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High-altitude vegetation of the Western Carpathians – a syntaxonomical review

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Abstract: This paper presents a survey of high-altitude plant communities which occur in the Western Carpathians with an enumeration of the characteristic, transgressive and differential species of the individual alliances, orders and classes. It describes the tall-herb vegetation (*Mulgedio-Aconitetea*) and communities of the subalpine shrubs (*Betulo carpaticae-Alnetea viridis*), the montane and alpine calcareous swards (*Elyno-Seslerietea*), the wind-exposed cryophilous swards on ridge edges with low snow cover (*Carici rupestris-Kobresietea bellardii*), the chionophilous communities of snow beds and snow fields (*Salicetea herbaceae*), the arctic-boreal dwarf-shrub heathlands (*Loiseleurio-Vaccinietea*), the alpine acidophilous grasslands (*Caricetea curvulae*) and the high-mountain mat-grass swards of the alliance *Nardion strictae* (*Nardetea strictae*).
This study summarises the results of the syntaxonomical and nomenclatural revisions of various types of high-altitude vegetation in the Western Carpathians and the longstanding research in the field. The aim of this paper is to amass knowledge about the nomenclatural features, such as the synonyms, original diagnoses and nomenclatural types of the higher syntaxa in the Western Carpathians, that will be important and useful for a forthcoming vegetation survey of high-rank syntaxa of Europe (EuroChecklist). It reflects the current status of knowledge regarding the floristic composition and distribution of high-altitude (alpine) non-forest communities in Slovakia.
The fourth volume of *Plant Communities of Slovakia*, which discusses high-altitude vegetation, was recently published. This paper, however, contains some corrections and improvements to the concepts. It is presented in a compact form and in English, which makes it more accessible by international readership.

Key words: nomenclature; plant communities; syntaxonomy; vegetation survey

Introduction

Alpine regions show strong gradients in abiotic conditions and contain highly specialised biota (Grabherr 1997). The specific conditions in high mountains have given rise to a diverse mosaic of vegetation types, with an abundance of rare, relic and endemic taxa. Rugged relief, heterogeneous bedrocks, and variable climatic and soil features all help to create an exceptional variety of habitats, including refugia that provide high-altitude plants with optimal conditions.

In the Western Carpathians, a detailed study of a group of vegetation units that are closely associated with high mountains and that occur mainly above the timberline began in the 1920s in the Tatry Mts (the highest mountains within the Carpathian mountain range). In their pioneer studies, the Polish authors (Szafer et al. 1923, 1927; Pawłowski 1925, 1935; Pawłowski & Stecki 1927; Pawłowski et al. 1928, 1929) recorded a number of relevés from different alpine communities of the Tatry Mts. The Czech authors continued with this research (Domin 1929, 1930; Krajina 1933; Hadač 1956; Hadač et al. 1969; Šmarda et al. 1971; Unar et al. 1984, 1985), whereas many Slovak authors published valuable data later on, frequently as parts of manuscripts and theses (Dúbravcová et al. 1976, 1980, 1990; Šeffer et al. 1989; Dúbravcová 1996). Some vegetation research was also carried out in the Nízke Tatry Mts (Sillinger 1933; Miadok 1995), the Malá Fatra Mts and the Veľká Fatra Mts (Klika 1932; Grebenščikov et al. 1956; Bělohlávková 1980; Kliment 1992), and in some other regions, e.g. Mt. Babia hora

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(Walas 1933). Numerous data have thus been scattered in partial and regional studies, diploma and dissertation theses, final reports, and other sources.

The study of the West Carpathian montane to subnival vegetation led to a complete overview of the high-altitude vegetation of Slovakia (Kliment & Valachovič 2007), forming part of the monographic series of the *Plant Communities of Slovakia*. In this publication it was impossible to present the whole synoptic table of higher syntaxa. In addition, further knowledge regarding the nomenclature was acquired after publication, and thus our study was required.

The overview of the high-altitude vegetation of the Western Carpathians (Kliment & Valachovič 2007) was preceded by the syntaxonomical revisions of the plant communities of the alliances *Petasition officinalis* (Kliment & Jarolímek 1995, 2002; Jarolímek et al. 2002), *Calamagrostion arundinaceae* (Kliment & Jarolímek 2003) and *Caricion firmae* (Šibík et al. 2004), orders *Calamagrostietalia villosae* and *Adenostyletalia alliariae* (Kliment et al. 2004) and classes *Elyno-Seslerietea* (Kliment et al. 2005a,b), *Carici rupestris-Kobresietea bellardii* (Petrík et al. 2005, 2006), *Loiseleurio-Vaccinietea* (Šibík et al. 2006, 2007a) and *Roso pendulinae-Pinetea mugo* (Šibík et al. 2005, 2010). In turn, this was preceded by parallel comparisons of the plant communities of several classes (Dúbravcová et al. 2005) in which previous knowledge was revised in the light of new methodological advances and new information about the diversity of the high-altitude vegetation in the surrounding mountain regions.

The aim of this paper has been to concentrate knowledge about the nomenclatural features, such as the synonyms, original diagnoses and nomenclatural types of the higher syntaxa occurring in the Western Carpathians, that will be important and useful for a forthcoming vegetation survey of high-rank syntaxa of Europe (EuroChecklist, cf. Mucina et al. 2009). This paper contains some corrections and improvements to the concepts published in Kliment & Valachovič (2007), and is presented in a compact form in English, which makes it more accessible by international readership.

Material and methods

The data for the numerical analyses were obtained from the Slovak National Vegetation Database (Jarolímek & Šibík 2008; Šibíková et al. 2009) and from the private databases of the authors, stored in the Turboveg program (Hennekens & Schaminée 2001). All the relevés used have been collected according to the principles of the Zürich-Montpelliér school (Braun-Blanquet 1964; Westhoff & van der Maarel 1978).

All the relevés were transformed into the nine-degree ordinal scale (van der Maarel 1979) in order to obtain data that could be compared by numerical classification. Taxa that were determined only at the genus level were excluded from the numerical analysis; some taxa were included in more broadly defined aggregates.

The numerical classification was performed with the NCLAS and HierClus programs from the SYN-TAX package (Podani 1993, 2001), whereas the arrangement of tables and the unification of plant names were performed with the FYTOPACK program (Jarolímek & Schlosser 1997). The final synoptic table was defined on the basis of a numerical classification and was achieved in several steps. The extensive data sets comparing the vegetation data from several traditionally comprehended classes (*Elyno-Seslerietea* s. l. – including the stands on non-calcareous bedrock in the Belianske Tatry Mts and *Juncetea trifidi* sensu Mucina & Maglocký 1985) were analysed in the first step. The β-flexible method with coefficients for ratio scale data was used since the cover of individual species in the vegetation types has been of great importance. The results of these extensive analyses were published in several papers: Petrík et al. (2005, 2006) – the comparison of the plant communities of the classes *Carici-Kobresietea* and *Elyno-Seslerietea*; Dúbravcová et al. (2005) – *Caricetea curvulae*, *Loiselerio-Vaccinietea*, *Carici-Kobresietea* and *Nardetea strictae*; Kliment et al. (2004, 2005a,b, partly unpublished) – *Elyno-Seslerietea*, *Mulgedio-Aconitetea*, partly *Festuco-Brometea* (stands with *Sesleria albicans*). As a next step, we analysed separately the inner variability of individual classes, most frequently at the alliance level. The presented synoptic table is hence the result of several subsequent numerical classifications. Vegetation units of the highest rank (classes) were analysed first, followed by the homogeneous units of lower rank (alliances). Outliers from the individual groups were removed from subsequent analysis.

The diagnostic taxa were chosen according to methods used in previous overviews of the plant communities of Slovakia (cf. Kliment & Valachovič 2007: 11, 17). The diagnostic taxa comprise characteristic taxa, differential taxa and constant taxa. The characteristic taxa represent the result of the comparison of floristic composition of all studied high-altitude plant communities (Table 1), with respect to previous opinions on their evaluation, as well as to the published data on the diagnostic taxa of another higher syntaxa (*Asplenietea trichomanis*, *Thlaspietea rotundifolii*, *Montio-Cardaminetea*; cf. Valachovič et al. 1995, 2001) and the long-term field experience of the authors of the fourth volume of *Plant Communities of Slovakia* (Kliment & Valachovič 2007). In special cases of syntaxonomically distant classes, the possibility of evaluation of one taxon as a characteristic of two syntaxa was allowed, e. g. for two distant alliances (or for the alliance and the class). The characteristic taxa are printed in bold in the synoptic table. The transgressive taxa (with the preference given to the syntaxon) are moreover printed with a rim. The differential taxa (shown in the synoptic table as underlined) differentiate the depicted syntaxon against other syntaxa of the same rank, within the first superior syntaxon [e. g. alliance within order]. The differential taxa of the orders are not, however, specified. Thus, one taxon can differentiate several alliances within the data set (Table 1) and be characteristic of a syntaxon, as well. Constant taxa are those that were present in more than 40 % of the relevés in the individual syntaxa (cf. Jarolímek and Šibík 2008). They are not highlighted in the synoptic table at all.

The descriptions of syntaxa are listed in descending order from class through the order to alliance. In some cases the association level follows the alliance level. The distribution of the relevés of the individual phytosociological classes of Slovakia is depicted with a map of Slovakia generated in DMAP software, version 7.2e (Morton 2005) – Figure 1. The order of the localities (orographical units) in the text (Dis-

tribution) has the West – East and North – South direction.

Syntaxonomical or nomenclatural notes (annotation), when necessary, complete the synopsis of the syntaxa. Important notes regarding the taxonomy of the constituent species and various opinions on the classification of a given syntaxon in the hierarchy are collected within these syntaxonomical notes.

The header of the synoptic table carries information on the number of relevés per given column and an average number of taxa in a community. In a given column, the constancy values of a taxon are expressed in percentage terms. The upper index accompanying the constancy values is indicative of the weighted average value of the cover/abundance of a taxon in a given column (in ordinal scale 1–9). The taxa in the table are grouped according to their diagnostic value. The sources of data (the number of relevés, the name of the author, the year of publication and the relevé number or the number of the table in the original source) for each particular column are identical to the sources of data published in Kliment & Valachovič (2007). The last column of Table 1, representing the alliance *Nardo-Agrostion tenuis*, was additionally incorporated only for comparison with the alliance *Nardion strictae* in order to highlight the differences between the most similar alliances of the class *Nardetea strictae*.

The nomenclature of the plants follows the checklist of Marhold & Hindák (1998); rare exceptions are added with the author's citation. The names of the subspecies in the synoptic table are abbreviated and marked by an asterisk (*). The Arctic-alpine elements in the Table 1 were defined following the study by Šibíková et al. (2010); the endemic taxa are in accordance with the study by Kliment (1999).

The vegetation survey in our paper is organised as a structured text featuring the syntaxa in hierarchical order. The high-rank syntaxa (classes, orders, alliances) are followed by short English characteristics. The names of the syntaxa (following the *International Code of Phytosociological Nomenclature*, 3rd ed.: Weber et al. 2000) comprise synonyms, which are further subdivided into the categories of homotypical or nomenclature synonyms (Syn.) and syntaxonomic synonyms (Syntax. syn.). Both of these categories reflect the concept of a given syntaxon. Within information about the content of the syntaxon, the notes on the included communities of lower rank but of the same syntaxonomical meaning (Incl.) are available. Communities that were invalidly identified with an individual syntaxon are marked as pseudonyms (Pseud.). A special category represents the so-called 'phantom names' (*Phantomnamen*), the names assigned to some authors who did not use that name in the cited work (cf. Mucina 1993). We also report the original form of the name (OFN). The term 'Basionym' (Bas.) is used in the sense of Weber (2003: 402) and it specifies the original author's citation of a new name.

Results and discussion

Syntaxonomy and nomenclature

The syntaxonomy and nomenclature of the high-altitude plant communities have been solved as part of the vegetation survey of Slovakia (Kliment & Valachovič 2007). New syntaxonomy and nomenclature were recently uncovered, however, and are summarised as follows (the numbers adjacent to the syntaxa names are identical to those in the headers of Table 1):

1 *Mulgedio-Aconitetea* Hadač et Klika in Klika et Hadač 1944

Tall-herb vegetation at high altitudes

Table 1, columns 1–8; Fig 1MU

OFN: *Mulgedio-Aconitea* Hadač-Klika 1944 (Klika & Hadač 1944: 283)

Syn.: *Betulo-Adenostyletea* Br.-Bl. et Tx. 1943 (Art. 8), *Betulo-Adenostyletea* Br.-Bl. in Br.-Bl. et al. 1947 (Art. 8), *Betulo-Adenostyletea* Br.-Bl. 1948 (Art. 3f), *Aconito-Cardaminetea* Hadač 1956 p. p. (Art. 25), *Stellario nemorum-Geranietea sylvatici* Niemann et al. 1973 (Art. 3b)

Syntax. syn.: *Galio-Urticetea* Passarge ex Kopecký 1969 p. p. (*Petasito-Chaerophylletalia*), *Nardo-Calamagrostietalia villosae* Jeník et al. 1980 p. p. (excl. *Nardion strictae*)

Phantomname: *Adenostyletea* Br.-Bl. et Tx. 1943 (Eggler 1952: 34)

Nomenclatural type: *Adenostyletalia* Br.-Bl. 1930, lectotypus (Jeník et al. 1980: 12)

Annotation: The name *Mulgedio-Aconitetea* Hadač et Klika in Klika 1948, which was accepted in several recent lists of syntaxa (e.g. Theurillat et al. 1994: 23, 1995: 223; Mucina 1997: 134; Malynovski & Kricsfalusy 2000: 141, 2002: 144; Kočí 2001: 295; Rivas-Martinez et al. 2001: 97; Kliment et al. 2007a: 24), turned out to be an earlier homonym. The original diagnosis of the name *Mulgedio-Aconitetea* was already validly published in the study by Klika & Hadač (1944: 283), where the authors (p. 257) noted the first valid publication of the name *Adenostyletalia* Br.-Bl. 1930 (Art. 2b, Note 1) by referring to the list of references in the study by Klika & Novák (1941). Hence we decided to use the older, widely-accepted name (cf. Kočí 2007: 91).

Distribution: Biele Karpaty Mts, Považský Inovec Mts, Javorníky Mts, Strážovské vrchy Mts, Kysucká vrchovina Mts, Oravské Beskydy Mts, Oravská vrchovina Mts, Lúčanská and Krivánska Malá Fatra Mts, Chočské vrchy Mts, Veľká Fatra Mts, Nízke Tatry Mts, Západné Tatry Mts, Vysoké Tatry Mts, Belianske Tatry Mts, Pieniny Mts, Spišská Magura Mts, Branisko Mts, Slovenský raj Mts, Kremnické vrchy Mts, Poľana Mts, Štiavnické vrchy Mts, Veporské vrchy Mts, Muránska planina Mts, Stolické vrchy Mts, Čergov Mts, Volovské vrchy Mts, Slovenský kras (inversion sites), Slanské vrchy Mts, Bukovské vrchy Mts

11 *Calamagrostietalia villosae* Pawłowski et al. 1928

Tall-grass vegetation of high-altitude meadows

Table 1, columns 1–5

OFN: *Calamagrostidetalia villosae* (Pawłowski et al. 1928: 245)

Syn.: *Calamagrostietalia villosae* Pawłowski 1928 (Art. 8), *Calamagrostietalia arundinaceae* Eggler 1952 (Art. 8), *Calamagrostietalia arundinaceae* Rejmánek et Šturs a in Sýkora et Štursa 1973 (Art. 8)

Nomenclatural type: *Calamagrostion villosae* Pawłowski et al. 1928, lectotypus (Art. 20; cf. Jeník et al. 1980: 9)

Table 1. Floristic composition of the higher syntaxa of high-altitude vegetation in the Western Carpathians (a brief synoptic table) The characteristic taxa are printed in bold. The transgressive taxa (with the preference given to the syntaxon) are moreover printed with a rim. The differential taxa (shown in the synoptic table as underlined) differentiate the depicted syntaxon against other syntaxa of the same rank, within the first superior syntaxon (e.g. alliance within order). The header of the synoptic table carries information on the number of relevés per given column and an average number of taxa in a community. In a given column, the constancy values of a taxon are expressed in percentage terms. The upper index accompanying the constancy values is indicative of the weighted average value of the cover/abundance of a taxon in a given column (in ordinal scale 1–9). Shaded are all the diagnostic taxa and the taxa of higher indicative (significance) value or the taxa with higher frequency in particular groups of plant communities.

