	Thuidium sp.	E0																										+											+	2	5
	Brachythecium sp.	E0					+																																	1	3
	Mnium sp.	E0																																	+					1	3
	Anomodon attenuatus	E0																										+												1	3
	Isothecyum alopecuroides	E0																										+												1	3

Localities of relevés: 9647/4: the village of Soča-Podklanec: 1, 2; the village of Lepena-Rečič: 3, 4; 9848/2: Modrejce, Modrejčansko polje: 5; 9848/4: the Idrijca valley, left bank between the villages of Slap and Dolenja Trebuša: 6; 9647/3: Čezsoča, eyot: 7, 25; 9746/2: between the villages of Žaga and Srpenica, right bank: 8, 12, 14, 22, 23, 24; 9647/3: Bovec, towards the village of Čezsoča, V Brezju: 9, 26; 9747/4: Smast, Lazna: 10, Ladra, Vrblje: 11; 9848/1:Tolmin, Log: 13, 15; Na dolgem, right bank of the river: 16, 17, 19, 20, 28, 34, 35, 36, 37; 9747/4: Kamno, right bank of the river: 18, 29; Kamno, towards the village of Selišče, left bank: 25, 35; 9747/4: between the villages of Idrsko and Kamno, Skala: 30, 31, 32; Ograjenca near the village of Idrsko: 33.