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Vegetation of annuals and succulents on dry calcareous substrates (*Alysso alyssoidis-Sedion*) in eastern Central Europe, western Ukraine and Moldova

Annuellen- und Sukkulenten-Vegetation auf trockenen Karbonatböden (*Alysso alyssoidis-Sedion*) in Ost-Mitteleuropa, der West-Ukraine und Moldau

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Abstract

Pioneer plant communities dominated by therophytes, succulents, bryophytes and lichens on base-rich substrata of the *Alysso-Sedion* alliance are endangered and highly important for biodiversity protection. This study aims to revise previous syntaxonomic concepts and provide a unified classification of the *Alysso-Sedion* communities in the northern part of the Carpathian-Pannonian region, Bohemian Massif, western Ukraine, Romania and Moldova. We extracted relevés dominated by annuals, succulents, bryophytes, and lichens from the European Vegetation Archive. We also selected nomenclatural types of 12 associations reported within the *Alysso-Sedion* alliance in the study area. Using a classification expert system, we selected an initial dataset of 10,211 relevés of annual and succulent vegetation. We resampled the initial dataset within geographical strata and obtained a dataset of 620 relevés, which we classified using the modified TWINSPAN algorithm. The TWINSPAN classification resulted in 19 clusters. We removed 11 clusters interpreted as outliers or non-target vegetation types and interpreted the remaining eight clusters as the associations *Alysso petraei-Sedetum hispanici*, *Alyssetum muralis*, *Saxifrago tridactylitae-Poetum compressae*, *Alysso alyssoidis-Sedetum*, *Aurinio saxatilis-Allietum podolici*, *Cerastietum pumili*, *Sedo albi-Allietum montani* and *Sempervivetum soboliferi*. The communities are differentiated along the gradients of nutrients, temperature and light availability. We provide the first unified international classification of the *Alysso-Sedion* alliance that includes Ukrainian and Moldovian communities. This classification largely corresponds to the existing classifications published in the vegetation monographs of Austria, the Czech Republic, Slovakia, Poland, Romania, Ukraine and Moldova.

Keywords: *Alysso-Sedetalia* order, *Alysso alyssoidis-Sedion* alliance, calcareous vegetation, Carpathian-Pannonian region, Moldova, Ukraine, vegetation classification

Erweiterte deutsche Zusammenfassung am Ende des Artikels

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1. Introduction

Basiphilous pioneer plant communities dominated by annuals, succulents, bryophytes and lichens (*Alysso alyssoidis-Sedion* alliance, hereafter *Alysso-Sedion*) usually occur in small patches within grasslands. They occupy shallow and skeletal soils on different calcareous bedrocks (limestone, dolomite, marl and conglomerate) and strongly depend on the chemical composition and physical properties of the bedrock. Many authors classify pioneer basiphilous communities within the class *Koelerio-Corynephoretea* (Mucina & Kolbek 1993, Matuszkiewicz 2001, Chytrý 2007, Sanda et al. 2008, Borhidi et al. 2012). However, the combination of succulents, ephemeral species and cryptogams suggests an alternative division of these communities into two groups: communities that occur on solid bedrock and those that occur on loose bedrock. Mucina et al. (2016) accepted the earlier proposed separation of two classes: *Sedo-Scleranthetea*, which includes pioneer communities dominated by annual plants and succulents, mainly on solid bedrocks, and *Koelerio-Corynephoretea*, which includes grass-dominated vegetation on sand. However, shared species of vascular plants and cryptogams make a clear separation of these classes difficult. Moreover, basiphilous communities of annuals and succulents can also occur on Anthropogenic substrates such as pavements, rock fences and walls, where they contain ruderal species. The syntaxonomy of such communities is unclear, and they could belong to classes of anthropogenic vegetation (Mucina et al. 2016).

Generally, communities of this type do not cover large areas, are often fragmented and occur in habitat mosaics. They have been reported from uplands and mountains in Western and Central Europe (Valachovič et al. 1995, de Foucault 1999, Matuszkiewicz 2001, Dengler & Löbel 2006, Chytrý 2007). There is incomplete information about the occurrence of these communities in Eastern Europe (Onyshchenko 2001, Kuzemko 2009, Kuzemko et al. 2014, Didukh & Vasheniak 2018, Vasheniak et al. 2021) and their syntaxonomy in this region is still unresolved (Onyshchenko 2001, Abduloieva 2002, Didukh & Vasheniak 2018). The vegetation overviews for the Carpathian-Pannonian region and western Ukraine assign annual and succulent communities on dry calcareous substrates to the widespread order *Alysso-Sedetalia* and the alliance *Alysso-Sedion* (Oberdorfer 1957, Moravec 1967, Passarge 1977, Mucina & Kolbek 1993, Valachovič et al. 1995, Matuszkiewicz 2001, Chytrý 2007, Sanda et al. 2008, Borhidi et al. 2012, Didukh 2019). However, they might also belong to the *Stipo pulcherrimae-Festucetalia pallentis* order, as the boundaries between these two orders are not fully clear (Korneck 1978, Didukh & Vasheniak 2018).

Pioneer plant communities dominated by therophytes, succulents, bryophytes and lichens on base-rich substrata are currently endangered and highly important for biodiversity protection. The main threats are the shading of open spaces, the spread of competitive perennial species, eutrophication, and the mining of dolomite and limestone (Świerkosz 2004, Świerkosz et al. 2010, Didukh et al. 2012). They are of conservation importance in Europe, being included in the EU Habitats Directive (Council Directive 92/43/EEC, https://eur-lex.europa.eu/eli/dir/1992/43/oj) as the habitat type 6110 "Rupicolous calcareous or basophilic grasslands of the *Alysso-Sedion albi*" (DG Environment 2013) and in the Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats 1979, www.coe.int/en/web/bern-convention) as E1.11 Euro-Siberian rock debris swards.

The main goal of the current study is to revise the classification of the *Alysso-Sedetalia* order in the Carpathian-Pannonian region, western Ukraine and Moldova based on a large international dataset and complete the knowledge of its syntaxonomy and ecology. To achieve this goal, we aim to: (1) provide a unified classification of the *Alysso-Sedion* alliance

in the study area at the association level; (2) analyze the distribution of the *Alysso-Sedion* communities within the study area; (3) characterize the main environmental factors that cause the differentiation of the *Alysso-Sedion* communities.

2. Study area

We consider *Alysso-Sedion* communities in the eastern part of Central Europe and the western part of Eastern Europe. Specifically, we focus on two distinct regions: (1) the Carpathian-Pannonian region and the Bohemian Massif in Central Europe and (2) western Ukraine (west of the Dnieper River), and Moldova in Eastern Europe. The Eastern European areas are separated from Central Europe by the Carpathian Mountains. Our study area encompasses a wide range of climates, spanning from suboceanic conditions in Central Europe to more continental conditions in Eastern Europe. This climatic gradient significantly impacts the distribution and composition of vegetation types within the study area.

The Carpathian-Pannonian region includes eastern Austria, eastern Czech Republic, Hungary, southern Poland, western Romania, Slovakia, northern Serbia, northeastern Slovenia and westernmost Ukraine. The Carpathian Mountains form a 1,500-km-long arc that runs from Austria in the west to Romania in the east (Kováč & Plašienka 2002). The Pannonian (also called Carpathian) Basin is a large sedimentary basin filled with sediments that range in age from the Late Eocene to the Quaternary, including clays, sandstones, and limestones, but it also includes hills formed of Mesozoic hard rocks (Royden & Horváth 1988, Plašienka et al. 1997, Horváth et al. 2015). The Carpathian-Pannonian region experiences a moderately continental climate. At lower elevations, where the *Alysso-Sedion* vegetation occurs, it generally has 500–700 mm annual precipitation with an average temperature of around -2 °C in January and 20–25 °C in July, with a wetter climate in the western parts of the region and a drier climate in the east (Karger et al. 2017). The Bohemian Massif covers a larger part of the Czech Republic and adjacent areas in Germany, Austria, and Poland. It consists of Precambrian and Paleozoic rocks, mainly gneiss, granite, and other metamorphic and igneous acidic rocks, but there are also local occurrences of metamorphic or sedimentary limestone (Kováč & Plašienka 2002). The climate at lower elevations of the Bohemian Massif, where the studied vegetation occurs, is characterized by mean January temperatures of -2–0 °C, mean July temperatures of 17–20 ºC and annual precipitation of 400–600 mm (Tolasz et al. 2007).

Western Ukraine and Moldova are located east of the Carpathians and characterized by the complex of the Volhyn, Podillia, Moldova and Pokuttia-Bessarabia Uplands and ancient canyons (Herenchuk 1973, 1978, 1981). Our data are from the Forest-Steppe Zone. Neogenic sedimentary bedrocks (limestones, marls, sandstones and dolomites) predominate in the upper layer of the uplands. The outcrops of sedimentary rocks are covered mainly by shallow initial soils and rendzinas with a low humus content, a high concentration of calcium and magnesium ions, and a neutral reaction (Harbar 2016). The climate of the region is moderately continental with mild winters and warm, wet summers (the mean January temperature is around -5 °C, the mean July temperature is around 18 °C, and the annual precipitation is from 500 to 700 mm; Karger et al. 2017).