Class			1						2		3			4		5			6		7	8	
Order			11			12		13	21	31				41		51		52	61		71	81	
Alliance	111	112	113	114	115	121	121	131	211	311	311	312	313	411	412	511	512	522	611	612	711	811	812
Suballiance						1211	1212			3111	3112												
Number of relevés	159	131	148	63	97	129	82	355	54	41	364	123	304	114	248	181	217	27	192	204	752	138	500
Average number of taxa	24	27	41	43	40	20	34	29	49	35	37	44	37	61	43	15	18	41	21	19	21	19	23
Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1 *Mulgedio-Aconitetea*																							
Acetosa arifolia	**33**^{3}	**27**^{3}	**40**^{3}	**2**^{3}	**37**^{2}	**79**^{4}	**70**^{4}	**18**^{2}	26^{2}	.	1^{2}	4^{2}	.	.	.	1^{2}	23^{3}	.	.	9^{3}	1^{2}	5^{2}	24^{3}
Aconitum firmum [C]	**13**^{2}	**76**^{5}	**2**^{2}	**6**^{3}	**32**^{3}	**36**^{3}	**48**^{4}	**11**^{3}	6^{2}	2^{2}	+^{2}	6^{2}	1^{2}	8^{2}	3^{2}	1^{1}	1^{2}	11^{2}	.	3^{2}	+^{2}	.	+^{2}
Geranium sylvaticum	**16**^{2}	**35**^{4}	**61**^{3}	**25**^{2}	**84**^{4}	**27**^{3}	**79**^{3}	**15**^{2}	93^{4}	2^{2}	2^{2}	35^{3}	+^{3}	1^{2}	1^{4}	.	1^{2}	.	.	2^{2}	+^{2}	.	3^{2}
Poa chaixii	**16**^{2}	**5**^{2}	**22**^{3}	**3**^{2}	**25**^{2}	**10**^{3}	**26**^{2}	**3**^{2}	19^{2}	.	.	4^{2}	.	.	.	.	5^{2}	.	.	4^{2}	.	1^{3}	21^{3}
Senecio subalpinus	**7**^{3}	**31**^{2}	**22**^{2}	**3**^{2}	**47**^{3}	**15**^{2}	**46**^{2}	**5**^{2}	17^{2}	.	1^{2}	7^{2}	.	.	.	1^{1}	6^{2}	.	.	1^{2}	+^{2}	9^{2}	5^{2}
Silene dioica	**7**^{2}	**9**^{3}	**5**^{2}	**.**	**26**^{2}	**37**^{3}	**51**^{2}	**32**^{2}	11^{2}	.	+^{2}	.	+^{2}	.	+^{2}	.	1^{2}	.	.	.	.	.	.
*Valeriana *sambucifolia*	**1**^{2}	**2**^{3}	**4**^{2}	**8**^{2}	**16**^{3}	**1**^{2}	**40**^{3}	**29**^{2}	11^{3}	.	.	.	+^{2}	.	.	.	.	.	.	.	.	.	.
*Veratrum *lobelianum*	**62**^{3}	**34**^{2}	**12**^{2}	**3**^{2}	**31**^{3}	**83**^{3}	**48**^{3}	**3**^{2}	24^{2}	.	.	3^{2}	.	.	3^{2}	1^{1}	13^{2}	4^{1}	1^{1}	14^{2}	1^{2}	17^{2}	14^{2}
Primula elatior	**1**^{2}	**8**^{2}	**35**^{2}	**21**^{2}	**70**^{3}	**11**^{3}	**56**^{3}	**38**^{2}	61^{2}	2^{1}	17^{2}	**58**^{3}	2^{2}	2^{2}	+^{1}	.	2^{2}	**48**^{3}	.	+^{2}	.	.	2^{2}
Gentiana asclepiadea	**21**^{2}	**7**^{3}	**38**^{2}	**19**^{2}	**29**^{2}	**16**^{3}	**43**^{2}	**6**^{2}	48^{2}	.	1^{2}	7^{2}	.	.	.	.	8^{2}	.	1^{2}	16^{2}	f^{2}	14^{2}	32^{3}
Thalictrum aquilegiifolium	**4**^{2}	**8**^{3}	**3**^{2}	**8**^{2}	**21**^{3}	**6**^{2}	**40**^{2}	**19**^{2}	35^{2}	.	1^{2}	1^{1}	.	.	.	.	.	.	.	.	.	.	+^{3}
Pedicularis hacquetii	**2**^{2}	**2**^{4}	**2**^{3}	**2**^{2}	**13**^{2}	**2**^{1}	**2**^{3}	**.**	4^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aconitum variegatum	**.**	**.**	**9**^{3}	**19**^{3}	**4**^{4}	**.**	**13**^{3}	**14**^{2}	33^{3}	.	3^{1}	.	.	.	.	.	.	.	.	+^{2}	.	.	.
11 *Calamagrostietalia villosae*																							
Luzula luzuloides[1]	***53**^{3}	***11**^{2}	***86**^{3}	***6**^{3}	***51**^{3}	*5^{2}	*22^{3}	3^{2}	*31^{3}	7^{2}	4^{2}	27^{3}	2^{2}	3^{2}	6^{2}	.	13^{3}	.	15^{2}	**44**^{3}	6^{2}	***43**^{2}	***61**^{3}
Solidago virgaurea[2]	***62**^{3}	***17**^{2}	***43**^{2}	***22**^{2}	***12**^{3}	*24^{2}	*10^{2}	1^{2}	*37^{2}	2^{2}	2^{1}	11^{2}	.	*3^{2}	*18^{2}	.	*26^{2}	*4^{1}	*15^{2}	*21^{2}	*11^{2}	*39^{2}	*29^{2}
Campanula serrata [C]	**11**^{2}	**2**^{2}	**71**^{2}	**24**^{2}	**28**^{2}	4^{1}	18^{2}	1^{2}	61^{2}	2^{2}	16^{2}	24^{2}	1^{2}	.	2^{2}	.	2^{2}	.	.	8^{2}	1^{2}	5^{2}	24^{2}
*Achillea *alpestris*	**8**^{2}	**6**^{2}	**67**^{3}	**22**^{3}	**46**^{3}	1^{2}	13^{2}	.	50^{2}	10^{2}	16^{2}	**46**^{3}	1^{2}	4^{3}	1^{2}	1^{1}	3^{3}	7^{1}	1^{1}	6^{2}	1^{2}	3^{2}	34^{2}
Anemone narcissiflora	**4**^{2}	**3**^{2}	**43**^{3}	**13**^{3}	**31**^{3}	2^{2}	1^{3}	.	9^{2}	10^{2}	1^{2}	**35**^{3}	2^{2}	7^{2}	29^{2}	1^{2}	2^{2}	15^{1}	5^{2}	6^{2}	5^{2}	1^{2}	4^{3}
Crepis conyzifolia	**25**^{3}	**8**^{2}	**36**^{3}	**6**^{2}	**7**^{2}	4^{2}	2^{4}	.	2^{1}	.	1^{2}	7^{4}	.	.	.	.	4^{3}	.	1^{3}	.	1^{3}	9^{3}	12^{2}
Trommsdorfia uniflora	**26**^{2}	**1**^{2}	**11**^{2}	**.**	**1**^{3}	1^{1}	.	.	2^{1}	.	+^{2}	10^{3}	.	.	2^{2}	.	12^{2}	.	10^{2}	5^{2}	11^{3}	**28**^{2}	**27**^{2}
Gentiana punctata	**62**^{3}	**32**^{2}	**.**	**.**	**1**^{2}	**64**^{3}	2^{2}	.	.	.	.	2^{2}	.	.	12^{2}	20^{2}	**49**^{3}	.	19^{2}	14^{2}	15^{2}	**22**^{2}	.
Crepis mollis	**1**^{2}	**.**	**48**^{2}	**19**^{2}	**48**^{3}	.	15^{2}	1^{3}	44^{2}	2^{2}	3^{2}	21^{2}	.	.	.	.	+^{2}	.	.	.	.	.	1^{2}
Linum extraaxillare [Cs]	**1**^{2}	**.**	**39**^{3}	**17**^{3}	**38**^{3}	.	6^{2}	.	19^{3}	27^{3}	4^{3}	**37**^{3}	1^{1}	9^{4}	3^{3}	.	.	.	.	2^{2}	+^{2}	.	1^{2}
Knautia maxima	**1**^{2}	**.**	**59**^{3}	**24**^{3}	**12**^{2}	1^{1}	2^{4}	1^{2}	35^{3}	.	1^{2}	2^{2}	.	.	.	.	.	.	.	.	.	.	2^{2}
Vicia oreophila	**.**	**.**	**41**^{2}	**24**^{2}	**5**^{2}	.	4^{2}	.	.	22^{2}	9^{2}	11^{2}	+^{2}	.	.	.	.	.	.	.	.	.	1^{2}
Cirsium erisithales	**.**	**.**	**53**^{3}	**70**^{2}	**34**^{3}	.	20^{2}	3^{2}	59^{3}	.	9^{1}	23^{2}	.	.	.	.	.	.	.	.	.	.	+^{2}
Cyanus mollis [Cs]	**.**	**.**	**27**^{4}	**37**^{2}	**18**^{3}	.	10^{2}	+^{1}	17^{4}	.	6^{2}	4^{3}	.	.	.	.	.	.	.	.	.	.	+^{5}
Laserpitium latifolium	**.**	**.**	**33**^{4}	**86**^{4}	**14**^{2}	.	4^{2}	+^{2}	41^{4}	5^{4}	27^{2}	4^{2}	.	.	.	.	.	.	.	.	.	.	.
Pimpinella major[3]	**.**	**.**	***60**^{3}	***65**^{3}	***52**^{4}	.	*20^{3}	1^{2}	*65^{3}	17^{3}	17^{2}	26^{3}	+^{2}	.	.	.	.	.	.	.	.	.	4^{2}
Pleurospermum austriacum	**.**	**.**	**11**^{2}	**16**^{2}	**4**^{3}	.	6^{2}	+^{2}	15^{3}	.	1^{2}	.	.	.	.	.	.	.	.	.	.	.	.
Bupleurum longifolium	**.**	**.**	**14**^{3}	**6**^{3}	**15**^{3}	.	4^{3}	.	39^{3}	.	+^{2}	3^{2}	.	.	.	.	.	.	.	.	.	.	.
Campanula elliptica	**.**	**.**	**50**^{3}	**27**^{2}	**32**^{2}	.	6^{2}	.	41^{2}	15^{3}	20^{2}	33^{3}	.	.	.	.	.	.	.	.	.	.	2^{2}
Phleum hirsutum	**.**	**.**	**49**^{3}	**24**^{3}	**39**^{3}	.	4^{2}	.	20^{2}	5^{2}	4^{2}	**48**^{3}	.	2^{2}	.	.	.	.	.	1^{2}	+^{3}	.	6^{2}
Pyrethrum clusii	**.**	**.**	**66**^{3}	**46**^{2}	**13**^{2}	.	1^{2}	.	46^{3}	5^{2}	6^{2}	4^{2}	.	.	+^{2}	.	.	.	.	+^{1}	.	.	7^{2}
Astrantia major	**.**	**.**	**28**^{2}	**32**^{2}	**60**^{3}	1^{3}	22^{2}	11^{2}	52^{3}	5^{2}	5^{2}	19^{2}	.	.	.	.	.	.	.	+^{2}	.	.	1^{2}
111 *Calamagrostion villosae*																							
Calamagrostis villosa	**100**^{8}	40^{3}	34^{8}	.	12^{4}	**72**^{3}	20^{2}	+^{2}	46^{6}	.	.	1^{2}	.	.	5^{2}	.	11^{3}	4^{1}	19^{2}	38^{3}	7^{2}	23^{2}	11^{3}
*Carex *silicicola*[4]	**47**^{3}	25^{2}	.	.	.	2^{2}	.	.	.	.	.	.	.	*45^{3}	*46^{3}	2^{2}	26^{2}	.	**43**^{2}	11^{2}	**46**^{4}	**54**^{3}	2^{2}
*Sempervivum *carpathicum* [C]	**23**^{2}	3^{2}	.	.	1^{2}	3^{2}	.	.	.	.	.	1^{2}	.	.	4^{2}	.	12^{2}	.	4^{1}	3^{1}	5^{2}	4^{2}	.
112 *Trisetion fusci*																							
Trisetum fuscum [C]	3^{2}	**33**^{4}	.	.	11^{3}	10^{2}	5^{2}	.	.	.	.	.	.	.	1^{2}	1^{2}	3^{3}	41^{3}	.	.	.	.	.
Rhodiola rosea [AA]	14^{2}	**64**^{4}	1^{2}	2^{2}	31^{3}	21^{2}	28^{3}	+^{2}	7^{4}	17^{3}	.	24^{2}	17^{2}	53^{2}	45^{2}	2^{3}	5^{2}	59^{2}	.	2^{2}	1^{2}	.	.
Taraxacum alpinum	3^{2}	**45**^{2}	.	.	.	7^{2}	4^{2}	.	.	.	.	3^{2}	.	.	.	15^{2}	14^{2}	44^{2}	.	.	.	1^{1}	.
Carex aterrima	3^{2}	**27**^{2}	.	.	2^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+^{2}	.	.
Cerastium fontanum	1^{1}	**21**^{2}	.	2^{2}	5^{2}	.	.	.	.	.	.	7^{2}	.	.	.	.	2^{2}	.	.	.	+^{3}	2^{2}	.
Bryum pseudotriquetrum (E_0)	.	**21**^{2}	.	.	.	.	.	1^{3}	.	.	.	.	.	.	1^{1}	1^{1}	.	.	.	.	.	.	.
Deschampsia cespitosa	5^{3}	**82**^{5}	38^{3}	.	19^{2}	11^{3}	40^{3}	20^{2}	24^{2}	.	4^{2}	2^{2}	.	.	.	11^{2}	9^{3}	.	.	7^{3}	1^{2}	17^{2}	36^{3}
*Caltha *laeta*	1^{2}	**41**^{3}	.	.	.	3^{3}	10^{4}	34^{2}	.	.	.	.	.	.	.	4^{2}	+^{2}	.	.	.	.	.	+^{2}
Cardaminopsis neglecta [C]	.	**14**^{2}	.	.	.	1^{2}	.	.	.	.	.	.	.	.	**25**^{2}	6^{2}	2^{2}	7^{2}	.	.	+^{2}	.	.
Cardamine amara[5]	.	*13^{2}	.	.	.	.	.	17^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+^{1}
113 *Calamagrostion arundinaceae*																							
Calamagrostis arundinacea	2^{3}	1^{5}	**87**^{6}	16^{3}	22^{2}	3^{2}	16^{3}	3^{2}	65^{6}	2^{3}	2^{2}	2^{4}	.	.	.	.	.	.	.	8^{3}	.	.	7^{2}
Hieracium prenanthoides	2^{2}	.	**39**^{3}	14^{3}	6^{2}	.	5^{3}	.	4^{2}	.	1^{2}	2^{2}	.	.	.	.	+2	.	.	1^{2}	.	.	1^{2}
Allium victorialis	.	.	**32**^{3}	8^{1}	.	.	.	.	26^{3}	.	+^{2}	2^{2}	.	.	.	.	.	.	.	1^{2}	.	.	4^{2}
Dianthus carthusianorum[6]	.	.	***30**^{2}	***17**^{2}	***3**^{2}	.	.	.	*15^{2}	.	16^{2}	7^{2}	.	.	.	.	.	.	.	.	.	.	4^{2}
Vicia sylvatica	.	.	**27**^{4}	13^{3}	4^{2}	.	2^{2}	1^{3}	57^{3}	2^{2}	1^{3}	1^{2}	.	.	.	.	.	.	.	.	.	.	+^{2}
Jacea pseudophrygia	.	.	**22**^{4}	11^{2}	1^{3}	.	.	.	13^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	2^{2}
Agrostis capillaris	.	7^{2}	**55**^{4}	11^{3}	3^{2}	.	1^{2}	1^{2}	.	.	6^{2}	6^{2}	.	.	.	.	+1	.	.	1^{3}	.	7^{2}	58^{4}
Ranunculus nemorosus	3^{2}	9^{2}	**49**^{2}	16^{2}	3^{2}	3^{2}	1^{1}	.	41^{2}	.	9^{2}	10^{2}	.	.	.	.	.	.	.	1^{2}	.	1^{1}	15^{2}
Cruciata glabra	.	.	**47**^{2}	13^{2}	3^{3}	.	.	6^{2}	11^{3}	.	9^{2}	3^{2}	.	.	.	.	.	.	.	.	.	.	28^{3}
Briza media	.	2^{1}	**32**^{2}	17^{2}	1^{2}	.	.	1^{2}	4^{2}	.	22^{2}	3^{2}	.	.	.	.	.	.	.	.	.	.	20^{2}
Hieracium lachenalii	2^{2}	.	**26**^{2}	5^{2}	.	.	.	.	.	.	4^{2}	5^{2}	.	.	.	.	.	.	.	7^{2}	.	1^{2}	26^{2}
Avenula planiculmis	.	.	**24**^{4}	2^{2}	1^{2}	.	.	.	6^{2}	.	3^{2}	.	.	.	.	.	.	.	.	.	.	.	15^{3}
114 *Calamagrostion variae*																							
Calamagrostis varia	.	.	2^{2}	**100**^{8}	23^{4}	.	10^{4}	3^{2}	26^{5}	.	23^{2}	7^{2}	.	.	.	.	.	.	.	.	.	.	.
Epipactis atrorubens	.	.	.	**21**^{2}	.	.	.	.	.	.	8^{2}	.	.	.	.	.	.	.	.	.	.	.	.
Gymnadenia odoratissima	.	.	.	**14**^{1}	1^{2}	.	.	.	.	.	8^{2}	.	+^{2}	.	.	.	.	.	.	.	.	.	.
115 *Festucion carpaticae*																							
Festuca carpatica [C]	.	.	7^{3}	10^{3}	**100**^{8}	1^{2}	27^{3}	.	56^{4}	12^{3}	2^{3}	19^{3}	.	1^{2}	.	.	.	.	.	.	.	.	.
Luzula sylvatica	8^{3}	4^{2}	13^{2}	8^{2}	**48**^{3}	9^{3}	**50**^{3}	5^{2}	67^{3}	.	3^{2}	10^{2}	2^{2}	.	.	.	1^{2}	.	.	**12**^{2}	.	6^{2}	14^{2}
Cortusa matthioli	.	.	1^{2}	13^{3}	**42**^{3}	.	**24**^{3}	9^{2}	46^{3}	.	1^{2}	4^{3}	6^{2}	4^{2}	+^{3}	.	.	22^{2}	.	+^{2}	.	.	.
12, 121 *Adenostyletalia alliariae*, *Adenostylion alliariae*																							
Adenostyles alliariae	28^{2}	27^{3}	9^{3}	3^{2}	22^{3}	**90**^{7}	**78**^{7}	3^{2}	35^{3}	.	.	.	.	.	+^{2}	1^{1}	8^{2}	4^{2}	.	2^{2}	.	.	.
Athyrium distentifolium	8^{2}	14^{2}	1^{2}	.	.	**49**^{6}	**23**^{3}	4^{2}	2^{2}	.	.	.	.	.	.	.	2^{2}	.	.	8^{3}	.	.	2^{2}
Doronicum austriacum	11^{2}	15^{2}	2^{2}	.	3^{2}	**50**^{4}	**48**^{4}	6^{3}	17^{3}	.	.	.	.	.	.	.	+^{2}	.	.	2^{2}	.	.	.
Milium effusum	10^{2}	13^{3}	3^{2}	.	10^{2}	**49**^{4}	**41**^{4}	15^{2}	26^{3}	.	.	.	.	.	.	.	1^{2}	.	.	.	.	.	.
Ranunculus platanifolius	22^{2}	10^{3}	19^{2}	6^{3}	7^{3}	**48**^{3}	**26**^{3}	3^{2}	13^{2}	.	.	.	.	.	+^{1}	.	+^{1}	.	.	2^{2}	.	1^{2}	2^{3}
Cicerbita alpina	2^{3}	2^{3}	3^{2}	.	2^{3}	**35**^{4}	**39**^{4}	2^{2}	9^{2}	.	.	.	.	.	.	.	1^{2}	.	.	+^{3}	.	1^{1}	.
1211 *Adenostylenion alliariae*																							
Oreogeum montanum	83^{3}	66^{3}	.	.	.	**66**^{3}	6^{2}	1^{2}	.	.	.	**24**^{3}	.	3^{2}	10^{2}	48^{3}	87^{5}	11^{1}	8^{2}	14^{2}	28^{2}	**65**^{3}	11^{3}

Table 1. (continued)

Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1212 *Delphinenion elati*																							
Delphinium elatum	.	.	6^{3}	8^{3}	7^{3}	.	**30^{5}**	5^{3}	.	.	.	2^{2}	.	.	.	.	.	.	.	.	.	.	.
Epilobium alpestre	.	1^{3}	6^{2}	2^{2}	23^{2}	3^{3}	**46^{3}**	5^{2}	30^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Geum rivale	1^{2}	15^{2}	7^{2}	3^{2}	36^{3}	3^{2}	$\underline{50}^{3}$	37^{2}	43^{3}	.	1^{2}	2^{2}	.	.	.	.	.	.	.	.	.	1^{1}	$+^{3}$
Galeobdolon luteum s. l.[7]	.	.	2^{2}	2^{3}	1^{2}	.	$\underline{22}^{3}$	14^{2}	2^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
13, 131 *Petasito-Chaerophylletalia*, *Petasition officinalis*																							
Chaerophyllum hirsutum	1^{3}	31^{4}	6^{3}	6^{3}	38^{3}	5^{2}	$\underline{76}^{5}$	**87^{4}**	9^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	$+^{2}$
Stellaria nemorum	.	31^{4}	5^{2}	.	5^{2}	14^{3}	50^{4}	**83^{4}**	9^{3}	.	.	.	$+^{1}$	.	.	.	.	.	.	$+^{2}$	.	.	2^{2}
Petasites hybridus	.	.	.	2^{2}	.	.	1^{6}	**70^{8}**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Geranium phaeum	.	.	1^{2}	2^{2}	1^{3}	.	4^{2}	**51^{5}**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carduus personata	.	2^{3}	8^{2}	2^{2}	8^{3}	1^{2}	$\underline{37}^{3}$	**51^{3}**	2^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chrysosplenium alternifolium	1^{2}	20^{3}	1^{2}	.	2^{2}	2^{3}	35^{3}	**47^{4}**	4^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Petasites kablikianus	.	.	.	.	.	1^{3}	11^{6}	**32^{7}**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Orobanche flava	.	.	.	.	.	.	4^{2}	**23^{2}**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Anthriscus nitida	.	.	.	.	1^{3}	.	2^{2}	**16^{3}**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Impatiens noli-tangere	.	.	.	.	.	.	4^{2}	$\underline{54}^{3}$	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mentha longifolia	.	.	.	.	.	.	.	$\underline{47}^{3}$	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Poa trivialis	.	.	.	.	.	.	4^{2}	$\underline{46}^{3}$	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chaerophyllum aromaticum	.	.	1^{2}	2^{1}	6^{3}	.	2^{3}	$\underline{46}^{3}$	2^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ranunculus repens	.	1^{1}	1^{3}	.	.	.	.	$\underline{45}^{2}$	.	.	$+^{2}$	1^{2}	.	.	.	.	$+^{2}$	.	.	.	.	.	1^{3}
Aegopodium podagraria	.	.	5^{2}	2^{2}	.	.	4^{2}	$\underline{39}^{3}$	.	.	.	.	.	.	.	.	.	.	.	.	.	.	$+^{1}$
Lamium maculatum	.	.	1^{2}	2^{2}	1^{3}	.	7^{3}	$\underline{37}^{3}$	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Filipendula ulmaria	.	1^{2}	2^{3}	2^{2}	3^{3}	.	11^{3}	$\underline{35}^{2}$	20^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rumex obtusifolius	.	.	.	.	.	.	.	$\underline{21}^{2}$	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2^{2}
2, 21, 211 *Betulo carpaticae-Alnetea viridis*, *Alnetalia viridis*, *Salicion silesiacae*																							
Salix silesiaca (E_2)	.	.	.	.	.	.	.	$+^{2}$	**100^{8}**	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Valeriana tripteris	15^{2}	5^{3}	9^{2}	25^{3}	31^{3}	9^{3}	11^{2}	3^{3}	$\underline{65}^{3}$	2^{2}	2^{2}	5^{2}	1^{2}	.	7^{3}	.	1^{2}	.	1^{2}	$+^{2}$	$+^{2}$	.	.
Lathyrus vernus	.	.	8^{2}	8^{1}	5^{2}	.	5^{2}	$+^{2}$	$\underline{63}^{2}$	.	2^{2}	.	.	.	.	.	.	.	.	.	.	.	$+^{2}$
Rosa pendulina	.	.	11^{2}	11^{2}	1^{2}	.	4^{2}	1^{2}	$\underline{52}^{3}$	.	$+^{2}$	.	.	.	.	.	.	.	.	$+^{2}$	.	.	.
Sorbus aucuparia (E_2)	.	.	1^{2}	.	.	.	.	.	$\underline{52}^{2}$	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Myosotis sylvatica	1^{2}	3^{2}	9^{2}	11^{2}	11^{2}	5^{2}	18^{2}	17^{2}	$\underline{43}^{3}$	.	.	1^{2}	$+^{2}$	.	.	.	$+^{2}$	.	.	.	.	.	$+^{1}$
Daphne mezereum	.	.	8^{2}	6^{2}	4^{2}	.	12^{2}	10^{2}	$\underline{37}^{2}$	.	$+^{1}$	.	.	.	.	.	.	.	.	$+^{2}$	.	.	.
Paris quadrifolia	1^{2}	.	3^{2}	6^{2}	9^{2}	.	12^{2}	6^{2}	$\underline{35}^{2}$	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Picea abies (E_2)	1^{2}	.	.	.	.	.	.	4^{4}	$\underline{22}^{2}$	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3, 31 *Elyno-Seslerietea*, *Seslerietalia coerulae*																							
Galium anisophyllon	4^{1}	7^{2}	28^{2}	40^{2}	39^{2}	.	5^{2}	.	22^{2}	**83^{2}**	**56^{2}**	**76^{2}**	**61^{2}**	$\underline{95}^{2}$	18^{2}	.	1^{2}	37^{2}	.	8^{2}	1^{2}	.	7^{2}
Ranunculus breyninus	3^{2}	1^{2}	1^{2}	21^{2}	31^{2}	.	4^{2}	.	.	**78^{3}**	**29^{3}**	**54^{3}**	**27^{2}**	$\underline{77}^{3}$	14^{3}	.	3^{4}	22^{1}	.	3^{2}	1^{2}	.	.
Helianthemum grandiflorum	.	.	11^{3}	29^{3}	36^{3}	.	.	.	33^{2}	**73^{3}**	**54^{3}**	**69^{4}**	**12^{2}**	18^{3}	1^{2}	.	.	7^{2}	.	2^{2}	$+^{2}$	.	1^{2}
Thymus pulcherrimus [C]	.	.	1^{2}	32^{3}	10^{3}	.	1^{3}	.	9^{2}	**71^{3}**	**67^{3}**	**39^{3}**	**9^{2}**	$\underline{25}^{3}$	.	1^{3}	.	7^{2}	.	3^{2}	$+^{3}$	.	.
Euphrasia salisburgensis	.	.	.	11^{2}	.	.	1^{2}	.	4^{2}	**63^{2}**	**36^{2}**	**31^{2}**	**31^{2}**	$\underline{33}^{2}$	2^{1}	.	.	4^{2}	.	1^{2}	.	.	$+^{2}$
Phyteuma orbiculare	1^{2}	.	26^{2}	62^{2}	44^{2}	.	4^{2}	.	28^{2}	**61^{2}**	**66^{2}**	**89^{3}**	**39^{2}**	$\underline{54}^{3}$	18^{2}	.	1^{2}	30^{2}	.	7^{2}	1^{3}	.	1^{2}
Scabiosa lucida	.	.	19^{2}	60^{3}	36^{3}	.	2^{2}	1^{2}	22^{2}	**54^{3}**	**60^{3}**	**78^{3}**	**12^{2}**	14^{2}	2^{2}	.	.	15^{2}	.	4^{2}	.	.	3^{2}
*Carex *tatrorum* [CW]	.	.	27^{3}	33^{3}	35^{3}	.	1^{2}	.	17^{2}	**51^{3}**	**41^{6}**	**96^{6}**	**14^{2}**	.	.	.	.	22^{3}	.	.	.	.	.
*Polygala *brachyptera*	.	.	5^{2}	25^{2}	12^{2}	.	1^{2}	.	2^{1}	**39^{2}**	**37^{2}**	**31^{2}**	**4^{2}**	.	$+^{2}$	.	.	.	.	.	.	.	$+^{2}$
Veronica fruticans [AA]	.	.	1^{2}	2^{2}	1^{2}	.	.	.	.	**37^{2}**	**8^{2}**	**11^{2}**	**$+^{2}$**	.	.	.	.	7^{2}	.	.	.	.	.
Gentiana clusii	.	.	.	2^{3}	.	.	.	.	.	**34^{2}**	**27^{2}**	**10^{2}**	**33^{2}**	.	.	.	.	.	.	.	.	.	$+^{1}$
*Anthyllis *alpestris*	.	.	7^{2}	25^{2}	4^{4}	.	1^{3}	.	.	**32^{2}**	**42^{3}**	**41^{3}**	**17^{2}**	.	.	.	.	.	.	1^{2}	.	.	2^{2}
Hieracium villosum	.	.	1^{2}	2^{2}	9^{2}	.	.	.	.	**32^{2}**	**12^{2}**	**37^{3}**	**3^{2}**	.	.	.	2^{2}	.	15	1^{2}	.	.	.
Astragalus australis	.	.	.	2^{2}	2^{3}	.	.	.	2^{1}	**32^{5}**	**$+^{2}$**	**21^{4}**	**2^{2}**	18^{3}	.	.	.	.	.	$+^{2}$	.	.	.
*Allium *montanum*	.	.	8^{2}	10^{2}	8^{2}	.	1^{2}	.	6^{2}	**32^{3}**	**23^{2}**	**10^{2}**	**1^{2}**	.	.	.	.	.	.	2^{2}	.	.	.
Bellidiastrum michelii	.	.	1^{2}	.	24^{3}	.	.	.	9^{2}	**24^{2}**	**24^{2}**	**64^{3}**	**40^{3}**	11^{2}	6^{2}	.	.	$\underline{67}^{3}$	.	1^{2}	$+^{3}$	.	$+^{2}$
Carduus glaucinus	.	.	1^{2}	$\underline{51}^{3}$	.	.	.	$+^{3}$	6^{2}	**17^{2}**	**47^{2}**	**40^{3}**	**1^{2}**	3^{3}	.	.	.	.	.	.	.	.	.
Gentianella fatrae [CW]	.	.	.	8^{2}	1^{2}	.	.	.	2^{1}	**15^{2}**	**21^{2}**	**18^{2}**	**1^{2}**	.	.	.	.	.	.	.	.	.	5^{2}
Thesium alpinum	.	.	14^{2}	46^{2}	6^{2}	.	2^{2}	.	6^{1}	**12^{2}**	**55^{2}**	**34^{2}**	**$+^{2}$**	.	.	.	.	.	.	$+^{2}$	.	.	1^{2}
Salix alpina	.	.	1^{3}	.	10^{3}	.	.	.	.	**7^{2}**	**4^{2}**	**21^{3}**	**44^{3}**	7^{4}	.	.	.	11^{4}	.	$\underline{13}^{3}$	$+^{2}$	.	.
Biscutella laevigata	.	.	.	2^{2}	12^{2}	.	.	.	.	**5^{2}**	**10^{2}**	**37^{2}**	**33^{2}**	7^{2}	.	.	.	7^{2}	.	4^{2}	$+^{1}$	.	.
*Dianthus *nitidus* [CW]	.	.	.	2^{2}	9^{2}	.	.	.	.	**2^{2}**	**22^{3}**	**24^{3}**	**32^{2}**	.	.	.	.	.	.	5^{2}	.	.	.
Astragalus alpinus [AA]	.	.	.	.	6^{4}	.	.	.	.	**12^{3}**	**.**	**12^{4}**	**$+^{2}$**	8^{3}	.	.	.	.	.	.	.	.	.
Knautia kitaibelii [CWs]	.	1^{2}	2^{2}	$\underline{33}^{2}$	6^{3}	.	.	.	.	**.**	**23^{2}**	**28^{3}**	**.**	.	.	.	.	.	.	.	.	.	1^{2}
311 *Astero alpini-Seslerion calcariae*																							
Sesleria albicans	.	.	36^{2}	48^{3}	16^{3}	.	1^{2}	$+^{2}$	.	**71^{4}**	**96^{5}**	.	16^{3}	.	.	.	.	.	.	6^{3}	.	.	4^{2}
*Dianthus *praecox* [CW]	.	.	.	5^{2}	2^{2}	.	.	.	.	**68^{3}**	**23^{2}**	3^{2}	4^{2}	.	.	.	.	.	.	$+^{2}$	.	.	.
Aster alpinus [AA]	.	.	.	.	.	.	.	.	.	**56^{3}**	**26^{3}**	1^{2}	8^{3}	$\underline{16}^{3}$	.	.	.	.	.	$+^{2}$	.	.	.
Festuca tatrae [C]	.	.	5^{3}	37^{2}	10^{4}	.	1^{2}	.	15^{2}	**46^{4}**	**50^{3}**	15^{2}	$+^{2}$	.	.	.	.	.	.	.	.	.	.
Minuartia langii	.	.	.	3^{2}	2^{3}	.	.	.	.	**20^{2}**	**47^{2}**	4^{2}	3^{2}	.	.	.	.	.	.	.	.	.	.
Jovibarba globifera	3^{3}	.	4^{2}	17^{2}	4^{2}	.	1^{3}	.	7^{2}	$\underline{54}^{2}$	$\underline{57}^{2}$	18^{2}	3^{2}	.	.	.	1^{2}	.	1^{2}	.	.	.	.
Asplenium ruta-muraria	.	.	.	.	.	.	.	.	.	$\underline{24}^{2}$	$\underline{37}^{2}$	2^{2}	1^{2}	.	.	.	.	.	.	.	.	.	.
Kernera saxatilis	.	.	.	5^{2}	.	.	.	.	.	$\underline{15}^{2}$	$\underline{31}^{2}$	.	4^{2}	.	.	.	.	.	.	.	.	.	.
Leontodon incanus	.	.	.	11^{2}	.	.	.	$+^{2}$	.	$\underline{5}^{2}$	$\underline{29}^{3}$	.	$+^{3}$	.	.	.	.	.	.	.	.	.	.
Hippocrepis comosa	.	.	1^{2}	2^{2}	.	.	.	.	.	$\underline{10}^{2}$	$\underline{15}^{2}$	1^{2}	.	.	.	.	.	.	.	.	.	.	.
3111 *Astero alpini-Seslerienion calcariae*																							
Bupleurum ranunculoides	.	.	3^{2}	2^{2}	2^{3}	.	.	.	.	**51^{2}**	.	3^{2}	5^{2}	$\underline{18}^{3}$	.	.	.	.	.	1^{2}	.	.	.
*Oxytropis *tatrae* [C]	.	.	.	.	.	.	.	.	.	**22^{4}**	.	1^{2}	1^{3}	1^{2}	.	.	.	.	.	.	.	.	.
Campanula tatrae [CW]	33^{2}	19^{2}	1^{2}	5^{2}	15^{2}	.	1^{2}	.	.	$\underline{39}^{2}$	.	37^{2}	9^{2}	79^{2}	58^{2}	1^{1}	12^{2}	33^{2}	12^{2}	5^{2}	9^{3}	16^{2}	9^{2}
3112 *Pulsatillo slavicae-Caricenion humilis*																							
Pulsatilla slavica [CW]	.	.	.	25^{2}	.	.	.	.	.	12^{5}	**50^{2}**	1^{2}	1^{2}	.	.	.	.	.	.	.	.	.	.
Carex humilis	.	.	.	3^{2}	.	.	.	.	.	.	**41^{6}**	.	.	.	.	.	.	.	.	.	.	.	.
Acinos alpinus	.	.	.	$\underline{17}^{2}$	.	.	.	.	.	.	**37^{2}**	5^{3}	$+^{3}$	.	.	.	.	.	.	.	.	.	.
Allium ochroleucum	.	.	.	5^{1}	.	.	.	.	.	.	**36^{3}**	1^{2}	.	.	.	.	.	.	.	.	.	.	.
Erysimum witmannii [C]	.	.	.	13^{2}	.	.	.	$+^{1}$	.	.	**28^{2}**	.	.	.	.	.	.	.	.	.	.	.	.
Rhodax rupifragus	.	.	.	.	.	.	.	.	.	.	**16^{3}**	.	.	.	.	.	.	.	.	.	.	.	.
Coronilla vaginalis	.	.	.	8^{2}	.	.	.	.	.	.	**15^{2}**	1^{3}	.	.	.	.	.	.	.	.	.	.	.
Globularia cordifolia (reg.)	.	.	.	.	.	.	.	.	.	.	**13^{3}**	.	.	.	.	.	.	.	.	.	.	.	.
Buphthalmum salicifolium (reg.)	.	.	1^{2}	5^{2}	.	.	.	.	.	.	**12^{3}**	.	.	.	.	.	.	.	.	.	.	.	.
Koeleria tristis (reg.) [CW]	.	.	.	.	.	.	.	.	.	.	**9^{3}**	.	.	.	.	.	.	.	.	.	.	.	.
Bromus monocladus (reg.) [CWs]	.	.	.	.	.	.	.	.	.	.	**7^{3}**	1^{2}	.	.	.	.	.	.	.	.	.	.	.
Galium austriacum (reg.)	.	.	.	.	.	.	.	.	.	.	**5^{2}**	.	.	.	.	.	.	.	.	.	.	.	.
Daphne arbuscula (reg.) [CW]	.	.	.	.	.	.	.	.	.	.	**2^{4}**	.	.	.	.	.	.	.	.	.	.	.	.
Tithymalus cyparissias	.	.	1^{2}	24^{2}	2^{3}	.	.	.	.	12^{3}	$\underline{37}^{2}$	6^{2}	.	.	.	.	.	.	.	.	.	.	$+^{2}$
Festuca pallens	.	.	.	6^{3}	.	.	.	.	.	.	$\underline{35}^{4}$	.	.	.	.	.	.	.	.	.	.	.	.
Seseli osseum	.	.	.	5^{2}	.	.	.	.	.	.	$\underline{35}^{3}$	.	.	.	.	.	.	.	.	.	.	.	.
Anthericum ramosum	.	.	.	13^{2}	.	.	.	.	.	.	$\underline{32}^{3}$	.	.	.	.	.	.	.	.	.	.	.	.
Hieracium bupleuroides	.	.	1^{2}	5^{2}	.	.	.	.	.	.	$\underline{27}^{2}$	1^{2}	.	.	.	.	.	.	.	.	.	.	.
Polygonatum odoratum	.	.	1^{2}	27^{2}	.	.	.	$+^{2}$	2^{2}	.	$\underline{26}^{2}$	.	.	.	.	.	.	.	.	.	.	.	.
Cyanus triumfettii	.	.	.	3^{1}	.	.	.	.	.	.	$\underline{26}^{2}$	.	.	.	.	.	.	.	.	.	.	.	.
Vincetoxicum hirundinaria	.	.	.	6^{1}	.	.	.	.	.	.	$\underline{24}^{3}$	.	.	.	.	.	.	.	.	.	.	.	.
Asperula tinctoria	.	.	.	10^{2}	.	.	.	.	.	.	$\underline{21}^{2}$	.	.	.	.	.	.	.	.	.	.	.	.

