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Phytosociology and ecology of *Rhamnus fallax* in the Southeastern Alps and in the northwestern part of the Dinaric Alps

Igor Dakskobler, Wilfried Robert Franz & Andrej Rozman

Summary: In the Julian Alps, the Karavanke/Karawanken and the Trnovski gozd plateau, we conducted a phytosociological study of scrubs dominated by the Illyrian species *Rhamnus fallax*. We found that these scrub communities, which mainly grow in the montane and subalpine beech forest belt, are frequently a long-term successional stage on screes, rockfall and stony gullies in which snow accumulates on an annual basis, as well as on karstified limestone ridges of the High Karst. These scrub communities are floristically very different from similar scrub communities in the central and southern parts of the Dinaric Alps, and so are classified into four new associations: *Polysticho lonchitis-Rhamnetum fallacis*, *Laserpitio latifolii-Rhamnetum fallacis* (both belong to the new alliance *Seslerio calcariae-Rhamnion fallacis*), *Laburno alpini-Rhamnetum fallacis* (classified into the alliance *Aremonio-Fagion*), and *Lunario redivivae-Rhamnetum fallacis* (alliance *Lonicero-Rhamnion fallacis*).

Keywords: phytosociology, *Rhamnus fallax*, *Seslerio calcariae-Rhamnion fallacis*, *Rhamnetalia fallacis*, scrub communities, succession, the Julian Alps, the Karavanke/Karawanken, the Trnovski gozd plateau, Slovenia, Austria

Rhamnus fallax (*Rhamnus alpina* subsp. *fallax*) is a Southeast-European montane shrub distributed in the Southeastern Alps (the Julian Alps, the Kamnik-Savinja Alps/Steiner Alps and the Karavanke Mts./Karawanken), in the Dinaric and Balkan Mts., and in the Apennine Peninsula (Aeschimann et al. 2004: 1018). Its northernmost localities are in southern Carinthia in Austria (Hartl et al. 1992: 297). The only locality situated further to the north is in Lower Austria (the gorge near Purgstall – Essl in Fischer et al. 2008: 557; this locality is probably subspontaneous and *Rhamnus fallax* has probably migrated into this gorge from the nearby castle park – Essl, in litt.). Its northwesternmost localities are under the Stol ridge in Breginjski kot (Lokarje) – Čušin (2006: 131) and under Matajur and Kolovrat in northeastern Italy (Poldini 2002: 408). In Slovenia, *Rhamnus fallax* is distributed in all phytogeographical regions, in larger numbers mainly in the western part of the country, in Alpine, pre-Alpine and Dinaric phytogeographical regions. The northeasternmost localities are along the Drava in the sub-Panonnian region (where it is likely to grow deposited in riparian stands), but it is not known in the Pohorje Mountains and in southeastern Slovenia. In its sub-Mediterranean part it grows mainly on higher lying slopes, it is very rare in the Karst and does not occur in the coastal part of Istria (Fig. 1). *Rhamnus fallax* is a species of stony forests and pastures, stabilized screes and rockfalls. It can grow up to 4 metres and reach 10 cm in diameter at chest height. Its often low, clustered growth is due to natural factors such as snowslides. Its sites are on calcareous (limestone) bedrock with shallow soils (lithosol, rendzina, rarely Chromic Cambisols). While it has no special needs regarding soil depth or temperature, it requires sufficient soil and air moisture. Its occurrence extends from valleys (lowland) to the subalpine belt, with its highest localities in Slovenia situated at elevations of around 1650 m (the Kanin Mts.), 1650 m to 1700 m (the Martuljek Mts., za Akom, Rutarski Vršič), 1700 m (Potočka Zijavka under Mt. Olševa, det. M. Wraber, 24.9.1970

and B. Vreš, N. Jogan and N. Praprotnik, 29.7.1994), 1740–1760 m (the Fužina Pasturelands, Vodene rupe to the northwest from the pasture Dedno polje, det. I. Dakskobler & B. Zupan, 26.7.2007 and on pasture Jezerce between Ogradi and Stogi, under Brda in the Pokljuka plateau), reaching almost 1800 m (Škarjev rob under Mt. Storžič, det. B. Anderle & B. Vreš, 12.7.2010) and 1890 m (Velska dolina under Triglav). It grows within some scree communities, for example in the stands of the associations *Petasitetum nivei*, *Festucetum laxae*, *Moehringio-Gymnocarpietum robertiani*), in tall herb communities (e.g. in the stands of the association *Doronico austriaci-Adenostyletum alliariae*), in places also in chasmophytic communities (e.g. in stands of the associations *Campanulo carnicae-Moehringietum villosae*, *Potentillo clusianae-Campanuletum zoysii* and *Potentilletum caulescentis*). It is most frequently described in forest communities. In beech forests it is especially frequent in stands of the associations *Arunco-Fagetum*, *Ostryo-Fagetum*, *Seslerio autumnalis-Fagetum*, *Rhododendro hirsuti-Fagetum*, *Omphalodo-Fagetum, Lamio orvalae-Fagetum, Ranunculo platanifolii-Fagetum, Aconito paniculati-Fagetum*, *Polysticho lonchitis-Fagetum*, *Anemono trifoliae-Fagetum* and *Homogyno sylvestris-Fagetum*. In spruce forests it is known in stands of the associations *Adenostylo glabrae-Piceetum*, *Laburno alpini-Piceetum*, *Petasiti paradoxi-Piceetum*, *Ribeso alpini-Piceetum* and *Rhamno fallacis-Piceetum* (see also Zupančič 1999) and in larch forests in stands of the association *Rhodothamno-Laricetum*. It grows in some pine communities, e.g. in stands of the associations *Fraxino orni-Pinetum nigrae*, *Rhododendro hirsuti-Pinetum mugo* and *Amelanchiero ovalis-Pinetum mugo*. Very rarely it can be found also in the subalpine mountain ash and green alder community (*Alno viridis-Sorbetum aucupariae*). It can even grow on undeveloped riparian soils, gravel bars, in stands of the association *Salicetum eleagno-purpureae* and in riparian grey willow, grey alder and small-leaved lime stands (*Lamio orvalae-Salicetum eleagni*, *Lamio orvalae-Alnetum incanae*, *Carici albae-Tilietum cordatae*). In noble hardwood communities it is found on rendzinas and colluvial-deluvial soils (*Saxifrago petraeae-Tilietum platyphylli*, *Corydalido ochroleucae-Aceretum pseudoplatani*, *Veratro nigri-Fraxinetum excelsioris*, *Hacquetio-Fraxinetum excelsioris*, *Omphalodo-Aceretum pseudoplatani*, *Lamio orvalae-Aceretum pseudoplatani*). It also grows in black hornbeam, flowering ash and pubescent oak communities (*Fraxinio orni-Ostryetum, Rhododendro hirsuti-Ostryetum*, *Cytisantho-Ostryetum, Seslerio autumnalis-Ostryetum carpinifoliae, Amelanchiero ovalis-Ostryetum*).

In Carinthia in Austria, *Rhamnus fallax* is known mainly on northern slopes of the Karawanken/Karavanke (Velika Suha at Pogöriach/Podgorje, Bärental/Medvedji dol under Mt. Stol, Petzen/Peca) and the Steiner/Kamnik Alps (Vellacher Kotschna/Belska Kočna). Most often it grows on established calcareous screes with northern, eastern and especially western aspects, in places with high air humidity, mean annual precipitation from 1500 mm to 2200 mm and with average snow cover duration of 150 days or more. It can often be found on rockfalls where snow between large rock blocks lingers much longer than in its surroundings. The largest and thickest specimens (height 4 m, chest-height diameter of up to 7 cm), frequently of sable growth, were spotted by one of the authors (WF) on exactly such sites on rough rockfall in Vellacher Kotschna/Belska Kočna in the Steiner/Kamnik Alps. Its free-growing and more easily accessible scrubs are often severely eaten by chamois (*Rupicapra rupicapra*) and on the sunny (Slovenian) side of the Karavanke (Sv. Ana at Ljubelj) also by ibexes (*Capra ibex*).

In Carinthia it grows sporadically in red and black pine communities (*Erico-Pinetum sylvestris*, *Fraxino orni-Pinetum nigrae*), larch (*Rhodothamno-Laricetum*), dwarf pine (*Rhododendro hirsuti-Pinetum mugo*), beech (*Anemono trifoliae-Fagetum*) and in some forms of black hornbeam and

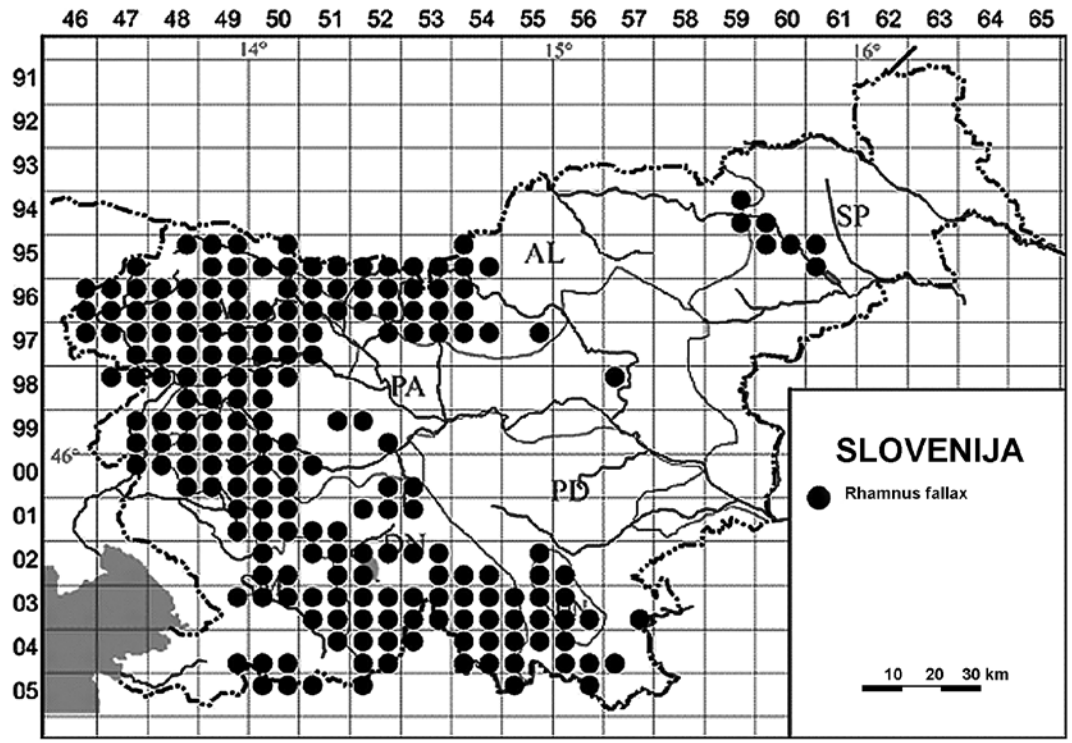

Figure 1. Distribution of *Rhamnus fallax* in Slovenia.

flowering ash communities (*Erico-Ostryetum* s. lat., sensu Franz & Willner 2007, *Sileno glareosae-Ostryetum*) – see Franz (2002, 2012) and Franz & Willner (2007a, b). On screes, it frequently grows in narrow strips in the slope direction, along torrents that become active only during heavy rain.

In the Dinaric Alps, *Rhamnus fallax* plays an important role in the belt of subalpine scrubs at the upper forest line. In Croatia, Bosnia and Herzegovina and further south, different authors have also described scrub communities where *Rhamnus fallax* is the dominant species. Fukarek & Stefanovič (1958: 138–139) found its stands on screes in the subalpine beech forest belt in Bosnian and Herzegovinian mountains and presented the provisional association *Rhamnetum fallacis* (= *Rhamnus fallax-Cynanchum vincetoxicum* ass.) with two relevés. Later, Fukarek (1969a, b) described this association in more detail, naming it *Cynancho-Rhamnetum fallacis* Fukarek & Stefanovič 1958. He classified it in the new alliance *Lonicero-Rhamnion* Fukarek 1969 and new order *Rhamnetalia fallacis* Fukarek 1969. One year later (Fukarek 1970: 255), he added to the association *Cynancho-Rhamnetum fallacis* also the association *Berberidi-Rhamnetum fallacis* Horvat 1962, a syntaxon that had been only briefly described in 1962 (Horvat 1962: 119). Stefanović (1986) mentions associations *Cynancho-Rhamnetum* and *Berberidi-Rhamnetum* on the forest line in the Dinaric Alps, at the contact point of subalpine maple-beech forest (*Aceri-Fagetum* s. lat.) and dwarf pine community (*Pinetum mugo* s. lat.). He also named the subassociation *Aceri-Fagetum rhamnetosum fallacis* Stefanović 1964 (Stefanović 1964) after *Rhamnus fallax*. Among the communities of order *Rhamnetalia fallacis* and alliance *Lonicero-Rhamnion fallacis* in Croatia, Trinajstić (2008) mentions only the association *Ribesi pallidigemmo-Rhamnetum fallacis* Trinajstić 1987 which he found on Biokovo, but his description

is based on only one relevé (Trinajstić 1987: 169). It is evident that *Rhamnus fallax* often forms fringe communities (scrubs) in the centre of its distribution area, especially in the belt of montane and subalpine forests. These are more or less long-term successional stages, e.g. in the overgrowing of established screes or on very stony or rocky sites – wherever conditions for forest growth are extreme, allowing only the most modest tree and scrub species to survive. Similar scrubs, although with a very different floristic composition reflecting very different phytogeographical conditions, have also been spotted in the northern part of its distribution area, in Slovenia and in Carinthia in Austria. The first to catch our attention were the stands of *Rhamnus fallax* on screes and in steep gullies in the Karavanke/Karawanken and in the Julian Alps, where forest growth conditions are rather extreme due to recurring snowslides, and where these stands are obviously long-term pioneer stages. Stands were recorded also on less extreme sites, such as extensive meadows under Krn (pastures above the village Krn, see also Surina 2005: 6), where their occurrence is subject not only to natural conditions, but above all also to human impact, and scrubs on dolomite slopes that developed in beech forests damaged by storms, especially windthrows. Even though *Rhamnus fallax* scrubs usually cover only small areas they have an important protective role. They prevent or slow down erosion and soil leaching, retain humus, improve soil conditions and allow subsequent successional development towards forest.

Materials & Methods

Scrubs with dominant *Rhamnus fallax* were studied according to the method of Braun-Blanquet (1964). 34 relevés were entered into the FloVegSi database (Seliškar et al. 2003). This database was used also in the preparation of the distribution map of *Rhamnus fallax* in Slovenia and in establishing its occurrence in different communities. Combined cover-abundance values were transformed into ordinal values (van der Maarel 1979). Numerical comparisons were made with the software package SYN-TAX (Podani 2001) and R (R Development Core Team 2012), using the package 'vegan' (Oksanen et al. 2012). The relevés were compared using the following methods: '(Unweighted) average linkage' – UPGMA, 'Incremental sum of squares' – MISSQ and 'Principal coordinates analysis' – PCoA. Wishart's similarity ratio was applied in all comparisons. Based on these comparisons the relevés formed four groups (Fig. 2). One relevé (the scree above Podljubelj) that stood out with a small number of species was excluded from further processing. Other relevés were arranged into four phytosociological tables based on the dendrogram in Fig. 2. We drew up a synthetic table and compared the columns using hierarchical classification and Principal Coordinates Analysis – PCoA (Figs 3 and 4). Wishart's similarity ratio was also applied in this comparison.

A phytoindication analysis in the stands of the four new syntaxa was carried out using ecological indicator values (Landolt et al. 2010). In the relevés we determined average conditions in terms of temperature (T), continentality (K), light conditions (L), moisture (M), soil reaction (R), nutrients (N), humus content (H) and aeration (A). In our calculations we used van der Maarel's ordinal plant cover values (medium coverage) as weight that was reduced by half in phytoindication values with a higher degree of variation (Landolt et al. 2010).

$$WA_{pop} = \frac{\sum_{i=1}^{s} (FV_i \times Abund_i \times VR_i)}{\sum_{i=1}^{s} (Abund_i \times VR_i)}$$

where WA_{pop} is the weighted average of indication values of plant species for an ecological factor on a relevé, FV_i is the phytoindication value of

the [*i*] row factor, $Abund_i$ is cover value, VR_i is range of variation of phytoindication value (I = 1, II = 0.5) and *s* the number of species in a relevé.

33 relevés of the stands with dominant *Rhamnus fallax* were compared using the Canonical Analysis of Principal Coordinates – CAP (Anderson & Willis 2003) on the basis of the Bray-Curtis dissimilarity index in which weighted averages of Landolt's phytoindication values (WA_{pop}) were used as constrained variables.

The nomenclature source for the names of vascular plants is the Mala flora Slovenije (Martinčič et al. 2007). Martinčič (2003, 2011) is the nomenclature source for the names of mosses. Suppan et al. (2000) is the nomenclature source for the names of lichens. The nomenclature sources for the names of syntaxa are Theurillat (2004) and Šilc & Čarni (2012). The data on the geological bedrock follow Jurkovšek (1987a, b) and Buser (1986, 1987, 2009). The source for the nomenclature of soil types is Urbančič et al. (2005). Climate data (precipitation volume, mean temperature) were obtained on the website of the Environmental Agency of the Republic of Slovenia, Ministry of Agriculture and Environment.