3. Materials and methods

3.1 Vegetation data

We focused on plant communities dominated by annuals, succulents, bryophytes, and lichens. In the EVA database (Chytrý et al. 2016), we selected all relevés from the Czech Republic, Poland, Austria, Slovakia, Hungary, Romania, Ukraine and Moldova assigned to the *Alysso-Sedetalia* order or subordinate syntaxa by the initial authors or database managers, or to the EUNIS habitat R13 "Cryptogam- and annual-dominated vegetation on calcareous and ultramafic rock outcrops", based on the EUNIS-ESy expert system (Chytrý et al. 2020). Additionally, we included plots with the occurrence of at least two species from the following list: (i) annual plants: *Alyssum alyssoides*, *Arabis auriculata*, *Arenaria leptoclados*, *A. serpyllifolia*, *Bombycilaena erecta*, *Cerastium brachypetalum*, *C. gracile*, *C. pumilum*, *C. semidecandrum*, *Clinopodium acinos*, *Clypeola jonthlaspi*, *Draba nemorosa*, *D. praecox*, *D. spatulata*, *D. verna*, *Holosteum umbellatum*, *Hornungia petraea*, *Medicago minima*, *Microthlaspi perfoliatum*, *Minuartia hybrida*, *M. rubra*, *Saxifraga tridactylites*, *Teucrium botrys*, *Veronica praecox*, (ii) succulents: *Jovibarba globifera*, *Sedum acre*, *S. album*, *S. anopetalum*, *S. hispanicum*, *Sedum sexangulare*, *Sempervivum ruthenicum*, (iii) bryophytes: *Camptothecium lutescens*, *Ceratodon purpureus*, *Encalypta streptocarpa*, *Hedwigia ciliata*, *Homalothecium sericeum*, *Orthotrichum anomalum*, *Schistidium apocarpum*, *Syntrichia ruralis*, *Tortella tortuosa*, (iv) lichens: *Catapyrenium squamulosum*, *Enchylium tenax*, *Thalloidima sedifolium*.

In addition, we included nomenclatural types of 12 associations of the *Alysso-Sedion* alliance recorded from the study area (Table 1, Supplement E1). The selection of the nomenclatural types was based on the national vegetation overviews of Austria (Mucina & Kolbek 1993), the Czech Republic (Chytrý 2007), Hungary (Borhidi et al. 2012), Moldova (Pînzaru 2015a, b), Poland (Matuszkiewicz 2001), Romania (Sanda et al. 2008), Slovakia (Valachovič et al. 1995), and Ukraine (Didukh 2019) and other regional publications.

The initial dataset included 10,211 relevés, in which we aggregated all synonymic taxon names (Supplement E2) and unified all names of vascular plants according to the Euro+Med Database (Euro+Med 2023; https://europlusmed.org/; accessed 2023-04-16), bryophytes according to Hodgetts et al. (2020) and lichens according to the Index Fungorum (http://www.indexfungorum.org/; accessed 2023-04-16).

3.2 Expert system processing

From the initial dataset of 10,211 relevés, we selected relevés corresponding to the *Sedo-Scleranthetea* class using a classification expert system. In this expert system, we defined groups of annuals, succulents and other perennials characteristic of this vegetation class (according to Mucina et al. 2016) and set the condition that their presence should be greater than that of other (non-characteristic) annuals, succulents and other perennials. If the condition was fulfilled, the relevé was considered to belong to the *Sedo-Scleranthetea* class. We also included the conditions that the cover of trees and shrubs was not greater than 15%, and the covers of non-characteristic annuals and ferns were not greater than 5%. The expert system was prepared as a script that can be run in the JUICE program (Tichý 2002) or in R (Bruelheide et al. 2021), using the ESy formal language described by Tichý et al. (2019) (and stored in the Zenodo repository (https://doi.org/10.5281/zenodo.13926665). The expert system selected 727 relevés corresponding to *Sedo-Scleranthetea*. We also kept all the nomenclatural types listed in Table 1 in the analysis, irrespective of their classification by the expert system.

3.3 Heterogeneity-constrained random resampling

We conducted a heterogeneity-constrained random (HCR) resampling (Lengyel et al. 2011) within cells of a geographical grid (3 minutes of latitude and 5 minutes of longitude). The purpose of resampling was to decrease the differences in sampling density in different locations. In the cells that contained more than five relevés, five of them were selected using the Bray-Curtis dissimilarity applied

Table 1. Nomenclatural types of the *Alysso-Sedion* associations occurring in the study area and close surroundings according to national overviews and regional publications.

Tabelle 1. Nomenklatorische Typen aller *Alysso-Sedion*-Assoziationen, welche nach nationalen und regionalen Übersichten im Untersuchungsgebiet vorkommen.

Association	Type
Alyssetum muralis Pop et Hodişan ex Vasheniak et al. *ass. nov.*	Holotypus: Pop & Hodişan 1979 (p. 3–4, Table 1, rel. 6)
Alysso alyssoidis-Sedetum Oberdorfer et T. Müller in T. Müller 1961	Neotypus (designated by Royer & Ferrez 2018): Korneck 1975 (p. 93, Table 33, rel. 1)
Alysso petraei-Sedetum hispanici Schneider-Binder et al. 1971	Lectotypus hoc loco: Schneider-Binder et al. 1971 (p. 101–102, Table 2, rel. 2)
Asplenio rutae-murariae-Allietum flavescentis Pînzaru 2015	Holotypus: Pînzaru 2015a (p. 77, Table 1, rel. 7)
Aurinio saxatilis-Allietum podolici Onyshchenko 2001	Holotypus: Onyshchenko 2001 (p. 92–95, Table 2, rel. 13)
Cerastietum pumili Oberdorfer et T. Müller in T. Müller 1961	Neotypus (designated by Royer & Ferrez 2018): Korneck 1975 (p. 86, Table 27, rel. 9)
Erodio cicutarii-Brometum hordeacei Mucina in Mucina et Kolbek 1993	Holotypus: Mucina & Kolbek 1993 (p. 513)
Jovibarbo-Sedetum albi Valachovič in Valachovič et al. 1995	Holotypus: Valachovič et al. 1995 (p. 100–102, Table 7, rel. 3)
Medicagini lupulinae-Sedetum spurii Mucina in Mucina et Kolbek 1993	Holotypus: Bornkamm 1961 (p. 11, Table 7, rel. 25)
Saxifrago tridactylitae-Poetum compressae Géhu 1961 *nom. invers.*	Lectotypus (designated by Dengler et al. 2003): Géhu 1961 (p. 208, Table 25, rel. 2)
Sedo acri-Saxifragetum tridactylitae Pînzaru 2015	Holotypus: Pînzaru 2015b (p. 85, Table 1, rel. 17)
Sedo-Sempervivetum tectorum Bornkamm 1961	Lectotypus (designated by Mucina & Kolbek 1993): Bornkamm 1961 (p. 11, Table 7, rel. 15)

to square-rooted percentage cover values of species. After the resampling procedure, 620 relevés (Austria – 43 relevés, Czech Republic – 242 relevés, Hungary – 6 relevés, Moldova – 28 relevés, Poland – 84 relevés, Romania – 30 relevés, Slovakia – 58 relevés, Ukraine – 117 relevés and 12 nomenclatural type relevés) remained and were included in subsequent analyses. The relevés were sampled in plots of 1–100 m^2.

3.4 TWINSPAN classification

We used the modified TWINSPAN algorithm (Hill 1979, Roleček et al. 2009) with three pseudospecies cut levels of 0%, 5%, and 25% cover, minimum group size for division of five relevés, and Whittaker's beta coefficient as a measure of internal cluster heterogeneity. We assessed the optimal number of clusters using OptimClass 1 (Tichý et al. 2010). For the numerical analysis, we deleted all bryophytes and lichens from the dataset because they were not recorded in a significant number of relevés, but we returned them to the final synoptic table (Table 2).

After inspection of the classification results, we used the non-modified TWINSPAN (Hill 1979) to further divide one of the clusters because of its ecological and floristic heterogeneity and a broad distribution in the study area. We used the same pseudospecies cut levels as above, ten relevés as the minimum group size for division, and two levels of division.

Diagnostic species for individual clusters were determined based on the *phi*-coefficient of association applied to virtually standardized cluster sizes (Chytrý et al. 2002, Tichý & Chytrý 2006). We used a fidelity threshold of *phi* = 0.25 combined with Fisher's exact test ($p < 0.05$). We used 25% and 50% constancy as thresholds for determining constant and highly constant species, respectively.

3.5 Ecological indicators and distribution of the communities

To explore environmental differences between clusters, we used Ellenberg-type indicator values for European plant species (Tichý et al. 2023). For each relevé, we calculated non-weighted means of species' values for light, temperature, moisture, soil reaction and nutrients and fitted them to the Detrended Correspondence Analysis (DCA) ordination plot using *envfit* function of the *vegan* R package. DCA was also calculated using *vegan*, with default parameters. We transformed species abundance data from the seven-grade Braun-Blanquet cover-abundance scale to percentage covers as follows: r = 1%, + = 2%, 1 = 3%, 2 = 13%, 3 = 38%, 4 = 68%, 5 = 88%. The obtained values were then log-transformed as log (x + 1) to diminish distribution skewness (Borcard et al. 2018, Tichý et al. 2020). We assessed the significance of differences in mean indicator values among clusters using the permutational max test (Zelený & Schaffers 2012), using the *weimea* R package (https://github.com/zdealveindy/weimea).

3.6 Software

DCA was calculated and box-and-whiskers plots created using *vegan* v. 2.6-4 (Oksanen et al. 2022), *weimea* v. 0.1.17 (https://github.com/zdealveindy/weimea), and *ggplot2* v. 3.5.0 (Wickham 2016) packages in R (R Core Team 2021). The TWINSPAN classification was done with JUICE v. 7.1 (Tichý 2002), and the dendrogram was coloured with Inkscape v. 1.3, keeping the dendrogram's topology. Maps were drawn using ggplot2 with ETRS89 coordinate reference system (https://epsg.io/4258).

4. Results & Discussion

4.1 Clusters corresponding to *Alysso-Sedion*

We obtained 17 clusters (Fig. 1a) and 19 clusters after the last cluster was classified separately (Fig. 1b). Eight clusters (labelled A to H in Fig. 1 and Table 2) contained nomenclatural types and diagnostic species of the *Alysso-Sedetalia* order and *Alysso-Sedion* alliance (316 relevés). They are described in detail below. The other clusters corresponded to the orders *Sedo-Scleranthetalia* and *Thero-Airetalia* and various ruderal and transitional communities (Supplement E3), which were excluded from further analysis.

Cluster A. *Sempervivetum soboliferi* Korneck 1975

33 relevés (Table 2, Fig. 2a, Fig. 3A)

Nomenclatural types included: relevé no 10205 – *Jovibarbo-Sedetum albi*

Diagnostic species: *Jovibarba globifera*, *Lactuca muralis*, *Sedum album*.

Constant species: *Allium lusitanicum* aggr., *Festuca pallens*, *Jovibarba globifera*, *Sedum album*, *Seseli osseum*.