Table 1. (continued)

Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Teucrium montanum	.	.	.	.	.	.	.	.	.	.	21^{3}	.	.	.	.	.	.	.	.	.	.	.	.
Asperula cynanchica	.	.	.	2^{1}	.	.	.	.	.	.	19^{2}	.	.	.	.	.	.	.	.	.	.	.	.
312 *Seslerion tatrae*																							
Sesleria tatrae [CWs]	1^{3}	.	7^{3}	6^{3}	$\underline{56}^{3}$	.	9^{3}	.	46^{2}	29^{3}	2^{2}	$\mathbf{99^{4}}$	30^{2}	$\underline{61}^{2}$	1^{2}	.	$+^{2}$	85^{2}	.	4^{2}	$+^{2}$	.	.
Gentiana verna	.	.	.	2^{2}	1^{2}	.	.	.	.	7^{2}	3^{2}	$\mathbf{31^{2}}$	5^{2}	$\underline{4}^{2}$	.	.	.	7^{2}	.	.	$+^{1}$	.	.
Tephroseris capitata	.	.	3^{2}	2^{2}	16^{2}	.	.	.	.	5^{4}	.	$\mathbf{28^{2}}$	$+^{1}$	$\underline{15}^{2}$	.	.	.	.	1^{2}	1^{2}	.	.	.
*Trifolium *kotulae* [C]	.	.	.	.	.	.	.	.	.	12^{2}	.	$\mathbf{21^{2}}$	.	.	.	.	1^{2}	.	.	.	.	.	.
Poa alpina	1^{1}	34^{2}	4^{2}	8^{2}	26^{2}	16^{3}	12^{2}	.	7^{2}	32^{2}	16^{3}	$\underline{59}^{3}$	16^{2}	$\underline{75}^{2}$	17^{2}	19^{2}	18^{2}	96^{3}	.	4^{2}	2^{2}	3^{2}	19^{2}
Parnassia palustris	.	.	1^{2}	10^{3}	36^{3}	.	4^{2}	.	7^{2}	15^{2}	11^{2}	$\underline{53}^{2}$	18^{2}	35^{2}	6^{2}	.	.	22^{2}	.	5^{2}	1^{2}	1^{2}	1^{2}
Anthoxanthum odoratum agg.[8]	$*56^{3}$	$*37^{2}$	$*25^{2}$	$*13^{3}$	$*24^{3}$	$*21^{2}$	12^{2}	$+^{2}$	9^{2}	$*2^{3}$	$*4^{3}$	$*\underline{50}^{3}$	$*+^{2}$	17^{2}	27^{2}	$*25^{2}$	$*56^{3}$	$*4^{3}$	$*13^{2}$	$*18^{2}$	$*17^{2}$	$*62^{3}$	$*47^{3}$
Ligusticum mutellina	90^{3}	83^{3}	14^{3}	.	36^{3}	75^{3}	35^{2}	1^{3}	13^{2}	.	4^{3}	$\underline{41}^{3}$	2^{2}	7^{2}	27^{2}	68^{3}	97^{4}	52^{3}	39^{2}	23^{2}	47^{3}	$\underline{80}^{3}$	13^{2}
Homogyne alpina	91^{3}	40^{2}	26^{3}	5^{2}	37^{3}	65^{2}	32^{2}	1^{2}	22^{3}	.	2^{2}	$\underline{41}^{3}$	3^{2}	7^{3}	17^{2}	14^{2}	$\underline{87}^{4}$	15^{2}	44^{3}	64^{3}	49^{3}	88^{3}	50^{3}
*Cerastium *glandulosum* [CW]	.	2^{4}	.	.	5^{2}	.	2^{2}	.	.	.	.	$\underline{22}^{2}$	4^{2}	18^{2}	12^{2}	.	2^{2}	$\underline{89}^{4}$	.	$+^{2}$	$+^{2}$	1^{3}	.
313 *Caricion firmae*																							
Carex firma	.	.	.	.	.	.	.	.	.	12^{3}	8^{2}	15^{2}	$\mathbf{96^{7}}$	$\underline{42}^{2}$	$+^{2}$	.	.	48^{2}	.	3^{2}	.	.	.
Ranunculus alpestris	.	.	.	.	1^{2}	.	1^{2}	.	.	15^{2}	1^{2}	3^{2}	$\mathbf{82^{3}}$	$\underline{42}^{2}$	15^{3}	2^{3}	.	$\mathbf{96^{4}}$	.	2^{2}	$+^{2}$	.	.
Saxifraga caesia	.	.	.	.	.	.	.	.	.	7^{2}	1^{2}	.	$\mathbf{62^{3}}$	2^{1}	.	.	.	.	.	.	.	.	.
Pinguicula alpina [AA]	.	.	.	.	.	.	.	.	.	.	1^{2}	6^{2}	$\mathbf{43^{2}}$	11^{2}	3^{2}	.	.	22^{2}	.	1^{2}	.	.	.
Crepis jacquinii	.	.	.	2^{1}	1^{2}	.	1^{2}	.	.	17^{2}	11^{2}	7^{2}	$\underline{69}^{3}$	$\underline{18}^{3}$	.	.	.	19^{2}	.	3^{2}	.	.	.
Saxifraga aizoides [AA]	.	1^{5}	.	1^{2}	.	.	.	.	.	.	1^{2}	10^{3}	$\underline{48}^{2}$	$\underline{44}^{2}$	5^{2}	.	.	$\underline{74}^{3}$	.	3^{2}	$+^{2}$	.	.
Ctenidium molluscum (E_0)	.	1^{2}	.	5^{3}	4^{2}	.	1^{7}	.	13^{2}	5^{2}	1^{2}	3^{4}	$\underline{43}^{3}$	14^{2}	1^{2}	.	.	22^{3}	.	.	.	.	$+^{2}$
Androsace lactea	.	.	.	2^{2}	2^{2}	.	.	.	.	22^{2}	2^{2}	2^{2}	$\underline{29}^{2}$	4^{2}	.	.	.	7^{2}	.	.	.	.	.
Orthothecium rufescens (E_0)	.	.	.	.	.	.	.	.	.	2^{2}	.	.	$\underline{25}^{3}$	10^{2}	$+^{2}$	.	.	26^{2}	.	.	.	.	.
4 *Carici rupestris-Kobresietea bellardii*																							
Bistorta vivipara [AA]	3^{2}	26^{2}	3^{3}	.	19^{2}	.	.	.	.	7^{2}	7^{3}	59^{3}	69^{2}	$\mathbf{97^{4}}$	$\mathbf{70^{2}}$	7^{2}	7^{2}	$\underline{93}^{3}$	11^{2}	11^{2}	21^{2}	4^{1}	4^{2}
Silene acaulis [AA]	.	2^{3}	.	.	.	.	.	.	.	.	$+^{2}$	18^{2}	44^{3}	$\mathbf{93^{6}}$	$\mathbf{76^{4}}$	3^{2}	$+^{2}$	37^{2}	1^{2}	2^{3}	7^{2}	.	.
Pedicularis oederi [AA]	1^{3}	8^{2}	.	.	.	.	.	.	.	.	.	24^{2}	43^{2}	$\mathbf{89^{3}}$	$\mathbf{53^{2}}$	1^{2}	1^{2}	81^{2}	1^{2}	1^{2}	5^{2}	.	.
Lloydia serotina [AA]	.	1^{2}	.	.	.	.	.	.	.	.	.	2^{2}	18^{2}	$\mathbf{82^{3}}$	$\mathbf{58^{2}}$	1^{7}	.	37^{2}	.	.	2^{2}	.	.
Dryas octopetala [AA]	.	.	.	.	.	.	.	.	.	5^{2}	2^{3}	15^{4}	$\underline{78}^{5}$	$\mathbf{51^{4}}$	$\mathbf{6^{4}}$	.	.	7^{2}	.	8^{2}	$+^{5}$	.	.
*Luzula *mutabilis*	.	.	.	.	.	.	.	.	.	.	.	2^{2}	$+^{2}$	$\mathbf{46^{2}}$	$\mathbf{44^{2}}$	.	$+^{1}$	4^{1}	.	.	2^{1}	.	.
Elyna myosuroides [AA]	.	.	.	.	.	.	.	.	.	.	.	.	.	$\mathbf{11^{5}}$	$\mathbf{1^{4}}$	.	.	.	.	.	.	.	.
Carex rupestris [AA]	.	.	.	.	.	.	.	.	.	.	.	.	4^{6}	.	$\mathbf{*1^{2}}$	.	.	.	.	.	1^{8}	.	.
41 *Oxytropido-Elynetalia*																							
*Festuca *versicolor* (reg.) [Cs]	.	.	2^{3}	2^{5}	3^{2}	.	.	.	.	$\underline{95}^{6}$	5^{3}	63^{5}	98^{4}	$\mathbf{97^{5}}$	$\mathbf{49^{5}}$	2^{2}	.	33^{2}	2^{2}	15^{2}	4^{4}	.	$+^{5}$
Cerastium eriophorum	.	.	.	.	.	.	.	.	.	.	.	8^{2}	15^{2}	$\boxed{\mathbf{94^{3}}}$	$\mathbf{30^{2}}$	.	$+^{2}$	.	.	$+^{2}$	1^{2}	.	.
Minuartia sedoides	.	.	.	2^{3}	.	.	.	.	.	.	.	7^{2}	33^{2}	$\mathbf{89^{4}}$	$\mathbf{41^{3}}$	1^{2}	.	11^{2}	.	.	2^{2}	.	.
Minuartia pauciflora [C]	.	.	.	.	.	.	.	.	.	.	.	3^{3}	25^{2}	$\boxed{\mathbf{82^{3}}}$	$\mathbf{22^{2}}$	.	.	11^{2}	.	.	$+^{2}$	.	.
Ligusticum mutellinoides	.	.	.	.	.	.	.	.	.	.	.	7^{3}	5^{2}	$\mathbf{78^{3}}$	$\mathbf{45^{2}}$	1^{5}	.	22^{2}	.	.	2^{3}	.	.
Carex fuliginosa	.	.	.	.	.	.	.	.	.	.	.	.	8^{2}	$\boxed{\mathbf{73^{3}}}$	$\mathbf{31^{2}}$	.	.	.	.	.	2^{2}	.	.
Saxifraga moschata[9]	.	5^{2}	.	.	1^{2}	.	.	.	.	10^{2}	.	14^{2}	9^{2}	$\mathbf{72^{3}}$	$\mathbf{56^{2}}$	2^{2}	$+^{2}$	26^{2}	.	2^{2}	2^{2}	.	.
Hedysarum hedysaroides	.	.	.	.	11^{3}	.	.	.	.	17^{3}	.	14^{3}	11^{2}	$\boxed{\mathbf{63^{3}}}$	$\mathbf{3^{5}}$	.	.	4^{3}	.	3^{2}	$+^{4}$	.	.
Carex atrata [AA]	.	.	.	.	2^{3}	2^{2}	.	.	.	.	.	11^{6}	6^{2}	$\mathbf{54^{3}}$	$\mathbf{25^{2}}$	1^{2}	.	33^{2}	2^{2}	2^{2}	10^{2}	4^{3}	.
Saussurea alpina [AA]	.	3^{3}	.	.	6^{3}	.	.	.	.	.	.	6^{2}	1^{2}	$\boxed{\mathbf{37^{3}}}$	$\mathbf{2^{3}}$	.	.	.	.	.	1^{2}	.	.
*Antennaria *carpatica* [C]	.	1^{2}	.	.	.	.	.	.	.	.	.	2^{2}	2^{2}	$\mathbf{32^{2}}$	$\mathbf{23^{2}}$	.	.	.	.	.	1^{2}	.	.
Dianthus glacialis	.	.	.	.	.	.	.	.	.	.	.	2^{2}	1^{2}	$\boxed{\mathbf{27^{2}}}$	$\mathbf{10^{2}}$	.	.	.	.	.	$+^{2}$	.	.
Saxifraga oppositifolia [AA]	.	.	.	.	.	.	.	.	.	.	.	1^{2}	5^{2}	$\mathbf{24^{3}}$	$\boxed{\mathbf{26^{3}}}$	.	.	7^{2}	.	.	$+^{1}$	.	.
Agrostis alpina	.	.	.	.	.	.	.	.	.	.	.	5^{2}	1^{2}	$\mathbf{19^{3}}$	$\mathbf{12^{3}}$	.	$+^{2}$	4^{2}	.	.	.	1^{2}	.
Gentiana nivalis [AA]	.	1^{1}	.	.	.	.	.	.	.	2^{2}	.	2^{2}	2^{2}	$\boxed{\mathbf{16^{2}}}$	$\mathbf{+^{2}}$	.	.	.	.	.	$+^{2}$	.	.
Saussurea pygmaea	.	.	.	.	.	.	.	.	.	.	.	.	.	$\mathbf{4^{2}}$	$\mathbf{17^{2}}$	.	.	.	.	.	2^{2}	.	.
411 *Oxytropido-Elynion*																							
Androsace chamaejasme [AA]	.	.	1^{2}	2^{2}	.	.	.	.	.	$\underline{17}^{2}$	.	24^{2}	39^{2}	$\mathbf{86^{3}}$	$+^{2}$	.	.	7^{2}	.	3^{2}	$+^{2}$	.	.
Rhodax alpestris	.	.	.	6^{2}	1^{2}	.	.	.	.	22^{4}	5^{2}	4^{3}	39^{3}	$\mathbf{62^{2}}$	.	.	.	.	.	$+^{2}$	.	.	.
Oxytropis halleri	.	.	.	.	2^{3}	.	.	.	.	.	.	1^{5}	2^{2}	$\mathbf{42^{3}}$	.	.	.	.	.	.	.	.	.
Vulpicida tubulosus (E_0)	.	.	.	.	.	.	.	.	.	5^{2}	.	1^{3}	28^{2}	$\mathbf{40^{2}}$	2^{2}	.	.	.	.	.	.	.	.
Comastoma tenellum [AA]	.	.	.	.	.	.	.	.	.	2^{2}	.	.	6^{2}	$\mathbf{38^{2}}$	.	.	.	.	.	.	.	.	.
Pyrola carpatica [C]	.	.	.	.	.	.	.	.	.	.	.	1^{2}	$\underline{12}^{3}$	$\mathbf{34^{3}}$	1^{2}	.	.	.	.	$+^{2}$	.	.	.
Dactylina madreporiformis (E_0)	.	.	.	.	.	.	.	.	.	.	.	.	13^{3}	$\mathbf{31^{2}}$	.	.	.	.	.	.	.	.	.
Carex capillaris	.	.	.	.	.	.	.	.	.	2^{3}	.	2^{2}	3^{2}	$\mathbf{27^{3}}$	.	.	.	.	.	.	.	.	.
Oxytropis carpatica (reg.) [C]	.	.	.	.	.	.	.	.	.	7^{3}	.	1^{3}	11^{3}	$\mathbf{26^{3}}$	.	.	.	.	.	.	.	.	.
Astragalus frigidus [AA]	.	.	.	.	4^{4}	.	.	.	.	.	.	3^{4}	1^{3}	$\mathbf{20^{3}}$	.	.	.	.	.	.	.	.	.
Erigeron hungaricus (reg.) [C]	.	.	.	2^{2}	4^{3}	.	.	.	.	5^{2}	.	7^{3}	1^{2}	$\mathbf{18^{2}}$	$+^{3}$	.	.	.	.	.	.	.	.
Astragalus norvegicus [AA]	.	.	.	.	1^{2}	.	.	.	.	.	.	3^{3}	$+^{2}$	$\mathbf{11^{3}}$	.	.	.	.	.	.	.	.	.
Myosotis alpestris	2^{2}	5^{2}	1^{2}	.	29^{2}	2^{2}	15^{3}	.	.	2^{2}	.	28^{2}	9^{2}	$\underline{77}^{2}$	13^{2}	.	4^{2}	$\underline{78}^{2}$	.	$+^{2}$	1^{2}	.	.
Ditrichum flexicaule (E_0)	.	.	.	6^{4}	1^{2}	.	.	.	6^{3}	17^{2}	29^{2}	4^{2}	64^{3}	$\underline{51}^{3}$	4^{3}	.	.	22^{3}	.	$+^{3}$	.	.	$+^{2}$
Swertia perennis[10]	$*1^{2}$	$*27^{2}$	.	$*14^{2}$	$*52^{3}$	$*1^{2}$	$*4^{3}$	1^{2}	4^{2}	2^{2}	4^{2}	27^{3}	36^{2}	$*\underline{47}^{3}$	$*19^{2}$	$*1^{7}$	.	$*\underline{70}^{3}$	.	$*3^{2}$	$*1^{2}$	2^{2}	$+^{2}$
Mnium thomsonii (E_0)	1^{3}	3^{2}	.	.	.	.	.	.	.	2^{2}	.	1^{3}	16^{2}	$\underline{46}^{2}$	5^{2}	.	.	30^{3}	.	.	.	.	.
Rhytidiadelphus triquetrus (E_0)	8^{3}	2^{2}	5^{4}	5^{3}	9^{4}	.	5^{4}	$+^{5}$	.	5^{2}	3^{2}	7^{3}	21^{2}	$\underline{45}^{3}$	19^{2}	.	2^{2}	11^{2}	3^{2}	11^{3}	2^{2}	1^{2}	1^{3}
*Cardaminopsis *tatrica* [CW]	1^{4}	2^{2}	12^{3}	2^{2}	16^{4}	7^{2}	18^{3}	1^{2}	.	.	.	22^{3}	.	$\underline{32}^{2}$	.	.	$+^{1}$	.	.	.	.	.	1^{2}
Arenaria tenella [CW]	.	.	.	2^{2}	.	.	.	.	.	10^{2}	.	2^{1}	36^{2}	$\underline{31}^{3}$	2^{2}	.	.	.	.	$+^{2}$	.	.	.
Draba aizoides	.	.	.	.	.	.	.	.	.	32^{2}	6^{2}	2^{2}	22^{2}	$\underline{24}^{2}$	1^{2}	.	.	4^{2}	.	.	.	.	.
412 *Festucion versicoloris*																							
Salix retusa s. l.[11]	5^{2}	10^{2}	.	.	3^{4}	.	.	.	.	2^{2}	.	4^{2}	7^{2}	25^{2}	$\mathbf{*63^{5}}$	$*3^{2}$	$*1^{2}$	30^{3}	9^{3}	1^{4}	$*5^{2}$	.	.
Gentiana frigida	.	1^{2}	.	.	.	1^{2}	.	.	.	.	.	.	.	6^{2}	$\mathbf{40^{2}}$	2^{2}	2^{2}	.	.	.	10^{2}	.	.
Erigeron uniflorus [AA]	.	.	.	.	.	.	.	.	.	.	.	2^{1}	$+^{2}$	.	$\mathbf{19^{2}}$	.	.	.	.	.	$+^{4}$	.	.
Saxifraga retusa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	$\mathbf{16^{2}}$	.	.	.	.	.	$+^{2}$	.	.
Pulsatilla vernalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	$\mathbf{3^{2}}$	.	.	.	.	.	.	.	.
Huperzia selago	3^{2}	2^{1}	.	.	1^{2}	1^{1}	1^{2}	.	.	.	$+^{2}$	2^{2}	13^{2}	8^{2}	$\underline{48}^{2}$	1^{2}	2^{1}	4^{2}	29^{2}	25^{2}	22^{2}	1^{1}	.
Polytrichum piliferum (E_0)	3^{2}	.	.	.	.	.	.	.	.	.	.	.	.	1^{3}	$\underline{25}^{2}$	17^{3}	9^{2}	.	20^{3}	3^{2}	29^{3}	4^{3}	1^{2}
Saxifraga bryoides	.	.	.	.	.	.	.	.	.	.	.	.	.	5^{3}	$\underline{24}^{2}$	.	$+^{2}$	.	.	.	1^{2}	.	.
Poa laxa	.	.	.	.	.	1^{2}	.	.	.	.	.	.	.	1^{2}	$\underline{23}^{2}$	5^{2}	6^{2}	.	.	.	5^{2}	.	.
Oxyria digyna [AA]	.	2^{2}	.	.	.	2^{2}	1^{2}	.	.	.	.	.	.	1^{2}	$\underline{18}^{2}$	4^{2}	1^{4}	26^{3}	.	.	$+^{2}$	.	.
Callianthemum coriandrifolium	.	3^{2}	.	.	3^{4}	1^{2}	.	.	.	.	.	1^{2}	.	.	$\underline{15}^{2}$	1^{2}	$+^{2}$	.	.	.	$+^{2}$	.	.
Novosieversia reptans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	$\underline{15}^{3}$	.	$+^{1}$	.	.	.	$+^{2}$	.	.
5 *Salicetea herbaceae*																							
*Luzula *obscura* [C]	31^{3}	52^{2}	.	.	.	$\underline{55}^{3}$	7^{3}	.	.	.	.	2^{2}	.	27^{2}	54^{2}	$\mathbf{85^{3}}$	$\mathbf{85^{6}}$	$\mathbf{19^{3}}$	14^{2}	10^{2}	47^{2}	.	.
Salix herbacea [AA]	1^{1}	8^{2}	.	.	.	.	.	.	.	.	.	.	.	.	$\underline{20}^{2}$	$\mathbf{51^{6}}$	$\mathbf{5^{2}}$	$\mathbf{11^{3}}$	$\underline{18}^{5}$	.	17^{5}	.	.
Anthelia juratzkana (E_0)	.	2^{1}	.	.	.	.	.	.	.	.	.	1^{2}	.	.	7^{2}	$\mathbf{38^{4}}$	$\mathbf{2^{2}}$	$\mathbf{26^{3}}$	2^{2}	.	3^{2}	.	.
*Veronica *pumila*	1^{2}	7^{2}	.	.	.	2^{1}	2^{2}	.	.	.	.	1^{2}	$+^{1}$	1^{2}	5^{2}	$\mathbf{27^{2}}$	$\mathbf{13^{2}}$	$\mathbf{59^{3}}$	.	.	1^{2}	1^{3}	.
Sagina saginoides [AA]	.	2^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	$\mathbf{3^{2}}$	$\mathbf{1^{2}}$	$\mathbf{11^{2}}$	.	.	.	.	.
51 *Salicetalia herbaceae*																							
Sedum alpestre	4^{1}	7^{1}	.	.	.	5^{2}	1^{2}	.	.	2^{2}	.	.	.	.	12^{2}	$\mathbf{59^{2}}$	$\mathbf{31^{2}}$	.	.	$+^{1}$	6^{2}	1^{2}	.
Omalotheca supina [AA]	1^{1}	3^{2}	.	.	.	1^{1}	.	.	.	.	.	.	.	.	1^{2}	$\mathbf{57^{3}}$	$\mathbf{21^{3}}$	.	1^{1}	.	5^{2}	2^{2}	.
*Leucanthemopsis *tatrae* [CW]	1^{2}	2^{1}	.	.	.	.	.	.	.	.	.	.	.	.	$\underline{21}^{2}$	$\mathbf{24^{2}}$	$\mathbf{24^{2}}$	.	4^{2}	1^{2}	23^{2}	1^{1}	.
Poa granitica [CW]	1^{3}	5^{2}	.	.	.	15^{3}	.	.	.	.	.	.	.	.	$+^{2}$	$\mathbf{7^{2}}$	$\mathbf{9^{2}}$	.	.	.	.	.	.
511 *Salicion herbaceae*																							
Polytrichum sexangulare (E_0)	.	4^{1}	.	.	.	.	.	.	.	.	.	.	.	.	.	$\mathbf{86^{5}}$	8^{2}	.	1^{3}	.	3^{3}	.	.
Kiaeria starkei s. l. (E_0)[12]	1^{2}	2^{2}	.	.	.	1^{2}	.	.	.	.	.	.	.	.	.	$\mathbf{76^{4}}$	16^{3}	.	.	.	4^{3}	.	.
Pohlia drummondii (E_0)	.	4^{1}	.	.	.	2^{6}	.	.	.	.	.	.	.	.	3^{2}	$\mathbf{61^{4}}$	8^{3}	.	.	.	1^{3}	.	.
Dichodon cerastoides [AA]	.	2^{3}	.	.	.	.	.	.	.	.	.	.	$+^{2}$	.	$+^{2}$	$\mathbf{50^{4}}$	9^{3}	.	.	.	1^{2}	1^{2}	.
512 *Festucion picturatae*																							
Festuca picturata	72^{4}	62^{3}	.	.	15^{3}	56^{3}	2^{2}	$+^{2}$	.	.	.	20^{4}	.	7^{3}	17^{3}	22^{2}	$\mathbf{86^{6}}$	7^{2}	2^{2}	9^{2}	7^{3}	$\underline{31}^{3}$	.
Doronicum stiriacum	14^{2}	3^{2}	.	.	.	11^{2}	.	.	.	.	.	1^{2}	.	15^{3}	$\underline{60}^{2}$	14^{2}	$\mathbf{30^{3}}$	11^{3}	10^{2}	3^{2}	31^{3}	1^{2}	.