Results

Conspectus of the determined and described syntaxa

Querco-Fagetea Br.-Bl. & Vlieg. 1937

Rhamnetali fallacis P. Fukarek 1969

Seslerio calcariae-Rhamnion fallacis all. nov. hoc loco

Polysticho lonchitis-Rhamnetum fallacis ass. nova hoc loco

Laserpitio latifolii-Rhamnetum fallacis ass. nova hoc loco

Lonicero-Rhamnion fallacis P. Fukarek 1969

Lunario redivivae-Rhamnetum fallacis ass. nova hoc loco

Fagetalia sylvaticae Walas 1933

Aremonio-Fagion (Ht. 1938) Borhidi in Török, Podani & Borhidi 1989

Laburno alpini-Rhamnetum fallacis ass. nova hoc loco

Description of communities with dominant *Rhamnus fallax* in the Southeastern Alps

The described scrubs with dominant *Rhamnus fallax* in the Dinaric Alps (Fukarek & Stefanović 1958; Fukarek 1969a, b, 1970; Trinajstić 1987) are floristically very different, and the four groups of our relevés (Figs 2, 3 and 4), or the four columns in the synthetic Table 5 [all Tables as Appendix!], are therefore classified as four new syntaxa. Two groups of relevés originate from the Southeastern Alps (the Julian Alps and the Karavanke/Karawanken), where these communities have not yet been researched. The largest group of relevés is classified in the association *Polysticho lonchitis-Rhamnetum fallacis* ass. nova hoc loco which characterises more or less long-term successional stages on established screes, rockfalls and in stony gullies, in places repeatedly damaged by snowslides, severely hindering the development of forest vegetation. The following relevés were made in the Julian Alps: at the pasture Leskovca in the Krn mountains, under Mt. Črna gora and Kontni vrh (Šoštar) on the Bohinj side of Mt. Črna prst, in the Beli

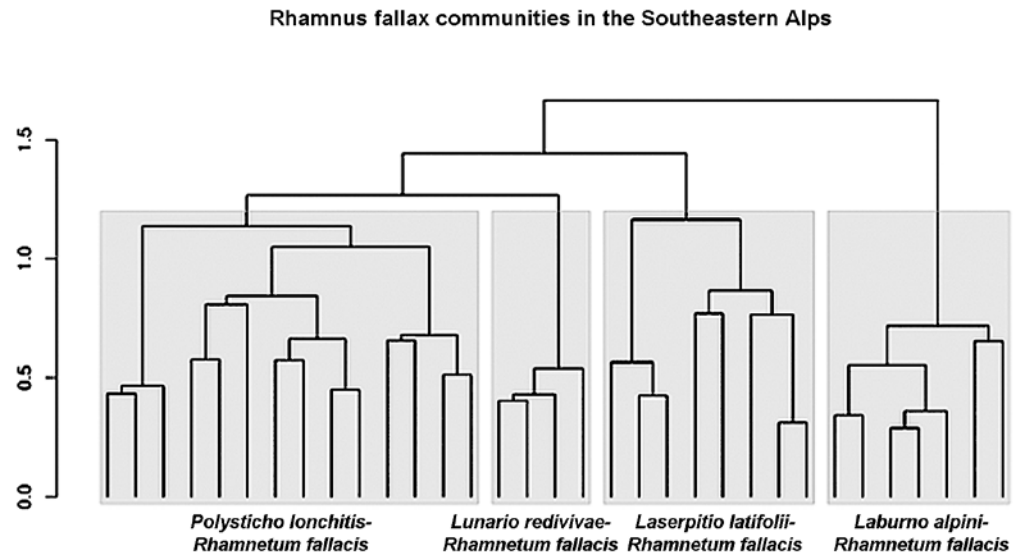

Figure 2. Dendrogram of relevés with dominant *Rhamnus fallax* in the southeastern Alps and in the Trnovski gozd plateau (MISSQ, similarity ratio).

potok valley in the Martuljek mountains and in the Karavanke: gullies at the Zabreznica and Žirovnica alps under Stol, shady slopes of Mt. Olševa above the Koprivna valley (Fig. 5). The localities are situated at elevations from 1260 m to 1580 m, i.e. in the forest belt, especially in the belt of altimontane and subalpine beech and fir-beech forests (*Polysticho lonchitis-Fagetum*, *Homogyno sylvestris-Fagetum*, *Ranunculo platanifolii-Fagetum*, *Anemono trifoliae-Fagetum*), partly also in the belt of subalpine larch forests (*Rhodothamno-Laricetum*). In some spots on less extreme

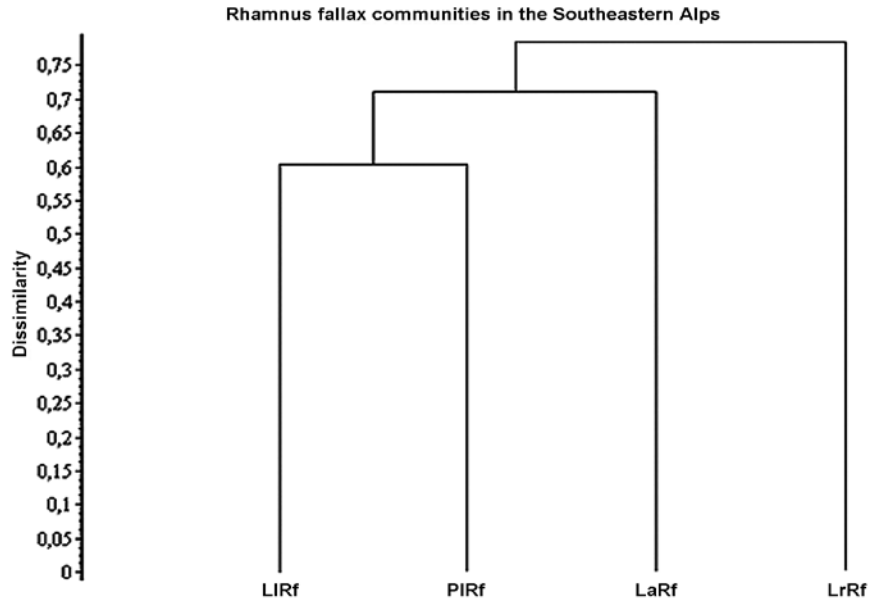

Figure 3. Dendrogram of *Rhamnus fallax* in the Southeastern Alps and in the Trnovski gozd plateau (UPMGA, similarity ratio). LlRf – *Laserpitio latifolii-Rhamnetum fallacis*; PlRf – *Polysticho lonchitis-Rhamnetum fallacis*; LaRf – *Laburno alpini-Rhamnetum fallacis;* LrRf – *Lunario redivivae-Rhamnetum fallacis*.

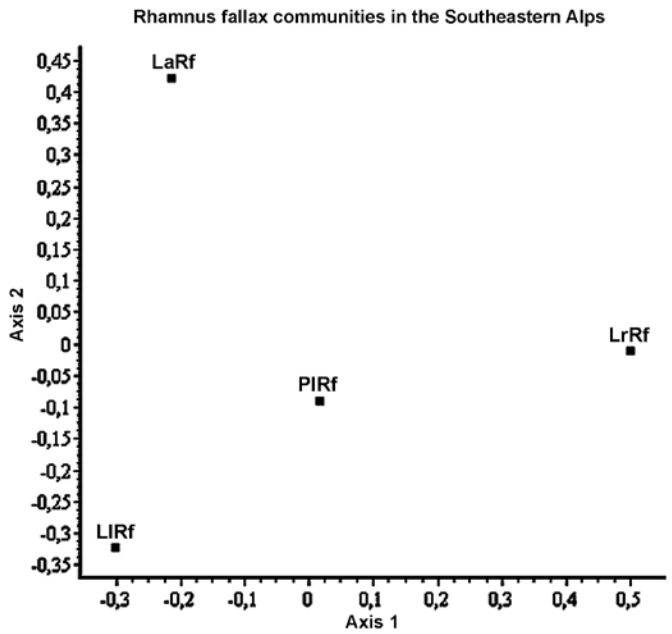

Figure 4. Two-dimensional scatter-diagram of *Rhamnus fallax* in the Southeastern Alps and in the Trnovski gozd plateau (PCoA, similarity ratio).

sites with more accumulated moder or raw humus, the contact communities are alpine dwarf pine shrubs (*Rhododendro hirsuti-Pinetum mugo*) or green alder stands (*Rhododendro hirsuti-Alnetum viridis*), which in such cases, with improved site conditions (accumulation of organic matter), usually represent the next stage of succession. The climate is montane with abundant precipitation (annual average of about 2000 mm and more) and long-lasting snow cover (as a result of snowslides or accumulation of snow from higher-lying slopes). The soil type is lithosol, rarely shallow colluvial-deluvial soils or rendzina. These sites are very extreme for forest growth (stoniness or rockiness usually exceeds 50% of the relevé area, frequently reaching as much as 90%) and the described community is therefore a long-lasting successional stage. In the more or less open shrub layer *Rhamnus fallax* dominates, in places admixed with similarly abundant *Salix appendiculata* and individual specimens of *Acer pseudoplatanus*, *Picea abies*, *Sorbus aria*, *Fagus sylvatica* and *Larix decidua*. *Rubus idaeus* is frequent in the lower shrub layer, on several plots also *Rhododendron hirsutum* and in places also *Lonicera alpigena*, *Pinus mugo* and other species. In the herb layer, the most frequent species are tall herbs from the class *Mulgedio-Aconitetea* and species of beech and spruce forests (Table 6). Due to its open structure there is a large number of accidental species. Diagnostic species of the new association are *Rhamnus fallax*, *Aconitum lycoctonum* subsp. *ranunculifolium* s. lat. (according Podobnik in Martinčič et al. 2007 = *Aconitum lupicida* according to Starmühler in Fischer et al. 2008), *Polystichum lonchitis* and *Rhododendron hirsutum*. The nomenclature type of the new association, *holotypus*, is relevé No. 7 in Table 1. In a way similar to dwarf pine and green alder stands, stands of the association *Polysticho lonchitis-Rhamnetum fallacis* also have a significant protective role in the montane landscape. Overgrowing bare rocks and screes, they promote soil development, accumulation of organic matter and – in the absence of annual destructive factors (snowslides) – even succession towards higher stages of development in vegetation on these sites.

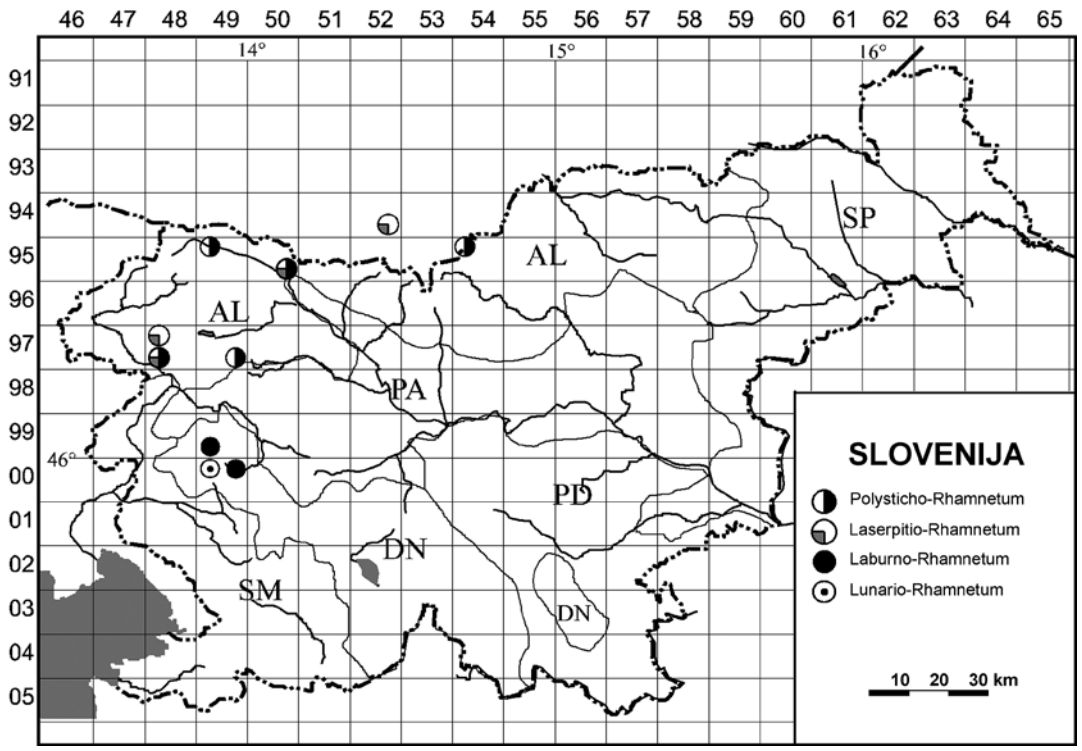

Figure 5. Approximate localities of stands of the associations *Polysticho lonchitis-Rhamnetum*, *Laserpitio-Rhamnetum*, *Laburno-Rhamnetum* and *Lunario-Rhamnetum* in Slovenia and in Carinthia (Austria).

The smaller group of relevés from the Karavanke/Karawanken and the Julian Alps (pasture Leskovca in the Krn mountains; Fig. 5) is floristically and ecologically slightly different from the stands of the association *Polysticho lonchitis-Rhamnetum fallacis*. These are very initial open scrubs on stabilized, more or less overgrown screes in the elevation belt 1200–1400 m, on both sunny and shady slopes. The sites are very dry, with poor decomposition and accumulation of organic matter (moder). The soil type is lithosol. Species of screes, dry and subalpine grasslands, forest edges and basophilous pine forests are common in the herb layer (Table 6). In the successional sere these stands represent a transition between scree communities and scrubs of the association *Polysticho lonchitis-Rhamnetum fallacis.* They are classified into the new association *Laserpitio latifolii-Rhamnetum fallacis*. Diagnostic species of the association are *Sesleria caerulea* subsp. *calcaria* (mainly because its medium cover is higher here than in the stands of the association *Polysticho-Rhamnetum*), *Laserpitium latifolium*, *Linum julicum* and *Rumex scutatus*. The nomenclature type of the new association, *holotypus*, is relevé No. 3 in Table 2. Two variants are distinguished. The variant with *Salix appendiculata* (the differential species include *Scrophularia juratensis*, *Primula veris* subsp. *columnae* and *Lilium carniolicum*) was documented mainly in the Julian Alps, on more populated screes, and the variant with *Convallaria majalis* mainly on shady aspects and screes in the Austrian part of the Karawanken/Karavanke.

Description of communities with dominant *Rhamnus fallax* in the nortwestern part of the Dinaric Alps

Rhamnus fallax is just as, or even more, frequent in the beech forests of the Dinaric Alps than in the forests and stony sites of the Southeastern Alps. It is therefore considered a character

species of the Illyrian alliance *Aremonio-Fagion*. In the northwesternmost part of the Dinaric Alps, in the Trnovski gozd plateau, which is characterised by a humid montane climate with abundant precipitation (average between 2000 mm to 3000 mm per year), we have studied two types of its scrubs so far. One is a distinctly pioneer successional stage in secondary succession in gaps following windthrows in beech forests on very steep shady dolomite slopes, especially in the stands of the associations *Arunco-Fagetum*, *Rhododendro hirsuti-Fagetum* and in part also *Omphalodo-Fagetum* and *Ranunculo platanifolii-Fagetum*. These scrubs, in succession usually soon replaced by beech forest, were classified into the new association *Laburno alpini-Rhamnetum fallacis*. Its diagnostic species are *Rhamnus fallax*, *Carex ferruginea*, *Laburnum alpinum*, *Ostrya carpinifolia* and *Fraxinus ornus*. Gaps are therefore populated mainly by heliophilous and relatively thermophilous species, while *Carex ferruginea* is diagnostic for preserved beech stands on these sites (especially for the association *Rhododendro hirsuti-Fagetum*). The nomenclature type of the new association, *holotypus*, is relevé No. 3 in Table 3. The stands of this association were recorded in the elevation belt of 650 m to 1100 m, on the northern edge of the Trnovski gozd plateau (Fig. 5). Their floristic composition is dominated by beech forest species (*Aremonio-Fagion*, *Fagetalia sylvaticae*) and species of basophilous pine forests (*Erico-Pinetea*; Table 6). Such species composition indicates original beech communities, and this association is therefore classified into the order *Fagetalia sylvaticae* and into the alliance *Aremonio-Fagion*. The pioneer stage plays an important protective role, preventing erosion and leaching of shallow soils on steep slopes.