Ecology and distribution: These communities occur on calcareous bedrocks (Neogene limestones and dolomites) at elevations of 250–800 m a.s.l. on slopes facing south to north-west. They occupy sun-exposed rocks mainly with an inclination of 30–45°. Relevés belonging to this cluster were recorded in the Carpathian-Pannonian region (Slovakia, Hungary), Bohemian Massif (Czech Republic) and southern Carinthia (Austria) (Fig. 5A).

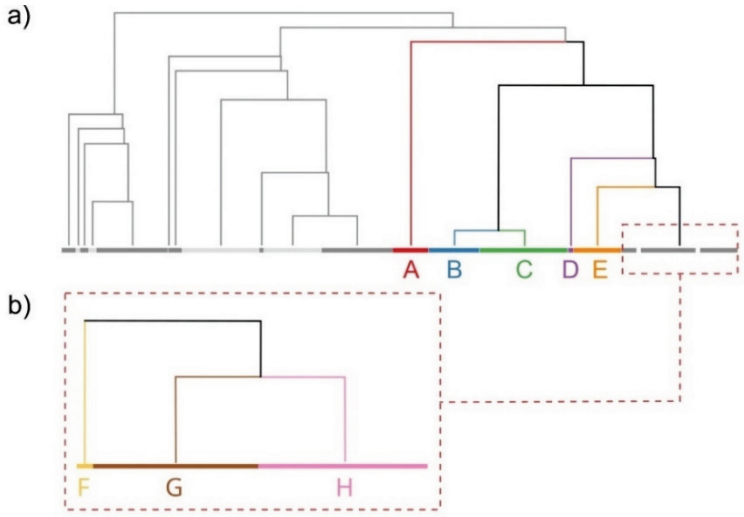

Fig. 1. Dendrogram of the *Sedo-Scleranthetea* based on the modified TWINSPAN classification. The last cluster in the dendrogram (a) was additionally divided into three clusters (b). Clusters corresponding to the *Alysso-Sedion* alliance (A–H) are coloured.

Abb. 1. Dendrogramm der *Sedo-Scleranthetea* entsprechend der modifizierten TWINSPAN-Klassifikation. Das letzte Cluster im Dendrogramm (a) wurde zusätzlich in drei Cluster unterteilt (b). Die dem Verband *Alysso-Sedion* entsprechenden Cluster (A–H) sind farblich hervorgehoben.

Syntaxonomy: Cluster A contains the nomenclatural type of *Jovibarbo-Sedetum albi*, first described in Slovakia by Valachovič (in Valachovič et al. 1995), and has all diagnostic species mentioned in the original diagnosis (*Allium lusitanicum* aggr., *Galium album*, *Geranium robertianum*, *Jovibarba globifera*, *Potentilla arenaria*, *Sedum album*). Valachovič et al. (1995) considered *Jovibarbo-Sedetum albi* to be vicarious to the *Sempervivetum soboliferi* association, described by Korneck (1975) from the Franconian Alb, where *Sempervivum soboliferum* (a synonym of *Jovibarba globifera*) and *Sedum album* have been indicated as the diagnostic species. A comparison of our data with the original diagnosis of *Sempervivetum soboliferi* does not show any significant difference between these two associations. Therefore, we consider them syntaxonomic synonyms and accept the concept of a broad association, for which the older name *Sempervivetum soboliferi* must be used. This association contains diagnostic species of the *Stipo pulcherrimae-Festucetalia pallentis* order (*Festuca pallens*, *Seseli osseum*), which indicates its transitional character to this order.

Cluster B. *Saxifrago tridactylitae-Poetum compressae* Géhu 1961 *nom. invers.*

47 relevés (Table 2, Fig. 2b, Fig. 3B)

Nomeclatural types included: relevé no 10190 – *Saxifrago tridactylitae-Poetum compressae*

Diagnostic species: *Clinopodium acinos*, *Sedum acre*, *Thymus pulegioides*.

Constant species: *Achillea millefolium* aggr., *Alyssum alyssoides*, *Arenaria serpyllifolia* aggr., *Artemisia campestris*, *Centaurea stoebe* aggr., *Clinopodium acinos*, *Dianthus carthusianorum* aggr., *Euphorbia cyparissias*, *Festuca valesiaca* aggr., *Pilosella officinarum*, *Poa compressa*, *Potentilla cinerea* aggr., *Sanguisorba minor*, *Scabiosa ochroleuca*, *Sedum acre*, *Thymus pulegioides*.

Table 2. Synoptic table showing the percentage constancy of species in the eight clusters corresponding to the *Alysso alyssoidis-Sedion* alliance. Diagnostic species are ordered by decreasing fidelity measured with the *phi*-coefficient. Species with a *phi*-value greater than 0.25 are considered diagnostic and shaded by light gray colour; species with a *phi*-value greater than 0.5 are considered highly diagnostic and shaded by dark gray colour. Species that are highly diagnostic or diagnostic in one cluster are accepted as diagnostic for associations; species that are highly diagnostic or diagnostic in more than one cluster are accepted as diagnostic for high-rank syntaxa. Bryophytes and lichens were not considered as diagnostic due to their incomplete recording in the dataset. Species with a constancy of 15% or less in all individual columns are not shown in the table (for the full table, see Supplements E4 and E5).

Tabelle 2. Synoptische Tabelle mit der prozentuellen Stetigkeit der Arten in den acht dem *Alysso-Sedion*-Verband entsprechenden Clustern. Die diagnostischen Arten sind nach absteigender Treue (bestimmt mit dem *phi*-Koeffizienten) sortiert, wobei Arten mit *phi* > 0,25 als diagnostisch (hellgrau markiert) und Arten mit *phi* > 0,5 als stark diagnostisch (dunkelgrau markiert) definiert sind. Arten, welche diese Treuekriterien nur in einem Cluster erfüllen, sind als diagnostisch für die Assoziationen gewertet; Arten, welche die Treuekriterien in zwei oder mehr Clustern erfüllen, als diagnostisch für höhere Syntaxa. Moose und Flechten wurden aufgrund ihrer unvollständigen Erfassung nicht als diagnostisch in Betracht gezogen. Nicht-diagnostische Arten sind nur dargestellt, wenn ihre Stetigkeit zumindest in einer Spalte 15 % übersteigt (für die vollständige Tabelle siehe Anhänge E4 und E5).

Syntaxon ID	A	B	C	D	E	F	G	H
No. of relevés	33	47	81	4	45	5	50	51
No. of relevés with records of cryptogams	18	34	74	0	33	0	37	33
Plot size, min (m^2)	1	1	1	1	1	4	1	1
Plot size, max (m^2)	100	100	100	25	100	100	45	80
Plot size, mean (m^2)	14	16	13	12	26	36	7	13
Association *Sempervivetum soboliferi*								
Jovibarba globifera	45	6	1	.	18	20	18	18
Lactuca muralis	9	.	.	.	.	.	.	.
Arabidopsis arenosa aggr.	21	4	12	.	2	.	2	.
Association *Saxifrago tridactylitae-Poetum compressae*								
Poa compressa	6	62	16	.	11	20	8	14
Achillea millefolium aggr.	3	47	15	.	16	.	4	22
Plantago media	.	13	1	.	.	.	.	.
Clinopodium acinos	12	83	58	.	51	20	64	67
Pilosella officinarum	.	30	4	.	22	.	8	2
Anthyllis vulneraria	.	13	1	.	2	.	.	2
Association *Aurinio saxatilis-Allietum podolici*								
Allium podolicum	.	.	38	.	.	.	.	.
Rostraria cristata	.	2	28	.	.	.	.	.
Sempervivum ruthenicum	.	.	19	.	.	.	.	.
Poa versicolor	.	.	15	.	.	.	.	.
Draba nemorosa	.	.	14	.	.	.	.	.
Gypsophila thyraica	.	.	12	.	.	.	.	.
Veronica incana	.	.	12	.	.	.	.	.
Erysimum diffusum	.	.	12	.	.	.	2	.
Bothriochloa ischaemum	.	4	20	.	7	.	.	4
Lappula squarrosa	.	.	12	.	.	.	.	4
Minuartia setacea	.	.	15	.	.	.	6	2
Thalictrum minus	3	.	11	.	.	.	.	.
Aurinia saxatilis	15	.	21	.	.	.	.	6
Stipa pulcherrima	.	.	10	.	.	.	2	.
Galium humifusum	.	.	7	.	.	.	.	.

Syntaxon ID	A	B	C	D	E	F	G	H
No. of relevés	33	47	81	4	45	5	50	51
Association *Alysso petraei-Sedetum hispanici*								
Aurinia petraea	.	.	.	75	.	.	.	.
Satureja kitaibelii	.	.	.	75	.	.	.	.
Piptatherum holciforme	.	.	.	75	.	.	.	.
Achillea crithmifolia	.	.	.	75	.	.	.	.
Orlaya grandiflora	.	.	.	75	.	.	2	.
Verbascum nigrum aggr.	.	2	1	75	.	.	.	.
Hippocrepis emerus	.	.	.	50	.	.	.	.
Scabiosa columbaria	.	.	.	50	.	.	.	.
Lactuca quercina	.	.	.	50	.	.	.	.
Centaurea atropurpurea	.	.	.	50	.	.	.	.
Tragopogon dubius	.	.	.	50	.	.	2	.
Veronica austriaca	.	.	1	50	.	.	.	2
Anisantha sterilis	3	2	.	75	7	40	2	6
Linaria genistifolia	.	2	6	50	2	.	4	4
Campanula sibirica	3	2	12	50	.	20	2	.
Silene vulgaris	12	11	.	50	9	.	.	6
Chondrilla juncea	.	.	.	25	.	.	2	.
Stipa eriocaulis	.	.	.	25	.	.	2	.
Asplenium ceterach	.	.	.	25	.	.	2	.
Dictamnus albus	.	.	1	25	.	.	2	.
Stachys recta aggr.	9	11	19	75	2	20	24	43
Association *Alysso alyssoidis-Sedetum* (central association)								
Festuca ovina aggr.	.	4	1	.	27	.	.	2
Association *Alyssetum muralis*								
Odontarrhena muralis	.	2	.	.	.	60	.	.
Clinopodium alpinum	3	.	.	.	.	60	.	.
Thymus comosus	.	.	.	.	.	40	.	.
Artemisia absinthium	6	.	7	.	.	40	.	.
Seseli osseum	33	.	1	.	9	80	38	27
Poa nemoralis	9	2	.	.	2	40	.	4
Fallopia convolvulus	6	.	4	.	.	40	.	8
Minuartia verna	.	.	.	.	.	20	.	.
Draba lasiocarpa	.	.	.	.	.	20	.	.
Cornus mas	.	.	.	.	.	20	.	.
Hylotelephium maximum aggr.	21	4	15	.	22	60	2	16
Sesleria heuflerana	.	.	1	.	.	20	.	.
Festuca pallens	33	.	4	.	13	60	22	18
Quercus pubescens	.	.	.	.	.	20	.	2
Sempervivum marmoreum	.	.	.	.	.	20	2	.
Ass. *Cerastietum pumili*								
Draba verna aggr.	.	9	19	.	18	.	46	8
Cerastium pumilum	.	.	.	.	2	.	20	2
Noccaea perfoliata	.	11	9	.	9	.	36	6
Thymus serpyllum aggr.	18	17	1	.	16	20	60	37
Sanguisorba minor	3	40	.	.	36	.	56	20
Holosteum umbellatum	.	15	12	.	7	.	32	8
Polycnemum arvense	.	.	.	.	.	.	10	.
Alyssum alyssoides	3	45	48	.	27	20	62	24