Table 1. (continued)

Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Ranunculus pseudomontanus [Cs]	36^{2}	24^{2}	5^{2}	5^{2}	12^{3}	29^{2}	1^{1}	.	2^{2}	.	12^{2}	28^{2}	4^{2}	6^{2}	27^{2}	12^{2}	52^{2}	11^{2}	6^{2}	5^{2}	24^{2}	17^{2}	7^{2}
Soldanella carpatica [CW]	69^{2}	49^{2}	26^{2}	16^{3}	57^{3}	52^{2}	43^{2}	1^{2}	35^{3}	.	6^{2}	59^{2}	44^{2}	52^{3}	61^{2}	18^{2}	58^{2}	96^{3}	25^{2}	25^{2}	34^{2}	57^{2}	16^{3}
52, 521 *Arabidetalia caeruleae*, *Arabidion caeruleae*																							
Saxifraga wahlenbergii [CW]	.	.	.	.	.	.	2^{2}	.	.	.	.	2^{2}	18^{2}	48^{2}	5^{2}	1^{2}	.	**100^{5}**	.	$+^{3}$	$+^{2}$	.	.
Pritzelago alpina	.	.	.	.	.	.	.	.	.	.	.	1^{2}	9^{2}	16^{2}	$+^{2}$	.	.	**85^{3}**	.	.	.	.	.
Salix reticulata [AA]	.	.	.	.	8^{2}	.	.	.	.	.	.	19^{3}	35^{3}	62^{5}	11^{3}	.	.	**81^{4}**	.	3^{3}	$+^{2}$	.	.
Saxifraga androsacea	.	2^{1}	.	.	.	.	1^{3}	.	.	.	.	2^{2}	1^{2}	11^{2}	17^{2}	6^{3}	1^{2}	**70^{5}**	.	.	$+^{3}$	.	.
Omalotheca hoppeana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**26^{3}**	.	.	.	.	.
*Plantago *carpatica* [C]	.	.	.	.	.	.	.	.	.	.	.	2^{2}	.	1^{2}	.	.	$+^{2}$	**11^{4}**	.	.	.	.	.
Sedum atratum	.	.	.	2^{2}	1^{1}	.	.	.	.	2^{2}	.	3^{2}	2^{2}	4^{2}	.	.	.	**11^{2}**	.	.	.	.	.
Tortella tortuosa (E_0)	1^{2}	2^{2}	8^{3}	21^{4}	21^{3}	2^{2}	4^{2}	2^{3}	15^{2}	78^{4}	48^{3}	49^{4}	79^{4}	67^{3}	36^{2}	.	1^{2}	70^{3}	1^{2}	3^{2}	1^{2}	.	$+^{2}$
Veronica aphylla	.	1^{2}	.	.	.	.	1^{2}	.	.	2^{2}	1^{2}	6^{2}	7^{2}	3^{2}	6^{2}	.	.	67^{2}	.	.	.	.	.
Distichium capillaceum (E_0)	.	.	.	.	.	.	1^{2}	.	6^{2}	17^{2}	5^{2}	2^{2}	29^{2}	33^{3}	12^{2}	.	.	67^{3}	.	1^{2}	.	.	.
Leontodon pseudotaraxaci [C]	1^{2}	3^{2}	.	.	2^{3}	.	.	.	.	.	.	20^{2}	7^{2}	25^{2}	15^{2}	2^{2}	1^{2}	63^{3}	.	$+^{2}$	1^{2}	.	.
Bryum elegans (E_0)	1^{1}	.	.	.	1^{3}	.	.	.	.	5^{2}	1^{2}	1^{2}	5^{2}	2^{2}	2^{2}	1^{3}	1^{1}	59^{3}	.	.	$+^{1}$	.	.
Selaginella selaginoides	2^{2}	4^{2}	.	2^{2}	6^{2}	.	.	.	.	.	2^{2}	35^{2}	46^{2}	34^{2}	12^{2}	.	.	56^{2}	1^{2}	1^{2}	1^{2}	.	2^{2}
Cardaminopsis arenosa agg.	.	.	20^{2}	29^{3}	13^{2}	.	13^{2}	3^{2}	33^{2}	20^{2}	22^{2}	19^{2}	15^{2}	20^{2}	$+^{2}$	.	.	52^{2}	.	$+^{1}$	.	.	.
6, 61 *Loiseleurio-Vaccinietea*, *Rhododendro-Vaccinietalia*																							
Vaccinium myrtillus (opt.)	71^{3}	8^{2}	35^{3}	8^{2}	18^{3}	16^{3}	20^{3}	1^{2}	56^{4}	.	3^{3}	27^{3}	10^{2}	4^{2}	21^{2}	1^{1}	26^{3}	.	**87^{4}**	**93^{7}**	43^{3}	80^{3}	73^{4}
Vaccinium vitis-idaea	21^{3}	3^{2}	12^{2}	10^{2}	8^{2}	.	1^{3}	.	20^{2}	10^{2}	7^{3}	32^{2}	31^{3}	25^{3}	33^{2}	1^{2}	$+^{2}$	.	**82^{3}**	**88^{5}**	41^{2}	30^{2}	44^{3}
Empetrum nigrum s.l.[13]	1^{2}	1^{2}	.	.	.	.	.	.	.	.	.	.	9^{3}	.	2^{2}	.	.	.	**48^{6}**	**41^{6}**	2^{2}	3^{2}	$+^{2}$
611 *Loiseleurio-Vaccinion*																							
Vaccinium gaultherioides	7^{3}	1^{2}	.	.	.	.	.	.	.	.	.	2^{4}	1^{2}	2^{2}	13^{2}	1^{2}	$+^{2}$	.	**83^{7}**	15^{5}	14^{2}	9^{3}	.
Loiseleuria procumbens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**1^{5}**	.	.	.	.
Cladonia rangiferina (E_0)	2^{2}	.	.	.	.	.	.	.	.	.	$+^{6}$	5^{2}	1^{3}	14^{3}	24^{2}	1^{2}	$+^{2}$	.	47^{3}	20^{2}	27^{2}	14^{2}	2^{3}
Cladonia gracilis (E_0)	3^{2}	3^{1}	.	.	.	.	.	.	.	.	$+^{3}$	2^{2}	6^{2}	17^{2}	36^{2}	4^{2}	3^{2}	4^{3}	45^{2}	7^{2}	39^{2}	6^{2}	.
Cladonia arbuscula (E_0)	1^{2}	.	.	.	.	.	.	.	.	.	.	1^{2}	2^{2}	6^{3}	25^{2}	2^{2}	1^{4}	.	44^{3}	6^{3}	25^{2}	11^{2}	$+^{2}$
Primula minima	1^{1}	3^{2}	.	.	.	1^{2}	.	.	.	.	.	.	8^{2}	54^{3}	71^{2}	19^{2}	3^{2}	11^{2}	28^{2}	1^{3}	38^{3}	1^{2}	.
612 *Vaccinion myrtilli*																							
Polytrichum strictum (E_0)	5^{3}	3^{2}	.	.	.	.	.	.	.	.	.	.	1^{3}	10^{4}	5^{2}	1^{2}	3^{2}	.	13^{4}	39^{4}	10^{2}	9^{3}	$+^{3}$
Dicranum scoparium (E_0)	16^{2}	5^{2}	3^{2}	.	.	3^{2}	4^{4}	1^{2}	.	5^{2}	1^{2}	2^{3}	10^{3}	18^{3}	17^{3}	.	3^{2}	.	11^{3}	38^{3}	9^{2}	7^{2}	3^{3}
Hylocomium splendens (E_0)	15^{3}	5^{2}	1^{3}	10^{3}	6^{3}	1^{2}	2^{4}	$+^{2}$	19^{5}	2^{3}	1^{2}	8^{3}	36^{4}	54^{4}	42^{3}	1^{4}	7^{3}	11^{2}	8^{3}	33^{5}	10^{2}	1^{2}	7^{3}
Sorbus aucuparia[14]	1^{1}	.	$*7^{1}$	6^{2}	1^{1}	.	6^{3}	1^{1}	7^{1}	2^{1}	2^{2}	.	6^{1}	.	.	.	.	.	$*2^{1}$	$*25^{2}$	.	.	3^{1}
Sphagnum capillifolium (E_0)	.	10^{4}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2^{2}	.	4^{2}	20^{6}	.	9^{2}	1^{5}
Sphagnum russowii (E_0)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6^{5}	.	1^{3}	.
7, 71 *Caricetea curvulae*, *Caricetalia curvulae*																							
Campanula alpina	16^{2}	5^{2}	.	.	.	.	.	.	.	.	.	6^{2}	6^{4}	46^{3}	68^{2}	13^{2}	22^{2}	4^{2}	85^{3}	17^{3}	**86^{4}**	36^{3}	.
Oreochloa disticha	3^{2}	4^{2}	.	.	.	.	.	.	.	.	.	6^{2}	1^{3}	38^{4}	76^{3}	16^{2}	12^{2}	.	65^{2}	18^{2}	**78^{4}**	4^{2}	.
Festuca supina	11^{2}	5^{3}	1^{2}	.	2^{3}	2^{2}	.	4^{2}	.	1^{2}	7^{2}	5^{3}	57^{4}	84^{3}	6^{3}	10^{3}	.	60^{3}	35^{3}	**73^{4}**	27^{2}	7^{3}
Avenula versicolor	28^{2}	7^{1}	.	2^{3}	3^{2}	1^{2}	.	.	.	.	.	18^{3}	.	18^{3}	36^{2}	3^{2}	23^{2}	.	62^{2}	10^{2}	**61^{3}**	57^{3}	$+^{2}$
Agrostis pyrenaica	17^{2}	23^{2}	.	.	.	.	.	.	.	.	.	8^{2}	.	7^{2}	26^{2}	45^{2}	21^{3}	4^{2}	49^{3}	7^{2}	**58^{5}**	59^{3}	.
Pulsatilla scherfelii	32^{3}	9^{2}	.	.	.	1^{2}	.	.	.	.	.	7^{2}	$+^{2}$	7^{2}	45^{3}	3^{2}	12^{2}	.	43^{3}	5^{3}	**39^{3}**	20^{2}	$+^{2}$
711 *Juncion trifidi*																							
Juncus trifidus [AA]	18^{2}	7^{2}	.	.	.	.	.	.	.	.	.	3^{2}	1^{2}	41^{3}	51^{2}	12^{2}	13^{2}	.	88^{3}	17^{3}	**72^{5}**	17^{2}	.
Hieracium alpinum	33^{2}	5^{2}	.	.	.	2^{2}	.	.	.	.	$+^{3}$	5^{2}	$+^{2}$	11^{2}	25^{2}	2^{2}	31^{2}	.	80^{2}	24^{2}	**61^{2}**	70^{2}	4^{2}
*Senecio *carpathicus*	9^{3}	.	.	.	.	.	.	.	.	.	.	.	.	13^{3}	6^{2}	.	6^{2}	.	6^{2}	1^{1}	**18^{3}**	7^{2}	.
*Senecio *carniolicus*	2^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	10^{2}	.	1^{2}	.	1^{2}	.	**7^{3}**	1^{1}	.
8, 81 *Nardetea strictae*, *Nardetalia strictae*																							
Nardus stricta	3^{2}	14^{2}	5^{2}	.	.	.	.	.	.	.	1^{2}	.	.	.	.	15^{2}	12^{2}	.	4^{2}	14^{3}	4^{3}	**100^{8}**	**100^{7}**
Potentilla aurea	75^{3}	53^{2}	37^{2}	13^{3}	34^{2}	21^{2}	13^{2}	$+^{2}$	.	2^{2}	11^{2}	59^{3}	1^{2}	13^{3}	16^{2}	11^{2}	68^{3}	15^{2}	16^{2}	20^{2}	31^{2}	**59^{3}**	**57^{3}**
Luzula sudetica	.	4^{1}	.	.	1^{3}	.	.	.	.	.	.	5^{2}	1^{2}	42^{2}	$+^{2}$	.	4^{2}	.	1^{2}	$+^{2}$	1^{2}	**24^{2}**	**3^{2}**
Phleum rhaeticum	17^{2}	34^{2}	2^{2}	2^{2}	11^{2}	27^{2}	11^{2}	.	.	.	$+^{2}$	4^{2}	.	.	.	6^{2}	33^{2}	4^{1}	.	1^{2}	1^{2}	**14^{2}**	**34^{3}**
Crocus discolor [CW]	.	.	.	.	.	.	.	.	.	.	$+^{2}$	.	.	.	.	.	.	.	.	.	.	**7^{3}**	**3^{2}**
Species of contact phytocoenoses with higher abundance in analysed syntaxa; naturally rare taxa																							
Leucanthemum rotundifolium [Cs]	7^{3}	22^{3}	.	2^{3}	10^{3}	11^{3}	20^{4}	8^{3}	.	.	.	2^{2}	.	.	$+^{2}$	.	.	4^{2}	.	$+^{2}$	.	1^{2}	.
Archangelica officinalis	.	14^{4}	.	2^{1}	2^{2}	2^{5}	9^{4}	$+^{1}$	.	.	.	.	.	.	.	.	.	11^{2}	.	.	.	.	.
Petasites albus	.	1^{2}	.	2^{5}	2^{2}	.	12^{5}	9^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mercurialis perennis	.	.	13^{2}	51^{2}	8^{3}	.	9^{4}	5^{2}	.	.	4^{1}	.	.	.	.	.	.	.	.	.	.	.	.
Laserpitium archangelica	.	.	3^{7}	11^{3}	3^{2}	.	.	3^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Digitalis grandiflora	.	.	44^{3}	51^{2}	21^{2}	.	7^{2}	2^{1}	30^{2}	10^{2}	5^{2}	8^{2}	.	.	.	.	.	.	.	.	.	.	.
Origanum vulgare	.	.	20^{3}	35^{3}	10^{2}	.	7^{3}	2^{2}	20^{3}	.	5^{2}	1^{2}	.	.	.	.	.	.	.	.	.	.	.
Clinopodium vulgare	.	.	20^{3}	17^{2}	5^{2}	.	4^{2}	3^{2}	24^{2}	.	$+^{2}$	1^{2}	.	.	.	.	.	.	.	.	.	.	.
Rubus saxatilis	.	.	16^{2}	49^{2}	7^{2}	.	6^{2}	$+^{2}$	39^{3}	.	6^{2}	2^{2}	$+^{2}$	.	.	.	.	.	.	.	.	.	.
*Picris *villarsii*	.	.	3^{3}	.	1^{3}	.	.	.	2^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phyteuma spicatum	23^{2}	13^{2}	15^{2}	5^{2}	26^{2}	18^{2}	21^{2}	5^{2}	30^{2}	.	$+^{1}$	10^{2}	.	.	.	.	2^{2}	.	.	$+^{1}$	.	.	6^{2}
Hylotelephium argutum [C]	4^{2}	1^{2}	15^{2}	8^{2}	2^{2}	4^{3}	17^{2}	2^{2}	2^{2}	.	.	1^{2}	.	.	.	.	.	.	.	.	.	.	.
Polygonatum verticillatum	3^{2}	1^{2}	30^{2}	21^{2}	19^{3}	2^{3}	22^{3}	1^{2}	57^{3}	.	1^{2}	5^{2}	.	.	$+^{2}$	.	.	.	.	2^{2}	.	.	6^{2}
Oxalis acetosella	3^{2}	2^{2}	3^{2}	8^{4}	2^{2}	16^{4}	23^{3}	17^{2}	9^{3}	.	.	.	1^{2}	.	.	.	.	.	.	7^{3}	.	.	1^{2}
Lilium martagon	3^{2}	1^{1}	20^{2}	37^{2}	27^{2}	.	7^{2}	$+^{1}$	44^{2}	.	9^{2}	6^{2}	.	.	.	.	.	.	.	$+^{2}$	.	.	$+^{1}$
Poa nemoralis	1^{3}	6^{2}	42^{4}	32^{3}	13^{3}	.	16^{3}	9^{2}	48^{4}	5^{2}	1^{2}	1^{3}	$+^{2}$	11^{3}	1^{2}	.	.	.	.	.	.	.	.
Galium schultesii	1^{2}	.	25^{4}	35^{2}	6^{2}	.	17^{3}	6^{2}	19^{4}	.	1^{2}	.	.	.	.	.	$+^{2}$	.	.	.	.	.	.
Dryopteris filix-mas	.	5^{2}	16^{2}	5^{2}	4^{2}	1^{2}	22^{3}	12^{2}	30^{2}	.	.	.	.	.	.	.	.	.	.	1^{2}	.	.	$+^{2}$
Scrophularia scopolii	.	1^{3}	5^{2}	2^{2}	6^{2}	.	15^{2}	14^{2}	13^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Saxifraga rotundifolia	.	2^{2}	.	.	8^{3}	.	18^{5}	1^{2}	24^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tithymalus amygdaloides	.	.	18^{2}	22^{2}	6^{2}	.	4^{2}	4^{2}	35^{2}	.	5^{2}	1^{2}	.	.	.	.	.	.	.	.	.	.	$+^{2}$
Asarum europaeum	.	.	16^{2}	5^{1}	7^{3}	.	2^{2}	19^{2}	28^{3}	.	$+^{1}$	.	.	.	.	.	.	.	.	$+^{2}$	.	.	$+^{1}$
Melica nutans	.	.	12^{2}	21^{2}	1^{2}	.	2^{2}	2^{2}	24^{3}	.	1^{2}	.	.	.	.	.	.	.	.	.	.	.	.
Pulmonaria obscura	.	.	9^{2}	3^{2}	3^{2}	.	15^{2}	11^{2}	11^{3}	.	.	1^{2}	.	.	.	.	.	.	.	.	.	.	.
*Hesperis *nivea* [C]	.	.	5^{2}	2^{3}	3^{2}	.	2^{2}	6^{2}	2^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Symphytum tuberosum	.	.	1^{2}	2^{2}	4^{2}	.	1^{2}	9^{2}	17^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Convallaria majalis	.	.	8^{2}	44^{3}	1^{1}	.	.	.	39^{3}	.	5^{2}	.	.	.	.	.	.	.	.	.	.	.	1^{2}
Rubus idaeus	3^{2}	6^{2}	24^{3}	5^{2}	8^{2}	19^{4}	27^{3}	40^{2}	48^{5}	.	2^{2}	.	.	.	.	.	.	.	1^{2}	11^{3}	.	1^{2}	7^{2}
Senecio nemorensis agg.	8^{2}	15^{3}	26^{3}	22^{2}	30^{3}	13^{3}	72^{4}	47^{2}	69^{3}	.	$+^{1}$	.	.	.	.	.	.	.	.	2^{2}	.	.	1^{2}
Epilobium montanum	.	2^{2}	16^{2}	5^{2}	3^{2}	.	11^{2}	19^{2}	26^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Myosotis scorpioides agg.	6^{2}	20^{2}	1^{3}	.	9^{2}	2^{2}	17^{2}	40^{2}	20^{2}	.	.	.	.	.	.	.	.	.	.	.	.	1^{1}	1^{2}
Crepis paludosa	3^{2}	3^{2}	4^{3}	10^{2}	18^{3}	1^{2}	30^{3}	37^{2}	20^{2}	.	$+^{2}$	.	.	.	.	.	.	.	.	.	.	.	1^{2}
Heracleum sphondylium	1^{2}	6^{2}	35^{2}	41^{2}	73^{3}	5^{2}	48^{2}	35^{2}	69^{3}	2^{3}	5^{2}	18^{2}	.	.	.	.	$+^{2}$	.	.	.	.	.	$+^{1}$
Dactylis glomerata	.	.	24^{3}	6^{2}	11^{3}	.	21^{3}	45^{2}	11^{3}	.	1^{2}	.	.	.	.	.	.	.	.	.	.	.	$+^{2}$
Urtica dioica	.	1^{3}	11^{2}	2^{3}	2^{2}	1^{2}	24^{2}	83^{3}	44^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	$+^{2}$
Aconitum vulparia	.	.	1^{3}	.	.	.	1^{6}	1^{1}	15^{4}	.	$+^{1}$	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum alpestre	.	.	1^{2}	.	3^{2}	.	.	.	.	85^{3}	25^{2}	7^{3}	41^{3}	16^{3}	$+^{2}$	.	.	7^{2}	1^{2}	$+^{2}$	1^{2}	.	.
*Primula *hungarica* [CWs]	.	.	1^{2}	2^{2}	.	.	.	.	.	63^{4}	40^{2}	7^{2}	45^{2}	9^{2}	.	.	.	4^{1}	.	.	.	.	.
Campanula cochleariifolia	.	.	1^{2}	3^{2}	.	.	.	.	.	24^{2}	18^{2}	2^{2}	46^{2}	.	.	.	.	.	.	.	.	.	.
Leontopodium alpinum	.	.	.	3^{2}	.	.	.	.	.	34^{2}	2^{2}	.	15^{2}	4^{2}	.	.	.	.	.	.	.	.	.
Gypsophila repens	.	.	.	.	.	.	.	.	.	49^{5}	9^{3}	.	7^{3}	1^{2}	.	.	.	.	.	.	.	.	.
Saxifraga mutata	.	.	.	.	.	.	.	.	.	.	$+^{2}$	.	1^{2}	.	.	.	.	.	.	.	.	.	.
Saxifraga paniculata	$+^{1}$	.	5^{2}	11^{3}	5^{2}	.	4^{2}	.	27^{2}	76^{3}	37^{2}	33^{3}	46^{2}	76^{3}	45^{3}	.	.	15^{2}	.	3^{2}	1^{2}	.	$+^{2}$
Pedicularis verticillata [AA]	.	2^{2}	.	.	14^{2}	.	.	.	.	37^{2}	9^{2}	45^{2}	44^{2}	39^{2}	48^{2}	.	1^{2}	19^{2}	2^{1}	5^{2}	5^{2}	.	.