The ecology of *Rhamnus fallax* at very rocky sites on ridges of the highest peaks of the Trnovski gozd plateau between Veliki Golak and Javorški vrh in the Golaki forest reserve (Fig. 5) is different. These ridges are situated at elevations from 1350 m to 1400 m and are continuously overgrown with altimontane – partly also by subalpine – beech and maple-beech forest and are for the time being still classified into the associations *Stellario montanae-Fagetum*, *Ranunculo platanifolii-Fagetum* and *Polysticho lonchitis-Fagetum*. The geological bedrock is limestone. On these ridges we found smaller, karstified rocky patches not overgrown by forest. They are overgrown by more or less open scrubs with dominant *Rhamnus fallax*. We do not know the origin of these natural forest gaps. These are totally remote regions where forests have never been managed, so human impact can be excluded with certainty. Possible reasons for formation of these rocky sites are natural factors, such as windthrow, snow breakage and consequently (with substantial precipitation levels of 2500 mm to 3000 mm) leaching of soil on the ridge and karstification. *Rhamnus fallax* is a pioneer, one of the first species to populate these rocks. In pockets between rocks it helps organic matter to accumulate and retain moisture, thus allowing tall herb species and some maple forest (*Tilio-Acerion*) species such as *Lunaria rediviva* or the indicator of nitrophilous sites *Urtica dioica*, to thrive in this community. These species occur also in the surrounding altimontane beech stands. Due to these site and floristic characteristics, which clearly differentiate these stands from other previously described communities, they are classified into the new association *Lunario redivivae-Rhamnetum fallacis*. Its diagnostic species are *Rhamnus fallax*, *Sambucus racemosa*, *Sedum hispanicum* and *Lunaria rediviva*. The nomenclature type of the new association, *holotypus*, is relevé No. 1 in Table 4. Unlike the previously described, relatively short-lived successional stage *Laburno-Rhamnetum fallacis*, the scrubs of the association *Lunario-Rhamnetum fallacis* are long-lasting vegetation on rocky, high-karst ridges, and have a significant regenerative role, being the core transitional stage from bare rocks towards the former forest.

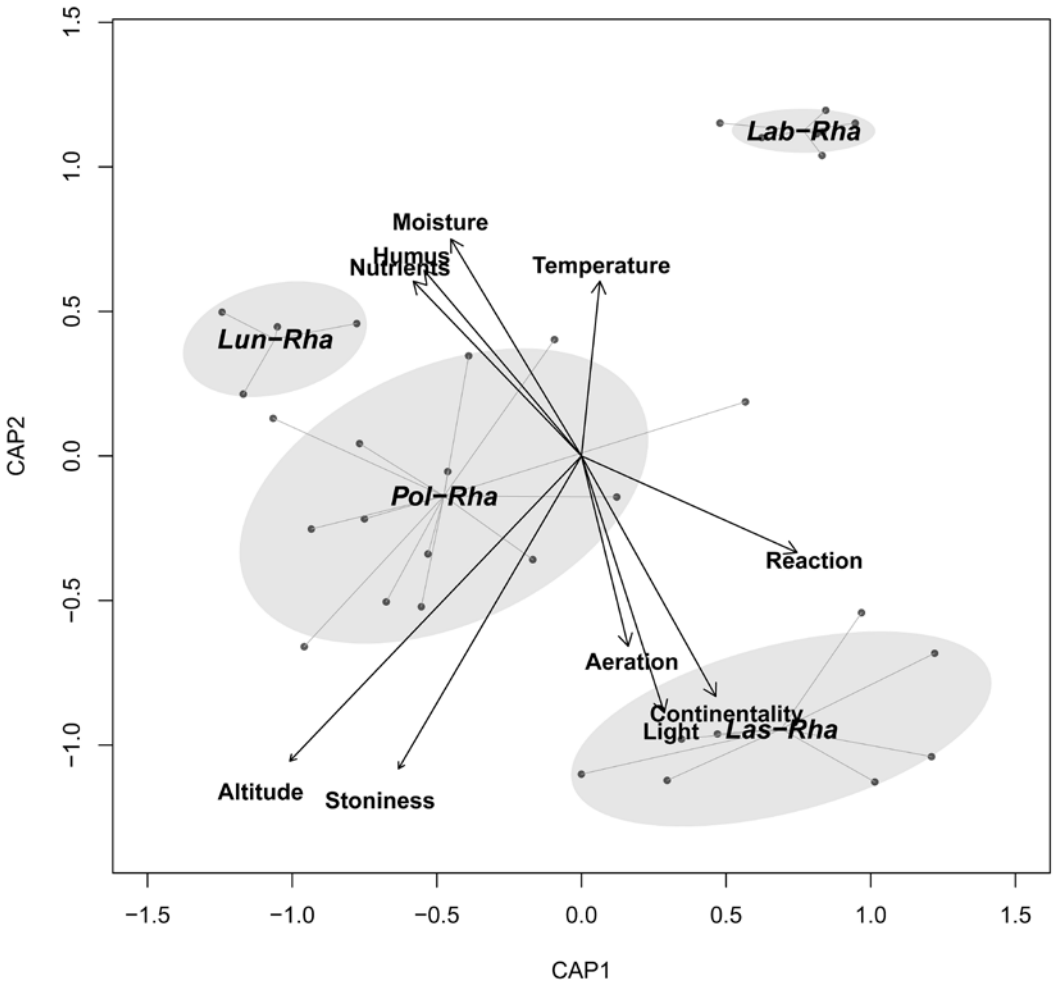

Figure 6. The ordination plot of the first and second CAP axes of vascular plant coverage in different syntaxa with dominant *Rhamnus fallax*. Arrows represent Landolt's indicator values.

Comparison of communities with dominant *Rhamnus fallax* according to Landolt's indicator values

The results of the phytoindication analysis in stands with dominant *Rhamnus fallax* that was carried out using ecological indicator values (Landolt et al. 2010) are presented in Figs 6 and 7. Calculated temperature values (T) indicate slightly more favourable temperature conditions in the stands of the association *Laburno-Rhamnetum fallacis* in comparison with the stands of the other compared syntaxa. Continentality (K) is most pronounced in the stands of the association *Laserpitio-Rhamnetum fallacis* and least pronounced in the stands of the association *Lunario-Rhamnetum fallacis*. Similarly, light conditions (L) are the most favourable in the stands of the association *Laserpitio-Rhamnetum*. Moisture (M) is highest in the stands of the associations *Lunario-Rhamnetum* and *Polysticho lonchitis-Rhamnetum*. Calculated soil reaction values (R) indicate slightly higher soil acidity in the stands of the associations *Lunario-Rhamnetum* and *Polysticho-Rhamnetum*, which is the result of accumulation of organic matter. The highest mean phytoindication values for soil reaction (R) were calculated in the stands of the association *Laserpitio-Rhamnetum*. Calculated nutrient values (N) indicate better nutrient supply on the sites

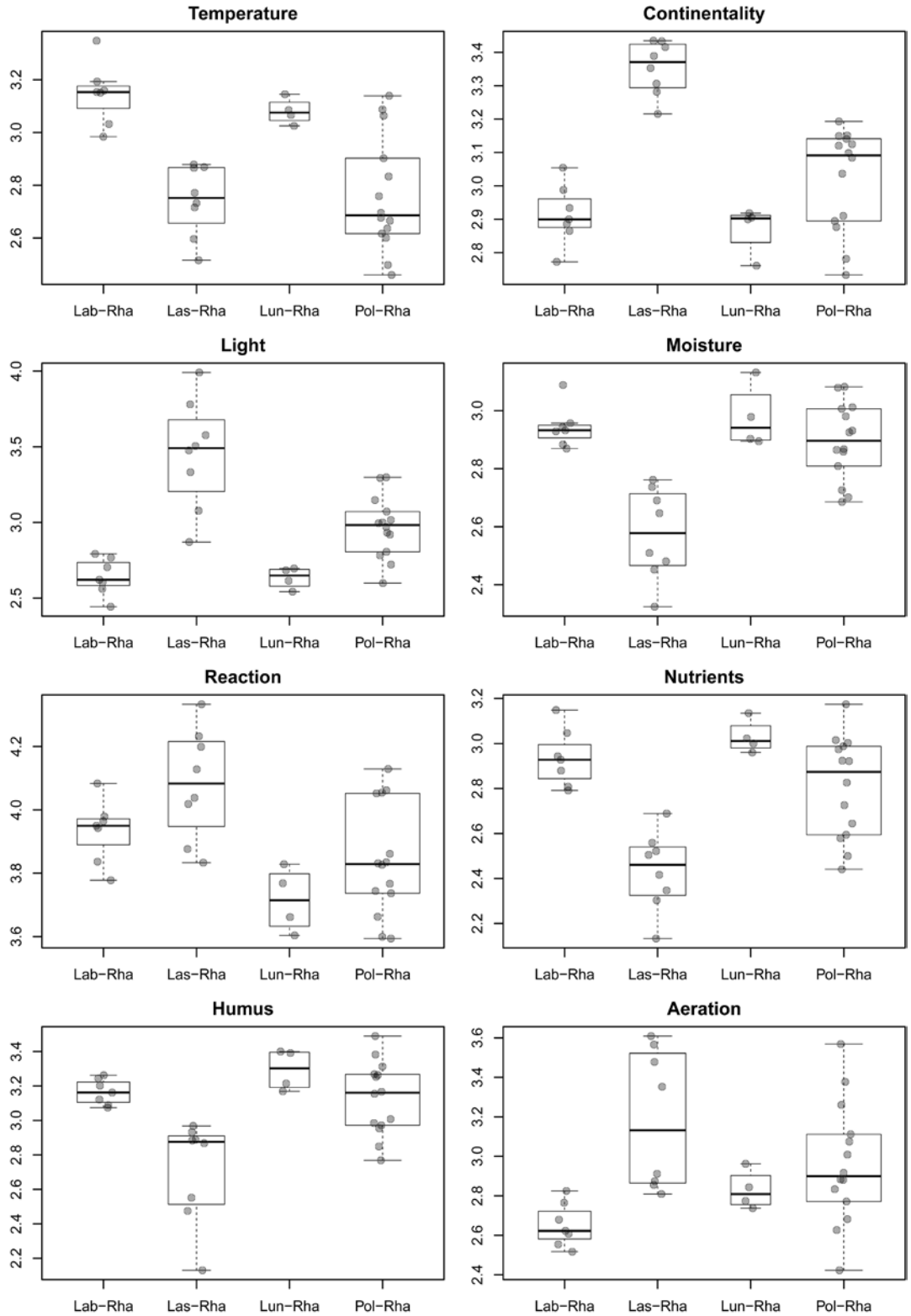

Figure 7. Comparison of ecological conditions in the communities with dominant *Rhamnus fallax*, determined with Landolt's phytoindication values.

of the associations *Lunario-Rhamnetum*, *Polysticho-Rhamnetum* and *Laburno-Rhamnetum*, while the sites of the association *Laserpitio-Rhamnetum* are the most nutrient-poor. On the sites of the associations *Lunario-Rhamnetum*, *Polysticho-Rhamnetum* and *Laburno-Rhamnetum* the humus content in soils (H) is higher and soil aeration (A) poorer than in the stands of the association *Laserpitio-Rhamnetum*.

Discussion and conclusions

Rhamnus fallax is a character species of Illyrian beech forests from the alliance *Aremonio-Fagion* and grows in the shrub layer of many beech associations from this alliance. Its modest ecological (soil) requirements allow it to thrive (with sufficient soil and air moisture) on very shallow initial soil (lithosol) from valleys to the subalpine belt. It is an important pioneer species in overgrowing established screes, rockfall, karstified ridges and forest gaps caused by windthrows. Its scrubs and fringe communities caught the attention of phytosociologists more than fifty years ago (Horvat 1925: 117 and 118, 1962). While character species of the alliance *Berberidion* and order *Prunetalia spinosae* are usually absent from these communities, Fukarek's proposal (1969a, b) to bring them together in a special alliance and order seems well-founded. His description of the new order *Rhamnetalia fallacis* and the new alliance *Lonicero-Rhamnion* is not substantiated with any tabular material and only provides a list of character species of the alliance and order. The conspectus of vegetation of Southeastern Europe (Horvat et al. 1974) does not refer to Fukarek's new order, new alliance and its associations. Based on the referenced publications (Fukarek & Stefanović 1958, Fukarek 1969a,b, 1970), it is, however, possible to implement the typification required by the existing applicable Code (Weber et al. 2000). The nomenclature type of the association *Cynancho vincetoxici-Rhamnetum fallacis* P. Fukarek & Stefanovič 1958 is relevé No. 1 in Table 9 (Fukarek & Stefanović 1958: 139), *lectotypus* hoc loco. The nomenclature type of the alliance *Lonicero-Rhamnion* P. Fukarek 1969 is association *Cynancho vincetoxici-Rhamnetum fallacis* P. Fukarek & Stefanović 1958, *lectotypus* hoc loco, and the nomenclature type of the order *Rhamnetalia fallacis* P. Fukarek 1969 is the alliance *Lonicero-Rhamnion* P. Fukarek 1969, *lectotypus* hoc loco. Scrubs with dominant *Rhamnus fallax* are classified by Trinajstić (2008) into the class *Querco-Fagetea*, which is appropriate considering their floristic composition and syndynamic affinity with beech forests. In terms of their physiognomy and the appearance of the several-metres high vegetation (rather than 10 and more metre-tall forest), their classification in the class of scrubs *Rhamno-Prunetea* would be also possible.

Scrub communities with dominant *Rhamnus fallax* in the northern part of its distribution area in the Southeastern Alps and on the northwestern edge of the Dinaric Alps are floristically very different from the scrub communities described so far where this species is in the centre of its distribution area. Their ecology, on the other hand, is very similar – they grow on very stony sites, screes, rockfall, karstified ridges and initial soils (lithosol, rendzina), mainly in the belt of montane and subalpine beech forests and are more or less long-lasting pioneer stages of succession that can be replaced, if natural conditions allow, by other scrubs (such as dwarf pine, green alder) or beech forest. In the Southeastern Alps (the Julian Alps and the Karavanke/Karawanken), the *Rhamnus fallax* scrubs on screes and rockfall take on a similar ecological and protective role to dwarf pine and green alder communities and are in places even syndynamically related to them. The factors decisive for their occurrence include gravelly, rocky bedrock, initial soil (lithosol) and annual snowslides. Stands of the newly described associations *Laserpitio latifolii-Rhamnetum fallacis* and *Polysticho lonchitis-Rhamnetum fallacis* represent natural scrub communities on the

most gravelly or rocky sites in the upper beech forest belt; whereas the first are explicitly initial, the latter already slightly resemble dwarf pine shrubs in their formation. The classification of these two syntaxa into higher units is somewhat problematic. Subalpine scrub communities of the Southeastern Alps are mainly classified into two classes: *Betulo carpaticae-Alnetea viridis* and *Roso pendulinae-Pinetea mugo* (Šilc & Čarni 2012). Character species of both classes are presented in the stands of the researched syntaxa, but except *Salix appendiculata* with low presence and cover value. For the initial association *Laserpitio latifolii-Rhamnetum fallacis,* classification into classes *Elyno-Seslerietea* or *Thlaspietea rotundifolii* would be also possible (see Table 6). But, considering the dominant species of the upper stand layer, we find that classification into a new alliance *Seslerio calcariae-Rhamnion fallacis* all. nov. hoc loco is also appropriate. The new alliance comprises scrubs with dominant *Rhamnus fallax* in the Southeastern Alps. Its nomenclature type, *holotypus,* is the association *Polysticho lonchitis-Rhamnetum fallacis*. Diagnostic species of the alliance is *Rhamnus fallax*, differential species are *Sesleria caerulea* subsp. *calcariae*, *Linum julicum*, *Pinus mugo*, *Larix decidua* and *Aconitum angustifolium.*

In the northern part of the Dinaric Alps, the species *Rhamnus fallax* plays an important role in forest regeneration after natural disasters, especially windthrows. Bedrock is also an important factor here, and the results of these events are also different, depending on whether the bedrock is dolomite or limestone. The soil on steep dolomite slopes is usually preserved despite increased erosion after flash floods. Stands of the new association *Laburno alpini-Rhamnetum fallacis* are therefore a transitional form of vegetation on windthrow areas, over decades gradually replaced by beech forest. This association is therefore classified into the alliance *Aremonio-Fagion* and order *Fagetalia sylvaticae.* Soil leaching is much more radical on karstified limestone ridges of altimontane and subalpine belt and the pioneer role of *Rhamnus fallax* is crucial in allowing accumulation of organic matter to take place in rock crevices, thus facilitating the growth of tall herbs. Stands of the new association *Lunario redivivae-Rhamnetum fallacis* are a long-term pioneer stage on beech or maple-beech sites. They are classified into the Dinaric alliance *Lonicero-Rhamnion fallacis.* Even though they may be insignificant in terms of size, stands of the newly described associations can be the key link in the primary and secondary succession in montane forests of the Southeastern Alps and the northern part of the Dinaric Alps.

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Addresses of the authors:

Dr Igor Dakskobler
Institute of Biology
Scientific Research Centre of the Slovenian Academy of Sciences and Arts
Regional unit Tolmin
Brunov drevored 13
5220 Tolmin
Slovenia
E-mail: igor.dakskobler@zrc-sazu.si

Univ.-Doz. Mag. Dr Wilfried Robert Franz
Am Birkengrund 75
9073 Klagenfurt am Wörthersee – Viktring
Austria
E-mail: wfranz@aon.at

Dr Andrej Rozman
Biotechnical Faculty of the University in Ljubljana
Department of Forestry and Renewable Forest Resources
Večna pot 83
1000 Ljubljana
Slovenia
E-mail: andrej.rozman@bf.uni-lj.si

Table 1. *Polysticho lonchitis-Rhamnetum fallacis* ass. nov.