Syntaxon ID	A	B	C	D	E	F	G	H
No. of relevés	33	47	81	4	45	5	50	51
Veronica praecox	.	.	2	.	.	.	12	2
Erodium cicutarium	3	4	1	.	9	.	22	8
Association *Sedo albi-Allietum montani*								
Melica transsilvanica	9	.	12	.	7	.	.	39
Erysimum crepidifolium	.	.	.	.	.	.	4	20
Dianthus carthusianorum aggr.	.	28	.	.	9	.	4	37
Koeleria macrantha aggr.	3	6	4	.	16	.	20	35
Pulsatilla pratensis	.	.	1	.	0	.	.	12
Allium lusitanicum aggr.	36	9	38	.	2	.	12	47
Alyssum montanum aggr.	9	.	4	.	2	.	2	20
Festuca valesiaca aggr.	6	36	57	.	40	.	44	63
Alliance *Alysso-Sedion*, order *Alysso-Sedetalia*								
Sedum hispanicum	.	2	7	100	.	80	.	.
Allium flavum	6	.	.	75	.	80	26	2
Melica ciliata	3	4	.	75	13	100	22	2
Sedum album	94	6	1	.	13	20	80	88
Saxifraga tridactylites	3	4	20	.	7	.	20	.
Class *Sedo-Scleranthetea*								
Thymus pulegioides	3	51	56	.	29	.	.	10
Sedum acre	12	87	84	.	24	60	54	31
Sedum sexangulare	6	21	11	.	93	.	36	59
Other vascular plant species								
Galium mollugo aggr.	12	11	9	75	11	60	.	2
Echium vulgare	15	21	21	25	20	20	40	53
Trifolium arvense	.	9	1	.	11	.	10	20
Centaurea stoebe aggr.	12	53	38	.	47	20	44	59
Teucrium chamaedrys	.	11	22	.	18	20	14	29
Phleum phleoides aggr.	6	21	.	.	11	20	4	24
Arrhenatherum elatius	3	15	.	.	16	.	2	16
Veronica verna aggr.	9	6	6	.	2	.	20	18
Poa bulbosa	6	4	15	25	16	.	26	25
Medicago minima	.	17	9	25	7	.	36	25
Convolvulus arvensis	.	13	7	.	4	20	.	8
Vincetoxicum hirundinaria	3	15	6	.	9	.	.	2
Artemisia campestris	18	32	21	.	13	40	16	31
Scabiosa ochroleuca	6	38	15	50	18	20	10	10
Fragaria viridis	.	15	2	.	7	.	4	2
Verbascum chaixii	.	.	1	.	2	20	.	6
Veronica spicata aggr.	.	4	7	.	7	20	.	8
Medicago falcata	.	19	9	25	9	.	.	8
Helianthemum nummularium	3	9	6	.	2	20	6	4
Jurinea mollis aggr.	.	.	4	.	.	20	2	.
Viola tricolor	3	.	5	.	.	20	.	4
Euphorbia cyparissias	18	51	52	25	53	60	30	39
Asperula cynanchica aggr.	.	11	23	.	11	20	24	16
Salvia verticillata	9	13	15	.	2	.	4	4
Cerastium arvense	.	4	1	25	11	.	2	.
Potentilla argentea aggr.	.	19	2	.	13	40	.	2
Hypericum perfoliatum	.	21	6	.	20	40	8	8

Syntaxon ID	A	B	C	D	E	F	G	H
No. of relevés	33	47	81	4	45	5	50	51
Teucrium montanum	3	.	9	.	.	20	.	.
Silene otites aggr.	3	6	21	.	7	.	2	16
Geranium robertianum	21	4	.	25	4	.	2	2
Geranium columbinum	3	4	.	.	4	20	10	.
Arabis auriculata	.	2	22	.	2	20	20	.
Potentilla cinerea aggr.	9	26	46	.	27	20	56	45
Arenaria serpyllifolia aggr.	6	64	68	.	40	40	68	47
Securigera varia	3	9	11	.	18	20	.	4
Viola arvensis aggr.	6	6	.	.	18	.	6	8
Plantago lanceolata	.	21	1	.	18	.	6	2
Pimpinella saxifraga aggr.	3	19	2	.	20	.	14	6
Elytrigia intermedia	.	13	19	.	2	.	2	2
Crataegus monogyna aggr.	.	4	2	.	2	20	.	.
Verbascum lychnitis	6	15	23	.	7	.	4	14
Silene nutans	.	2	4	.	.	20	.	.
Bryophytes and lichens								
Enchylium tenax	.	9	32	.	.	.	.	.
Xanthoria elegans	.	2	19	.	.	.	.	.
Syntrichia ruralis	15	28	69	.	24	.	54	25
Schistidium apocarpum	.	4	26	.	16	.	.	4
Bryum argenteum	12	4	30	.	4	.	10	12
Rhytidium rugosum	.	15	16	.	2	.	14	4
Tortella tortuosa	12	11	17	.	4	.	20	10
Ptychostomum imbricatulum	.	11	15	.	.	.	4	2
Hypnum cupressiforme	9	2	5	.	16	.	12	2
Abietinella abietina	6	34	43	.	27	.	48	22
Cladonia pyxidata	3	19	28	.	4	.	24	8
Grimmia pulvinata	3	13	7	.	7	.	16	8
Ceratodon purpureus	18	23	14	.	20	.	22	24

Ecology and distribution: These communities occur on Neogene limestones, base-rich sands and also in anthropogenic habitats such as walls at elevations of 170–590 m a.s.l. on different aspects of slopes with low inclination (mainly 20–30°) in contact with the steppe vegetation. The presence of dry grassland species (*Centaurea stoebe* aggr., *Euphorbia cyparissias*, *Festuca valesiaca* aggr.) indicates close relationships with *Festuco-Brometea* communities. This association is widely distributed in the Carpathian-Pannonian region, Bohemian Massif and sporadically occurs in western Ukraine and Moldova (Fig. 5B).

Syntaxonomy: Cluster B contains the nomenclatural type of *Saxifrago tridactylitae-Poetum compressae* and can be interpreted as this association. There are different names for this association in different vegetation overviews, including *Saxifragetum tridactylitae* Kreh 1945, *Saxifrago tridactylitae-Poetum compressae* (Kreh 1945) Géhu et Leriq 1957, considered as a phantom name (Art. 7, Theurillat et al. 2021), *Arenario serpyllifoliae-Sedetum acris* Hallberg ex Passarge 1977 and *Rumici tenuifolii-Sedetum acris* Passarge 1977 according to Dengler et al. (2003). The latter authors considered *Poo compressae-Saxifragetum tridactylitae* Géhu 1961 as the valid name of the association and selected the *lectotypus* from the table provided by Géhu (1961) (Dengler et al. 2003). These communities are described from the Carpathian-Pannonian region and Ukraine as *Saxifrago tridactylitae-Poetum compressae* (Mucina & Kolbek 1993, Valachovič et al. 1995, Didukh 2019). Although

described as “Association à *Poa compressa* L. et *Saxifraga tridactylites* L.”, the name must be inverted to *Saxifrago tridactylitae-Poetum compressae* Géhu 1961 *nom. invers*. according to the Code (Art. 42, Theurillat et al. 2021). While both species (*Saxifraga tridactylites*, *Poa compressa*) have the same cover in the type relevé, *Poa compressa* has a higher constancy and average cover in the original diagnosis.

Cluster C. *Aurinio saxatilis-Allietum podolici* Onyshchenko 2001

81 relevés (Table 2, Fig. 2c, Fig. 3C)

Nomenclatural types included: relevé no 10188 – *Asplenio rutae-murariae-Allietum flavescentis*; relevé no 10189 – *Aurinio saxatilis-Allietum podolici*

Diagnostic species: *Allium lusitanicum* aggr., *A. podolicum*, *Bothriochloa ischaemum*, *Erysimum diffusum*, *Gypsophila thyraica*, *Poa versicolor*, *Rostraria cristata*, *Sempervivum ruthenicum*, *Thalictrum minus*, *Thymus pulegioides*, *Veronica incana*.

Constant species: *Allium lusitanicum* aggr., *A. podolicum*, *Alyssum alyssoides*, *Arenaria serpyllifolia* aggr., *Centaurea stoebe* aggr., *Clinopodium acinos*, *Euphorbia cyparissias*, *Festuca valesiaca* aggr., *Potentilla cinerea* aggr., *Rostraria cristata, Sedum acre*, *Thymus pulegioides*.

Ecology and distribution: These communities occur on calcareous bedrocks (Neogene limestones and gypsum, Silurian marls) at elevations of 120–380 m a.s.l. on north- and north-west-facing slopes with inclinations from 5 to 45°. They only occur in western Ukraine (Podillia Upland and the Dniester River valley) and Moldova (Fig. 5C).