Table 1. (continued)

Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Potentilla crantzii [AA]	.	.	3^{2}	.	7^{2}	.	.	.	.	17^{3}	1^{2}	25^{3}	3^{2}	23^{3}	16^{2}	1^{7}	.	4^{1}	.	1^{2}	1^{3}	.	$+^{1}$
Chamorchis alpina [AA]	.	.	.	.	.	.	.	.	.	.	.	2^{2}	21^{2}	11^{2}	.	.	.	.	.	$+^{2}$	.	.	.
Saxifraga hieraciifolia [AA]	.	.	.	.	.	.	1^{1}	.	.	.	.	1^{1}	1^{2}	30^{2}	17^{2}	.	.	11^{2}	.	.	$+^{2}$	.	.
Artemisia eriantha	.	.	.	.	.	.	.	.	.	.	.	.	3^{2}	16^{2}	8^{2}	.	.	.	.	.	.	.	.
Draba dubia	.	.	.	.	.	.	.	.	.	.	.	.	.	4^{2}	1^{2}	.	.	.	.	.	.	.	.
Salix helvetica	10^{9}	18^{8}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salix phylicifolia	1^{3}	3^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Crepis sibirica	.	.	1^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trommsdorfia maculata	.	.	14^{2}	24^{2}	.	.	.	.	.	.	1^{2}	1^{1}	.	.	.	.	.	.	.	$+^{2}$	.	.	2^{2}
Achillea stricta	.	.	11^{3}	46^{3}	.	.	1^{2}	.	.	.	9^{2}	.	.	.	.	.	.	.	.	.	.	.	2^{2}
Knautia slovaca [CW]	.	.	.	11^{3}	.	.	.	.	.	.	$+^{2}$	.	.	.	.	.	.	.	.	.	.	.	.
Adenophora liliifolia	.	.	.	11^{1}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hieracium laevigatum	.	.	.	10^{1}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stachys sylvatica	.	.	1^{1}	.	.	.	4^{3}	45^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cirsium oleraceum	.	.	.	.	.	.	4^{3}	36^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Glechoma hederacea	.	.	1^{2}	.	.	.	1^{2}	32^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Alliaria petiolata	.	.	1^{2}	.	.	.	1^{3}	31^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Roegneria canina	.	.	7^{2}	.	.	.	7^{2}	30^{2}	7^{3}	2^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.
Eupatorium cannabinum	.	.	.	2^{2}	.	.	.	25^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Galium aparine	.	.	.	.	.	.	.	22^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Brachypodium sylvaticum	.	.	1^{2}	.	.	.	.	20^{2}	.	.	$+^{2}$	.	.	.	.	.	.	.	.	.	.	.	.
Lysimachia nummularia	.	.	.	.	.	.	.	18^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Festuca gigantea	.	.	1^{2}	.	.	.	1^{2}	15^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Telekia speciosa	.	.	.	.	.	.	.	6^{4}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Virga pilosa	.	.	.	.	.	.	.	2^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Inula ensifolia	.	.	.	.	.	.	.	.	.	.	10^{3}	.	.	.	.	.	.	.	.	.	.	.	.
Carex approximata Bell. ex All.	.	.	.	.	.	.	.	.	.	.	6^{6}	.	.	.	.	.	.	.	.	.	.	.	.
Pulsatilla subslavica [CW]	.	.	.	.	.	.	.	.	.	.	6^{2}	.	.	.	.	.	.	.	.	.	.	.	.
Campanula xylocarpa [CW]	.	.	1^{2}	.	.	.	.	.	.	.	5^{2}	.	.	.	.	.	.	.	.	.	.	.	.
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	4^{6}	.	.	.	.	.	.	.	.	.	.	.	.
Androsace villosa	.	.	.	.	.	.	.	.	.	.	1^{5}	.	.	.	.	.	.	.	.	.	.	.	.
Draba siliquosa	.	.	.	.	.	.	.	.	.	.	.	.	$+^{2}$	14^{3}	.	.	.	.	.	.	.	.	.
Draba fladnicensis [AA]	.	.	.	.	.	.	.	.	.	.	.	.	.	8^{2}	.	.	.	.	.	.	.	.	.
Tofieldia pusilla [AA]	.	.	.	.	.	.	.	.	.	.	.	.	.	4^{3}	.	.	.	.	.	.	.	.	.
Carex atrofusca [AA]	.	.	.	.	.	.	.	.	.	.	.	.	.	3^{2}	.	.	.	.	.	.	.	.	.
Arctous alpina [AA]	.	.	.	.	.	.	.	.	.	.	.	.	.	2^{5}	.	.	.	.	.	.	.	.	.
Juncus triglumis [AA]	.	.	.	.	.	.	.	.	.	.	.	.	.	1^{2}	.	.	.	.	.	.	.	.	.
Bellardiochloa violacea	.	.	.	.	.	.	.	.	.	.	.	.	.	1^{2}	.	.	.	.	.	.	.	.	.
Ranunculus glacialis [AA]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8^{2}	.	$+^{2}$	.	.	.	$+^{3}$	.	.
Carex lachenalii	.	6^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	14^{2}	.	.	.	.	$+^{2}$	.	.
Sibbaldia procumbens [AA]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1^{3}	.	.	.	.	.	.	.
Ranunculus pygmaeus [AA]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1^{2}	.	.	.	.	.	.	.
Papaver tatricum [CW]	.	.	.	.	.	.	.	.	.	.	.	.	$+^{2}$	.	$+^{2}$	.	.	30^{2}	.	.	.	.	.
Cystopteris regia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19^{2}	.	.	.	.	.
Saxifraga cernua [AA]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7^{4}	.	.	.	.	.
Carpathian (sub)endemics																							
Euphrasia tatrae [C]	3^{2}	4^{2}	1^{2}	.	7^{2}	.	1^{2}	.	.	.	1^{2}	18^{2}	$+^{2}$	7^{2}	16^{2}	1^{2}	2^{1}	.	8^{1}	$+^{1}$	4^{2}	1^{3}	.
Soldanella hungarica [Cs]	1^{2}	.	1^{2}	.	7^{4}	2^{6}	2^{2}	.	.	.	$+^{2}$	.	.	.	.	.	.	.	.	3^{2}	$+^{2}$	1^{5}	19^{2}
*Primula *platyphylla* [Cs]	.	.	.	.	.	.	.	.	.	2^{3}	.	2^{2}	.	2^{3}	.	.	.	.	$+^{2}$	.	.	.	.
Campanula carpatica [C]	.	.	.	3^{3}	.	.	.	1^{2}	.	.	19^{2}	.	.	.	.	.	.	.	.	.	.	.	.
*Pilosella *ullepitschii* [C]	1^{1}	.	.	.	.	.	.	.	.	.	.	.	.	.	6^{2}	.	.	.	3^{2}	.	.	.	.
Aconitum moldavicum [Cs]	.	.	3^{2}	5^{1}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dentaria glandulosa [Cs]	.	.	.	.	.	.	1^{2}	1^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Symphytum cordatum [Cs]	.	.	.	.	.	.	.	1^{3}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sempervivum matricum [Cs]	.	.	.	.	.	.	.	.	.	.	1^{2}	.	.	.	.	.	.	.	.	.	.	.	.
Aconitum lasiocarpum [CE]	.	.	3^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tithymalus sojakii [CE]	.	.	3^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
West Carpathian endemics																							
Delphinium oxysepalum	.	11^{3}	.	.	6^{3}	.	7^{4}	$+^{2}$	.	2^{2}	.	.	2^{2}	19^{2}	2^{2}	.	$+^{3}$	22^{3}	.	$+^{2}$	.	.	.
Erysimum wahlenbergii	.	.	1^{6}	.	6^{2}	.	1^{2}	1^{3}	.	2^{2}	.	2^{2}	.	.	.	.	.	.	.	.	.	.	.
Cochlearia tatrae	.	1^{2}	.	.	.	.	.	.	.	.	.	.	.	.	2^{2}	.	.	.	.	.	.	.	.
*Thlaspi *tatrense*	.	.	1^{2}	.	.	.	1^{1}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*Silene *sillingeri*	.	.	.	2^{1}	.	.	.	.	.	.	1^{2}	.	.	.	.	.	.	.	.	.	.	.	.
Taraxacum nigricans	.	.	.	.	2^{3}	.	.	.	.	.	.	2^{2}	.	.	.	.	.	.	.	.	.	.	.
Poa margilicola	.	.	.	.	.	.	.	.	.	.	$+^{2}$	.	.	.	.	.	.	.	.	.	.	.	.
Arctic-alpine taxa																							
Bartsia alpina	8^{2}	3^{2}	1^{2}	.	33^{2}	.	.	.	.	24^{3}	12^{2}	55^{3}	55^{3}	40^{2}	49^{2}	1^{2}	4^{2}	48^{2}	4^{2}	11^{2}	4^{2}	4^{2}	$+^{2}$
Arabis alpina	1^{2}	11^{3}	.	3^{4}	16^{3}	2^{3}	24^{3}	6^{2}	.	5^{2}	1^{2}	7^{2}	2^{2}	.	2^{2}	.	1^{3}	70^{2}	.	$+^{1}$	$+^{3}$	.	.
Epilobium anagallidifolium	.	5^{2}	.	.	.	1^{2}	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diphasiastrum alpinum	.	.	.	.	.	.	.	.	.	.	.	.	$+^{3}$	.	.	.	.	.	3^{4}	2^{4}	1^{4}	1^{2}	.
Kobresia simpliciuscula	.	.	.	.	.	.	.	.	.	.	.	.	9^{4}	4^{2}	.	.	.	.	.	.	.	.	.
Constant companions of selected syntaxa																							
Alchemilla spec. div.	9^{2}	77^{3}	34^{2}	10^{2}	62^{3}	28^{3}	71^{4}	10^{2}	59^{3}	2^{2}	16^{3}	47^{3}	1^{2}	20^{2}	18^{2}	3^{3}	7^{3}	44^{3}	.	4^{2}	2^{2}	4^{2}	35^{3}
Viola biflora	11^{2}	69^{3}	18^{3}	13^{3}	56^{3}	36^{3}	72^{3}	23^{3}	44^{3}	12^{2}	1^{2}	21^{3}	11^{2}	19^{3}	26^{2}	1^{2}	2^{2}	44^{2}	.	3^{2}	1^{3}	1^{2}	2^{3}
Bistorta major	37^{3}	57^{3}	4^{3}	.	52^{3}	38^{3}	39^{3}	$+^{2}$	2^{3}	5^{2}	$+^{2}$	21^{2}	1^{2}	33^{3}	19^{2}	2^{2}	24^{3}	.	8^{2}	18^{3}	16^{2}	11^{2}	6^{3}
Avenella flexuosa	76^{3}	29^{2}	39^{4}	.	3^{2}	22^{2}	15^{3}	1^{2}	2^{3}	.	1^{2}	3^{2}	1^{3}	.	13^{2}	9^{2}	36^{3}	.	54^{2}	77^{4}	40^{3}	77^{2}	67^{5}
Hypericum maculatum	30^{3}	24^{3}	84^{3}	17^{2}	54^{3}	24^{2}	62^{3}	9^{2}	87^{3}	.	10^{2}	15^{2}	.	.	.	.	7^{3}	.	1^{2}	17^{2}	$+^{2}$	14^{3}	65^{3}
Leucanthemum vulgare agg.	.	1^{1}	36^{2}	49^{2}	31^{2}	.	1^{2}	1^{2}	35^{2}	27^{2}	46^{2}	57^{3}	$+^{2}$	1^{2}	$+^{2}$	.	.	11^{1}	.	1^{3}	$+^{2}$	.	25^{2}
Fragaria vesca	.	.	39^{2}	52^{2}	4^{2}	.	10^{2}	10^{2}	44^{3}	5^{2}	15^{2}	2^{2}	.	.	.	.	.	.	.	$+^{2}$	.	.	3^{2}
Lotus corniculatus	.	.	31^{2}	59^{2}	21^{2}	.	1^{2}	.	19^{2}	27^{3}	41^{2}	51^{3}	1^{4}	.	.	.	.	.	.	1^{2}	.	.	19^{2}
Libanotis pyrenaica	.	.	3^{3}	24^{3}	10^{3}	.	1^{2}	.	13^{2}	51^{3}	13^{2}	7^{2}	.	.	.	.	.	.	.	.	.	.	.
Vicia cracca	.	.	12^{3}	5^{1}	3^{3}	.	.	2^{2}	52^{2}	.	6^{2}	7^{2}	$+^{2}$	.	.	.	.	.	.	$+^{2}$	.	.	1^{2}
Festuca rubra	.	.	16^{2}	5^{2}	.	.	1^{2}	.	2^{2}	2^{3}	3^{2}	4^{2}	.	.	.	.	.	.	.	.	.	.	44^{3}
Luzula campestris agg.[15]	.	.	6^{2}	.	.	.	.	.	.	.	2^{2}	2^{2}	.	1^{2}	.	.	.	.	.	1^{2}	.	1^{2}	56^{2}
Potentilla erecta	1^{2}	.	8^{3}	.	.	.	.	1^{2}	.	.	1^{2}	.	.	.	.	.	.	.	.	.	.	4^{2}	53^{4}

Explanations:

[1] values marked with asterisk – *Luzula luzuloides* subsp. *rubella*

[2] values marked with asterisk – *Solidago virgaurea* subsp. *minuta*

[3] values marked with asterisk – *Pimpinella major* subsp. *rhodochlamys*

[4] values marked with asterisk – rarely also *Carex *tatrorum*

[5] values marked with asterisk – *Cardamine amara* subsp. *opicii*

[6] values marked with asterisk – *Dianthus carthusianorum* subsp. *latifolius*

[7] *Galeobdolon luteum* s. l. = *G. luteum* and *G. montanum*

[8] values marked with asterisk – *Anthoxanthum alpinum*

[9] *Saxifraga moschata* = subsp. *dominii* [CW] and subsp. *kotulae* [CW]

[10] values marked with asterisk – *Swertia perennis* subsp. *alpestris*

[11] values marked with asterisk – *Salix kitaibeliana* [C]; columns 1, 2, 18–20: *Salix retusa* and *S. kitaibeliana*

Table 1. (continued)

[12] *Kiaeria starkei* s. l. = *K. starkei* and *K. falcata* (cf. Dúbravcová 2007)
[13] nearly all suit the *Empetrum hermaphroditum* [*E. nigrum* subsp. *hermaphroditum* (Hagerup) Böcher]; due to the potential co-occurrence of *E. nigrum* and *E. hermaphroditum*, as well as of the hybrid species, we use the broadly defined taxa
[14] values marked with asterisk – *Sorbus aucuparia* subsp. *glabrata*
[15] incl. *Luzula multiflora*
reg. – diagnostic taxon from the regional point of view, in another area it should have different status or it does not occur
+ – occurence with frequency lower than 0.5 %. [AA] – arctic-alpine taxon, [C] – Carpathian endemic, [Cs] – Carpathian subendemic, [CE] – East Carpathian endemic, [CW] – West Carpathian endemic, [CWs] – West Carpathian subendemic

Annotation: Hadač et al. (1969) previously indicated that there are two distinctly differentiated groups of plant communities recognisable within the alliance, differing in type of geological bedrock. The first group is formed by the communities of the alliances *Calamagrostion villosae* and *Trisetion fusci* (Table 1, columns 1, 2), and is differentiated primarily by the occurrence of *Agrostis pyrenaica*, *Carex *silicicola*, *Festuca picturata*, *Gentiana punctata*, *Luzula *obscura* and *Pulsatilla scherfelii*. The second group comprises the plant communities of the alliances *Calamagrostion arundinaceae*, *Calamagrostion variae* and *Festucion carpaticae* (Table 1, columns 3–5) and is differentiated from the first group by the occurrence of many calciphilous and semi-calciphilous taxa, or species bound to sheltered, leeward sites: *Astrantia major*, *Bupleurum longifolium*, *Campanula elliptica*, *Carex sempervirens* subsp. *tatrorum* (Zapał.) Pawł., *Cirsium erisithales*, *Clinopodium vulgare*, *Crepis mollis*, *Cyanus mollis*, *Digitalis grandiflora*, *Helianthemum grandiflorum*, *Knautia maxima*, *Laserpitium latifolium*, *Linum extraaxillare*, *Origanum vulgare*, *Phleum hirsutum*, *Pimpinella *rhodochlamys*, *Pyrethrum clusii*, *Rubus saxatilis*, *Scabiosa lucida*, *Sesleria albicans*, *Tragopogon orientalis*, *Vicia oreophila*, etc.