			1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Database number of relevé		240922	240923	240924	244173	244517	243318	244172	244433	244523	244557	244842	240895	240909	240910		
	Elevation in m		1260	1260	1260	1481	1440	1370	1442	1450	1485	1580	1380	1420	1390	1290		
	Aspect		SW	SW	SW	SEE	SE	NW	NE	W	NW	NW	NE	W	SW	N		
	Slope in degrees		15	15	15	20	35	35	15	25	30	30	30	40	35	20		
	Parent material		Gr	Gr	Gr	Gr	Gr	Gr	A	Gr	Gr	Gr	Gr	D	DA	Gr		
	Soil		Li	Li	Li	Li	Li	R	Li	Li	Co	Li	Co	Li	Li	Li		
	Stoniness in %		50	40	40	80	100	30	90	90	90	100	20	40	100	70		
	Cover of shrub layer in %	E2	80	70	80	80	70	90	60	60	90	60	70	70	70	80		
	Cover of herb layer in %	E1	60	60	60	40	30	60	40	30	30	30	70	30	30	10		
	Cover of moss layer in %	E0	10	5	5	20	5	5	10	5	20	.	10	5	10	20		
	Number of species		80	63	93	40	45	37	67	54	60	34	62	29	56	47		
	Relevé area	m^2	200	100	300	100	200	100	100	200	100	100	100	50	100	100		
	Date of taking relevé		8/30/2011	8/30/2011	10/12/2011	8/5/2012	8/24/2012	5/20/2012	8/5/2012	8/22/2012	8/24/2012	8/24/2012	9/18/2012	10/4/2011	8/30/2011	8/30/2011		
	Locality		Zabreška planina	Zabreška planina	Žirovniška planina	Home - Črna gora	Pl. Za Liscem	Pl. Leskovca	Konte-Šoštar	Pl. Za Liscem	Pl. Za Liscem	Pl. Za Liscem	Olševa - Koprivna	Beli potok	Beli potok	Beli potok		
	Quadrant		9550/4	9550/4	9550/4	9749/4	9749/4	9748/3	9749/4	9749/4	9749/4	9749/4	9554/1	9549/1	9549/1	9549/1		
	Coordinate GK Y (D-48)	m	435932	435819	435779	418774	417882	398948	418695	418565	418441	418262	477466	413559	412687	412748		
	Coordinate GK X (D-48)	m	5142380	5142520	5142571	5122014	5122265	5123423	5121770	5122243	5122014	5121597	5145632	5147320	5146516	5146791		
	Diagnostic species of the association																Pr.	Fr.
ScRFRf	*Rhamnus fallax*	E2b	4	4	4	5	3	4	4	4	4	4	4	4	4	4	14	100
AF	*Rhamnus fallax*	E1	.	.	.	.	.	.	+	.	.	+	.	.	.	.	2	14
MuA	*Aconitum lycoctonum* subsp. *ranunculifolium* s. lat.	E1	+	1	+	+	+	+	2	+	+	+	+	.	.	.	11	79

Tab. 1	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.
VP	*Polystichum lonchitis*	E1	.	.	+	.	.	+	+	.	1	+	+	+	+	1	9	64
EP	*Rhododendron hirsutum*	E2a	.	.	.	.	.	.	+	r	1	.	+	+	+	+	7	50
ScR	**Differential species of the alliance *Seslerio calcariae-Rhamnion fallacis***																	
ES	*Sesleria caerulea* subsp. *calcaria*	E1	+	.	+	+	.	.	+	+	.	.	.	+	+	+	8	57
VP	*Larix decidua*	E2b	.	.	.	.	.	.	.	.	.	.	+	2	+	1	4	29
ES	*Linum julicum*	E1	.	.	.	.	.	.	+	.	.	+	.	.	.	.	2	14
EP	*Pinus mugo*	E2	.	.	.	.	.	.	+	.	.	.	.	.	+	.	2	14
MuA	*Aconitum angustifolium*	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	7
AF	***Aremonio-Fagion***																	
	Cyclamen purpurascens	E1	1	+	+	.	.	.	.	.	.	.	1	+	+	.	6	43
	Helleborus niger	E1	+	+	1	.	.	.	.	.	.	.	+	1	.	.	5	36
	Dentaria enneaphyllos	E1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	3	21
EC	*Primula vulgaris*	E1	.	+	1	.	.	.	.	.	.	.	.	.	.	.	2	14
	Anemone trifolia	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	+	2	14
	Omphalodes verna	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Aremonia agrimonoides	E1	.	.	r	.	.	.	.	.	.	.	.	.	.	.	1	7
EC	*Helleborus odorus*	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	7
	Knautia drymeia	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
FS	***Fagetalia sylvaticae***																	
	Dryopteris filix-mas	E1	2	2	2	r	+	+	.	2	2	+	2	.	1	1	12	86
	Mercurialis perennis	E1	+	+	+	+	.	.	1	.	1	1	+	+	.	+	10	71
	Daphne mezereum	E2a	+	.	+	+	.	.	+	+	+	.	+	+	+	+	10	71
	Melica nutans	E1	+	.	.	.	+	.	+	+	+	.	+	+	.	+	8	57
	Actaea spicata	E1	+	.	+	.	.	.	+	r	+	+	.	.	.	.	6	43
	Galeobdolon flavidum	E1	.	.	+	.	+	.	+	+	1	+	.	.	.	.	6	43
	Myosotis sylvatica	E1	1	2	1	+	.	.	.	.	.	.	+	.	.	.	5	36
	Mycelis muralis	E1	.	+	+	.	.	.	.	.	.	.	+	+	+	.	5	36
	Corydalis cava	E1	+	+	+	.	.	+	.	.	.	.	.	.	.	.	4	29
	Poa nemoralis	E1	+	.	+	.	.	+	.	+	.	.	.	.	.	.	4	29
	Epilobium montanum	E1	+	.	+	.	.	+	.	.	.	.	+	.	.	.	4	29
	Campanula trachelium	E1	.	+	+	.	.	.	.	+	r	.	.	.	.	.	4	29
	Paris quadrifolia	E1	.	.	+	.	.	.	.	.	+	.	.	.	+	+	4	29
	Asarum europaeum subsp. *caucasicum*	E1	+	+	1	.	.	.	.	.	.	.	.	.	.	.	3	21
	Pulmonaria officinalis	E1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	3	21

Tab. 1	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.
	Fagus sylvatica	E3	r	.	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Fagus sylvatica	E2b	+	.	+	.	.	.	.	.	.	.	+	.	.	.	3	21
	Fagus sylvatica	E2a	.	.	.	.	.	.	.	r	.	.	.	.	.	.	1	7
	Fagus sylvatica	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	+	2	14
	Lonicera alpigena	E2a	+	.	.	.	+	.	.	.	.	.	+	.	.	.	3	21
	Galium laevigatum	E1	.	.	.	.	+	.	.	+	+	.	.	.	.	.	3	21
	Brachypodium sylvaticum	E1	+	.	.	.	.	.	.	.	.	.	+	.	+	.	3	21
	Dentaria bulbifera	E1	+	.	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Salvia glutinosa	E1	.	+	.	.	.	.	.	.	.	.	.	+	.	.	2	14
	Prenanthes purpurea	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	+	2	14
	Fraxinus excelsior	E3a	r	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Lathyrus vernus subsp. *vernus*	E1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Dentaria pentaphyllos	E1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Scrophularia nodosa	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Lilium martagon	E1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	7
	Euphorbia amygdaloides	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
	Ranunculus lanuginosus	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
	Symphytum tuberosum	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
TA	***Tilio-Acerion***																	
	Acer pseudoplatanus	E3a	r	+	.	+	.	.	.	.	.	.	.	.	.	.	3	21
	Acer pseudoplatanus	E2	+	1	+	+	+	+	.	+	1	.	+	.	.	.	9	64
	Acer pseudoplatanus	E1	.	.	.	.	.	.	.	.	+	.	+	.	.	.	2	14
	Geranium robertianum	E1	1	1	+	1	+	1	.	.	.	.	.	.	.	.	6	43
	Polystichum aculeatum	E1	+	.	.	r	.	.	.	.	.	.	+	.	+	+	5	36
	Hesperis candida	E1	.	.	.	+	.	.	.	.	+	.	.	.	.	.	2	14
	Phyllitis scolopendrium	E1	.	.	.	+	.	.	.	r	.	.	.	.	.	.	2	14
	Acer platanoides	E3a	.	.	r	.	.	.	.	.	.	.	.	.	.	.	1	7
	Tephroseris pseudocrispa	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Ulmus glabra	E3a	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Aruncus dioicus	E1	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	7
QP	***Quercetalia pubescentis***																	
	Sorbus aria	E2	+	.	+	.	.	+	.	.	.	.	.	.	.	+	4	29
	Arabis turrita	E1	+	.	.	.	.	+	.	.	.	.	.	.	.	.	2	14
	Peucedanum schottii var. *petraeum*	E1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	7

Tab. 1 Number of relevé

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.
	Convallaria majalis	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
QF	***Querco-Fagetea***																	
	Lonicera xylosteum	E2	1	+	2	.	+	.	.	.	.	.	.	.	.	.	4	29
	Hepatica nobilis	E1	+	+	1	.	.	.	.	.	.	.	1	.	.	.	4	29
	Anemone nemorosa	E1	+	+	.	.	.	+	.	.	.	.	.	.	.	.	3	21
	Corylus avellana	E2b	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Clematis vitalba	E2	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Galium sylvaticum	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
BcAv	***Bertulo carpaticae-Alnetea viridis***																	
	Salix appendiculata	E2	.	.	+	.	r	4	.	+	1	+	+	.	+	.	8	57
	Salix glabra	E2	1	.	.	.	+	.	.	+	+	.	.	.	.	+	5	36
	Ribes alpinum	E2a	+	.	+	.	r	.	.	.	1	.	+	.	.	.	5	36
	Salix waldsteiniana	E2a	.	.	.	.	.	.	.	.	+	+	.	.	.	.	2	14
	Sorbus mougeotii	E3a	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Sorbus mougeotii	E2b	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Alnus viridis	E2b	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	7
MuA	***Mulgedio-Aconitetea***																	
	Heracleum pollinianum (incl. *H. montanum*)	E1	.	.	+	1	+	1	+	+	+	+	.	.	.	.	8	57
	Senecio ovatus	E1	1	+	1	.	+	1	+	.	.	.	+	.	.	.	7	50
	Polygonatum verticillatum	E1	+	.	+	.	.	+	1	+	.	+	1	.	.	.	7	50
	Aconitum degenii subsp. p*aniculatum*	E1	1	+	+	+	.	.	.	.	+	.	+	.	.	.	6	43
	Hypericum maculatum	E1	+	+	1	.	.	+	.	.	+	.	1	.	.	.	6	43
	Myrrhis odorata	E1	1	1	1	.	+	.	.	.	+	+	.	.	.	.	6	43
	Agropyron caninum	E1	1	1	.	1	+	.	1	.	.	.	.	.	.	.	5	36
	Thalictrum aquilegiifolium	E1	+	+	.	.	.	.	.	+	.	+	.	.	.	.	4	29
	Silene dioica	E1	.	+	+	+	.	.	.	.	.	.	+	.	.	.	4	29
	Ranunculus platanifolius	E1	.	+	.	.	.	.	.	.	r	1	+	.	.	.	4	29
	Geranium sylvaticum	E1	.	.	.	.	.	.	1	.	+	.	+	.	.	+	4	29
	Lamium maculatum	E1	1	2	1	.	.	.	.	.	.	.	.	.	.	.	3	21
	Veratrum album	E1	.	.	.	.	.	1	1	.	.	.	+	.	.	.	3	21
	Senecio cacaliaster	E1	.	.	.	.	.	.	.	+	1	+	.	.	.	.	3	21
	Athyrium filix-femina	E1	.	.	.	.	.	.	.	r	.	.	+	.	+	.	3	21
	Scrophularia scopolii	E1	.	.	r	.	.	.	.	.	r	.	.	.	.	.	2	14
	Pleurospermum austriacum	E1	.	.	.	.	.	+	r	.	.	.	.	.	.	.	2	14

Tab. 1	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.
	Chaerophyllum hirsutum	E1	.	.	.	.	.	+	.	.	.	.	1	.	.	.	2	14
	Saxifraga rotundifolia	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	1	2	14
	Viola biflora	E1	.	.	.	.	.	.	.	.	.	.	.	.	1	+	2	14
	Streptopus amplexifolius	E1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Allium victorialis	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Carduus personata	E1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	7
	Poa hybrida	E1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	7
	Primula elatior	E1	.	.	.	.	.	2	.	.	.	.	.	.	.	.	1	7
	Rumex arifolius	E1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	7
	Rumex alpinus	E1	.	.	.	.	.	.	.	r	.	.	.	.	.	.	1	7
	Doronicum austriacum	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	7
	Crepis pyrenaica	E1	.	.	.	.	.	.	.	.	r	.	.	.	.	.	1	7
	Athyrium distentifolium	E1	.	.	.	.	.	.	.	.	r	.	.	.	.	.	1	7
	Aconitum tauricum	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
	Crepis paludosa	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7
EA	***Epilobietea angustifolii***																	
	Rubus idaeus	E2a	1	1	+	.	1	2	.	1	1	.	2	+	.	+	10	71
	Urtica dioica	E1	1	1	1	1	1	1	.	1	1	.	.	.	.	.	8	57
	Sambucus racemosa	E2	.	.	r	+	+	.	+	.	.	.	.	.	+	+	6	43
	Fragaria vesca	E1	+	.	+	.	.	.	.	.	.	.	+	.	.	+	4	29
	Solanum dulcamara	E1	+	.	+	+	.	.	.	.	.	.	.	.	.	.	3	21
	Eupatorium cannabinum	E1	+	+	.	.	.	.	.	.	.	.	.	.	.	.	2	14
	Salix caprea	E3a	r	.	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Cuscuta europaea	E1	.	+	.	1	.	.	.	.	.	.	.	.	.	.	2	14
	Geum urbanum	E1	.	+	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Bromus benekenii	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Tussilago farfara	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	7
	Cirsium palustre	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	7
EP	***Erico-Pinetea***																	
	Cirsium erisithales	E1	+	+	+	.	+	+	2	+	.	+	+	.	.	.	9	64
	Rubus saxatilis	E1	.	.	+	.	+	.	1	+	1	.	1	.	.	.	6	43
	Buphthalmum salicifolium	E1	+	+	.	.	.	.	1	r	.	.	.	.	+	.	5	36
	Juniperus sibirica	E2a	.	.	.	.	+	.	+	+	1	+	.	.	.	.	5	36
	Calamagrostis varia	E1	.	.	.	.	.	.	+	.	.	.	+	1	+	+	5	36

Tab. 1 Number of relevé

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.
	Allium ericetorum	E1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	3	21
	Peucedanum austriacum	E1	1	.	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Rhodothamnus chamaecistus	E1	.	.	.	.	.	.	+	.	.	.	.	.	+	.	2	14
	Erica carnea	E1	.	.	.	.	.	.	.	.	.	.	.	1	.	+	2	14
	Aquilegia nigricans	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Genista radiata	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	7
	Carex ornithopoda	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	Asperula aristata	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
VP	***Vaccinio-Piceetea***																	
	Picea abies	E3a	.	.	+	.	.	.	r	.	.	.	.	.	.	.	2	14
	Picea abies	E2b	.	.	.	.	.	.	.	+	+	.	+	.	+	.	4	29
	Picea abies	E2a	+	.	+	.	.	.	.	.	+	.	.	r	+	+	6	43
	Picea abies	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	7
	Rosa pendulina	E2a	.	.	.	.	+	.	+	+	+	.	.	.	+	.	5	36
	Gentiana asclepiadea	E1	.	.	.	.	.	.	1	+	+	+	1	.	.	.	5	36
	Solidago virgaurea	E1	.	+	.	.	.	.	1	+	1	.	.	.	.	.	4	29
	Valeriana tripteris	E1	.	.	.	.	.	.	r	+	.	.	+	+	.	.	4	29
	Homogyne sylvestris	E1	.	.	.	.	.	.	r	.	+	.	1	.	.	+	4	29
	Clematis alpina	E1	.	.	+	.	+	.	.	.	.	.	.	.	.	+	3	21
	Larix decidua	E3a	.	.	.	.	.	.	r	.	.	.	.	.	+	+	3	21
	Larix decidua	E2a	.	.	.	.	.	.	.	.	.	.	+	.	+	+	3	21
	Larix decidua	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	7
	Lonicera caerulea	E2a	.	.	.	.	r	.	+	.	.	.	.	.	.	.	2	14
	Oxalis acetosella	E1	.	.	.	.	.	2	.	.	.	.	.	.	.	+	2	14
	Veronica urticifolia	E1	.	.	.	.	.	.	.	+	.	.	+	.	.	.	2	14
	Phegopteris connectilis	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	1	2	14
	Aposeris foetida	E1	.	.	.	.	.	.	.	.	.	.	+	+	.	.	2	14
	Lonicera nigra	E2a	.	.	.	.	.	.	.	.	.	.	+	.	.	+	2	14
	Abies alba	E2a	.	.	.	.	r	.	.	.	.	.	.	.	.	.	1	7
	Luzula luzuloides	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	7
	Dryopteris dilatata	E1	.	.	.	.	.	.	.	.	r	.	.	.	.	.	1	7
	Gymnocarpium dryopteris	E1	.	.	.	.	.	.	.	.	r	.	.	.	.	.	1	7
	Maianthemum bifolium	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	7