Syntaxonomy: We interpret cluster C as the *Aurinio saxatilis-Allietum podolici* association (Onyshchenko 2001, Didukh & Vasheniak 2018, Vasheniak et al. 2021), which is likely to be confined to Ukraine and Moldova. The nomenclatural type of this association was included in the cluster. *Asplenio rutae-murariae-Allietum flavescentis* nomenclatural type was also classified to this cluster, reflecting that this association, described from the Dniester valley in Moldova and Ukraine, can be considered as a synonym of *Aurinio saxatilis-Allietum podolici*.

Cluster D. *Alysso petraei-Sedetum hispanici* Schneider-Binder et al. 1971

4 relevés (Table 2, Fig. 2d, Fig. 3D)

Nomenclatural types included: relevé no 10208 – *Alysso petraei-Sedetum hispanici*

Diagnostic species: *Achillea crithmifolia*, *Allium flavum*, *Anisantha sterilis*, *Asplenium ceterach*, *Aurinia petraea*, *Campanula sibirica*, *Centaurea atropurpurea, Dictamnus albus, Galium mollugo* aggr., *Hippocrepis emerus*, *Lactuca quercina*, *Linaria genistifolia*, *Melica ciliata*, *Orlaya grandiflora*, *Piptatherum holciforme*, *Satureja kitaibelii*, *Scabiosa columbaria*, *S. ochroleuca*, *Sedum hispanicum*, *Silene vulgaris*, *Stachys recta* aggr., *Stipa eriocaulis*, *Tragopogon dubius*, *Verbascum nigrum* aggr., *Veronica austriaca*.

Constant species: *Achillea crithmifolia*, *Allium flavum*, *Anisantha sterilis*, *Aurinia petraea*, *Campanula sibirica*, *Centaurea atropurpurea*, *Galium mollugo* aggr., *Hippocrepis emerus*, *Lactuca quercina*, *Linaria genistifolia*, *Melica ciliata*, *Orlaya grandiflora*, *Piptatherum holciforme*, *Satureja kitaibelii*, *Scabiosa columbaria*, *S. ochroleuca*, *Sedum hispanicum*, *Silene vulgaris*, *Stachys recta* aggr., *Tragopogon dubius*, *Verbascum nigrum* aggr., *Veronica austriaca*.

Ecology and distribution: These communities occur on calcareous bedrocks (Neogene limestones) at elevations of 220 to 610 m a.s.l. on steep south-facing slopes (around 45°). They only occur in south-western Romania, near the boundaries with Serbia (Fig. 5D).

Syntaxonomy: Cluster D contains only four relevés including the nomenclatural type of the *Alysso petraei-Sedetum hispanici* association, and we interpret it as this association (Schneider-Binder et al. 1973). The association has a specific floristic composition, including *Aurinia petraea*, *Hippocrepis emerus* and *Lactuca quercina* (Sanda et al. 2008).

Cluster E. *Alysso alyssoidis-Sedetum* Oberdorfer et T. Müller in T. Müller 1961

45 relevés (Table 2, Fig. 2e, Fig. 3E)

Nomenclatural types included: relevé no 10192 – *Alysso alyssoidis-Sedetum*

Diagnostic species: *Sedum sexangulare*.

Constant species: *Alyssum alyssoides*, *Arenaria serpyllifolia* aggr., *Centaurea stoebe* aggr., *Clinopodium acinos*, *Euphorbia cyparissias*, *Festuca ovina* aggr., *F. valesiaca* aggr., *Potentilla cinerea* aggr., *Sanguisorba minor*, *Sedum sexangulare*, *Thymus pulegioides*.

Ecology and distribution: The communities occur on various types of sedimentary or metamorphic calcareous bedrocks at elevations of 150–540 m a.s.l. on south-east- to south-west-facing slopes with various inclinations (5–60°). They are widely distributed in relatively dry and warm areas of Central and partly Eastern Europe (Carpathian-Pannonian region, Bohemian Massif) but do not occur in western Ukraine and Moldova (Fig. 5E).

Syntaxonomy: We interpret cluster E as the *Alysso alyssoidis-Sedetum* association because of the presence of its nomenclatural type. This association was first described by Oberdorfer and Müller in Müller (1961). The authors provided neither a table of individual relevés nor the nomenclatural type of the association. They only provided constancy tables, which was sufficient for a valid publication before 1979. Royer & Ferrez (2018) designated the neotype of the association (Art. 21, Theurillat et al. 2021) from the publication of Korneck (1975), who described this association from the same region (between Kelheim and Gronsdorf, Lower Bavaria, Germany). This cluster is similar to the stadium *Sedum boloniense-Allium montanum* described by Klika (1928) and interpreted by Valachovič et al. (1995) as an association, using the phantom name *Allio montani-Sedetum sexangularis*. At this stage of the analysis, we consider this vegetation as the *Alysso alyssoidis-Sedetum* association, the central association of the alliance, which is only negatively differentiated.

Cluster F. *Alyssetum muralis* Pop et Hodişan ex Vasheniak et al. 2024

5 relevés (Table 2, Fig. 2f, Fig. 3F)

Nomenclatural types included: relevé no 10199 – *Alyssetum muralis*.

Diagnostic species: *Allium flavum*, *Anisantha sterilis*, *Artemisia absinthium*, *Clinopodium alpinum*, *Draba lasiocarpa*, *Fallopia convolvulus*, *Festuca pallens*, *Galium mollugo* aggr., *Hylotelephium maximum* aggr., *Jurinea mollis* aggr., *Melica ciliata*, *Minuartia verna*, *Odontarrhena muralis*, *Poa nemoralis*, *Sedum hispanicum*, *Sempervivum marmoreum*, *Seseli osseum*, *Sesleria heuflerana*, *Thymus comosus*.

Constant species: *Allium flavum*, *Anisantha sterilis*, *Arenaria serpyllifolia* aggr., *Artemisia absinthium*, *Artemisia campestris*, *Clinopodium alpinum*, *Euphorbia cyparissias*, *Fallopia convolvulus*, *Festuca pallens*, *Galium mollugo* aggr., *Hylotelephium maximum* aggr., *Hypericum perfoliatum*, *Melica ciliata*, *Odontarrhena muralis*, *Poa nemoralis*, *Potentilla argentea* aggr., *Sedum acre*, *S. hispanicum*, *Seseli osseum*, *Thymus comosus*.

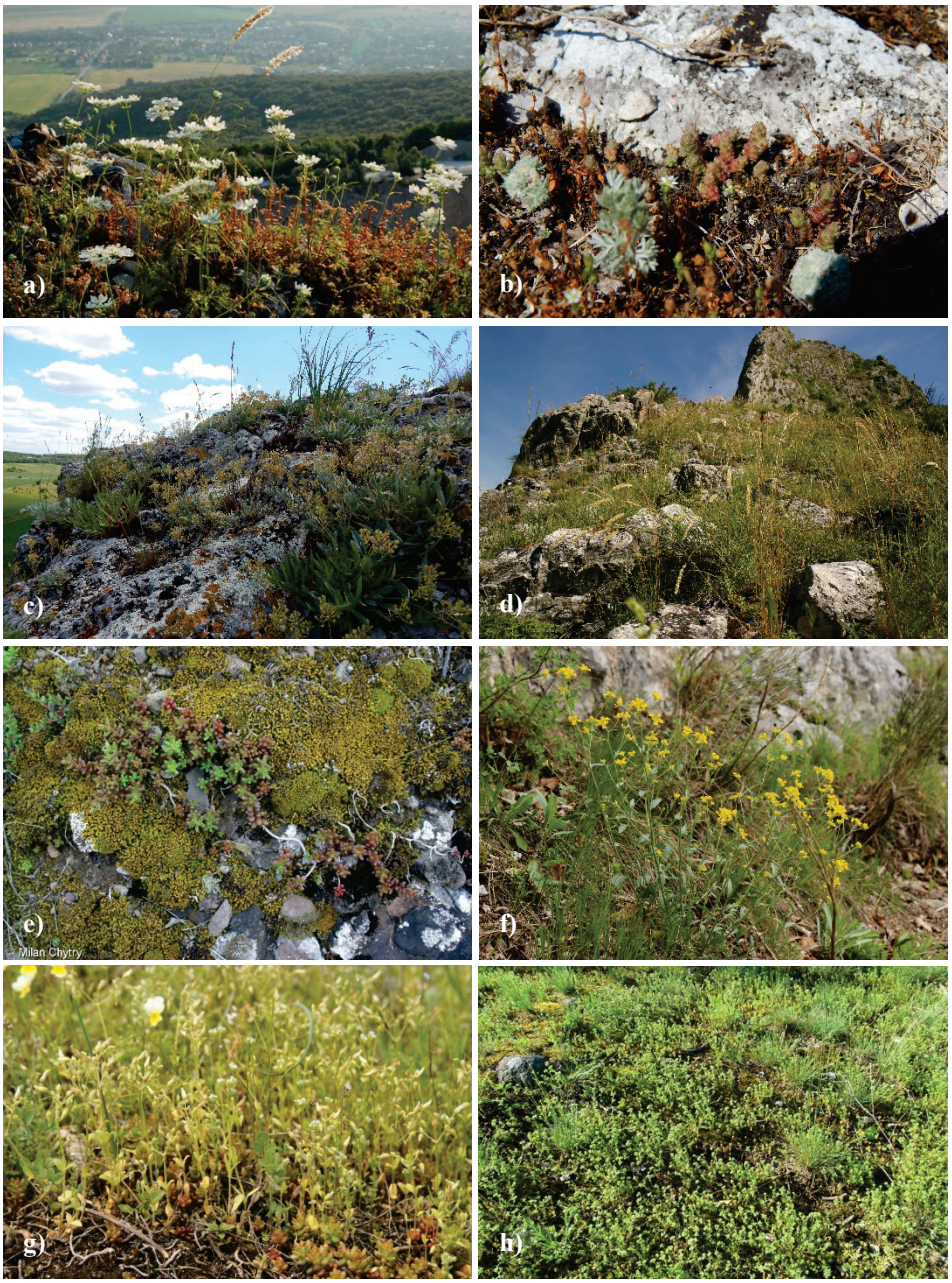

Fig. 2. Examples of *Alysso-Sedion* communities in the study area. **a)** *Sempervivetum soboliferi* (Mount Zobor, Tríbeč Mountains, Slovakia, 2010); **b)** *Saxifrago tridactylitae-Poetum compressae* (Podilski Tovtry, Ukraine, 2020); **c)** *Aurinio saxatilis-Allietum podolici* (Podilski Tovtry, Ukraine, 2018); **d)** *Alysso petraei-Sedetum hispanici* (Cheile Vălișoarei, Trascău Mountains, Romania, 2015); **e)** *Alysso alyssoidis-Sedetum* (Rokytná valley near Moravský Krumlov, Czech Republic, 2005); **f)** *Alyssetum muralis* (Cheile Vălișoarei, Trascău Mountains, Romania, 2015); **g)** *Cerastietum pumili* (Pavlov Hills, Czech Republic, 2005); **h)** *Sedo albi-Allietum montani* (Čabraď castle, Krupinská Mountains, Slovakia, 2013) (Photos: (e, g) M. Chytrý; (a) J. Košťál; (d, f) T. Kuhn; (h) M. Valachovič; (b, c) I. Vasheniak).