111 *Calamagrostion villosae* Pawłowski et al. 1928

Tall-grass vegetation on siliceous bedrock
Table 1, column 1
OFN: *Calamagrostidion villosae*-Verband (Pawłowski et al. 1928: 247)
Syn.: *Calamagrostion villosae* Pawłowski 1928 (Art. 8)
Nomenclatural type: *Calamagrostis villosa-Festuca picta*-Assoziation Pawłowski in Pawłowski et al. 1928 (Pawłowski et al. 1928: 248), lectotypus hoc loco
Annotation: In their original diagnosis, Pawłowski et al. (1928: 248, Table VIII) published the name *Calamagrostis villosa-Festuca picta*-Ass. with the name *Calamagrostidetum villosae tatricum* as a synonym. Hence, Kliment et al. (2004: 96), in order to correct the name of the association (Art. 43) and according to the dominating species of the community (cf. Pawłowski et al. 1928, Table VIII), as well as according to Art. 10b, inverted the order of the taxa names as follows: *Festuco picturatae-Calamagrostietum villosae* Pawłowski in Pawłowski et al. 1928 corr. Kliment et al. 2004. According to Art. 42, it is necessary to correct this citation as follows: ***Festuco picturatae-Calamagrostietum villosae* Pawłowski in Pawłowski et al. 1928 corr. Kliment et al. 2004 nom. invers. propos.**

112 *Trisetion fusci* Krajina 1933

Tall-grass vegetation on alluviums of mountain streams on siliceous bedrock
Table 1, column 2
OFN: Verband: *Trisetion fusci* (Krajina 1933: 929)
Syn.: *Deschampsion caespitosae* Borza 1934 (Art. 29c, 31), *Phleo alpini-Deschampsion caespitosae* (Borza 1934) Csürös et al. 1985 (Art. 29c)
Syntax. syn.: *Adenostylion alliariae* Br.-Bl. 1930 p. p. (*Aconitum firmum-Delphinium oxysepalum*-Ass.), *Aconition firmi* Krajina 1933
Nomenclatural type: *Trisetetum fusci* Krajina 1933 (Krajina 1933: 933), lectotypus (Art. 20)
Annotation: A recent syntaxonomical revision of the plant communities of the alliance *Trisetion fusci* in the Western Carpathians (Kliment et al. 2004) confirmed the older unpublished opinion of Šeffer (1984: 23). He claimed that the association *Trisetetum fusci* is a piece of the variability (syntax. syn.) of the association *Rhodiolo-Deschampsietum caespitosae* Krajina 1933. Hence, the association *Rhodiolo-Deschampsietum caespitosae* Krajina 1933 was chosen by Kliment et al. (2004: 99) as the lectotype of the name of the alliance. According to Art. 20 of the ICPN, however, the correct lectotype of the alliance is the association *Trisetetum fusci* Krajina 1933.

113 *Calamagrostion arundinaceae* (Luquet 1926) Oberdorfer 1957

Subthermophilous species-rich tall-grass vegetation on calcareous bedrock
Table 1, column 3
OFN: *Calamagrostidion* Luq. 26 (Oberdorfer 1957: 347)
Syn.: *Calamagrostion atlanticum* Luquet 1926 (Art. 34a), *Calamagrostion arundinaceae* Oberdorfer 1949 (Art. 8), *Calamagrostion arundinaceae* Jeník 1959 (Art. 8), *Calamagrostion arundinaceae* (Luquet 1926) Jeník 1961 (Art. 31)
Phantomname: *Calamagrostion arundinaceae* Oberdorfer 1950 (Karner & Mucina 1993: 489; Theurillat et al. 1995: 223)
Nomenclatural type: *Calamagrostietum arundinaceae* Luquet 1926, holotypus [Luquet 1926: 107 ut Association à *Calamagrostis arundinacea* (L.) Roth (Art. 41b)]
Annotation 1: Apart from the name *Calamagrostion arundinaceae* (Luquet 1926) Jeník 1961 (cf. Kliment

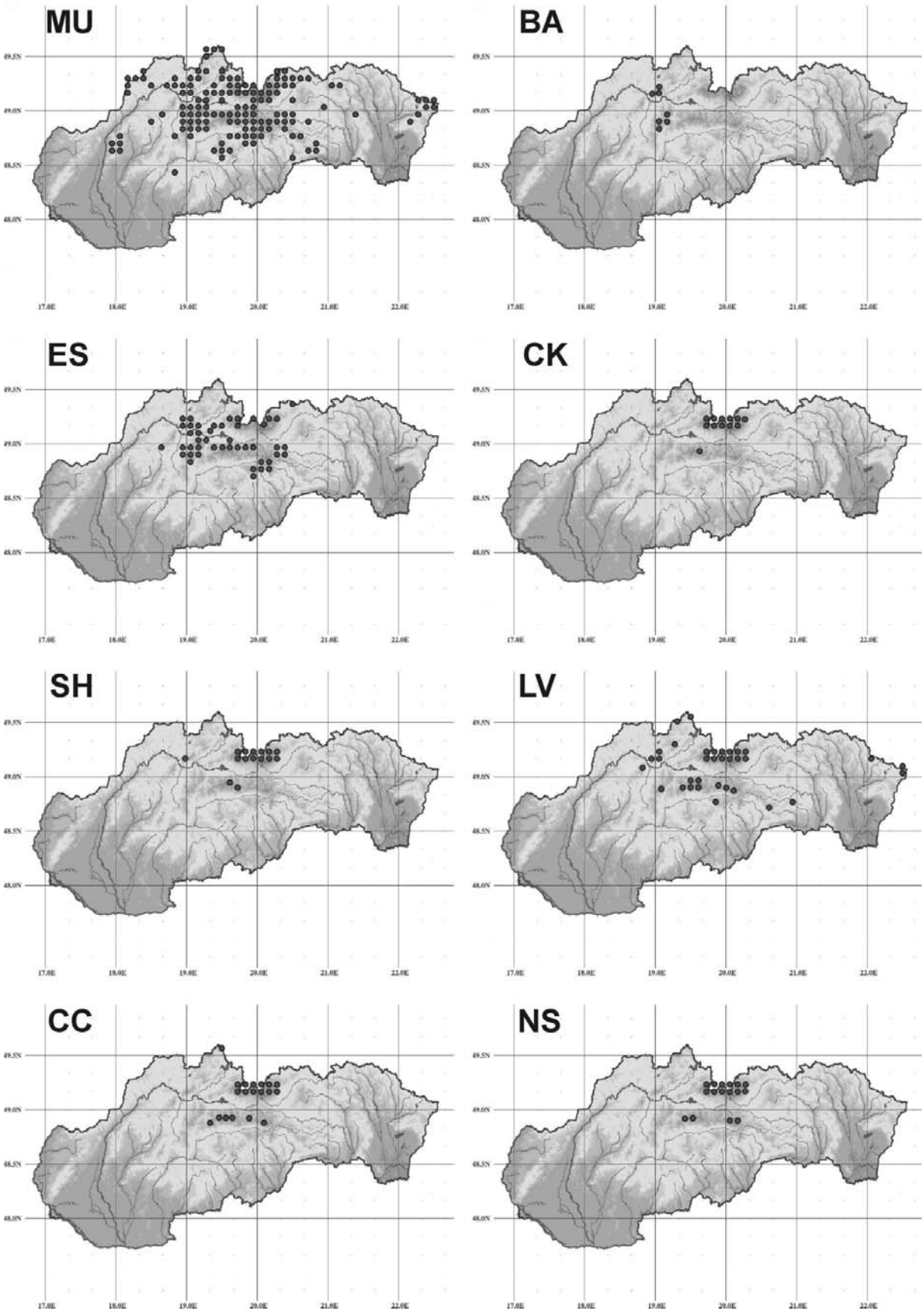

Fig. 1. The map of the distribution of high-altitude plant communities in the Western Carpathians.
Phytosociological classes are abbreviated as follows: MU – *Mulgedio-Aconitetea*, BA – *Betulo carpaticae-Alnetea viridis*, ES – *Elyno-Seslerietea*, CK – *Carici rupestris-Kobresietea bellardii*, SH – *Salicetea herbaceae*, LV – *Loiseleurio-Vaccinietea*, CC – *Caricetea curvulae*, NS – *Nardion strictae* (*Nardetea strictae*).

et al. 2007a: 51), we decided to use the older combination – *Calamagrostion arundinaceae* (Luquet 1926) Oberdorfer 1957 (cf. Kočí 2007: 106), where the species epithet is obvious from its only subordinated association *Sorbo-Calamagrostietum* (*arundinaceae*).

Annotation 2: Sillinger (1933: 262) described the tall-grass community with *Calamagrostis arundinacea* as 'semi-xerophilous *Calamagrostidetum arundinaceae* or *Calamagrostis arundinacea-Digitalis ambigua*-association'. The dominant species is noticeable from both the name of the community and the cover values of the name-giving taxa (Art. 10b). In line with Art. 42, we have corrected the name of the association as follows: ***Digitali ambiguae-Calamagrostietum arundinaceae* Sillinger 1933 nom. invers. propos.**

Annotation 3: A repeated partial revision of these plant communities showed that in spite of several differential taxa (cf. Kliment et al. 2007a: 66), it is possible to include the regional association *Anemono narcissiflorae-Avenelletum flexuosae* (just like the association *Jaceo elatioris-Calamagrostietum villosae*) in the broadly defined association *Anemono narcissiflorae-Laserpitietum latifolii*. We have modified the basic characteristics of the association in the light of recent knowledge as follows:

***Anemono narcissiflorae-Laserpitietum latifolii* Grebenščikov et al. 1956**

Syntax syn.: *Anemono narcissiflorae-Avenelletum flexuosae* Kmoníček ex Kliment 1994, *Jaceo elatioris-Calamagrostietum villosae* Kliment 1997

Incl.: sociation *Deschampsia flexuosa-Anemone narcissiflora* Kmoníček 1935 (Art. 3d), type *Deschampsia flexuosa-Anemone narcissiflora* Kmoníček 1936 (Art. 2b, 3d)

Characteristic taxa: *Hieracium prenanthoides* (transgr.), *Jacea pseudophrygia* (transgr.)

Differential taxa: *Anemone narcissiflora*, *Cyanus mollis*

114 *Calamagrostion variae* Sillinger 1932

Calcareous meso-hygrophilous tall-grass vegetation on gravelly soils

Table 1, column 4

OFN: *Calamagrostidion variae* (Sillinger 1932: 19)

Phantomname: *Calamagrostion variae* Sillinger 1929 (Grabherr et al. 1993: 430; Theurillat et al. 1995: 218), *Calamagrostion variae* Sillinger ex Hadač 1962 (Mucina & Maglocký 1984: 34), *Calamagrostion variae* Sillinger ex Hadač 1963 (Mucina & Maglocký 1985: 187)

Nomenclatural type: *Calamagrostidetum variae* Sillinger 1932, lectotypus (Art. 20; cf. Kliment et al. 2004: 102) [nom. illeg. (Art. 31); correct name: *Geranio sylvatici-Calamagrostietum variae* (Sillinger 1932) Kliment et al. 2004 (see Kliment et al. 2004: 103, 2007a: 78)]

115 *Festucion carpaticae* Bělohlávková et Fišerová 1989

Calcareous chionophilous hygrophilous tall-grass vegetation of the Carpathians

Table 1, column 5

OFN: *Festucion carpaticae*, alliancia nova hoc loco (Bělohlávková & Fišerová 1989: 12)

Syntax. syn.: *Calamagrostion variae* Sillinger 1932 p. p. (*Festucetum carpaticae*)

Nomenclatural type: *Festucetum carpaticae* Domin 1925, holotypus (Bělohlávková & Fišerová 1989: 12)

12 *Adenostyletalia alliariae* Br.-Bl. 1930

Tall-forb and fern-rich chionophilous communities of high-altitudes

Table 1, columns 6–7

OFN: *Adenostyletalia* (Braun-Blanquet 1930: 82)

Syn.: *Adenostyletalia* G. Br.-Bl. et J. Br.-Bl. 1931 (Art. 31)

Syntax. syn.: *Seslerietalia tatrae* Hadač ex Hadač et al. 1969 p. p. (*Delphinion elati*)

Nomenclatural type: *Adenostylion alliariae* Br.-Bl. 1930 (Braun-Blanquet 1930: 95 ut *Adenostylion*), lectotypus (Art. 20) [nom. illeg. (Art. 31); correct name: *Adenostylion alliariae* Br.-Bl. 1926 (see below)]

121 *Adenostylion alliariae* Br.-Bl. 1926

Tall-forb and fern-rich chionophilous communities at high-altitudes

Table 1, columns 6–7

OFN: *Adenostylion* (Praeries à hautes herbes) (Braun-Blanquet 1926: 37)

Syn.: *Adenostylion* Luquet 1926 (Art. 33), *Adenostylion* Pawłowski 1928 p. p. (Art. 8), *Adenostylion alliariae* Pawłowski et al. 1928 p. p. (Art. 31), *Adenostylion alliariae* Br.-Bl. 1930 p. p. (Art. 31), *Adenostylion* G. Br.-Bl. et J. Br.-Bl. 1931 (Art. 31), *Adenostylion alliariae* Sillinger 1933 (Art. 31), *Adenostylion alliariae* Aichinger 1933 p. p. (Art. 31), *Alno-Adenostylion* Br.-Bl. 1948 (Art. 29c), *Dryopterido-Athyrion distentifolii* Holub in Holub et al. 1967 (Art. 3b)

Syntax. syn.: *Dryopterido-Athyrion distentifolii* (Holub ex Sýkora et Štursa 1973) Jeník et al. 1980

Incl.: *Eu-Adenostylion* Klika in Klika et Hadač 1944, *Eu-Adenostylenion alliariae* Sýkora et Štursa 1973, *Dryopterido-Athyrenion distentifolii* Holub ex Sýkora et Štursa 1973

Nomenclatural type: *Adenostylo alliariae-Cicerbitetum alpinae* Br.-Bl. 1926 (Braun-Blanquet 1926: 38 ut Association à *Adenostyles alliariae* et *Cicerbita alpina*), holotypus (Art. 18a)

Annotation: In recent studies and overviews, the fern communities of the Sudetes and the Western Carpathians have been delimited as the suballiance *Dryopterido-Athyrenion distentifolii* (Sýkora & Štursa 1973; Mucina & Maglocký 1984, 1985) or as a separate alliance *Dryopterido-Athyrion distentifolii* (Jeník et al. 1980; Moravec et al. 1983a, b, 1995; Kočí 2001, 2007; Rodwell et al. 2002). The syntaxonomical revision of the relevés from the Slovak part of the Western Carpathians (Kliment et al. 2004, 2007a) showed that the associations *Ranunculo platanifolii-Adenostyletum alliariae* and *Adenostylo alliariae-Athyrietum alpestris* (suballiance *Adenostylenion alliariae*) form numerous transi-

tional phytocoenoses, and hence their evaluation within the separate alliances is unsubstantiated in this geographical area. The phytocoenoses of the association *Daphno mezerei-Dryopteridetum filicis-maris* are classified because of their floristic composition in the suballiance *Delphinenion elati* (cf. Kliment et al. 2007a; Jarolímek & Kliment 2008).

1211 *Adenostylenion alliariae* Klika in Klika et Hadač 1944
Tall-forb and fern-rich chionophilous communities on siliceous bedrock
Table 1, column 6
OFN: *Eu-Adenostylion* (Kraj. 1933) Klika 1944 (Klika and Hadač 1944: 283)
Nomenclatural type: identical with the name of alliance (Art. 28)

1212 *Delphinienion elati* (Hadač ex Hadač et al. 1969) Boşcaiu et Mihăilescu 1997
Tall-forb and fern-rich chionophilous communities on calcareous bedrock
Table 1, column 7
OFN: *Delphinenion elati* (Hadač 1969) status novus (Boşcaiu & Mihăilescu 1997: 38)
Bas.: *Delphinion elati* Hadač ex Hadač et al. 1969
Syn.: *Delphinion elati* Hadač 1962 (Art. 8), *Delphinenion elati* (Hadač ex Hadač et al. 1969) Kliment et al. 2004 (Art. 31)
Syntax. syn.: *Adenostylion* Br.-Bl. 1930 p. p. (*Adenostyletum alliariae*), *Calamagrostion variae* Sillinger 1932 p. p. min. (*Adenostyletum calcicolum*), *Adenostylion alliariae* Sillinger 1933 p. p. (*Adenostyletum calcicolum*)
Nomenclatural type: *Petasito kablikiani-Senecietum nemorensis* Hadač et al. 1969, lectotypus (Kliment et al. 2004: 109)

13 *Petasito-Chaerophylletalia* Morariu ex Kopecký 1969
Natural nitrophilous tall-herb vegetation on alluviums and banks of montane streams
Table 1, column 8
OFN: *Petasiteto-Chaerophylletalia* Morariu 67 (Kopecký 1969: 251)
Syn.: *Petasiteto-Chaerophylletalia* Morariu 1967 (Art. 8)
Nomenclatural type: *Petasition officinalis* Sillinger 1933 (Kopecký 1969: 251 ut *Petasition officinalis* Sillinger 33 em. Kopecký hoc loco), holotypus (Art. 18a)
Annotation: Morariu (1967: 242) described the order *Petasiteto-Chaerophylletalia* n. ord. on the basis of the only alliance *Telekiion* n. al. The description of the alliance is based on four associations (the original wording is used): *Petasiteto-Telekietum speciosae* n. as. (Art. 2b); *Chaerophylletum cicutariae-hirsuti* Soó 34c, 64; As. *Petasites hybridus-Aegopodium podagrariae* Borza et Boscaiu 65 n. n. (Art. 2b) and *Carduetum personatae* n. as. (Art. 2b). The name *Chaerophylletum cicutariae* Soó 34c was based on an indirect reference in the study by Soó (1964: 172, 306), and has remained problematic. It was determined, however, that Soó (1934: 108) only published the name of the association. In addition, he referred to an even older study (Soó 1927: 80) in the list of syntaxa (Soó 1964: 172), but he published there only the list of diagnostically important taxa of the associations *Equisetetum maximi* (*Chaerophylletum cicutariae*) (Art. 2b, 3a). The original diagnosis of the alliance *Telekion speciosae* Morariu 1967 and thus of the order *Petasito-Chaerophylletalia* Morariu 1967, is therefore insufficient (Art. 8). The name of the order was validated by Kopecký (1969: 251) on the basis of the alliance *Petasition officinalis* Sillinger 1933, and on the phytosociological relevés (tables) of the associations *Petasitetum hybridi* Oberdorfer 1949 em. Kopecký and *Petasitetum officinalis-glabrati* Sillinger 1933.

131 *Petasition officinalis* Sillinger 1933
Tall-herb vegetation of raw alluvium soils on montane streamsides in Carpathians and Hercynic mountains
Table 1, column 8
OFN: *Petasition officinalis* (Sillinger 1933: 131)
Syn.: *Petasition officinalis* vel *albae* (Sillinger 1933) Klika 1955 (Art. 10a, 29c), *Petasition kablikiani* Hadač et Smola 1962 (Art. 8), *Telekion speciosae* Morariu 1967 p. p. (Art. 8), *Chaerophyllo-Petasition hybridi* (Sillinger 1933) Kopecký 1968 (Art. 29c), *Petasito-Chaerophyllion* (Sillinger 1933) Niemann et al. 1973 (Art. 29c, 32d)
Pseud.: *Filipendulo-Petasition* sensu Špániková 1983 p. p. maj. non Br.-Bl. ex Duvigneaud 1949
Nomenclatural type: *Petasitetum officinalis-glabrati* Sillinger 1933 (Sillinger 1933: 131), lectotypus hoc loco
Annotation 1: Sillinger (1933: 131) described the association *Petasitetum officinalis-glabrati* from the middle parts of the mountain valleys of the Nízke Tatry Mts (760–920 m a. s. l.) as a plant community dominated by *Petasites hybridus*, with random occurrences of the species *Petasites kablikianus*. Kopecký (1969: 247) markedly changed the delimitation of this association when he included in it the phytocoenoses dominated by *Petasites kablikianus* (rarely also by *P. hybridus*) or the phytocoenoses co-dominanated of both species. He included the stands dominated by *Petasites hybridus* (without the presence of *P. kablikianus*) in the subassociation *Petasitetum hybridi* Oberdorfer 1949 em. Kopecký 1969 *typicum* Kopecký 1969, and in the Sudeten-Carpathian geographical variant with *Chaerophyllum aromaticum*. Later, several Slovak and Czech authors adopted this conception. Afterwards, Kliment & Jarolímek (2002: 107) limited the concept of the association *Petasitetum officinalis-glabrati* to the stands with transitional floristic composition occurring in the area where both dominant species in the submontane belt of the Carpathian mountains can be found. The stands that were dominated by *Petasites kablikianus* were evaluated as *Agropyro caninae-Petasitetum kablikiani* Pawłowski et Walas 1949. In their next study (Jarolímek et al. 2002) the authors assigned the stands, dominated by *Petasites hybridus*, in

the association *Chrysosplenio alternifolii-Petasitetum hybridi* Hadač et Soldán 1989. Afterwards, the alluvial butterbur communities were evaluated in a similar manner in the fourth volume of *Plant Communities of Slovakia* (Kliment et al. 2007a).

The ongoing study of the alluvial butterbur streamsides in the mountain valleys of the Western Carpathians shows that the stands with the co-occurrence of *Petasites hybridus* and *P. kablikianus* are difficult to distinguish by numerical analysis as a separate plant community. They most often occur in mildly wide parts of the valleys on streamsides with rolling relief (owing to alternation of gravelly layers and fine-grained silts). The transitional composition of the butterbur stands is noticeable also in marginal sites of the valleys, within the boundary zone of the vertical distribution of the community. It is conditioned by the characteristics of the habitat and the floristic composition of the neighbouring phytocoenoses. In the upper parts (up to the end) of the valleys, we recorded the *Petasites hybridus* phytocoenoses only with the occurrence of differential taxa of the association *Agropyro-Petasitetum kablikiani* and with the absence of own differential taxa. In the lower parts of the valleys the converse applied. These observations, together with the re-evaluation of the phytosociological relevés (Kliment et al., unpubl.), led us to conclude that the original relevés of the association *Petasitetum officinalis-glabrati* (Sillinger 1933: 134) can be evaluated as a variable of the broadly defined Carpathian plant community that is dominated by *Petasites hybridus*. The name, published by Sillinger, is the oldest validly published name for this community, and thus we have corrected the definition as follows:

***Petasitetum officinalis-glabrati* Sillinger 1933**

OFN: *Petasitetum officinalis-glabrati* (Sillinger 1933: 131)

Syn.: *Geranio phaei-Petasitetum* (Sillinger 1933) R. Tx. 1967 (Art. 29c), *Chaerophyllo-Petasitetum hybridi-kablikiani* (Sillinger 1933) Kopecký 1968 (Art. 29c, 30), *Petasitetum hybridi tatricum* Hadač et al. 1969 prov. (Art. 3b), *Petasitetum hybridi-kablikiani* sensu auct. carp. (e.g. Špániková 1983) p. p. (Art. 30)

Syntax. syn.: *Chrysosplenio alternifolii-Petasitetum hybridi* Hadač et Soldán 1989, *Lysimachio nummulariae-Petasitetum hybridi* Hadač et Soldán 1989 p. p.

Incl.: *Petasitetum hybridi typicum* Kopecký 1969, Sudeten-Carpathian variant with *Chaerophyllum aromaticum* p. p.; *Petasitetum officinalis-glabrati chaerophylletosum aromatici* Kopecký 1969; *Petasitetum officinalis-glabrati doronicetosum austriaci* Kopecký 1969 p. p. min.; *Petasitetum hybridi chaerophylletosum aromatici* Špániková 1983

Non: *Chaerophyllo hirsuti-Petasitetum officinalis* Kaiser 1926

Pseud.: *Petasitetum hybridi* sensu auct. carp. occid. (e.g. Fajmonová 1980; Špániková 1983) non Oberdorfer 1949

Nomenclatural type: Sillinger 1933: 134, rel. 1, lectotypus (Kliment & Jarolímek 2002: 107)

Differential taxa: *Angelica sylvestris*, *Anthriscus sylvestris*, *Chaerophyllum aromaticum* (const.), *Galium aparine*, *Glechoma hederacea*, *Lysimachia nummularia*, *Petasites hybridus* (dom., const.), *Stachys sylvatica* (const.)

Constant companions: *Chaerophyllum hirsutum*, *Geranium phaeum*, *Stellaria nemorum*, *Urtica dioica*

Annotation 2: A later re-evaluation brought some changes into the synonymy and differentiation of the plant community with *Petasites kablikianus*. In line with Art. 10b and 42, we have corrected the author's citation [only the relevant synonyms are presented; for the whole synonymy see Kliment et al. (2007a: 110)] as follows:

***Agropyro caninae-Petasitetum kablikiani* Pawłowski et Walas 1949 nom. invers. propos.**

OFN: Association à *Petasites Kablikianus* et *Agropyrum caninum = Petasitetum Kablikiani (= glabrati)* Pawł. et Wal. (Pawł. 1936; Szaf., Pawł. et Kulcz. 1927) (Pawłowski & Walas 1949: 149)

Syn.: *Petasitetum hybridi-kablikiani* sensu auct. carp. (e.g. Špániková 1983) p. p. (Art. 30)

Incl.: *Petasitetum officinalis-glabrati doronicetosum austriaci* Kopecký 1969 p. p. maj.; *Petasitetum hybridi-kablikiani typicum* Špániková 1983 p. p.