Tab. 1	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.
RP	***Rhamno-Prunetea***																	
	Rosa canina	E2	r	.	+	+	.	.	.	.	.	.	.	.	.	.	3	21
	Berberis vulgaris	E2a	r	.	1	.	.	.	.	.	.	.	.	+	.	.	3	21
ES	***Elyno-Seslerietea***																	
	Betonica alopecuros	E1	+	.	+	.	.	+	.	+	+	+	.	+	+	.	8	57
	Festuca calva	E1	+	+	+	+	1	.	.	.	.	.	.	.	.	.	5	36
	Thymus praecox subsp. *polytrichus*	E1	.	+	.	+	+	.	.	.	.	.	.	+	.	.	4	29
	Scabiosa lucida subsp. *stricta*	E1	.	+	+	.	.	.	+	.	.	.	+	.	.	.	4	29
	Carduus crassifolius	E1	.	.	.	.	+	.	+	.	.	.	.	.	+	.	3	21
	Laserpitium peucedanoides	E1	+	.	.	.	.	.	.	.	.	.	.	.	+	.	2	14
	Myosotis alpestris	E1	.	.	.	.	+	.	.	+	.	.	.	.	.	.	2	14
	Erigeron glabratus	E1	.	.	.	.	.	.	r	+	.	.	.	.	.	.	2	14
	Pulsatilla alpina subsp. *austroalpina*	E1	.	.	.	.	.	.	r	.	.	+	.	.	.	.	2	14
	Carex ferruginea	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	+	2	14
	Thesium alpinum	E1	.	.	.	.	.	.	.	.	r	.	.	.	r	.	2	14
	Hieracium villosum	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	7
	Achillea clavenae	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	7
	Aster bellidiastrum	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	7
	Campanula witasekiana	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	7
	Gentiana lutea subsp. *symphyandra*	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	7
	Leontopodium alpinum	E1	.	.	.	.	.	.	r	.	.	.	.	.	.	.	1	7
	Soldanella alpina	E1	.	.	.	.	.	.	r	.	.	.	.	.	.	.	1	7
	Juncus monanthos	E1	.	.	.	.	.	.	.	.	.	r	.	.	.	.	1	7
	Carduus defloratus	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	Heliosperma alpestre	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
TG	***Trifolio-Geranietea***																	
	Origanum vulgare	E1	+	1	1	+	r	.	.	.	.	.	.	.	.	.	5	36
	Calamintha einseleana	E1	+	+	1	.	.	.	.	.	.	.	.	.	.	.	3	21
	Digitalis grandiflora	E1	+	.	.	.	.	.	.	+	+	.	.	.	.	.	3	21
	Iris graminea	E1	.	+	+	.	r	.	.	.	.	.	.	.	.	.	3	21
	Vincetoxicum hirundinaria	E1	.	+	1	.	.	.	.	+	.	.	.	.	.	.	3	21
	Libanotis sibirica subsp. *montana*	E1	+	.	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Clinopodium vulgare	E1	+	.	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Polygonatum odoratum	E1	.	+	+	.	.	.	.	.	.	.	.	.	.	.	2	14

Tab. 1 Number of relevé

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.
	Thalictrum minus	E1	.	+	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Verbascum lanatum	E1	.	+	.	.	+	.	.	.	.	.	.	.	.	.	2	14
	Valeriana wallrothii	E1	.	.	+	.	+	.	.	.	.	.	.	.	.	.	2	14
	Laserpitium siler	E1	.	.	.	+	.	.	+	.	.	.	.	.	.	.	2	14
	Silene nutans	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Achillea distans	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Arabis pauciflora	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Stachys recta	E1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	7
FB	***Festuco-Brometea***																	
	Carlina acaulis	E1	+	.	.	.	.	.	+	.	.	.	.	.	+	.	3	21
	Koeleria pyramidata	E1	.	.	.	.	r	.	+	r	.	.	.	.	.	.	3	21
	Galium lucidum	E1	+	+	.	.	.	.	.	.	.	.	.	.	.	.	2	14
	Centaurea triumfettii	E1	+	.	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Gymnadenia conopsea	E1	.	.	.	.	.	.	r	.	.	.	.	.	.	.	1	7
	Gentianella ciliata	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	Linum catharticum	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
PaT	***Poo alpinae-Trisetalia***																	
	Poa alpina	E1	+	+	.	+	.	.	+	+	.	.	.	.	.	.	5	36
	Crocus albiflorus	E1	+	+	1	.	.	.	.	.	.	.	.	.	.	.	3	21
MA	***Molinio-Arrhenatheretea***																	
	Galium album	E1	+	1	.	+	+	.	.	.	.	.	.	.	.	.	4	29
	Angelica sylvestris	E1	.	.	.	.	.	1	+	.	+	+	.	.	.	.	4	29
	Vicia sepium	E1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Vicia cracca	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Deschampsia cespitosa	E1	.	r	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Lathyrus pratensis	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Taraxacum officinale	E1	.	.	r	.	.	.	.	.	.	.	.	.	.	.	1	7
	Pimpinella major	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
	Dactylis glomerata s.str.	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	7
SCf	***Scheuchzerio-Caricetea fuscae***																	
	Parnassia palustris	E1	.	.	.	.	.	.	+	.	.	.	.	.	.	+	2	14
TR	***Thlaspietea rotundifolii***																	
	Adenostyles glabra	E1	+	+	.	.	+	1	1	.	1	1	+	.	1	.	9	64
	Festuca nitida	E1	.	.	.	.	.	.	+	+	1	1	+	.	+	+	7	50

Tab. 1	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.
	Gymnocarpium robertianum	E1	.	.	+	.	.	+	.	.	.	.	1	1	2	1	6	43
	Dryopteris villarii	E1	.	.	.	.	.	+	1	+	+	1	.	.	+	.	6	43
	Rhodiola rosea	E1	.	.	.	.	+	.	1	1	2	1	.	.	.	.	5	36
	Rumex scutatus	E1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	3	21
	Campanula cespitosa	E1	r	.	.	.	.	.	.	.	.	.	.	.	+	.	2	14
	Trisetum argenteum	E1	+	.	.	.	.	.	.	.	.	.	.	.	1	.	2	14
	Petasites paradoxus	E1	.	+	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Viola pyrenaica	E1	.	+	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Ligusticum seguieri	E1	.	.	.	+	.	.	1	.	.	.	.	.	.	.	2	14
	Arabis alpina	E1	.	.	.	+	.	.	.	.	+	.	.	.	.	.	2	14
	Valeriana montana	E1	.	.	.	.	.	.	.	.	.	1	.	1	.	.	2	14
	Campanula cochleariifolia	E1	.	.	.	.	.	.	.	.	.	+	.	.	+	.	2	14
	Taraxacum laevigatum agg.	E1	r	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Scrophularia juratensis	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	7
	Leontodon hispidus subsp. *hyoseroides*	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	7
	Biscutella laevigata	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	Hieracium porrifolium	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	Silene vulgaris subsp. *glareosa*	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	Festuca laxa	E1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	7
	Hieracium bifidum	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
	Saxifraga caesia	E1	.	.	.	.	.	.	.	.	.	.	.	.	r	.	1	7
	Astrantia carniolica	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	7
AT	***Asplenietea trichomanis***																	
	Paederota lutea	E1	.	.	.	.	.	.	+	+	.	+	.	.	+	+	5	36
	Sedum album	E1	+	+	1	1	.	.	.	.	.	.	.	.	.	.	4	29
	Asplenium viride	E1	.	.	.	.	.	.	+	.	.	.	.	+	1	1	4	29
	Asplenium trichomanes	E1	.	.	.	.	.	.	.	.	+	+	.	.	+	+	4	29
	Sedum hispanicum	E1	.	.	.	+	.	.	.	1	+	.	.	.	.	.	3	21
	Kernera saxatilis	E1	.	.	.	.	.	.	+	.	.	.	.	+	+	.	3	21
	Sedum maximum	E1	.	.	.	+	1	.	.	.	.	.	.	.	.	.	2	14
	Silene hayekiana	E1	.	.	.	r	r	.	.	.	.	.	.	.	.	.	2	14
	Valeriana saxatilis	E1	.	.	.	.	.	.	r	.	.	.	.	.	+	.	2	14
	Moehringia muscosa	E1	.	.	.	.	.	.	.	+	.	.	.	.	+	.	2	14
	Primula auricula	E1	.	.	r	.	.	.	.	.	.	.	.	.	.	.	1	7

Tab. 1	Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Pr.	Fr.
	Festuca stenantha	E1	.	.	.	r	.	.	.	.	.	.	.	.	.	.	1	7
	Cystopteris fragilis	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	7
	Saxifraga hostii	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	7
	Carex brachystachys	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	7
	Asplenium ruta-muraria	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	7
O	**Other species**																	
	Sorbus aucuparia	E3a	r	.	+	.	.	.	.	.	.	.	.	.	.	.	2	14
	Sorbus aucuparia	E2b	.	.	+	.	.	.	.	+	.	.	.	.	.	.	2	14
	Sorbus aucuparia	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	7
	Juniperus communis	E2a	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	7
ML	**Mosses and lichens**																	
	Pseudoleskeella catenulata	E0	1	+	.	1	1	.	+	.	1	1	+	.	.	.	8	57
	Tortella tortuosa	E0	.	.	.	+	+	.	1	+	1	.	+	.	1	1	8	57
	Ctenidium molluscum	E0	.	.	.	.	.	.	1	+	1	+	+	.	2	2	7	50
	Schistidium apocarpum	E0	.	.	.	.	+	.	.	+	+	.	.	.	.	.	3	21
	Homalothecium lutescens	E0	+	.	.	.	.	.	.	+	.	.	.	.	.	.	2	14
	Rhytidiadelphus triquetrus	E0	.	.	.	.	.	.	.	+	.	.	+	.	.	.	2	14
	Isothecium alopecuroides	E0	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	7
	Homalothecium philippeanum	E0	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	7
	Eurhynchium striatum	E0	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	7
	Polytrichum formosum	E0	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	7
	Dicranum scoparium	E0	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	7
	Hylocomium splendens	E0	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	7
	Peltigera leucophlebia	E0	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	7

A – Limestone
D – Dolomite
Gr – Gravel
Li – Lithosols
R – Rendzina
Ko – Colluvial-deluvial soil

Table 2. *Laserpitio latifolii-Rhamnetum fallacis* ass. nov.

	Number of relevé		1	2	3	4	5	6	7	8		
	Database number of relevé		243312	243315	243316	240925	246830	246829	246827	246828		
	Elevation in m		1255	1275	1280	1230	1395	1280	1322	1307		
	Aspect		SW	SW	SW	SSE	W	N	N	N		
	Slope in degrees		30	30	30	20	30	20	25	20		
	Parent material		Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr		
	Soil		Li	Li	Li	Li	Li	Li	Li	Li		
	Stoniness in %		80	80	80	100	100	100	100	100		
	Cover of shrub layer in %	E2	70	60	70	60	70	70	70	70		
	Cover of herb layer in %	E1	30	40	60	30	80	80	60	60		
	Cover of moss layer in %	E0	5	5	.	.	.	.	.	.		
	Number of species		51	70	85	66	27	20	22	22		
	Relevé area	m^2	100	100	100	200	400	200	200	200		
	Date of taking relevé		5/20/2012	5/20/2012	5/20/2012	8/30/2011	6/19/2009	10/1/2011	10/1/2011	9/28/2011		
	Locality		Pl. Leskovca	Pl. Leskovca	Pl. Leskovca	Monštranca (Stol)	Klein Obir - A	Bärental - A	Bärental - A	Bärental - A		
	Quadrant		9748/1	9748/1	9748/3	9550/4	9452/4	9550/4	9550/4	9550/4		
	Coordinate GK Y (D-48)	m	398456	398631	398675	435243	460165	435694	435665	435694		
	Coordinate GK X (D-48)	m	5123799	5123713	5123656	5142874	5152114	5144977	5144980	5144977		
	Author of relevé		ID	ID	ID	ID	WF	WF	WF	WF		
	Diagnostic species of the association										Pr.	Fr.
ScRf	*Rhamnus fallax*	E2b	4	4	4	3	2	2	4	4	8	100
ScRf	*Rhamnus fallax*	E2a	.	+	.	.	.	.	.	.	1	13
ScRf	*Rhamnus fallax*	E1	.	.	+	.	.	.	.	.	1	13
ES	*Sesleria caerulea* subsp. *calcaria*	E1	2	1	2	+	2	1	.	.	6	75
TG	*Laserpitium latifolium*	E1	+	+	+	.	.	+	r	+	6	75
CA	*Linum julicum*	E1	+	1	1	.	.	1	+	.	5	63
TR	*Rumex scutatus*	E1	.	+	+	1	+	1	.	.	5	63
	Diagnostic species of lower units											
BcAv	*Salix appendiculata*	E2b	1	1	1	+	.	.	.	.	4	50
TR	*Scrophularia juratensis*	E1	.	+	+	+	.	.	.	.	3	38
QP	*Primula veris* subsp. *columnae*	E1	1	+	1	.	.	.	.	.	3	38
TG	*Lilium carniolicum*	E1	+	+	+	.	.	.	.	.	3	38
QP	*Convallaria majalis*	E1	.	.	.	.	5	1	2	1	4	50
	Differential species of the alliance *Seslerio calcariae-Rhamnion fallacis*											
EP	*Pinus mugo*	E2b	.	.	.	1	1	.	1	+	4	50
MuA	*Aconitum angustifolium*	E1	1	1	1	.	.	.	.	.	3	38
AF	***Aremonio-Fagion***											
	Cyclamen purpurascens	E1	+	+	+	1	.	.	3	3	6	75
	Helleborus niger	E1	.	.	.	.	+	.	1	1	3	38
	Anemone trifolia	E1	+	.	+	.	.	.	.	.	2	25
	Knautia drymeia	E1	.	.	.	+	.	.	.	.	1	13

Tab. 2 Number of relevé		1	2	3	4	5	6	7	8	Pr.	Fr.
TA ***Tilio-Acerion***											
Acer pseudoplatanus	E3a	.	+	.	.	.	.	.	.	1	13
Acer pseudoplatanus	E2b	.	.	r	.	.	.	.	r	2	25
Acer pseudoplatanus	E1	.	+	+	.	.	.	.	r	3	38
Geranium robertianum	E1	.	.	.	+	.	.	.	.	1	13
Hesperis candida	E1	.	.	+	.	.	.	.	.	1	13
FS ***Fagetalia sylvaticae***											
Mercurialis perennis	E1	.	+	.	.	.	.	+	+	3	38
Daphne mezereum	E2a	+	.	+	.	.	.	.	.	2	25
Lilium martagon	E1	+	.	+	.	.	.	.	.	2	25
Galeobdolon flavidum	E1	.	+	.	1	.	.	.	.	2	25
Laburnum alpinum	E2b	.	1	1	.	.	.	.	.	2	25
Laburnum alpinum	E1	.	+	.	.	.	.	.	.	1	13
Myosotis sylvatica	E1	.	+	+	.	.	.	.	.	2	25
Campanula trachelium	E1	.	.	+	.	.	.	.	.	1	13
Euphorbia amygdaloides	E1	.	.	.	+	.	.	.	.	1	13
Fagus sylvatica	E1	.	.	.	+	.	.	.	.	1	13
Fraxinus excelsior	E3a	.	.	+	.	.	.	.	.	1	13
Heracleum sphondylium	E1	.	.	.	.	.	+	.	.	1	13
Lathyrus vernus	E1	.	.	+	.	.	.	.	.	1	13
Lathyrus vernus subsp. *flaccidus*	E1	.	.	+	.	.	.	.	.	1	13
Melica nutans	E1	.	.	.	.	.	.	.	+	1	13
Mycelis muralis	E1	.	.	.	+	.	.	.	.	1	13
Paris quadrifolia	E1	.	.	+	.	.	.	.	.	1	13
Dryopteris filix-mas	E1	.	.	.	+	.	.	.	.	1	13
QP ***Quercetalia pubescentis***											
Sorbus aria	E2a	.	+	.	+	+	.	.	r	4	50
Fraxinus ornus	E2a	.	.	.	r	.	.	.	.	1	13
Ostrya carpinifolia	E2b	r	.	.	.	.	.	.	.	1	13
QF ***Querco-Fagetea***											
Listera ovata	E1	.	+	+	.	.	.	.	.	2	25
Carex digitata	E1	.	.	.	.	+	r	.	.	2	25
Corylus avellana	E2b	1	.	.	.	.	.	.	.	1	13
Corylus avellana	E1	+	.	.	.	.	.	.	.	1	13
Clematis vitalba	E2a	.	.	.	+	.	.	.	.	1	13
Lonicera xylosteum	E2a	.	.	.	+	.	.	.	.	1	13
EP ***Erico-Pinetea***											
Buphthalmum salicifolium	E1	1	1	1	1	2	+	1	+	8	100
Calamagrostis varia	E1	+	1	+	1	.	1	2	1	7	88
Cirsium erisithales	E1	.	+	.	+	.	+	1	2	5	63
Carex ornithopoda	E1	+	.	1	+	.	.	.	.	3	38
Allium ericetorum	E1	.	.	.	+	.	4	.	1	3	38
Peucedanum austriacum	E1	.	.	.	+	.	.	1	1	3	38
Aquilegia nigricans	E1	.	.	.	.	1	.	.	1	2	25
Rhododendron hirsutum	E2a	.	.	+	.	.	.	.	.	1	13
Cotoneaster tomentosus	E2a	.	.	.	+	.	.	.	.	1	13
Epipactis atrorubens	E1	.	.	.	+	.	.	.	.	1	13
Amelanchier ovalis	E2b	.	.	.	.	1	.	.	.	1	13
Amelanchier ovalis	E1	.	.	.	.	1	.	.	.	1	13
Polygala chamaebuxus	E1	.	.	.	.	1	.	.	.	1	13
Erica carnea	E1	.	.	.	.	.	r	.	.	1	13
Rubus saxatilis	E1	.	.	.	.	.	.	.	+	1	13