Ecology and distribution: These communities occur on calcareous bedrocks at elevations of 450–590 m a.s.l. on the south- to south-west-facing steep slopes (40–70°). A single relevé from Hungary was assigned as *Campanulo divergentiformis-Festucetum* by Vojtkó (1996) within the *Stipo pulcherrimae-Festucetalia pallentis* order, and there was no previous record of this association in this country (Borhidi et al. 2012) (Fig. 5F).

Syntaxonomy: Cluster F includes the nomenclatural type of the *Alyssetum muralis* association (Pop & Hodişan 1979). This association was not validly published according to the Code (Art. 5, Theurillat et al. 2021) as it was described in 1979, and no nomenclatural type was designated. Thus, we validate this name here as *Alyssetum muralis* Pop et Hodişan ex Vasheniak et al. *ass. nov*. and chose the *holotypus* from the original publication (Pop & Hodişan 1979, p. 3–4: Table 1, rel. 6).

Diagnostic species of the association (*Clinopodium alpinum*, *Odontarrhena muralis*, *Thymus comosus*) are present in Cluster F. Graminoids (*Festuca pallens*, *Melica ciliata*) are also present among diagnostic species and indicate transitional features to the *Festuco-Brometea* class. It should be noted that the *Alyssetum muralis* association was preliminarily considered within the *Stipo pulcherrimae-Festucetalia pallentis* order (Sanda et al. 2008). However, these communities are closer to the other communities that have a more solid diagnostic block of the *Alysso-Sedetalia* order (Moravec 1967). Based on our analysis (Table 2), we consider this association within the *Alysso-Sedetalia* order and the *Alysso-Sedion* alliance.

Cluster G. *Cerastietum pumili* Oberdorfer et T. Müller in T. Müller 1961

50 relevés (Table 2, Fig. 2g, Fig. 3G)

Nomeclatural types included: relevé no 10191 – *Cerastietum pumili*

Diagnostic species: *Alyssum alyssoides*, *Cerastium pumilum*, *Noccaea perfoliata*, *Sanguisorba minor*, *Sedum album*, *Thymus serpyllum* aggr.

Constant species: *Allium flavum*, *Alyssum alyssoides*, *Arenaria serpyllifolia* aggr., *Centaurea stoebe* aggr., *Clinopodium acinos*, *Draba verna* aggr., *Echium vulgare*, *Euphorbia cyparissias*, *Festuca valesiaca* aggr., *Holosteum umbellatum*, *Medicago minima*, *Noccaea perfoliata*, *Poa bulbosa*, *Potentilla cinerea* aggr., *Sanguisorba minor*, *Sedum acre*, *S. album*, *S. sexangulare*, *Seseli osseum*, *Thymus serpyllum* aggr.

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Abb. 2. Beispiele für *Alysso-Sedion*-Gesellschaften im Untersuchungsgebiet. **a)** *Sempervivetum soboliferi* (Zobor, Tríbeč-Gebirge, Slowakei, 2010); **b)** *Saxifrago tridactylitae-Poetum compressae* (Podilski Tovtry, Ukraine, 2020); **c)** *Aurinio saxatilis-Allietum podolici* (Podilski Tovtry, Ukraine, 2018); **d)** *Alysso petraei-Sedetum hispanici* (Cheile Vălişoarei, Trascău-Gebirge, Rumänien, 2015); **e)** *Alysso alyssoidis-Sedetum* (Rokytná-Tal bei Mährisch Kromau, Tschechien, 2005); **f)** *Alyssetum muralis* (Cheile Vălişoarei, Trascău-Gebirge, Rumänien, 2015); **g)** *Cerastietum pumili* (Pollauer Berge, Tschechien, 2005); **h)** *Sedo albi-Allietum montani* (Burg Čabraď, Krupinská-Gebirge, Slowakei, 2013). (Fotos: (e, g) M. Chytrý; (a) J. Košťál; (d, f) T. Kuhn; (h) M. Valachovič; (b, c) I. Vasheniak).

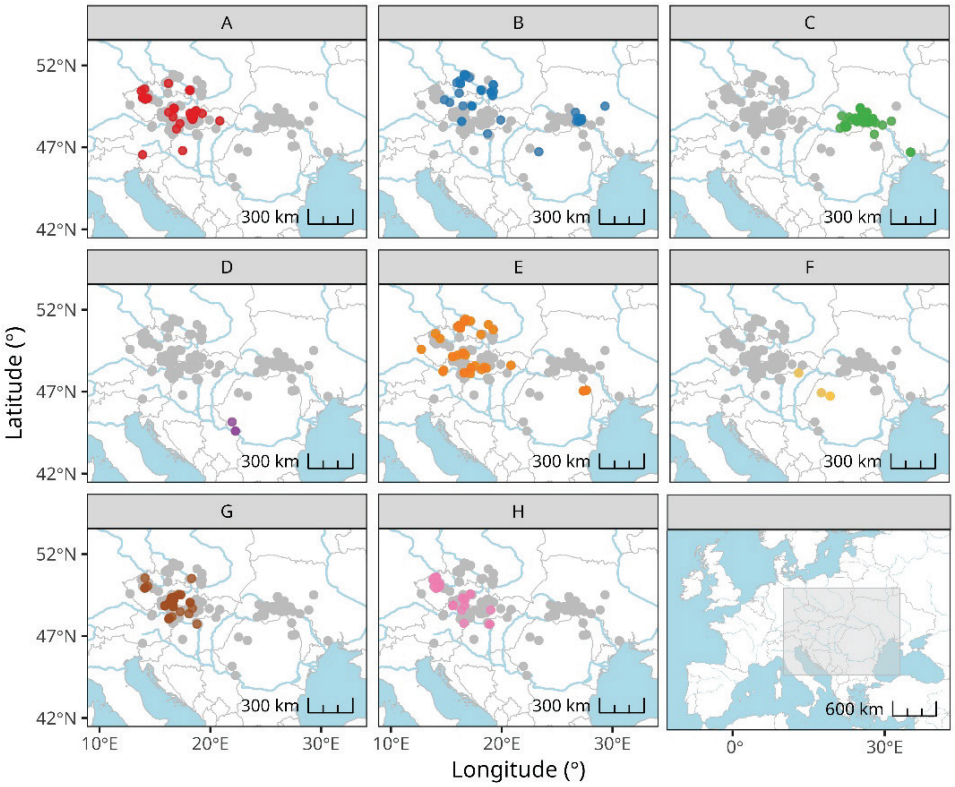

Fig. 3. Spatial distribution of the plots belonging to *Alysso-Sedion* associations (TWINSPAN clusters A–H) within the study area. For each map, relevés of the target association are highlighted in colour, whereas the other plots are in grey.

Abb. 3. Geographische Verbreitung der *Alysso-Sedion*-Assoziationen (TWINSPAN-Cluster A–H) im Untersuchungsgebiet. Die Aufnahmen der jeweiligen Assoziation sind in Farbe dargestellt, die übrigen Aufnahmen in grau.

Ecology and distribution: These communities occur on various types of calcareous, both sedimentary and metamorphic bedrock at elevations of 220–430 m a.s.l. and slopes of various aspects (0–40°). They only occur in Central Europe and have not been observed in Eastern Europe (Fig. 5G).

Syntaxonomy: Cluster G contains the nomenclatural type of this association and its diagnostic species (Table 2; *Alyssum alyssoides*, *Noccaea perfoliata*, *Sedum album*). Like *Alysso-Sedetum*, this association was also described by Oberdorfer & Müller in Müller (1961), and Royer & Ferrez (2018) designated its neotype (Art. 21, Theurillat et al. 2021) from Korneck (1975), who described the association from the region of Upper Alsace, France.

Cluster H. *Sedo albi-Allietum montani* Klika 1939

51 relevés (Table 2, Fig. 2h, Fig. 3H)

Nomeclatural types included: relevé no 4312 – *Sedo albi-Allietum montani*

Diagnostic species: *Allium lusitanicum* aggr., *Alyssum montanum* aggr., *Dianthus carthusianorum* aggr., *Erysimum crepidifolium*, *Koeleria macrantha* aggr., *Melica transsilvanica*, *Sedum album*, *S. sexangulare.*

Constant species: *Allium lusitanicum* aggr., *Arenaria serpyllifolia* aggr., *Artemisia campestris*, *Centaurea stoebe* aggr., *Clinopodium acinos*, *Dianthus carthusianorum* aggr., *Echium vulgare*, *Euphorbia cyparissias*, *Festuca valesiaca* aggr., *Koeleria macrantha* aggr., *Melica transsilvanica*, *Potentilla cinerea* aggr., *Sedum acre*, *S. album*, *S. sexangulare*, *Seseli osseum*, *Stachys recta* aggr., *Teucrium chamaedrys*, *Thymus serpyllum* aggr.