Pseud.: *Petasitetum officinalis-glabrati* sensu auct. slov. et bohem. p. p. non Sillinger 1933

Nomenclatural type: Pawłowski & Walas 1949, Table XIII, rel. 6, lectotypus (Kliment & Jarolímek 2002: 103)

Characteristic taxa: *Petasites kablikianus* (transgr., dom., const.), *Orobanche flava* (transgr.)

Differential taxa: *Cortusa matthioli*, *Viola biflora*

Constant companions: *Chaerophyllum hirsutum*, *Stellaria nemorum*

2 *Betulo carpaticae-Alnetea viridis* Rejmánek in Huml et al. 1979

Subalpine communities of deciduous shrubs

Table 1, column 9; Fig 1BA

OFN: *Betulo (carpaticae)-Alnetea viridis* Rejmánek, cl. nova (Huml et al. 1979: 38)

Syn.: *Mugo-Alnetea viridis* Eggler 1952 p. p. (Art. 8), *Betulo carpaticae-Alnetea viridis* Rejmánek 1977 (Art. 8)

Nomenclatural type: *Alnetalia viridis* Rübel ex Rejmánek in Huml et al. 1979 (Huml et al. 1979: 38), holotypus (Art. 18a)

Distribution: Kriváska Malá Fatra Mts, Veľká Fatra Mts

21 *Alnetalia viridis* Rübel ex Rejmánek in Huml et al. 1979

Subalpine communities of small-leaved shrubs

Table 1, column 9

OFN: *Alnetalia viridis* Rübel 1933 (Huml et al. 1979: 38)

Syn.: *Alnetalia viridis* Rübel 1933 (Art. 8), *Mugo-Alnetalia viridis* Eggler 1952 p. p. (Art. 8)

Nomenclatural type: *Alnion viridis* Rübel ex Rejmánek in Huml et al. 1979 (Huml et al. 1979: 38), holo-

typus (Art. 18a) [nom. illeg. (Art. 31); correct name: *Alnion viridis* Schnyder 1930 (Schnyder 1930: 175)]

211 *Salicion silesiacae* Rejmánek et al. 1971
Subalpine willow shrubs of the Western Carpathians and Hercynicum rich in tall herbs
Table 1, column 9
OFN: *Salicion silesiacae* foederatio nova (Rejmánek et al. 1971: 36)
Nomenclatural type: *Salici silesiacae-Betuletum carpaticae* Rejmánek et al. 1971, lectotypus (Jeník et al. 1980: 17)

3 *Elyno-Seslerietea* Br.-Bl. 1948
Montane and alpine calcareous swards
Table 1, columns 10–13; Fig 1ES
OFN: Classe *Elyno-Seslerietea* (Braun-Blanquet 1948: 147)
Syn.: *Elyno-Seslerietea* Br.-Bl. in Br.-Bl. et al. 1947 (Art. 8), *Seslerietea variae* Oberdorfer 1978 (Art. 29c), *Seslerietea albicantis* Oberdorfer 1978 corr. Oberdorfer 1990 (Art. 29c, 30)
Syntax. syn.: *Seslerio-Arabidetea alpinae* Klika in Klika et Hadač 1944 p. p. (*Seslerietalia calcariae*), *Festuco-Seslerietea* Barbero et Bonin 1969 p. p. (*Festucion scopariae*)
Phantomname: *Seslerietea albicantis* Br.-Bl. 1948 em. Oberdorfer 1978 (Oberdorfer 1983: 41; Coldea 1997: 207), *Elyno-Seslerietea albicantis* Br.-Bl. 1948 corr. Oberdorfer 1983 em. Ohba 1974 (Theurillat et al. 1994: 23, 1995: 216)
Nomenclatural type: *Seslerietalia caeruleae* Br.-Bl. 1948 [Braun-Blanquet 1948: 149 ut "*coeruleae*" (Art. 41a)], holotypus (Art. 18a)
Annotation: After the description of the class *Carici rupestris-Kobresietea* Ohba 1974, Oberdorfer (1978: 194) described the class *Seslerietea variae*. This class, similarly to the class *Elyno-Seslerietea*, was described on the basis of the only order *Seslerietalia caeruleae*, therefore the *Seslerietea variae* Oberdorfer 1978 represents the superfluous name for *Elyno-Seslerietea* Br.-Bl. 1948 (Art. 29c). Although the alliance *Elynion medioeuropaeum* Br.-Bl. 1948 [correct name: *Oxytropido-Elynion* Br.-Bl. (1948) 1949; see below] was also part of the original diagnosis of the class *Elyno-Seslerietea* (within the order *Seslerietalia caeruleae*), the order *Oxytropido-Elynetalia* Oberdorfer ex Albrecht 1969 was described later. Therefore, according to Art. 35, which concerns the rejection of the double syntaxa names, it is not possible to assign the name *Elyno-Seslerietea* Br.-Bl. 1948 as a synonym (cf. Grabherr et al. 1993: 403; Rivas-Martinez et al. 2001: 100).
Distribution: Lúčanská and Krivánska Malá Fatra Mts, Chočské vrchy Mts, Veľká Fatra Mts, Nízke Tatry Mts, Západné Tatry Mts, Vysoké Tatry Mts, Belianske Tatry Mts, Pieniny Mts, Slovenský raj Mts, Muránska planina Mts

31 *Seslerietalia caeruleae* Br.-Bl. in Br.-Bl. et Jenny 1926
Montane and alpine calcareous swards
Table 1, columns 10–13
OFN: *Seslerietalia coeruleae* (Braun-Blanquet and Jenny 1926: 225)
Syn.: *Seslerietalia caeruleae* G. Br.-Bl. in Br.-Bl. 1931 (Art. 31), *Seslerietalia calcariae* Br.-Bl. in Br.-Bl. et Jenny 1926 corr. Klika in Klika et Hadač 1944 (Art. 30), *Seslerietalia caeruleae* Br.-Bl. in Br.-Bl. et al. 1947 (Art. 8), *Seslerietalia variae* Br.-Bl. in Br.-Bl. et Jenny 1926 corr. Eggler 1952 (Art. 30), *Seslerietalia albicantis* Br.-Bl. in Br.-Bl. et Jenny 1926 corr. Oberdorfer 1983 (Art. 30), *Seslerietalia tatrae* Hadač 1962 p. p. (Art. 2b, 8)
Syntax. syn.: *Caricetalia firmae* Wendelberger 1962, *Seslerietalia tatrae* Hadač ex Hadač et al. 1969 p. p. (*Seslerion tatrae*)
Phantomname: *Seslerietalia albicantis* Br.-Bl. 1926 (Coldea 1997: 207; Malynovski & Kricsfalusy 2000: 84, 2002: 85), *Seslerietalia variae* Br.-Bl. 1926 (Oberdorfer et al. 1967: 38; Albrecht 1969: 15; Ohba 1974: 382)
Nomenclatural type: *Seslerion caerulae* Br.-Bl. in Br.-Bl. et Jenny 1926 [Braun-Blanquet & Jenny 1926: 225 ut "*coerulae*" (Art. 41a)], holotypus (Art. 18a)
Annotation: The corrections of the syntaxa names based on the name *Sesleria caerulea* (L.) Ard. are unfounded, according to Art. 43. The name *S. caerulea*, in the sense of the lectotypification (Rauschert 1969: 412, Foggi et al. 2001: 1103), does not relate to the marsh taxon *S. uliginosa*, but the species of calcareous sites (syn.: *S. albicans*, *S. calcarea*, *S. varia*) (cf. Weber et al. 2000: 756).

311 *Astero alpini-Seslerion calcariae* Hadač ex Hadač et al. 1969 nom. invers. propos.
Montane and alpine more or less open communities on shallow soils on sunny slopes with short snow cover in the Western Carpathians
Table 1, columns 10–11
OFN: *Seslerio-Asterion alpini*, Hadač 1962, 51 (Hadač et al. 1969: 64)
Syn.: *Seslerieto-Asterion alpini* Hadač 1962 (Art. 8), *Astereto-Seslerion calcariae* Hadač et Smola 1962 (Art. 8), *Astero serpentimontani-Seslerion* Hadač 1962 corr. Mucina 1981 (Art. 43)
Pseud.: *Seslerion caeruleae* auct. carpat. occid. p. p. non Br.-Bl. in Br.-Bl. et Jenny 1926
Phantomname: *Seslerio tatrae-Asterion alpini* Hadač 1962 (Coldea 1997: 207)
Nomenclatural type: *Astereto-Seslerietum calcariae* Hadač et al. 1969, lectotypus (Art. 20, cf. Kliment et al. 2005a: 125) [Art. 41b; correct form of the name: *Astero alpini-Seslerietum calcariae* Hadač et al. 1969]

3111 *Astero alpini-Seslerienion calcariae* Kliment et al. 2005
Subalpine-alpine open communities on shallow soils on steep sunny slopes
Table 1, column 10
Nomenclatural type: identical with the name of alliance (Art. 28)

3112 *Pulsatillo slavicae-Caricenion humilis* Uhlířová suball. nov. hoc loco
Montane-subalpine more or less open communities on shallow soils on sunny slopes
Table 1, column 11
Syn.: *Pulsatillo slavicae-Caricenion humilis* Uhlířová in Kliment et al. 2005 (Art. 5)
Nomenclatural type: *Caricetum humilis carpaticum* Sillinger 1933 (Sillinger 1933: 177), lectotypus [nom. illeg. (Art. 34a); correct name: *Pulsatillo slavicae-Caricetum humilis* (Sillinger 1933) Mucina ex Uhlířová et Bernátová 2004 (see Kliment et al. 2007b: 176)]
Annotation 1: Uhlířová (in Kliment et al. 2005a: 127–128) published the description of a new suballiance, but since the category of the nomenclatural type was not used *expressis verbis* in this study, this rendered the description invalid (Art. 5).
Annotation 2: In the study by Kliment et al. (2007b), some of the nomenclatural types were not set in the associations. To complete the study, we set them as follows:
***Festuco tatrae-Caricetum humilis* Uhlířová et Petrík 2006**
Nomenclatural type: Uhlířová & Petrík 2006, Table 2, rel. 3, holotypus
***Seslerio calcariae-Festucetum tatrae* Sillinger 1933**
Nomenclatural type: Sillinger 1933, Table between p. 188–189, rel. 16, lectotypus hoc loco

312 *Seslerion tatrae* Pawłowski 1935 corr. Klika 1955
Calcareous alpine swards of the Western Carpathians on deeper soils with prolonged snow cover
Table 1, column 12
OFN: *Seslerion (Bielzii) tatrae* Pawł. 1935 (Klika 1955: 306)
Syn.: *Seslerion bielzii* Pawłowski 1935 (Art. 43), *Seslerion tatrae* Pawłowski 1956 (Art. 8), *Seslerion tatrae* Hadač et Smola 1962 (Art. 8), *Seslerion tatrae* Pawłowski em. Hadač 1962 (Art. 8)
Phantom name: *Seslerion tatrae* Hadač 1962 (Mucina & Maglocký 1984: 32, 1985: 198)
Non: *Festuco saxatilis-Seslerion bielzii* (Pawłowski et Walas 1949) Coldea 1984
Nomenclatural type: *Versicoloretum tatricum* Pawłowski 1935 (Pawłowski 1935: 132), lectotypus hoc loco [nom. illeg. (Art. 34a); correct name: *Seslerio tatrae-Festucetum versicoloris* Pawłowski et Stecki 1927 corr. Kliment et al. 2005 nom. invers. propos. (see Annotation 2)]
Annotation 1: Kliment et al. (2005a: 129) chose the association *Seslerietum bielzii* Domin 1929 as a lectotype of the name of the alliance; but this association was not in the original diagnosis of the alliance *Seslerion bielzii*.
Annotation 2: According to the order of the taxa names in the original diagnosis of the association *Festuca varia-Sesleria bielzii* (Pawlowski & Stecki 1927: 96 ut *Festuca varia-Sesleria Bielzii*-Assoziation oder das *Varietum tatricum*), it is necessary to correct the name *Seslerio tatrae-Festucetum versicoloris* Pawłowski et Stecki 1927 corr. Kliment et al. 2005 (cf. Kliment et al. 2005a: 131) as follows:***Seslerio tatrae-Festucetum versicoloris* Pawłowski et Stecki 1927 corr. Kliment et al. 2005 nom. invers. propos.** (Art. 42).
Annotation 3: Kliment et al. (2005a: 130) published the correction of the name *Seslerietum bielzii* Domin 1929 to *Seslerietum tatrae* Domin 1929 corr. Kliment et al. 2005 (Art. 43); and thereby it created the earlier homonym of the validly published name *Seslerietum tatrae* Šmarda 1956 (Art. 40b). To correct the name of the association, several new combinations of the subassociation names published in that study were needed:
***Seslerietum tatrae* Šmarda 1956**
Nomenclatural type: Šmarda 1956: 20, holotypus (Art. 18a)
***Seslerietum tatrae luzuletosum rubellae* (Kliment et al. 2005) comb. nov. hoc loco**
Bas.: *Seslerietum tatrae* Domin 1929 corr. Kliment et al. 2005 *luzuletosum rubellae*
Nomenclatural type: Domin 1929: 9, holotypus (Kliment et al. 2005a: 131)
***Seslerietum tatrae biscutelletosum laevigatae* (Kliment et al. 2005) comb. nov. hoc loco**
Bas.: *Seslerietum tatrae* Domin 1929 corr. Kliment et al. 2005 *biscutelletosum laevigatae*
Nomenclatural type: Unar et al. 1984, Table 19, rel. 3, holotypus (Kliment et al. 2005a: 131)

313 *Caricion firmae* Gams 1936
Alpine cushion-like open sedge and tussocky swards on hard limestone on northern windswept slopes and ridges with low snow cover
Table 1, column 13
OFN: *Caricion firmae* (Gams 1936: 57)
Syn.: *Seslerion bielzii* Pawłowski 1935 p. p. (Art. 43), *Caricion firmae* Hadač 1962 (Art. 8), *Caricion firmae* Wendelberger 1962 (Art. 29c, 31)
Syntax. syn.: *Seslerion caerulae* Br.-Bl. in Br.-Bl. et Jenny 1926 p. p. min. (*Caricetum firmae*), *Seslerion caerulae* Aichinger 1933 p. p. min. (*Caricetum firmae*)
Incl.: *Caricenion firmae* (Gams 1936) Theurillat in Theurillat et al. 1995
Pseud.: *Seslerion caerulae* sensu auct. carpat. occid. p. p. non Br.-Bl. in Br.-Bl. et Jenny 1926
Nomenclatural type: *Caricetum firmae* Br.-Bl. in Br.-Bl. et Jenny 1926 (Gams 1936: 57), holotypus (Art. 18a) [nom. illeg. (Art. 31); correct name: *Caricetum firmae* Rübel 1911 (see Grabherr et al. 1993: 406)]

4 *Carici rupestris-Kobresietea bellardii* Ohba 1974
Wind-exposed, cryophile swards and carpets on edges with low snow cover
Table 1, columns 14–15; Fig 1CK
OFN: *Carici rupestris-Kobresietea bellardii* nom. nov. (Ohba 1974: 379)

Syn.: *Elyno-Seslerietea* Br.-Bl. in Br.-Bl. et al. 1947 p. p. (Art. 8), *Kobresio-Elynetea* Oberdorfer 1957 (Art. 3b)
Syntax. syn.: *Juncetea trifidi* Hadač in Klika et Hadač 1944 p. p. min. (*Festucion versicoloris*), *Elyno-Seslerietea* Br.-Bl. 1948 p. p. min. (*Elynion medioeuropaeum*)
Nomenclatural type: *Kobresio-Dryadetalia* Br.-Bl. ex Ohba 1974 (Ohba 1974: 384), lectotypus hoc loco [syn.: *Elyno-Dryadetalia* Br.-Bl. 1948 (Art. 8)]
Annotation 1: The previous typification of the name of the class (Dierssen 1992: 214) was illegitimate because the author used the invalid name *Oxytropido-Elynetalia* Oberdorfer 1957 (Art. 17; cf. Theurillat & Moravec 1995: 364) as the nomenclatural type.
Annotation 2: Two diagnostic taxa, *Carex rupestris* and *Festuca *versicolor*, were assigned subjectively on the basis of a wider knowledge of coenology and ecology of both taxa. The first, the arctic-alpine species *Carex rupestris*, was evaluated as a diagnostic after new knowledge was obtained about the sociology of this species in the Western Carpathians (cf. Šibík et al. 2007b). The second, the Carpathian subendemic *Festuca *versicolor*, represents a relic species of the old autochthonous flora of the Carpathians (Hendrych 1981; Kliment 1999). Owing to a relatively wide ecological valence, this species can be found in the plant communities of rocky fissures [the class *Asplenietea trichomanis* (Br.-Bl. in Meyer et Br.-Bl. 1934) Oberd. 1977] and in the communities of the classes *Elyno-Seslerietea* and *Carici rupestris-Kobresietea*. Owing to the presence of a fine and dense rooting system, this species thrives in windward habitats. It is one of the few plants that can survive in habitats with periglacial climate together with solifluction and ice blasts that reach the advanced stages of cryoplanation. This species usually dominates stands with at least a thin layer of fine-grained soil; on stands with a deeper soil profile it cannot compete with other species (Bělohlávková 1980). Therefore, we decided to evaluate this taxon as a regional characteristic species (reg. char.) for the order *Oxytropido-Elynetalia* (hence it occurs in a smaller part of the distributional area of the alliance) because in its habitat preferences and ecology it resembles the alpine species *Festuca pumila* Vill., which is characterised similarly by Ohba (1974). Although *Festuca *versicolor* occurs very often in the plant communities of other classes, it occupies extreme habitats there, too. Thus, we suppose that the stands of the class *Carici rupestris-Kobresietea* are ecologically optimal for this species. Jarolímek et al. (2008) also evaluated this species as a diagnostic taxon for the class *Carici rupestris-Kobresietea*, as well as for the alliance *Oxytropido-Elynion*.
Distribution: Nízke Tatry Mts, Západné Tatry Mts, Vysoké Tatry Mts, Belianske Tatry Mts

41 *Oxytropido-Elynetalia* Oberdorfer ex Albrecht 1969

Species-rich alpine tundra of high mountains in central Europe and the Balkans
Table 1, columns 14–15
OFN: *Oxytropis-Elynetalia* Oberdorfer 1957 (Albrecht 1969: 27)
Syn.: *Elynetalia* Oberdorfer 1957 (Art. 3b), *Oxytropido-Elynetalia* Oberdorfer (1957) 1962 (Art. 3b), *Oxytropido-Kobresietalia* Oberdorfer ex Albrecht 1969 (in Grabherr 1993a: 374) (Art. 30)
Syntax. syn.: *Seslerietalia caeruleae* Br.-Bl. 1948 p. p. (*Elynion medioeuropaeum*), *Festucetalia versicoloris* Jeník in Moravec et al. 1995
Phantomname: *Oxytropido-Kobresietalia* Oberdorfer 1957 (Ohba 1974: 382)
Nomenclatural type: *Oxytropido-Elynion* Br.-Bl. (1948) 1949 (Albrecht 1969: 27 ut *Oxytropido-Elynion* Br.-Bl. 1948), holotypus (Art. 18a)
Annotation: Oberdorfer (1957: 305) published the name *Elynetalia*, although conditionally (Art. 3b). He published the name *Oxytropido-Elynetalia* later, but it was invalid in every publication. In the first study (Oberdorfer 1962: 33), he published it as *Oxytropido-Elynetalia* (Oberdorfer 57) prov. (Art. 3b). In the second study (Oberdorfer et al. 1967: 39) it was published as *Oxytropido-Elynetalia* Oberdorfer 57, but without reference to the original diagnosis of the alliance *Oxytropido-Elynion* and the original name of the alliance (Art. 2b); and in the last study (Oberdorfer 1970: 33) without reference to the original diagnosis of the alliance *Oxytropido-Elynion*. Despite the fact that the authors' citation was incorrect in the name of the alliance in the study by Albrecht 1969 (but see Oberdorfer et al. 1967: 39), we still consider the citation 'Oberdorfer ex Albrecht 1969' according to Art. 6 and Recomm. 46D to be legitimate.

411 *Oxytropido-Elynion* Br.-Bl. (1948) 1949

Alpine xero-cryophilous wind-exposed swards and carpets on calcium-rich soils
Table 1, column 14
OFN: Verband *Oxytropo-Elynion* Br.-Bl. 1948 (Braun-Blanquet 1949b: 24)
Bas.: *Elynion medioeuropaeum* Br.-Bl. 1948 (Art. 34a)
Syn.: *Elynion* Gams 1936 (Art. 8), *Oxytropo-Elynion* Br.-Bl. in Br.-Bl. et al. 1947 (Art. 8)
Syntax. syn.: *Seslerion caeruleae* Br.-Bl. in Br.-Bl. et Jenny 1926 p. p. min. (*Elynetum*)
Non: *Elynion bellardii* (*boreoatlanticum*) Nordhagen 1936 (Art. 8)
Phantomname: *Oxytropido-Elynion* Oberdorfer 1957 (Ohba 1974: 382), *Oxytropido-Kobresion* Oberdorfer 1957 (Ohba l. c.)
Nomenclatural type: Ass. *Elyno-Oxytropidetum foucaudi* Br.-Bl. 1948 [Braun-Blanquet 1948: 164 ut Ass. *Elyneto-Oxytropidetum foucaudi* (Ass. à *Elyna myosuroides* et *Oxytropis foucaudi*)], holotypus (Art. 18a)
Annotation: Braun-Blanquet (1948: 163) described a new alliance *Elynion medioeuropaeum* and included it in the order *Seslerietalia caeruleae*. The name was illegitimate, however, because he used a geographical epithet to name the Central European phytocoenoses in order to distinguish them from the North

European phytocoenoses (Art. 34a). One year later (Braun-Blanquet 1949b: 24), he corrected the name to *Oxytropo-Elynion* Br.-Bl. 1948, and instead of publishing the original name, he referred to it as follows: 'Die nähere Begründung dieses Vorgehens ist in meiner Vegetations-Monographie der Ostpyrenäen (1948) erläutert'. Therefore we have corrected the authors' citation in the name of the alliance stated in the study by Šibík et al. (2007b: 222) as mentioned above (cf. Rivas-Martinez et al. 2001: 100).

412 *Festucion versicoloris* Krajina 1933
Alpine xero-cryophilous tussocky, cushion-like and dwarf-shrub vegetation on siliceous-neutral soils on mylonites
Table 1, column 15
OFN: Verband: *Festucion versicoloris* (Krajina 1933: 53)
Nomenclatural type: *Festucetum versicoloris graniticum* Krajina 1933 (Krajina 1933: 69), lectotypus hoc loco [nom. illeg. (Art. 34a); correct name: *Agrosti alpinae-Festucetum versicoloris* Pawłowski in Pawłowski et al. 1928 nom. invers. propos. (see Dúbravcová & Šibík 2006: 227; Šibík et al. 2007b: 237)]

5 *Salicetea herbaceae* Br.-Bl. 1948
Vegetation of long-lasting snow beds and snow fields and slopes irrigated by melt waters
Table 1, columns 16–18; Fig 1SH
OFN: *Salicetea herbaceae* (Braun-Blanquet 1948: 71)
Syn.: *Salicetea herbaceae* Br.-Bl. et al. 1947 (Art. 8)
Syntax. syn.: *Juncetea trifidi* Hadač in Klika et Hadač 1944 p. p. (*Festucion pictae*, *Salicetalia herbaceae*)
Nomenclatural type: *Salicetalia herbaceae* Br.-Bl. 1948 (Braun-Blanquet 1948: 73), lectotypus (Art. 20) [nom. illeg. (Art. 31); correct name: *Salicetalia herbaceae* Br.-Bl. in Br.-Bl. et Jenny 1926 (see below)]
Distribution: Kriváska Malá Fatra Mts, Nízke Tatry Mts, Západné Tatry Mts, Vysoké Tatry Mts, Belianske Tatry Mts

51 *Salicetalia herbaceae* Br.-Bl. in Br.-Bl. et Jenny 1926
Vegetation of long-lasting snow beds on siliceous bedrock
Table 1, columns 16–17
OFN: *Salicetalia herbaceae* (Braun-Blanquet & Jenny 1926: 213)
Syn.: *Salicetalia herbaceae* G. Br.-Bl. et J. Br.-Bl. 1931 (Art. 31)
Nomenclatural type: *Salicion herbaceae* Br.-Bl. in Br.-Bl. et Jenny 1926 (Braun-Blanquet & Jenny 1926: 213), holotypus (Art. 18a)

511 *Salicion herbaceae* Br.-Bl. in Br.-Bl. et Jenny 1926
Dwarf-willow and moss dominated communities of snow beds on acid soils soils and rocks
Table 1, column 16
OFN: *Salicion herbaceae*-Verband (Braun-Blanquet & Jenny 1926: 213)
Syn.: *Salicion herbaceae* Pawłowski 1928 (Art. 8), *Salicion herbaceae* Br.-Bl. 1930 (Art. 31), *Salicion herbaceae* G. Br.-Bl. et J. Br.-Bl. 1931 (Art. 31), *Salicion herbaceae* Sillinger 1933 (Art. 31), *Salicion herbaceae* Aichinger 1933 (Art. 31)
Nomenclatural type: *Salicetum herbaceae* Br.-Bl. in Br.-Bl. et Jenny 1926 (Braun-Blanquet & Jenny 1926: 220), lectotypus (Art. 20; cf. Englisch 1993: 385) [nom. illeg. (Art. 31); correct name: *Salicetum herbaceae* Rübel 1911 (see Englisch l. c.)]