Tab. 2 Number of relevé		1	2	3	4	5	6	7	8	Pr.	Fr.
VP ***Vaccinio-Piceetea***											
Valeriana tripteris	E1	.	.	+	.	.	1	1	3	4	50
Picea abies	E3a	.	+	.	+	.	.	.	.	2	25
Picea abies	E2b	+	.	.	.	.	.	.	.	1	13
Picea abies	E2a	.	.	.	+	.	.	.	.	1	13
Picea abies	E1	.	.	+	.	.	.	.	.	1	13
Solidago virgaurea	E1	.	.	.	+	.	.	.	+	2	25
Clematis alpina	E1	.	.	.	+	.	.	.	.	1	13
Veronica urticifolia	E1	.	.	+	.	.	.	.	.	1	13
Rosa pendulina	E2a	.	.	.	.	+	.	.	.	1	13
BcAv ***Betulo carpaticae-Alnetea viridis***											
Salix glabra	E2a	.	.	.	+	2	.	.	.	2	25
MuA ***Mulgedio-Aconitetea***											
Aconitum lycoctonum subsp. *ranunculifolium* s. lat.	E1	.	+	.	.	.	.	1	1	3	38
Heracleum pollinianum (incl. *H. montanum*)	E1	.	+	+	1	.	.	.	.	3	38
Thalictrum aquilegiifolium	E1	.	+	+	.	.	.	+	.	3	38
Senecio ovatus	E1	.	1	1	.	.	.	.	.	2	25
Pleurospermum austriacum	E1	.	+	+	.	.	.	.	.	2	25
Polygonatum verticillatum	E1	.	+	+	.	.	.	.	.	2	25
Viola biflora	E1	.	.	+	.	.	.	+	.	2	25
Allium victorialis	E1	.	r	.	.	.	.	.	.	1	13
Lathyrus occidentalis var. *montanus*	E1	.	.	+	.	.	.	.	.	1	13
Primula elatior	E1	.	.	+	.	.	.	.	.	1	13
Rumex arifolius	E1	.	.	+	.	.	.	.	.	1	13
Phyteuma ovatum	E1	.	.	.	.	.	.	.	r	1	13
Ca ***Caricion austroalpinae***											
Festuca calva	E1	2	2	2	.	.	.	.	.	3	38
Centaurea haynaldi subsp. *julica*	E1	+	1	+	.	.	.	.	.	3	38
Laserpitium peucedanoides	E1	.	.	.	.	+	.	.	.	1	13
Ranunculus hybridus	E1	.	.	.	r	+	.	.	.	2	25
Carduus crassifolius	E1	+	.	.	.	.	.	.	.	1	13
ES ***Elyno-Seslerietea***											
Betonica alopecuros	E1	1	1	.	+	.	.	1	+	5	63
Ranunculus carinthiacus	E1	+	1	1	.	.	.	.	.	3	38
Acinos alpinus	E1	+	+	+	.	.	.	.	.	3	38
Leucanthemum adustum	E1	+	+	+	.	.	.	.	.	3	38
Pimpinella alpina	E1	+	+	+	.	.	.	.	.	3	38
Carex sempervirens	E1	+	+	.	.	.	.	.	.	2	25
Hieracium villosum	E1	+	+	.	.	.	.	.	.	2	25
Potentilla crantzii	E1	+	.	+	.	.	.	.	.	2	25
Achillea clavenae	E1	+	.	.	.	.	1	.	.	2	25
Arabis vochinensis	E1	.	+	+	.	.	.	.	.	2	25
Polygala alpestris	E1	.	+	+	.	.	.	.	.	2	25
Thymus praecox subsp. *polytrichus*	E1	.	.	+	+	.	.	.	.	2	25
Globularia cordifolia	E1	.	.	.	+	1	.	.	.	2	25
Carex ferruginea	E1	.	.	.	.	2	.	+	.	2	25
Helianthemum grandiflorum	E1	+	.	.	.	.	.	.	.	1	13
Androsace villosa	E1	+	.	.	.	.	.	.	.	1	13
Anemone narcissiflora	E1	+	.	.	.	.	.	.	.	1	13
Cerastium strictum	E1	.	+	.	.	.	.	.	.	1	13
Gentiana verna	E1	.	.	+	.	.	.	.	.	1	13
Rhinanthus aristatus	E1	.	.	.	1	.	.	.	.	1	13
Senecio abrotanifolius	E1	.	.	.	.	+	.	.	.	1	13

Tab. 2 Number of relevé		1	2	3	4	5	6	7	8	Pr.	Fr.
TG ***Trifolio-Geranietea***											
Polygonatum odoratum	E1	.	+	+	.	1	.	1	.	4	50
Libanotis sibirica subsp. *montana*	E1	+	+	.	+	.	.	.	.	3	38
Laserpitium siler	E1	+	.	.	+	1	.	.	.	3	38
Silene nutans	E1	+	+	.	.	.	.	.	.	2	25
Stachys recta	E1	.	1	.	1	.	.	.	.	2	25
Valeriana wallrothii	E1	.	+	r	.	.	.	.	.	2	25
Verbascum lanatum	E1	.	+	+	.	.	.	.	.	2	25
Origanum vulgare	E1	.	.	+	+	.	.	.	.	2	25
Achillea distans	E1	.	.	+	.	.	.	.	.	1	13
Calamintha einseleana	E1	.	.	.	+	.	.	.	.	1	13
RP ***Rhamno-Prunetea***											
Rosa canina	E2a	+	+	.	.	.	.	.	.	2	25
TR ***Thlaspietea rotundifolii***											
Silene vulgaris subsp. *glareosa*	E1	.	+	.	1	.	.	r	.	3	38
Gypsophila repens	E1	1	+	.	.	.	.	.	.	2	25
Adenostyles glabra	E1	+	+	.	.	.	.	.	.	2	25
Dryopteris villarii	E1	1	.	+	.	.	.	.	.	2	25
Biscutella laevigata	E1	1	.	.	1	.	.	.	.	2	25
Gymnocarpium robertianum	E1	1	.	.	+	.	.	.	.	2	25
Sedum sexangulare	E1	.	+	1	.	.	.	.	.	2	25
Valeriana montana	E1	.	.	.	1	+	.	.	.	2	25
Petasites paradoxus	E1	.	.	.	+	2	.	.	.	2	25
Athamanta cretensis	E1	.	.	.	+	+	.	.	.	2	25
Campanula cespitosa	E1	.	.	.	1	.	+	.	.	2	25
Dianthus sternbergii	E1	.	.	.	.	+	1	.	.	2	25
Ligusticum segueri	E1	1	.	.	.	.	.	.	.	1	13
Trisetum argenteum	E1	.	.	.	1	.	.	.	.	1	13
Festuca laxa	E1	.	.	.	+	.	.	.	.	1	13
Hieracium porrifolium	E1	.	.	.	+	.	.	.	.	1	13
Viola pyrenaica	E1	.	.	.	+	.	.	.	.	1	13
Rhodiola rosea	E1	.	.	.	+	.	.	.	.	1	13
Trisetum distichophyllum	E1	.	.	.	.	.	3	.	.	1	13
FB ***Festuco-Brometea***											
Carlina acaulis	E1	.	+	+	.	.	.	+	.	3	38
Hippocrepis comosa	E1	.	+	.	+	+	.	.	.	3	38
Galium lucidum	E1	.	.	.	1	.	1	1	.	3	38
Gymnadenia conopsea	E1	+	+	.	.	.	.	.	.	2	25
Dianthus monspessulanus	E1	.	+	+	.	.	.	.	.	2	25
Euphorbia cyparissias	E1	.	+	+	.	.	.	.	.	2	25
Allium senescens	E1	+	.	.	.	.	.	.	.	1	13
Polygala amarella	E1	.	+	.	.	.	.	.	.	1	13
Melica ciliata	E1	.	.	+	.	.	.	.	.	1	13
Plantago media	E1	.	.	r	.	.	.	.	.	1	13
Centaurea triumfettii	E1	.	.	.	+	.	.	.	.	1	13
Koeleria pyramidata	E1	.	.	.	+	.	.	.	.	1	13
Gentianella germanica subsp. *rhaetica*	E1	.	.	.	.	.	r	.	.	1	13
PaT ***Poo alpinae-Trisetalia***											
Cardaminopsis ovirensis	E1	.	.	+	.	.	.	.	.	1	13
Crocus albiflorus	E1	.	.	+	.	.	.	.	.	1	13
Polygonum bistorta	E1	.	.	+	.	.	.	.	.	1	13
Trollius europaeus	E1	.	.	+	.	.	.	.	.	1	13

Tab. 2 Number of relevé		1	2	3	4	5	6	7	8	Pr.	Fr.
MA ***Molinio-Arrhenatheretea***											
Galium album	E1	+	+	1	.	.	.	.	.	3	38
Angelica sylvestris	E1	.	+	+	.	.	.	.	.	2	25
Lathyrus pratensis	E1	.	+	.	.	.	.	.	.	1	13
Taraxacum officinale	E1	.	.	1	.	.	.	.	.	1	13
Veronica chamaedrys	E1	.	.	+	.	.	.	.	.	1	13
Vicia cracca	E1	.	.	.	+	.	.	.	.	1	13
AT ***Asplenietea trichomanis***											
Primula auricula	E1	+	+	+	.	.	.	.	.	3	38
Saxifraga hostii	E1	+	+	+	.	.	.	.	.	3	38
Sedum maximum	E1	.	+	+	+	.	.	.	.	3	38
Sedum album	E1	.	.	+	+	.	.	.	.	2	25
Saxifraga crustata	E1	+	.	.	.	.	.	.	.	1	13
Cystopteris regia	E1	.	.	+	.	.	.	.	.	1	13
Moehringia muscosa	E1	.	.	.	+	.	.	.	.	1	13
Silene hayekiana	E1	.	.	.	+	.	.	.	.	1	13
Erysimum sylvestre	E1	.	.	.	.	1	.	.	.	1	13
EA ***Epilobietea angustifolii***											
Rubus idaeus	E2a	.	+	+	.	.	.	.	.	2	25
Ranunculus sardous	E1	.	+	.	.	.	.	.	.	1	13
Cirsium eriophorum	E1	.	.	r	.	.	.	.	.	1	13
Urtica dioica	E1	.	.	+	.	.	.	.	.	1	13
Sambucus racemosa	E2a	.	.	r	.	.	.	.	.	1	13
Solanum dulcamara	E1	.	.	.	+	.	.	.	.	1	13
O **Other species**											
Juniperus communis	E2a	.	+	+	.	.	.	.	.	2	25
Alchemilla sp.	E1	.	.	+	.	.	.	.	.	1	13
Poa sp.	E1	.	.	+	.	.	.	.	.	1	13
Salix purpurea	E2b	.	.	.	1	.	.	.	.	1	13
ML **Mosses**											
Homalothecium lutescens	E0	1	+	+	.	.	.	.	.	3	38
Schistidium apocarpum	E0	+	+	.	+	.	.	.	.	3	38
Tortella tortuosa	E0	.	+	.	+	.	.	.	.	2	25
Ctenidium molluscum	E0	.	.	+	.	.	.	.	.	1	13

Gr – Gravel
Li – Lithosols
ID – Igor Dakskobler
WF – Wilfried Franz

Table 3. *Laburno alpini-Rhamnetum fallacis* ass. nov.

	Number of relevé		1	2	3	4	5	6	7		
	Database number of relevé		244292	244293	244294	244296	244295	244297	244416		
	Elevation in m		830	845	960	1100	1040	1010	650		
	Aspect		NEE	SEE	E	W	SW	E	NE		
	Slope in degrees		25	30	30	35	30	25	35		
	Parent material		D	D	D	D	D	D	D		
	Soil		R	R	R	R	R	R	R		
	Stoniness in %		5	2	20	10	5	20	20		
	Cover of tree layer in %	E3	.	.	5	5	20	20	.		
	Cover of shrub layer in %	E2	80	90	80	70	60	80	60		
	Cover of herb layer in %	E1	80	80	60	60	30	30	50		
	Cover of moss layer in %	E0	5	5	5	5	0	5	0		
	Number of species		36	27	33	32	30	27	19		
	Relevé area	m^2	100	100	100	100	100	100	100		
	Date of taking relevé		8/10/2012	8/10/2012	8/10/2012	8/10/2012	8/10/2012	8/10/2012	8/20/2012		
	Locality		Govci-Poldanovec	Govci-Poldanovec	Govci-Poldanovec	Govci-Orlejci	Govci-Orlejci	Govci-Poldanovec	Nemškarica		
	Quadrant		9949/3	9949/3	9949/3	9949/3	9949/3	9949/3	0049/2		
	Coordinate GK Y (D-48)	m	409800	409798	409706	410953	410903	410603	419457		
	Coordinate GK X (D-48)	m	5097512	5097433	5097320	5096528	5096456	5096532	5090516		
	Diagnostic species of the association									Pr.	Fr.
AF	*Rhamnus fallax*	E2b	4	4	4	4	4	3	3	7	100
AF	*Rhamnus fallax*	E2a	.	.	+	1	+	+	.	4	57
AF	*Rhamnus fallax*	E1	1	+	.	.	.	.	.	2	29
ES	*Carex ferruginea*	E1	.	1	1	1	1	+	.	5	71
FS	*Laburnum alpinum*	E3a	.	.	.	.	+	+	.	2	29
FS	*Laburnum alpinum*	E2b	+	.	+	+	+	1	.	5	71
FS	*Laburnum alpinum*	E1	.	.	+	+	+	.	.	3	43
QP	*Ostrya carpinifolia*	E3a	.	.	.	+	1	+	.	3	43
QP	*Ostrya carpinifolia*	E2b	+	1	1	.	1	.	1	5	71
QP	*Ostrya carpinifolia*	E2a	.	1	.	.	+	.	.	2	29
QP	*Ostrya carpinifolia*	E1	+	.	.	.	.	.	.	1	14
FS	*Fraxinus ornus*	E2	.	+	.	.	.	+	.	2	29
QP	*Fraxinus ornus*	E1	+	.	+	+	+	.	+	5	71
AF	***Aremonio-Fagion***										
	Cyclamen purpurascens	E1	+	+	1	1	1	+		6	86
	Dentaria enneaphyllos	E1	+	+	+	+	+	+		6	86
	Anemone trifolia	E1	+			+		+		3	43
	Helleborus niger	E1				+				1	14
FS	***Fagetalia sylvaticae***										
	Salvia glutinosa	E1	3	2	1	2	2	.	1	6	86
	Daphne mezereum	E2a	+	+	+	1	+	+	.	6	86