Ecology and distribution: These communities have a significant proportion of graminoids (*Festuca valesiaca* aggr., *Koeleria macrantha* aggr., *Melica transsilvanica*) and other hemicryptophytes (*Artemisia campestris*, *Petrorhagia saxifraga*, *Trifolium arvense*) in combination with annual plants and succulents (*Alyssum alyssoides*, *Jovibarba globifera*), which makes them transitional between the classes *Sedo-Scleranthetea* and *Festuco-Brometea*. Most species are basiphilous, while acidophilic species are missing (Chytrý 2007). This vegetation occurs on calcareous bedrocks at elevations from 150 to 1000 m, often on north- to east-facing steep slopes (40–60°). The communities are widespread in the Czech Republic, Slovakia and partly in Austria (Fig. 5H).

Syntaxonomy: Cluster H is interpreted as *Sedo albi-Allietum montani* association, first described by Klika (1939). The original diagnosis (Klika 1939: p. 256) contains three relevés, of which two are dominated by *Sedum album* and *S. sexangulare* and clearly belong to the *Sedo-Scleranthetea* class, whereas the third relevé is dominated by *Allium lusitanicum* aggr. and is closer to the *Festuco-Brometea* class. Consequently, there are different interpretations of this association. Matuszkiewicz (2001) assigned it to *Sedo-Scleranthetea*, while Chytrý (2007) classified it to *Festuco-Brometea*. We suggest that the *Poo badensis-Allietum montani* Gauckler 1957 described from gypsum in Franconia could be considered as a syntaxonomic synonym of the *Sedo albi-Allietum montani* due to the presence of similar species (*Allium lusitanicum* aggr., *Potentilla cinerea* aggr., *Sedum acre*). However, further studies are necessary to confirm this conclusion.

Proposed syntaxonomic scheme

Class: *Sedo-Scleranthetea* Br.-Bl. 1955

Order: *Alysso-Sedetalia* Moravec 1967

Alliance: *Alysso alyssoidis-Sedion* Oberdorfer et T. Müller in T. Müller 1961

A Ass.: *Sempervivetum soboliferi* Korneck 1975

B Ass.: *Saxifrago tridactylitae-Poetum compressae* Géhu 1961 nom. invers.

C Ass.: *Aurinio saxatilis-Allietum podolici* Onyshchenko 2001

D Ass.: *Alysso petraei-Sedetum hispanici* Schneider-Binder et al. 1971

E Ass.: *Alysso alyssoidis-Sedetum* Oberdorfer et T. Müller in T. Müller 1961

F Ass.: *Alyssetum muralis* Pop et Hodişan ex Vasheniak et al. 2024

G Ass.: *Cerastietum pumili* Oberdorfer et T. Müller in T. Müller 1961

H Ass.: *Sedo albi-Allietum montani* Klika 1939

4.2 Environmental relationships of the *Alysso-Sedion* communities

Detrended correspondence analysis (DCA) showed the differentiation of syntaxa across the axes DCA1 and DCA2. *Aurinio saxatilis-Allietum podolici* and *Alysso alyssoidis-Sedetum* differentiate along DCA1, which corresponds to soil reaction (Fig. 4). On the other hand, *Alysso alyssoidis-Sedetum*, *Alysso petraei-Sedetum hispanici, Sempervivetum soboliferi* and *Aurinio saxatilis-Allietum podolici* differentiate along DCA1, which corresponds to moisture and nutrients. *Alysso alyssoidis-Sedetum*, *Alysso petraei-Sedetum hispanici* and *Sempervivetum soboliferi* associations differ from the other associations along the moisture, nutrients and soil reaction gradients due to their occurrence on wetter rendzic leptosols on limestone and dolomite bedrocks with higher concentrations of calcium ions. In contrast, several plots of *Aurinio saxatilis-Allietum podolici* and *Cerastietum pumili* occupy dry eroded shallow soils on Silurian marls or metamorphic bedrocks respectively with lower values of calcium ions (Fig. 4). *Alysso alyssoidis-Sedetum*, *Cerastietum pumili* and *Sedo albi-Allietum montani* are overlapping due to their similarity in species composition and habitats.

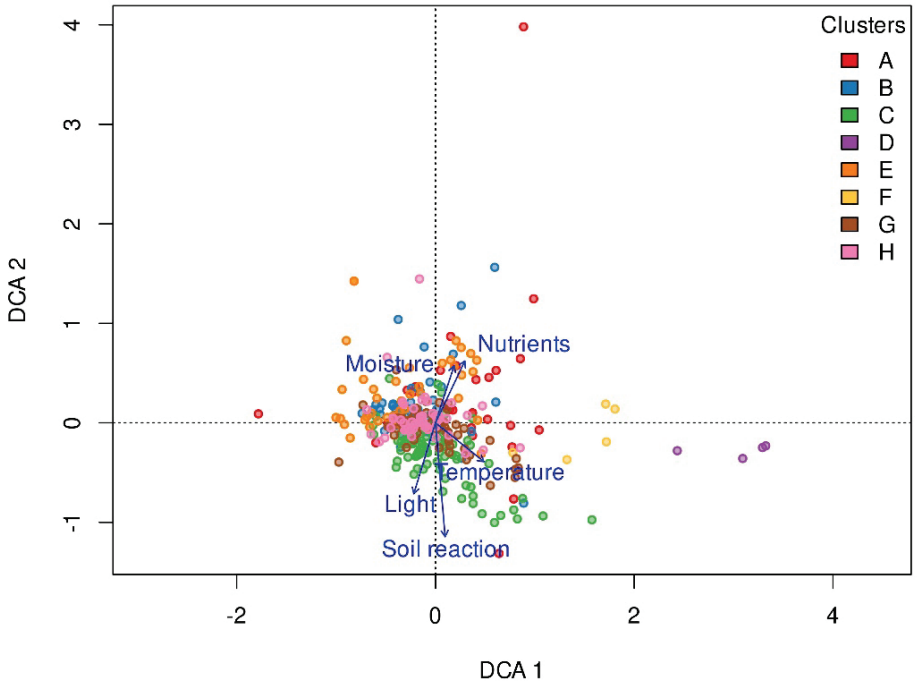

Fig. 4. DCA ordination of the *Alysso-Sedion* associations (TWINSPAN clusters A–H) with passively projected mean indicator values.

Abbreviations: A – *Sempervivetum soboliferi*; B – *Saxifrago tridactylitae-Poetum compressae*; C – *Aurinio saxatilis-Allietum podolici*; D – *Alysso petraei-Sedetum hispanici;* E – *Alysso alyssoidis-Sedetum*; F – *Alyssetum muralis*; G – *Cerastietum pumili*; H – *Sedo albi-Allietum montani*

Abb. 4. DCA-Ordination der *Alysso-Sedion*-Gesellschaften (TWINSPAN-Cluster A–H) mit passiv projizierten mittleren Zeigerwerten. Abkürzungen siehe oben.

The box-and-whiskers plots (Fig. 5) show a differentiation between associations in indicator values. The permutation test revealed significant differences only in light indicator values. *Cerastietum pumili* (G) and *Aurinio saxatilis-Allietum podolici* (C) have the highest mean light values (8.2 and 8.0, respectively), whereas *Alysso petraei-Sedetum hispanici* (D) has the lowest values (7.8) as it often occurs in shaded crevices of calcareous rocks. The thermophilic *Alyssetum muralis* association (F) has the highest mean temperature values (6.5), and the widespread *Alysso alyssoidis-Sedetum* association (E) has the lowest mean temperature values (5.9). *Aurinio saxatilis-Allietum podolici* (C) and *Cerastietum pumili* (G) associations are characterized by higher mean values of soil reaction (7.0 and 6.9, respectively) than the other associations. All communities develop on the calcareous leptosols that slighly vary in the soil organic carbon content and moisture, but at the same time, the *Alysso alyssoidis-Sedetum* and *Alysso petraei-Sedetum hispanici* associations are characterized by higher mean values of nutrients (2.7 and 3.4, respectively) and moisture (3.5 and 2.7 points, respectively) than the other associations.

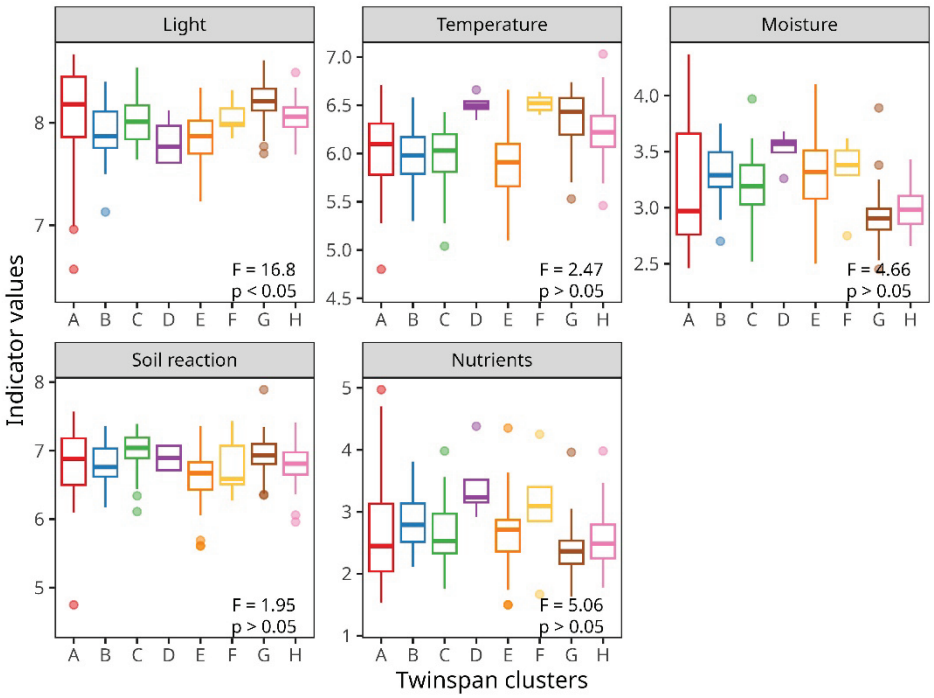

Fig. 5. Box-and-whiskers plots of mean indicator values of the *Alysso-Sedion* associations (TWINSPAN clusters A–H). *F*-value and significance level is given for each comparison (ANOVA with permutation max test). The differences among clusters are only significant for the light values ($F = 16.8$, $p < 0.05$).