512 *Festucion picturatae* Krajina 1933 corr. Dúbravcová 2007
Chionophilous communities of fixed screes on siliceous bedrock
Table 1, column 17
Syn.: *Festucion pictae* Krajina 1933 (Art. 43)
Nomenclatural type: *Festucetum pictae* Krajina 1933 (Krajina 1933: 835), lectotypus (Art. 20)
Annotation: Malynovski & Kricsfalusy (2000: 67) corrected the name *Festucetum pictae* Krajina 1933 (Art. 43) to *Festucetum picturatae* Krajina 1933 corr. Malynovski et Kricsfalusy 2000. Thereby they created the earlier homonym of the name *Festucetum picturatae* Schittengruber 1961 corr. Theurillat 1989 (Art. 40b). According to Art. 43, paragraph 3, it is necessary to create a *nomen novum* for the association *Festucetum pictae* Krajina 1933 (Art. 39). For the name-giving taxon, we have chosen one of the three most diagnostically important taxa of the association that were determined in its original diagnosis (Krajina 1933, Table 13):
***Gentiano punctatae-Festucetum picturatae* (Krajina 1933) Dúbravcová nom. nov. et nom. corr. hoc loco**
Bas.: *Festucetum pictae* Krajina 1933 (Krajina 1933: 835)
Non: *Festucetum pictae* Domin 1929
Nomenclatural type: Krajina 1933, Table 13, rel. 3, lectotypus (Unar et al. 1985: 18)
Thus, it was necessary to create new combinations of previously described subassociations, which were classified under the different association name (Art. 26):
***Gentiano punctatae-Festucetum picturatae hieracietosum alpini* (Dúbravcová 2007) Dúbravcová comb. nov. hoc loco**
Bas.: *Festucetum picturatae hieracietosum alpini* Dúbravcová 2007 (Dúbravcová 2007: 272)
Nomenclatural type: Dúbravcová 2007: 272, holotypus
***Gentiano punctatae-Festucetum picturatae typicum* (Dúbravcová 2007) Dúbravcová comb. nov. hoc loco**
Bas.: *Festucetum picturatae typicum* Dúbravcová 2007 (Dúbravcová 2007: 272)
Nomenclatural type: identical with the name of association

52 *Arabidetalia caeruleae* Br.-Bl. 1948
Alpine basiphilous vegetation of snow fields on stabilised screes with long-lasting snow cover
Table 1, column 18
OFN: *Arabidetalia coeruleae* (Braun-Blanquet 1948: 92)
Syn.: *Arabidetalia caeruleae* Rübel 1933 (Art. 8), *Arabidetalia caeruleae* Rübel ex Br.-Bl. 1949 (Art. 31)
Syntax. syn.: *Salicetalia retusae* Lakušić 1970
Phantomname: *Arabidetalia caeruleae* Rübel ex Br.-Bl. 1948 (Englisch et al. 1993: 307; Dúbravcová 2007: 273)
Nomenclatural type: *Arabidion caeruleae* Br.-Bl. 1948 [Braun-Blanquet 1948: 92 ut "*coeruleae*" (Art. 41a)], lectotypus (Art. 20)
Annotation 1: Braun-Blanquet (1949a: 291) validated the name of the order *Arabidetalia caeruleae* Rübel 1933 in issue 4–5 of the first volume of the journal *Vegetatio*. This issue, however, was published 1 August 1949, so the name *Arabidetalia caeruleae* Br.-Bl. 1948 has priority. The incorrect date of the validation of the name of the alliance is presumably reflective of the incorrect date of the whole volume of the journal (see References).
Annotation 2: Theurillat et al. (1995: 206) published the name *Arabidetalia caeruleae* Rübel ex Nordhagen 1936 as a valid name of the order. That name is invalid (Art. 2b), however, because Nordhagen (1936: 44) in his article published the name *Arabidetalia coeruleae* Rübel (without the year) and he adduced two studies by Rübel in the references.

521 *Arabidion caeruleae* Br.-Bl. in Br.-Bl. et Jenny 1926
Basiphilous vegetation of snow fields on stabilised screes with long-lasting snow cover (rocky snow patches)
Table 1, column 18
OFN: *Arabidion caeruleae*-Verband [Braun-Blanquet & Jenny 1926: 198 ut "*coeruleae*" (Art. 41a)]
Syn.: *Arabidion caeruleae* Pawłowski 1928 (Art. 8), *Arabidion caeruleae* Br.-Bl. 1930 (Art. 31), *Arabidion caeruleae* G. Br.-Bl. et J. Br.-Bl. 1931 (Art. 31)
Nomenclatural type: *Arabidetum caeruleae* Br.-Bl. in Br.-Bl. et Jenny 1926 [Braun-Blanquet & Jenny 1926: 199 ut "*coeruleae*" (Art. 41a)], lectotypus (Art. 20) [nom. illeg. (Art. 31); correct name: *Arabidetum caeruleae* Br.-Bl. 1918 (see Englisch et al. 1993: 309)]

6 *Loiseleurio-Vaccinietea* Eggler ex Schubert 1960
Arctic-boreal and (sub)alpine dwarf-shrub heathlands
Table 1, columns 19–20; Fig 1LV
OFN: *Loiseleurio-Vaccinietea* (Eggler 52 emend.) (Schubert 1960: 194)
Syn.: *Loiseleurio-Vaccinietea* Eggler 1952 (Art. 8)
Syntax. syn.: *Vaccinio-Piceetea* Br.-Bl. in Br.-Bl. et al. 1939 p. p. (*Loiseleurio-Vaccinion*), *Juncetea trifidi* Hadač in Klika et Hadač 1944 p. p. (*Rhodoreto-Vaccinietalia*), *Loiseleurio-Cetrarietea* Suzuki-Tokio et Umezu in Suzuki-Tokio 1964, *Calluno-Vaccinietea myrtilli* de Foucalt 1990 p. p. (*Empetretalia hermaphroditi*)
Nomenclatural type: *Empetretalia hermaphroditi* Schubert 1960 [Schubert 1960: 194 ut *Empetretalia hermaphroditae* (ord. nov.)], holotypus (Art. 18a)
Distribution: Lúčanská and Krivánska Malá Fatra Mts, Oravské Beskydy Mts, Oravská Magura Mts, Chočské vrchy Mts, Veľká Fatra Mts, Nízke Tatry Mts, Západné Tatry Mts, Vysoké Tatry Mts, Belianske Tatry Mts, Muránska planina Mts, Volovské vrchy Mts, Bukovské vrchy Mts

61 *Rhododendro-Vaccinietalia* Br.-Bl. in Br.-Bl. et Jenny 1926
Arctic-boreal and (sub)alpine ericoid dwarf-shrub heathlands
Table 1, columns 19–20
OFN: *Rhodoreto-Vaccinietalia* (Braun-Blanquet and Jenny 1926: 286)
Syn.: *Rhodoretalia* G. Br.-Bl. et J. Br.-Bl. 1931 (Art. 29c, 41b), *Loiseleurio-Vaccinietalia* Eggler 1952 (Art. 8)
Syntax. syn.: *Empetretalia hermaphroditi* Schubert 1960, *Cladonio-Vaccinietalia* Kielland-Lund 1967 p. p. (*Loiseleurio-Vaccinion*, *Rhododendro-Vaccinion*)
Nomenclatural type: *Loiseleurio-Vaccinion* Br.-Bl. in Br.-Bl. et Jenny 1926 (Braun-Blanquet & Jenny 1926: 287 ut *Loiseleurieto-Vaccinion*-Verband), holotypus (Art. 18a)
Annotation: The alliance *Rhododendro-Vaccinion* Br.-Bl. in Br.-Bl. et Jenny 1926 was described invalidly (Art. 2b; cf. Grabherr 1993b: 456), therefore the alliance *Loiseleurio-Vaccinion* remained as the only proper choice of the type. A valid description of the alliance *Rhododendro-Vaccinion* was published by Schnyder (1930: 171) and afterwards by G. Braun-Blanquet & J. Braun-Blanquet (1931: 61).

611 *Loiseleurio procumbentis-Vaccinion* Br.-Bl. in Br.-Bl. et Jenny 1926
Chionophobous cryophilous dwarf-shrub heathlands on widswept slopes and edges
Table 1, column 19
OFN: *Loiseleurieto-Vaccinion*-Verband [Braun-Blanquet & Jenny 1926: 287 (Art. 41b)]
Syn.: *Loiseleurio-Vaccinion* G. Br.-Bl. et J. Br.-Bl. 1931 (Art. 31), *Loiseleurio-Vaccinion* Aichinger 1933 (Art. 31), *Loiseleurio-Vaccinion uliginosi* Krajina 1933 p. p. maj. (Art. 43)
Incl.: *Cetrario-Loiseleurenion* Br.-Bl. et Sissingh in Br.-Bl. et al. 1939
Phantomname: *Loiseleurio-Vaccinion* Br.-Bl. in Br.-Bl. et Jenny ex Krajina 1933 (Mucina & Maglocký 1985: 192)
Non: *Loiseleurio-Vaccinion uliginosi* Nordhagen 1936 [nom. inval. (Art. 8); correct name: *Loiseleurio-Diapension* (Nordhagen in Br.-Bl. et al. 1939) Daniëls 1982; see Braun-Blanquet et al. 1939: 89; Dierssen 1992: 218, 1996: 779]
Nomenclatural type: *Empetro-Vaccinietum uliginosi* Br.-Bl. in Br.-Bl. et Jenny 1926 [Braun-Blanquet

& Jenny 1926: 291 ut *Empetreto-Vaccinietum* (*Empetrum-Vaccinium uliginosum*-Heide)], lectotypus hoc loco [nom. illeg. (Art. 43); correct name: *Empetro-Vaccinietum gaultherioidis* Br.-Bl. in Br.-Bl. et Jenny 1926 corr. Grabherr 1993 (see Grabherr 1993b: 454)]
Annotation 1: Šibík et al. (2007c: 291) did not use *expressis verbis* the category of the nomenclatural type to typify the name of the alliance (Art. 5); therefore, the typification in this study is invalid.
Annotation 2: Šibík et al. (2007a: 103, 2007c: 296) classified the phytocoenoses, dominated by *Calluna vulgaris* from the subalpine to lower alpine belt of the Tatra Mts, as the association *Junco trifidi-Callunetum vulgaris* (Krajina 1933) Hadač ex Šibík et al. 2007. Phytocoenoses from the Krkonoše Mts, similar to those occurring in the Tatra Mts, were previously described by Zlatník (1925: 40) as *Calluneto-Deschampsietum*. After considering the species composition and the synecology of the community, we identify the West Carpathian phytocoenoses with those from the Sudetes (Krkonoše Mts, Jeseníky Mts). Therefore, we suggest using the name published by Kočí & Chytrý (2007: 67):
***Avenello flexuosae-Callunetum vulgaris* Zlatník 1925 nom. invers. propos. et nom. mut. propos.**
Syn.: *Callunetum vulgaris tatricum* Krajina 1933 (Art. 34a), *Junco trifidi-Callunetum* (Krajina 1933) Hadač in Mucina et Maglocký 1985 (Art. 2b), *Junco trifidi-Callunetum* (Krajina 1933) Hadač 1987 (Art. 2b), *Junco trifidi-Callunetum vulgaris* (Krajina 1933) Hadač ex Šibík et al. 2006 (Art. 3i)
Syntax. syn.: *Junco trifidi-Callunetum vulgaris* (Krajina 1933) Hadač ex Šibík et al. 2007
Annotation 3: Hadač (1972: 357) published the name *Loiseleurio-Arctostaphylion* Kalliola 1939 as the valid name for the alliance *Loiseleurio-Vaccinion* Nordhagen 1936 non Br.-Bl. in Br.-Bl. et al. 1926. Kalliola (1939: 174), however, described the alliance *Loiseleurieto-Vaccinion* on the basis of the sociations, and hence invalidly (Principle II, Art. 3d).

612 *Vaccinion myrtilli* Krajina 1933

Subalpine acidophilous mesophilous dwarf-shrub heathlands in the Western Carpathians and Hercynic mountains
Table 1, column 20
OFN: *Vaccinion myrtilli* (Krajina 1933: 162)
Syntax. syn.: *Melampyro-Vaccinion* Jeník et al. 1980
Pseud.: *Rhodoreto-Vaccinion* sensu Klika & Hadač 1944 p. p. non Schnyder 1930
Non: *Genisto pilosae-Vaccinion* Br.-Bl. 1926
Phantomname: *Rhodoreto-Vaccinion myrtilli* (Br.-Bl. 1926) Krajina 1933 (Klika 1948: 307, 1955: 308; Unar et al. 1985: 26)
Nomenclatural type: *Vaccinietum myrtilli tatricum* Szafer et al. 1927, lectotypus (Šibík et al. 2007a: 104) [nom. illeg. (Art. 34a); correct name: *Avenastro versicoloris-Vaccinietum myrtilli* Krajina 1933 nom. invers. propos. (see Šibík et al. 2007a: 103, 2007c: 299)]
Annotation 1: Šibík et al. (2006: 43, 2007c: 297) emended the content of the alliance *Vaccinion myrtilli* that was described by Krajina (1933). The alliance was restricted only to the subalpine acido-mesophilous dwarf-shrub heathlands of the Western Carpathians and the Sudetes. From the original diagnosis of the alliance, they excluded the (sub)associations *Myrtilleto-Calamagrostidetum villosae carpaticum* Krajina 1933, *Vaccinietum myrtilli tatricum pinetosum mughi* Krajina 1933 and *Vaccinietum myrtilli tatricum piceetosum abietis* Krajina 1933 that represent the elements of other higher syntaxa.
Annotation 2: Chytrý & Härtel (2007: 311) took the name *Vaccinion myrtilli* Krajina 1933 as a partial synonym of the alliance *Genisto pilosae-Vaccinion* Br.-Bl. 1926, in which they classified the subalpine heathlands with *Vaccinium myrtillus* from the high Sudeten mountains. As was reported by Šibík et al. (2006: 44, 2007c: 298), the classification of these species-poor communities (association *Festuco supinae-Vaccinietum myrtilli* Šmarda 1950 that could be mistaken for *Avenastro versicoloris-Vaccinietum myrtilli* Krajina 1933 nom. invers. propos.) is complicated. They represent the transitional stands between the plant communities of the alliances *Genisto-Vaccinion* and *Vaccinion myrtilli*. The latter alliance is analogous with the alpine alliance *Rhododendro-Vaccinion* Schnyder 1930 (syn.:*Rhododendro-Vaccinion* Br.-Bl. in Br.-Bl. et Jenny 1926, Art. 2b). The alliance *Rhododendro-Vaccinion* is differentiated from the plant communities of the *Genisto-Vaccinion* (widespread in low mountain ranges of Western Europe) by the occurrence of mountain and boreal taxa, such as *Calamagrostis villosa*, *Empetrum nigrum* s. l., *Homogyne alpina*, *Huperzia selago*, *Melampyrum sylvaticum* etc., and also by the absence of many characteristic species with subatlantic distribution typical of Western Europe and disappearing eastward (cf. Schaminée et al. 1993).

7 *Caricetea curvulae* Br.-Bl. 1948 nom. cons. propos.

Alpine siliceous swards
Table 1, column 21; Fig 1CC
OFN: *Caricetea curvulae* (Braun-Blanquet 1948: 185)
Syn.: *Caricetea curvulae* Br.-Bl. in Br.-Bl. et al. 1947 (Art. 8)
Syntax. syn.: *Juncetea trifidi* Hadač in Klika et Hadač 1944 p. p. min. (*Juncion trifidi*)
Phantomname: *Caricetea curvulae* Br.-Bl. 1926 (Lakušić 1970: 355), *Juncetea trifidi* Hadač 1946 em. Br.-Bl. 1948 (Theurillat et al. 1994: 23, 1995: 218)
Nomenclatural type: *Caricetalia curvulae* Br.-Bl. in Br.-Bl. et Jenny 1926 (Braun-Blanquet 1948: 186), holotypus (Art. 18a)
Annotation: Theurillat et al. (1995: 218) proposed to protect the name *Caricetea curvulae* Br.-Bl. 1948 (Art. 52). Therefore, we corrected the name of the class from the previous form in the study by Dúbravcová & Jarolímek (2007: 321) into the correct form.
Distribution: Nízke Tatry Mts, Západné Tatry Mts, Vysoké Tatry Mts, Belianske Tatry Mts

71 *Caricetalia curvulae* Br.-Bl. in Br.-Bl. et Jenny 1926
Alpine siliceous swards on impoverished humic soils
Table 1, column 21
OFN: *Caricetalia curvulae* (Braun-Blanquet & Jenny 1926: 262)
Syn.: *Caricetalia curvulae* G. Br.-Bl. et J. Br.-Bl. 1931 (Art. 31), *Caricetalia curvulae* Br.-Bl. in Br.-Bl. et al. 1947 (Art. 8)
Nomenclatural type: *Caricion curvulae* Br.-Bl. in Br.-Bl. et Jenny 1926 (Braun-Blanquet & Jenny 1926: 263 ut *Caricion curvulae*-Verband), lectotypus (Art. 20)

711 *Juncion trifidi* Krajina 1933
Rush-swards in the Eastern Alps and the Western Carpathians
Table 1, column 21
OFN: *Juncion trifidi* (*Trifidion*) (Krajina 1933: 2)
Syn.: *Juncion trifidi* Pawłowski 1928 (Art. 8)
Pseud.: *Caricion curvulae* sensu auct. carpat. occid. (e.g. Pawłowski et al. 1928 p. p. maj.; Braun-Blanquet 1930; Pawłowski 1935) non Br.-Bl. in Br.-Bl. et Jenny 1926
Nomenclatural type: *Juncetum trifidi* Szafer et al. 1923 em. Krajina 1933 [Krajina 1933: 20 ut *Juncetum trifidi* (*Trifidetum*) Szafer, Pawłowski, Kulczyński 33, 1923 (excl. *Agrostidetum rupestris* et *Oreochloetum*)], lectotypus (Art. 20)

8 *Nardetea strictae* Rivas Goday et Borja Carbonell 1961
Montane and alpine mat-grass meadows and pastures
Table 1, columns 22–23; Fig 1NS
OFN: *Nardetea* (Oberdorfer, Prsg. 1949) (Rivas Goday & Borja Carbonell 1961: 218)
Syntax. syn.: *Juncetea trifidi* Hadač in Klika et Hadač 1944 p. p. min. (*Nardion strictae*), *Caricetea curvulae* Br.-Bl. 1948 p. p. (*Nardion*), *Nardo-Callunetea* Preising 1949 p. p. (*Nardetalia strictae*), *Nardo-Calamagrostietea villosae* Jeník et al. 1980 p. p. min. (*Nardion strictae*)
Non: *Calluno-Ulicetea* Br.-Bl. et Tx. ex Klika in Klika et Hadač 1944
Nomenclatural type: *Nardetalia strictae* Oberdorfer ex Preising 1949 [Rivas Goday & Borja Carbonell 1961: 218 ut *Nardetalia* (Oberdorfer 1949) Prsg. 1949], holotypus (Art. 18a)

81 *Nardetalia strictae* Oberdorfer ex Preising 1949
Montane and alpine mat-grass meadows and pastures
Table 1, columns 22–23
OFN: *Nardetalia* (Oberdorfer 1949 n. n.) Prsg. 1949 (Preising 1949: 23)
Syn.: *Nardetalia* Oberdorfer 1949 (Art. 3b, 8)
Nomenclatural type: *Nardo-Galion saxatilis* Preising 1949 (Preising 1949: 20), holotypus (Art. 18a) [nom. illeg. (Art. 29c); correct name: *Violion caninae* Schwickerath 1944 (cf. Krahulec 1983: 207)]
Annotation: Preising (1949: 23) described the order *Nardetalia* on the basis of three alliances: *Nardion boreale* Prsg. 1949 (prov.) (Art. 3b), *Nardo-Trifolion alpini* Prsg. 1949 (*Nardion* Br.-Bl. 1926 p. p.) (Art. 8) and *Nardo-Galion saxatilis* Prsg. 1949 (*Violion caninae* Schwickerath 1944 p. p.). Of these, only the name of the alliance *Nardo-Galion saxatilis* was published validly (with the reference of the original diagnosis of the alliance *Violion caninae*, stated as synonym). Therefore, this name became the only proper choice of the type (cf. Krahulec 1983: 208).

811 *Nardion strictae* Br.-Bl. 1926
Alpine and subalpine dense low-stem mat-grass swards
Table 1, column 22
OFN: *Nardion* (Pacages alpestres à *Nardus stricta*) (Braun-Blanquet 1926: 31)
Syn.: *Nardion strictae* Br.-Bl. in Br.-Bl. et Jenny 1926 (Art. 8), *Nardion strictae* Luquet 1926 (Art. 33), *Nardion strictae* Pawłowski 1928 (Art. 8), *Nardion strictae* Wallisch in Pawłowski et al. 1928 (Art. 31), *Nardion strictae* Sillinger 1933 (Art. 31), *Nardion strictae* Rübel 1933 (Art. 8), *Eu-Nardion* Oberdorfer 1949 (Art. 3h, 8), *Nardo-Trifolion alpini* Preising 1949 (Art. 8), *Hygronardion* Hadač et al. 1969 (Art. 3b)
Phantomname: Verband *Eu-Nardion* Br.-Bl. 1926 (Oberdorfer 1957: 308, 1962: 34)
Nomenclatural type: *Plantagini alpinae-Nardetum* Br.-Bl. 1926 (Braun-Blanquet 1926: 32 ut Association à *Nardus* et *Plantago alpina*), holotypus (Art. 18a; cf. Krahulec 1983: 208)
Annotation: From the higher syntaxa of the class *Nardetea strictae*, only the primary low-stem floriferous mat-grass swards of the alliance *Nardion strictae* (Kliment 2007b) were compiled in the fourth volume of *Plant Communities of Slovakia*. Pastures affected by humans that are included in the alliances *Nardo-Agrostion tenuis* Sillinger 1933 and *Violion caninae* Schwickerath 1944 are discussed in a separate study (Ujházy & Kliment 2007). Therefore, these are not dealt with directly in this article. In order to depict the diagnostic species of the class *Nardetea strictae*, order *Nardetalia strictae* and alliance *Nardion strictae*, we have attached a column to the synoptic table that represents the alliance *Nardo-Agrostion tenuis* from the area of the Western Carpathians (Table 1, column 23).
Distribution: Nízke Tatry Mts, Západné Tatry Mts, Vysoké Tatry Mts, Belianske Tatry Mts

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