Tab. 3 Number of relevé			1	2	3	4	5	6	7	Pr.	Fr.
	Fagus sylvatica	E3	.	.	+	.	.	1	.	2	29
	Fagus sylvatica	E2b	.	.	+	+	1	3	+	5	71
	Fagus sylvatica	E2a	.	+	1	1	1	2	.	5	71
	Fagus sylvatica	E1	+	1	.	.	+	1	1	5	71
	Acer pseudoplatanus	E3a	.	.	.	.	+	.	.	1	14
	Acer pseudoplatanus	E2	.	.	+	1	.	1	.	3	43
	Acer pseudoplatanus	E1	+	+	.	+	+	+	.	5	71
	Polystichum aculeatum	E1	+	+	.	+	+	.	+	5	71
	Mercurialis perennis	E1	+	.	1	.	1	1	.	4	57
	Lonicera alpigena	E2a	.	+	1	+	.	+	.	4	57
	Actaea spicata	E1	.	.	+	+	.	+	.	3	43
	Galium laevigatum	E1	+	.	1	.	.	+	.	3	43
	Galeobdolon flavidum	E1	.	+	.	.	+	.	.	2	29
	Melica nutans	E1	+	.	.	.	+	.	.	2	29
	Euphorbia amygdaloides	E1	.	.	+	.	+	.	.	2	29
	Dryopteris filix-mas	E1	.	+	.	.	.	.	.	1	14
	Epilobium montanum	E1	.	.	.	.	.	.	+	1	14
	Mycelis muralis	E1	.	.	.	.	.	+	.	1	14
	Prenanthes purpurea	E1	.	.	.	.	r	.	.	1	14
	Sambucus nigra	E2	.	.	.	.	.	.	+	1	14
	Fraxinus excelsior	E1	.	.	.	.	.	.	+	1	14
	Epipactis helleborine	E1	.	.	.	+	.	.	.	1	14
QP	***Quercetalia pubescentis***										
	Sorbus aria	E2	+	.	.	.	.	.	.	1	14
	Sorbus aria	E1	.	.	+	.	.	.	.	1	14
QF	***Querco-Fagetea***										
	Carex digitata	E1	+	.	.	.	.	.	+	2	29
	Hepatica nobilis	E1	.	.	+	.	.	.	.	1	14
BcAv	***Betulo carpaticae-Alnetea viridis***										
	Salix glabra	E2	+	2	+	+	+	.	.	5	71
	Salix glabra	E1	.	.	.	+	.	.	.	1	14
	Salix appendiculata	E2	.	.	.	+	.	.	.	1	14
	Salix appendiculata	E1	.	.	.	+	.	.	.	1	14
MuA	***Mulgedio-Aconitetea***										
	Senecio ovatus	E1	+	1	+	.	+	.	.	4	57
	Aconitum lycoctonum subsp. *ranunculifolium* s. lat.	E1	.	+	.	.	.	.	.	1	14
	Athyrium filix-femina	E1	+	.	.	.	.	.	.	1	14
EA	***Epilobietea angustifolii***										
	Eupatorium cannabinum	E1	3	3	1	1	1	+	3	7	100
	Rubus idaeus	E2a	.	.	+	+	+	+	1	5	71
	Atropa bella-donna	E1	.	.	.	.	.	1	1	2	29
	Verbascum thapsus	E1	.	.	.	.	.	r	+	2	29
	Cirsium vulgare	E1	.	.	.	.	r	.	.	1	14
	Solanum dulcamara	E1	.	.	.	.	.	+	.	1	14
EP	***Erico-Pinetea***										
	Calamagrostis varia	E1	2	3	2	2	2	1	1	7	100
	Cirsium erisithales	E1	+	+	1	1	1	+	.	6	86
	Carex alba	E1	2	1	3	3	+	.	.	5	71
	Molinia arundinacea	E1	3	1	+	.	.	.	.	3	43
	Buphthalmum salicifolium	E1	.	.	+	+	+	.	.	3	43
	Rhododendron hirsutum	E2a	1	.	.	.	.	.	.	1	14
VP	***Vaccinio-Piceetea***										
	Polystichum lonchitis	E1	.	.	r	+	.	.	.	2	29

Tab. 3 Number of relevé			1	2	3	4	5	6	7	Pr.	Fr.
	Picea abies	E2a	.	.	.	+	.	.	+	2	29
	Valeriana tripteris	E1	.	+	.	.	.	.	.	1	14
	Veronica urticifolia	E1	.	.	.	+	.	.	.	1	14
	Aposeris foetida	E1	.	.	+	.	.	.	.	1	14
	Phegopteris connectilis	E1	r	.	.	.	.	.	.	1	14
	Hieracium murorum	E1	.	.	+	.	.	.	.	1	14
ES	***Elyno-Seslerietea***										
	Carduus crassifolius	E1	.	.	.	+	1	.	.	2	29
	Betonica alopecuros	E1	+	.	.	.	.	.	.	1	14
TG	***Trifolio-Geranietea***										
	Digitalis grandiflora	E1							+	1	14
TR	***Thlaspietea rotundifolii***										
	Gymnocarpium robertianum	E1	1	1	1	2	1	+	+	7	100
	Adenostyles glabra	E1	1	2	1	1	2	1	.	6	86
	Petasites paradoxus	E1	.	+	.	.	.	.	.	1	14
	Hieracium porrifolium	E1	r	.	.	.	.	.	.	1	14
	Arabis sp.	E1	.	.	.	.	.	.	+	1	14
AT	***Asplenietea trichomanis***										
	Paederota lutea	E1	+	+	+	.	.	.	.	3	43
	Asplenium viride	E1	+	.	.	.	.	.	.	1	14
	Asplenium ruta-muraria	E1	.	.	.	.	r	.	.	1	14
ML	**Mosses**										
	Ctenidium molluscum	E0	+	.	.	+	.	+	.	3	43
	Tortella tortuosa	E0	+	.	.	.	.	.	.	1	14
	Schistidium apocarpum	E0	.	.	.	.	.	+	.	1	14
	Polytrichum formosum	E0	+	.	.	.	.	.	.	1	14

D – Dolomite
R – Rendzina

Table 4. *Lunario redivivae-Rhamnetum fallacis* ass. nov.

	Number of relevé		1	2	3	4		
	Database number of relevé		245786	245787	245789	245788		
	Elevation in m		1375	1380	1400	1395		
	Aspect		SW	SE	S	SW		
	Slope in degrees		25	30	15	30		
	Parent material		A	A	A	A		
	Soil		R	Li	Li	Li		
	Stoniness in %		60	90	90	90		
	Cover of shrub layer in %	E2	60	70	60	70		
	Cover of herb layer in %	E1	70	30	40	30		
	Cover of moss layer in %	E0	20	30	20	40		
	Number of species		41	29	29	31		
	Relevé area	m^2	50	50	50	50		
	Date of taking relevé		5/11/2012	5/11/2012	7/2/2012	5/11/2012		
	Locality		Golaki-Javorški vrh	Golaki-Javorški vrh	Golaki-Javorški vrh	Golaki-Javorški vrh		
	Quadrant		0049/1	0049/1	0049/1	0049/1		
	Coordinate GK Y (D-48)	m	414894	414873	415177	414834		
	Coordinate GK X (D-48)	m	5092152	5092171	5091926	5092221		
	Diagnostic species of the association						Pr.	Fr.
LRf	*Rhamnus fallax*	E2b	4	4	3	4	4	100
EA	*Sambucus racemosa*	E2	+	2	1	1	4	100
AT	*Sedum hispanicum*	E1	+	+	2	+	4	100
TA	*Lunaria rediviva*	E1	2	.	2	2	3	75
	Differential species of the alliance *Lonicero-Rhamnion fallacis*							
QF	*Lonicera xylosteum*	E2	+	.	+	.	2	50
FS	*Lonicera alpigena*	E2a	.	.	+	.	1	25
BcAv	*Salix appendiculata*	E1	.	r	.	.	1	25
AF	***Aremonio-Fagion***							
	Dentaria enneaphyllos	E1	1	+	.	1	3	75
FS	***Fagetalia sylvaticae***							
	Dryopteris filix-mas	E1	1	+	+	1	4	100
	Galeobdolon flavidum	E1	1	+	1	1	4	100
	Epilobium montanum	E1	+	+	+	.	3	75
	Mercurialis perennis	E1	2	r	.	+	3	75
	Dentaria bulbifera	E1	1	+	.	1	3	75
	Actaea spicata	E1	+	+	.	+	3	75
	Heracleum sphondylium	E1	+	+	.	+	3	75
	Campanula trachelium	E1	+	.	+	.	2	50
	Paris quadrifolia	E1	+	+	.	.	2	50
	Corydalis cava	E1	1	.	.	+	2	50
	Polygonatum multiflorum	E1	+	.	.	+	2	50
	Poa nemoralis	E1	.	.	+	+	2	50

Tab. 4 Number of relevé		1	2	3	4	Pr.	Fr.
Sambucus nigra	E2	+	.	.	.	1	25
Daphne mezereum	E2a	+	.	.	.	1	25
Mycelis muralis	E1	.	.	+	.	1	25
Lilium martagon	E1	.	.	.	+	1	25
Fagus sylvatica	E1	.	.	.	+	1	25
TA ***Tilio-Acerion***							
Geranium robertianum	E1	+	+	1	.	3	75
Acer pseudoplatanus	E2	r	.	r	r	3	75
Hesperis candida	E1	+	.	.	1	2	50
Adoxa moschatellina	E1	.	+	.	+	2	50
QF ***Querco-Fagetea***							
Corylus avellana	E2b	.	.	+	r	2	50
Stellaria holostea	E1	.	+	.	.	1	25
MuA ***Mulgedio-Aconitetea***							
Senecio ovatus	E1	1	+	+	.	3	75
Veratrum album	E1	2	+	.	.	2	50
Ribes alpinum	E2a	+	+	.	.	2	50
Aconitum degenii subsp. *paniculatum*	E1	1	.	.	+	2	50
Ranunculus platanifolius	E1	+	.	.	.	1	25
Doronicum austriacum	E1	+	.	.	.	1	25
Centaurea montana	E1	+	.	.	.	1	25
Hypericum maculatum	E1	.	+	.	.	1	25
Chaerophyllum aureum	E1	.	.	+	.	1	25
Milium effusum	E1	.	.	+	.	1	25
Polygonatum verticillatum	E1	.	.	.	+	1	25
EA ***Epilobietea angustifolii***							
Urtica dioica	E1	1	3	1	1	4	100
Rubus idaeus	E2a	2	1	.	.	2	50
Solanum dulcamara	E1	.	.	+	.	1	25
Hypericum hirsutum	E1	.	.	.	+	1	25
EP ***Erico-Pinetea***							
Calamagrostis varia	E1	.	.	.	+	1	25
MA ***Molinio-Arrhenatheretea***							
Angelica sylvestris	E1	.	.	+	.	1	25
AT ***Asplenietea trichomanis***							
Polypodium vulgare	E1	+	+	.	.	2	50
Cystopteris fragilis	E1	+	.	.	.	1	25
Moehringia muscosa	E1	.	+	.	.	1	25
Asplenium trichomanes	E1	.	.	+	.	1	25
Asplenium ruta-muraria	E1	.	.	.	+	1	25
ML **Mosses and lichens**							
Ctenidium molluscum	E0	2	2	1	1	4	100
Schistidium apocarpum	E0	+	1	1	1	4	100
Homalothecium lutescens	E0	2	3	1	3	4	100
Tortella tortuosa	E0	1	.	1	1	3	75
Pseudoleskeella catenulata	E0	1	1	+	.	3	75
Isothecium alopecuroides	E0	+	.	+	.	2	50
Peltigera canina	E0	+	.	+	.	2	50
Cladonia pyxidata	E0	.	+	.	+	2	50
Thamnobryum alopecurum	E0	+	.	.	.	1	25

A – Limestone
R – Rendzina
Li – Lithosols

Table 5. Synoptic table of scrub communities with dominant *Rhamnus fallax* in Slovenia and Carinthia (A).

	Successive number		1	3	2	4
	Number of releves		8	14	7	4
	Sign for syntaxa		LlRf	PlRf	LaRf	LrRf
	Author		ID, WF	ID, AR	ID	ID
	Diagnostic species of the syntaxa					
AF	*Rhamnus fallax*	E2b	100	100	100	100
AF	*Rhamnus fallax*	E2a	13	0	57	0
AF	*Rhamnus fallax*	E1	13	14	29	0
ES	*Sesleria caerulea* subsp. *calcaria*	E1	75	57	0	0
TG	*Laserpitium latifolium*	E1	75	0	0	0
ES	*Linum julicum*	E1	63	14	0	0
TR	*Rumex scutatus*	E1	63	21	0	0
QP	*Convallaria majalis*	E1	50	7	0	0
TR	*Scrophularia juratensis*	E1	38	7	0	0
QP	*Primula veris* subsp. *columnae*	E1	38	0	0	0
TG	*Lilium carniolicum*	E1	38	0	0	0
MuA	*Aconitum lycoctonum* subsp. *ranunculifolium* s. lat.	E1	38	79	14	0
VP	*Polystichum lonchitis*	E1	0	64	29	0
EP	*Rhododendron hirsutum*	E2a	13	50	14	0
ES	*Carex ferruginea*	E1	25	14	71	0
FS	*Laburnum alpinum*	E3a	0	0	29	0
FS	*Laburnum alpinum*	E2b	25	0	71	0
FS	*Laburnum alpinum*	E1	13	0	43	0
QP	*Ostrya carpinifolia*	E3a	0	0	43	0
QP	*Ostrya carpinifolia*	E2b	13	0	71	0
QP	*Ostrya carpinifolia*	E2a	0	0	29	0
QP	*Ostrya carpinifolia*	E1	0	0	14	0
QP	*Fraxinus ornus*	E2	13	0	29	0
QP	*Fraxinus ornus*	E1	0	0	71	0
EA	*Sambucus racemosa*	E2	13	43	0	100
AT	*Sedum hispanicum*	E1	0	21	0	100
TA	*Lunaria rediviva*	E1	0	0	0	75
	Diagnostic species of the order *Rhamnetalia fallacis*					
BcAv	*Salix appendiculata*	E2	50	57	14	0
BcAv	*Salix appendiculata*	E1	0	0	14	25
	Differential species of the alliance *Seslerio calcariae-Rhamnion fallacis*					
EP	*Pinus mugo*	E2	50	14	0	0
MuA	*Aconitum angustifolium*	E1	38	7	0	0
VP	*Larix decidua*	E3a	0	21	0	0
VP	*Larix decidua*	E2b	0	29	0	0
VP	*Larix decidua*	E2a	0	21	0	0
VP	*Larix decidua*	E1	0	7	0	0
	Differential species of the alliance *Lonicero-Rhamnion fallacis*					
	Lonicera alpigena	E2a	0	21	57	25
	Lonicera xylosteum	E2	13	29	0	50
AF	***Aremonio-Fagion***					
	Cyclamen purpurascens	E1	75	43	86	0
	Anemone trifolia	E1	25	14	43	0
	Knautia drymeia	E1	13	7	0	0
	Dentaria enneaphyllos	E1	0	21	86	75
	Helleborus niger	E1	38	36	14	0
	Primula vulgaris	E1	0	14	0	0
	Aremonia agrimonoides	E1	0	7	0	0
	Omphalodes verna	E1	0	7	0	0
	Helleborus odorus	E1	0	7	0	0
FS	***Fagetalia sylvaticae***					
	Mercurialis perennis	E1	38	71	57	75

Tab. 5 Successive number

			1	3	2	4
	Melica nutans	E1	13	57	29	0
	Heracleum sphondylium	E1	13	0	0	75
	Daphne mezereum	E2a	25	71	86	25
	Galeobdolon flavidum	E1	25	43	29	100
	Myosotis sylvatica	E1	25	36	0	0
	Lilium martagon	E1	25	7	0	25
	Dryopteris filix-mas	E1	13	86	14	100
	Fagus sylvatica	E3	0	14	29	0
	Fagus sylvatica	E2b	0	21	71	0
	Fagus sylvatica	E2a	0	7	71	0
	Fagus sylvatica	E1	13	14	71	25
	Mycelis muralis	E1	13	36	14	25
	Campanula trachelium	E1	13	29	0	50
	Paris quadrifolia	E1	13	29	0	50
	Euphorbia amygdaloides	E1	13	7	29	0
	Fraxinus excelsior	E3a	13	7	0	0
	Lathyrus vernus subsp. *vernus*	E1	13	7	0	0
	Lathyrus vernus subsp. *flaccidus*	E1	13	0	0	0
	Salvia glutinosa	E1	0	14	86	0
	Actaea spicata	E1	0	43	43	75
	Galium laevigatum	E1	0	21	43	0
	Epilobium montanum	E1	0	29	14	75
	Prenanthes purpurea	E1	0	14	14	0
	Sambucus nigra	E2	0	0	14	25
	Fraxinus excelsior	E1	0	0	14	0
	Epipactis helleborine	E1	0	0	14	0
	Corydalis cava	E1	0	29	0	50
	Poa nemoralis	E1	0	29	0	50
	Asarum europaeum subsp. *caucasicum*	E1	0	21	0	0
	Brachypodium sylvaticum	E1	0	21	0	0
	Pulmonaria officinalis	E1	0	21	0	0
	Dentaria bulbifera	E1	0	14	0	75
	Dentaria pentaphyllos	E1	0	7	0	0
	Ranunculus lanuginosus	E1	0	7	0	0
	Scrophularia nodosa	E1	0	7	0	0
	Symphytum tuberosum	E1	0	7	0	0
	Polygonatum multiflorum	E1	0	0	0	50
TA	***Tilio-Acerion***					
	Acer pseudoplatanus	E3a	13	21	14	0
	Acer pseudoplatanus	E2	25	64	43	75
	Acer pseudoplatanus	E1	38	14	71	0
	Geranium robertianum	E1	13	43	0	75
	Hesperis candida	E1	13	14	0	50
	Polystichum aculeatum	E1	0	36	71	0
	Phyllitis scolopendrium	E1	0	14	0	0
	Adoxa moschatellina	E1	0	0	0	50
	Acer platanoides	E3a	0	7	0	0
	Aruncus dioicus	E1	0	7	0	0
	Tephroseris pseudocrispa	E1	0	7	0	0
	Ulmus glabra	E3a	0	7	0	0
QP	***Quercetalia pubescentis***					
	Sorbus aria	E2	50	29	14	0
	Sorbus aria	E1	0	0	14	0
	Arabis turrita	E1	0	14	0	0
	Peucedanum schottii var. *petraeum*	E1	0	7	0	0
QF	***Querco-Fagetea***					
	Carex digitata	E1	25	0	29	0
	Listera ovata	E1	25	0	0	0

Tab. 5 Successive number			1	3	2	4
	Corylus avellana	E2b	13	7	0	50
	Corylus avellana	E1	13	0	0	0
	Clematis vitalba	E2	13	7	0	0
	Hepatica nobilis	E1	0	29	14	0
	Anemone nemorosa	E1	0	21	0	0
	Galium sylvaticum	E1	0	7	0	0
	Stellaria holostea	E1	0	0	0	25
BcAv	***Betulo carpaticae-Alnetea viridis***					
	Salix glabra	E2	25	36	71	0
	Salix glabra	E1	0	0	14	0
	Ribes alpinum	E2a	0	36	0	50
	Salix waldsteiniana	E2a	0	14	0	0
	Sorbus mougeotii	E3a	0	7	0	0
	Sorbus mougeotii	E2b	0	7	0	0
	Alnus viridis	E2	0	7	0	0
MuA	***Mulgedio-Aconitetea***					
	Thalictrum aquilegiifolium	E1	38	29	0	0
	Viola biflora	E1	25	14	0	0
	Phyteuma ovatum	E1	13	0	0	0
	Heracleum pollinianum (incl. *H. montanum*)	E1	38	57	0	0
	Senecio ovatus	E1	25	50	57	75
	Polygonatum verticillatum	E1	25	50	0	25
	Pleurospermum austriacum	E1	25	14	0	0
	Allium victorialis	E1	13	7	0	0
	Primula elatior	E1	13	7	0	0
	Rumex arifolius	E1	13	7	0	0
	Lathyrus occidentalis var. *montanus*	E1	13	0	0	0
	Athyrium filix-femina	E1	0	21	14	0
	Aconitum degenii subsp. *paniculatum*	E1	0	43	0	50
	Hypericum maculatum	E1	0	43	0	25
	Myrrhis odorata	E1	0	43	0	0
	Agropyron caninum	E1	0	36	0	0
	Ranunculus platanifolius	E1	0	29	0	25
	Veratrum album	E1	0	21	0	50
	Geranium sylvaticum	E1	0	29	0	0
	Silene dioica	E1	0	29	0	0
	Lamium maculatum	E1	0	21	0	0
	Senecio cacaliaster	E1	0	21	0	0
	Chaerophyllum hirsutum	E1	0	14	0	0
	Saxifraga rotundifolia	E1	0	14	0	0
	Scrophularia scopolii	E1	0	14	0	0
	Doronicum austriacum	E1	0	7	0	25
	Aconitum tauricum	E1	0	7	0	0
	Carduus personata	E1	0	7	0	0
	Crepis paludosa	E1	0	7	0	0
	Crepis pyrenaica	E1	0	7	0	0
	Poa hybrida	E1	0	7	0	0
	Rumex alpinus	E1	0	7	0	0
	Streptopus amplexifolius	E1	0	7	0	0
	Athyrium distentifolium	E1	0	7	0	0
	Centaurea montana	E1	0	0	0	25
	Chaerophyllum aureum	E1	0	0	0	25
	Milium effusum	E1	0	0	0	25
EA	***Epilobietea angustifolii***					
	Rubus idaeus	E2a	25	71	71	50
	Urtica dioica	E1	13	57	0	100
	Solanum dulcamara	E1	13	21	14	25
	Cirsium eriophorum	E1	13	0	0	0

Tab. 5 Successive number		1	3	2	4
Eupatorium cannabinum	E1	0	14	100	0
Atropa bella-donna	E1	0	0	29	0
Verbascum thapsus	E1	0	0	29	0
Cirsium vulgare	E1	0	0	14	0
Fragaria vesca	E1	0	29	0	0
Cuscuta europaea	E1	0	14	0	0
Geum urbanum	E1	0	14	0	0
Salix caprea	E3a	0	14	0	0
Bromus benekenii	E1	0	7	0	0
Cirsium palustre	E1	0	7	0	0
Tussilago farfara	E1	0	7	0	0
Hypericum hirsutum	E1	0	0	0	25
EP ***Erico-Pinetea***					
Buphthalmum salicifolium	E1	100	36	43	0
Calamagrostis varia	E1	88	36	100	25
Cirsium erisithales	E1	63	64	86	0
Allium ericetorum	E1	38	21	0	0
Peucedanum austriacum	E1	38	14	0	0
Aquilegia nigricans	E1	25	7	0	0
Rubus saxatilis	E1	13	43	0	0
Erica carnea	E1	13	14	0	0
Amelanchier ovalis	E2	13	0	0	0
Polygala chamaebuxus	E1	13	0	0	0
Carex ornithopoda	E1	38	7	0	0
Cotoneaster tomentosus	E2a	13	0	0	0
Epipactis atrorubens	E1	13	0	0	0
Carex alba	E1	0	0	71	0
Molinia arundinacea	E1	0	0	43	0
Juniperus sibirica	E2a	0	36	0	0
Rhodothamnus chamaecistus	E1	0	14	0	0
Asperula aristata	E1	0	7	0	0
Genista radiata	E1	0	7	0	0
VP ***Vaccinio-Piceetea***					
Valeriana tripteris	E1	50	29	14	0
Picea abies	E3a	25	14	0	0
Picea abies	E2b	13	29	0	0
Picea abies	E2a	13	43	29	0
Picea abies	E1	13	7	0	0
Solidago virgaurea	E1	25	29	0	0
Rosa pendulina	E2a	13	36	0	0
Clematis alpina	E1	13	21	0	0
Veronica urticifolia	E1	13	14	14	0
Aposeris foetida	E1	0	14	14	0
Phegopteris connectilis	E1	0	14	14	0
Gentiana asclepiadea	E1	0	36	0	0
Homogyne sylvestris	E1	0	29	0	0
Hieracium murorum	E1	0	0	14	0
Lonicera caerulea	E2a	0	14	0	0
Lonicera nigra	E2a	0	14	0	0
Oxalis acetosella	E1	0	14	0	0
Abies alba	E2a	0	7	0	0
Luzula luzuloides	E1	0	7	0	0
Maianthemum bifolium	E1	0	7	0	0
Dryopteris dilatata	E1	0	7	0	0
Gymnocarpium dryopteris	E1	0	7	0	0
ES ***Elyno-Seslerietea***					
Betonica alopecuros	E1	63	57	14	0
Achillea clavenae	E1	25	7	0	0

Tab. 5 Successive number			1	3	2	4
	Globularia cordifolia	E1	25	0	0	0
	Ranunculus hybridus	E1	25	0	0	0
	Laserpitium peucedanoides	E1	13	14	0	0
	Carduus defloratus	E1	13	7	0	0
	Senecio abrotanifolius	E1	13	0	0	0
	Astrantia bavarica	E1	13	0	0	0
	Festuca calva	E1	38	36	0	0
	Acinos alpinus	E1	38	0	0	0
	Centaurea haynaldi subsp. *julica*	E1	38	0	0	0
	Leucanthemum adustum	E1	38	0	0	0
	Pimpinella alpina	E1	38	0	0	0
	Ranunculus carinthiacus	E1	38	0	0	0
	Thymus praecox subsp. *polytrichus*	E1	25	29	0	0
	Hieracium villosum	E1	25	7	0	0
	Arabis vochinensis	E1	25	0	0	0
	Carex sempervirens	E1	25	0	0	0
	Polygala alpestris	E1	25	0	0	0
	Potentilla crantzii	E1	25	0	0	0
	Carduus crassifolius	E1	13	21	29	0
	Androsace villosa	E1	13	0	0	0
	Anemone narcissiflora	E1	13	0	0	0
	Cerastium strictum	E1	13	0	0	0
	Gentiana verna	E1	13	0	0	0
	Helianthemum grandiflorum	E1	13	0	0	0
	Rhinanthus aristatus	E1	13	0	0	0
	Scabiosa lucida subsp. *stricta*	E1	0	29	0	0
	Erigeron glabratus	E1	0	14	0	0
	Myosotis alpestris	E1	0	14	0	0
	Pulsatilla alpina subsp. *austroalpina*	E1	0	14	0	0
	Thesium alpinum	E1	0	14	0	0
	Aster bellidiastrum	E1	0	7	0	0
	Campanula witasekiana	E1	0	7	0	0
	Gentiana lutea subsp. *symphyandra*	E1	0	7	0	0
	Heliosperma alpestre	E1	0	7	0	0
	Juncus monanthos	E1	0	7	0	0
	Leontopodium alpinum	E1	0	7	0	0
	Soldanella alpina	E1	0	7	0	0
TG	***Trifolio-Geranietea***					
	Polygonatum odoratum	E1	50	14	0	0
	Laserpitium siler	E1	38	14	0	0
	Thalictrum minus	E1	0	14	0	0
	Libanotis sibirica subsp. *montana*	E1	38	14	0	0
	Origanum vulgare	E1	25	36	0	0
	Valeriana wallrothii	E1	25	14	0	0
	Verbascum lanatum	E1	25	14	0	0
	Silene nutans	E1	25	7	0	0
	Stachys recta	E1	25	7	0	0
	Calamintha einseleana	E1	13	21	0	0
	Achillea distans	E1	13	7	0	0
	Digitalis grandiflora	E1	0	21	14	0
	Iris graminea	E1	0	21	0	0
	Vincetoxicum hirundinaria	E1	0	21	0	0
	Clinopodium vulgare	E1	0	14	0	0
	Arabis pauciflora	E1	0	7	0	0
FB	***Festuco-Brometea***					
	Galium lucidum	E1	38	14	0	0
	Carlina acaulis	E1	38	21	0	0
	Hippocrepis comosa	E1	38	0	0	0

Tab. 5 Successive number			1	3	2	4
	Gentianella germanica	E1	13	0	0	0
	Gymnadenia conopsea	E1	25	7	0	0
	Dianthus monspessulanus	E1	25	0	0	0
	Euphorbia cyparissias	E1	25	0	0	0
	Koeleria pyramidata	E1	13	21	0	0
	Centaurea triumfettii	E1	13	14	0	0
	Allium senescens	E1	13	0	0	0
	Melica ciliata	E1	13	0	0	0
	Plantago media	E1	13	0	0	0
	Polygala amarella	E1	13	0	0	0
	Gentianella ciliata	E1	0	7	0	0
	Linum catharticum	E1	0	7	0	0
PaT	***Poo alpinae-Trisetalia***					
	Cardaminopsis ovirensis	E1	13	0	0	0
	Crocus albiflorus	E1	13	21	0	0
	Polygonum bistorta	E1	13	0	0	0
	Trollius europaeus	E1	13	0	0	0
	Poa alpina	E1	0	36	0	0
MA	***Molinio-Arrhenatheretea***					
	Galium album	E1	38	29	0	0
	Angelica sylvestris	E1	25	29	0	25
	Lathyrus pratensis	E1	13	7	0	0
	Taraxacum officinale	E1	13	7	0	0
	Vicia cracca	E1	13	7	0	0
	Ranunculus sardous	E1	13	0	0	0
	Veronica chamaedrys	E1	13	0	0	0
	Dactylis glomerata s. str.	E1	0	7	0	0
	Deschampsia cespitosa	E1	0	7	0	0
	Pimpinella major	E1	0	7	0	0
	Vicia sepium	E1	0	7	0	0
RP	***Rhamno-Prunetea***					
	Rosa canina	E2	25	21	0	0
	Berberis vulgaris	E2a	0	21	0	0
SCf	***Scheuchzerio-Caricetea fuscae***					
	Parnassia palustris	E1	0	14	0	0
TR	***Thlaspietea rotundifolii***					
	Silene vulgaris subsp. *glareosa*	E1	38	7	0	0
	Petasites paradoxus	E1	25	14	14	0
	Dianthus sternbergii	E1	25	0	0	0
	Tisetum distichophyllum	E1	13	0	0	0
	Campanula cespitosa	E1	25	14	0	0
	Valeriana montana	E1	25	14	0	0
	Festuca laxa	E1	13	7	0	0
	Athamanta cretensis	E1	25	0	0	0
	Trisetum argenteum	E1	13	14	0	0
	Adenostyles glabra	E1	25	64	86	0
	Gymnocarpium robertianum	E1	25	43	100	0
	Dryopteris villarii	E1	25	43	0	0
	Biscutella laevigata	E1	25	7	0	0
	Gypsophila repens	E1	25	0	0	0
	Sedum sexangulare	E1	25	0	0	0
	Rhodiola rosea	E1	13	36	0	0
	Hieracium porrifolium	E1	13	7	14	0
	Ligusticum seguieri	E1	13	14	0	0
	Viola pyrenaica	E1	13	14	0	0
	Festuca nitida	E1	0	50	0	0
	Arabis alpina	E1	0	14	0	0
	Campanula cochleariifolia	E1	0	14	0	0

Tab. 5	Successive number		1	3	2	4
	Astrantia carniolica	E1	0	7	0	0
	Hieracium bifidum	E1	0	7	0	0
	Leontodon hispidus subsp. *hyoseroides*	E1	0	7	0	0
	Saxifraga caesia	E1	0	7	0	0
	Taraxacum laevigatum agg.	E1	0	7	0	0
AT	***Asplenietea trichomanis***					
	Erysimum sylvestre	E1	13	0	0	0
	Sedum maximum	E1	38	14	0	0
	Primula auricula	E1	38	7	0	0
	Saxifraga hostii	E1	38	7	0	0
	Sedum album	E1	25	29	0	0
	Moehringia muscosa	E1	13	14	0	25
	Silene hayekiana	E1	13	14	0	0
	Saxifraga crustata	E1	13	0	0	0
	Cystopteris regia	E1	13	0	0	0
	Paederota lutea	E1	0	36	43	0
	Asplenium viride	E1	0	29	14	0
	Asplenium ruta-muraria	E1	0	7	14	25
	Asplenium trichomanes	E1	0	29	0	25
	Kernera saxatilis	E1	0	21	0	0
	Valeriana saxatilis	E1	0	14	0	0
	Cystopteris fragilis	E1	0	7	0	25
	Carex brachystachys	E1	0	7	0	0
	Festuca stenantha	E1	0	7	0	0
	Polypodium vulgare	E1	0	0	0	50
O	**Other species**					
	Juniperus communis	E2a	25	7	0	0
	Alchemilla sp.	E1	13	0	0	0
	Poa sp.	E1	13	0	0	0
	Salix purpurea	E2b	13	0	0	0
	Sorbus aucuparia	E3a	0	14	0	0
	Sorbus aucuparia	E2b	0	14	0	0
	Sorbus aucuparia	E1	0	7	0	0
	Arabis sp.	E1	0	0	14	0
ML	**Mosses and lichens**					
	Schistidium apocarpum	E0	38	21	14	100
	Homalothecium lutescens	E0	38	14	0	100
	Tortella tortuosa	E0	25	57	14	75
	Ctenidium molluscum	E0	13	50	43	100
	Pseudoleskeella catenulata	E0	0	57	0	75
	Isothecium alopecuroides	E0	0	7	0	50
	Polytrichum formosum	E0	0	7	14	0
	Rhytidiadelphus triquetrus	E0	0	14	0	0
	Dicranum scoparium	E0	0	7	0	0
	Eurhynchium striatum	E0	0	7	0	0
	Homalothecium philippeanum	E0	0	7	0	0
	Hylocomium splendens	E0	0	7	0	0
	Peltigera leucophlebia	E0	0	7	0	0
	Cladonia pyxidata	E0	0	0	0	50
	Peltigera canina	E0	0	0	0	50
	Thamnobryum alopecurum	E0	0	0	0	25

LlRf – *Laserpitio latifolii-Rhamnetum fallacis*
PlRf – *Polysticho lonchitis-Rhamnetum fallacis*
LaRf – *Laburno alpini-Rhamnetum fallacis*
LrRf – *Lunario redivivae-Rhamnetum fallacis*

Table 6. Groups of diagnostic species in the *Rhamnus fallax* scrub comunities in the Southeastern Alps and in the Trnovski gozd plateau (Slovenia, S-Austria).

Successive number	1	2	3	4
Sign for syntaxa	ScRf	PlRf	LaRf	LrRf
Aremonio-Fagion	6	5	**12**	5
Fagetalia sylvaticae	7	**15**	**28**	**30**
Tilio-Acerion	2	4	6	**10**
Quercetalia pubescentis	3	1	**9**	0
Querco-Fagetea	2	2	1	4
Mulgedio-Aconitetea, Betulo carpaticae-Alnetea viridis	8	**16**	6	**13**
Epilobietea angustifolii	2	5	8	**9**
Erico-Pinetea	**12**	7	**11**	0
Vaccinio-Piceetea	4	**10**	4	0
Elyno-Seslerietea	**17**	7	3	0
Trifolio-Geranietea	**8**	4	0	0
Festuco-Brometea	**6**	2	0	0
Poo alpinae-Trisetalia	1	1	0	0
Molinio-Arrhenatheretea	2	2	0	0
Rhamno-Prunetea	0	0	0	0
Scheuchzerio-Caricetea fuscae	0	0	0	0
Thlaspietea rotundifolii	**11**	**8**	7	0
Asplenietea trichomanis	4	5	2	**8**
Other species	1	0	0	0
Mosses and lichens	2	5	3	**19**
Total	100	100	100	100