Abb. 5. Box-Plots für die mittleren Zeigerwerte der *Alysso-Sedion*-Gesellschaften (TWINSPAN-Cluster A–H). Für jeden Vergleich (ANOVA mit Permutationstest) sind die *F*- und *p*-Werte angegeben. Signifikante Unterschiede zwischen den Clustern wurden nur für den Lichtwert gefunden ($F = 16{,}8$; $p < 0{,}05$).

4.3 Syntaxonomy of the *Alysso-Sedion* communities: general overview

The present study provides an overview of the communities of the *Alysso-Sedion* alliance in the study area. The alliances *Sileno conicae-Cerastion semidecandri* Korneck 1974 and *Bassio laniflorae-Bromion tectorum* Borhidi 1996 also belong to the *Alysso-Sedetalia* order according to Mucina et al. (2016), however, our expert system (https://doi.org/10.5281/zenodo.13926665) for *Sedo-Scleranthetea* identified no relevés of these alliances except for three relevés of *Brometum tectorum* Bojko 1934. These relevés were not included in the target vegetation (clusters A–H, Fig. 1a). Therefore, our analysis is restricted to the *Alysso-Sedion* alliance.

The associations *Alysso alyssoidis-Sedetum* (cluster E), *Cerastietum pumili* (cluster G) and *Saxifrago tridactylitae-Poetum compressae* (cluster B) have been recognized in Austria, Czech Republic, Slovakia and Poland (Mucina & Kolbek 1993, Valachovič et al. 1995, Matuszkiewicz 2001). It should be noted, however, that the pioneer vegetation of succulents and therophytes within the *Alysso-Sedion* alliance is only fragmentarily described from Ukraine (Onyshchenko 2001, Kuzemko 2009, Kuzemko et al. 2014, Didukh & Vasheniak 2018), while there is no evidence from eastern Ukraine. The Prodrome of Vegetation of Ukraine (Didukh 2019) reports three associations within the *Alysso-Sedion* alliance (*Aurinio saxatilis-Allietum podolici*, *Minuartio auctae-Festucetum pallentis* and *Saxifrago tridactylitae-Poetum compressae*). However, the *Minuartio auctae-Festucetum pallentis* association was removed lately from the *Alysso-Sedion* alliance due to the presence of rocky grassland diagnostic species and placed within the *Galio campanulate-Poion versicoloris* alliance of the *Stipo pulcherrimae-Festucetalia pallentis* order (Vasheniak et al. 2021). Therefore, we did not include this association in our analysis.

The calcareous vegetation of Moldova was preliminarily described within the alliance *Sempervivo ruthenici-Schivereckion* Pînzaru et Ruschuk 2009, which belongs to the *Asplenietea trichomanis* class (Pînzaru 2015a, b). After further revision, these communities were considered within the *Alysso-Sedion* alliance, *Alysso-Sedetalia* order and *Sedo-Scleranthetea* class (Vasheniak et al. 2021). Based on our analysis, we confirm that *Alysso-Sedion* communities do occur in Moldova.

There are transitional communities that have features of rocky grasslands but were recognized by our expert system (https://doi.org/10.5281/zenodo.13926665) as *Sedo-Scleranthetea* communities. This concerns, for example, communities on calcareous bedrocks that were described as the *Semperviretum soboliferi* association (cluster A) and the communities of the alliance *Alysso-Festucion pallentis* Moravec in Holub et al. 1967. Their syntaxonomic position needs further study that requires a joint analysis of the data from the *Sedo-Scleranthetea* and *Festuco-Brometea* classes.

It also has to be mentioned that clusters A, E and H are not sharply differentiated. They have a similar floristic composition with the presence of *Allium lusitanicum* aggr., *Jovibarba globifera*, *Sedum album* and *S. sexangulare*; however, according to the TWINSPAN classification, which was our main criterion for delimiting the groups, three associations can be recognized (Fig. 4). If a broader association concept was used, they could all be considered within a broad *Sedo albi-Allietum montani* association. This question must be addressed in the future using data from Germany and other countries not included in the present study.

The association *Alysso petraei-Sedetum hispanici* (cluster D) was classified within the *Alysso-Sedion* alliance, *Alysso-Sedetalia* order, *Sedo-Scleranthetea* class according to our analysis (Table 2). On the other hand, limited data on *Alysso petraei-Sedetum hispanici* and

the high presence of perennial plants in the communities indicate that these communities could also belong to the *Stipo pulcherrimae-Festucetalia pallentis* order.

The syntaxonomical position of the *Alyssetum muralis* association (cluster F) was revised and assigned within the *Alysso-Sedetalia* and *Alysso-Sedion* in this paper. However, Sanda et al. (2008) noticed these communities could be transitional to the *Stipo-Festucetalia pallentis* order.

The cryptogam component of the *Alysso-Sedion* communities is significantly developed in some places. However, because of the absence of cryptogam information in some relevés, we cannot consider bryophytes and lichens (such as *Bryum argenteum*, *Enchylium tenax*, and *Syntrichia ruralis*) as diagnostic species despite their high fidelity and constancy. Moreover, certain syntaxa (such as *Alyssetum muralis* or *Alysso petraei-Sedetum hispanici*) do not contain any records of cryptogam species in general (Table 2).

4.4 Geographical distribution of the *Alysso-Sedion* communities

Distribution of the *Alysso alyssoidis-Sedetum* and *Saxifrago tridactylitae-Poetum compressae* is mainly concentrated within the Carpathian-Pannonian region and Bohemian Massif (Fig. 3). Since the widespread *Alysso alyssoidis-Sedetum* occurs near the eastern border of Romania, it might also be found in Ukraine and Moldova, which have similar ecological conditions (Vasheniak et al. 2021). However, we did not find evidence of its presence, particularly in western Ukraine (Onyshchenko 2001, Didukh & Vasheniak 2018, Didukh 2019). The *Saxifrago tridactylitae-Poetum compressae* association, mentioned in Ukraine by Didukh (2019), has been confirmed by our analysis (Fig. 3). In Ukraine, the *Saxifrago tridactylitae-Poetum compressae* association occurs on limestones, marls and calcareous sandstones (Didukh 2019).

The *Sempervivetum soboliferi* is mainly distributed in the Czech Republic and Slovakia, but we also identified geographically outlying occurrences in southern Carinthia (Austria). It should be noted that the diagnostic species *Jovibarba globifera* is represented by different subspecies in different parts of the study area: *Jovibarba globifera* subsp. *arenaria* (W. D. J. Koch) J. Parn. and *Jovibarba globifera* subsp. *pseudohirta* (Leute) Letz are mentioned for the western part of the Carpathian-Pannonian region; *Jovibarba globifera* subsp. *preissiana* (Domin) Holub occurs in Poland, Romania, Slovakia and Ukraine; *Jovibarba globifera* subsp. *globifera* (L.) J. Parn. and *Jovibarba globifera* subsp. *hirta* (L.) J. Parn. are widespread in the study area.

Similar communities dominated by *Sempervivum soboliferum* (*Jovibarba globifera* subsp. *hirta*) were described from Slovenia (Šilc & Čarni 2012). Further studies are needed to clarify their relationships to the widespread *Sempervivetum soboliferi* association.

The *Seslerio kalnikensis-Jovibarbetum hirtae* Accetto 2002 and *Seslerio calcariae-Jovibarbetum hirtae* Accetto 2002, described from Slovenia, might be included in the *Sempervivetum soboliferi* association because *Jovibarba hirta* (L.) Opiz is also considered a subspecies – *Jovibarba globifera* subsp. *hirta* (L.) J. Parn.

Our results suggest that the associations *Alysso petraei-Sedetum hispanici* and *Alyssetum muralis* occur in Romania and the *Aurinio saxatilis-Allietum podolici* in Ukraine and Moldova. The latter association was described by Onyshchenko (2001) from western Podillia, a region with several endemic species (Zaverukha 1985). Our analysis shows the distribution of the *Aurinio saxatilis-Allietum podolici* in western Ukraine and partly Moldova and its absence in mountainous regions.

4.5 Syntaxa excluded from the *Alysso-Sedion* alliance

The nomenclatural types of *Medicagini lupulinae-Sedetum spuriae* Mucina in Mucina et Kolbek 1993, *Sedo-Sempervivetum tectorum* Bornkamm 1961 and *Erodio cicutarii-Brometum hordeacei* Mucina in Mucina et Kolbek 1993 were not classified to clusters A-H of the dendrogram; therefore, we excluded them from the analysis (Supplement E3). Since these associations contain a lot of ruderal species (e.g. *Anisantha tectorum, Atriplex patula, Polygonum aviculare* aggr.; Bornkamm 1961, Mucina & Kolbek 1993), they might be assigned to the *Artemisietea vulgaris* class.

The *Sedo acri-Saxifragetum tridactylitae* Pînzaru 2015 association was originally considered within the *Asplenietea trichomanis* (Pînzaru 2015a, b) and later preliminarily assigned to the *Sedo-Scleranthetea* class (Vasheniak et al. 2021). It contains a few silicicolous species (*Artemisia austriaca*, *Veronica verna*), which likely occurred on the lime-silicate rocks in the Dniester Canyon (Pînzaru 2015b). The nomenclatural type of the *Sedo acri-Saxifragetum tridactylitae* association was assigned to the 11th cluster of the TWINSPAN classification (Fig. 1). However, the 11th cluster correlated with the *Sedo-Scleranthion* communities and did not belong to the target vegetation (clusters A–H, Fig. 1). At this stage of the analysis, we consider this association transitional between the *Sedo-Scleranthetalia* and *Alysso-Sedetalia* orders.

The Hungarian association *Geranio rotundifolii-Sedetum albi*, invalidly (Art. 3i, Theurillat et al. 2021) described by Bauer (2005), could not be reproduced because the main part of the Hungarian relevés was not assigned to the *Sedo-Scleranthetea* by our expert system.

Erweiterte deutsche Zusammenfassung

Einleitung – Basiphile, von Annuellen, Sukkulenten, Moosen und Flechten dominierte Pioniergesellschaften (Verband *Alysso-Sedion*) kommen hauptsächlich auf kleinflächigen Felsköpfen im Kontakt mit Trockenrasen vor. Sie besiedeln seichtgründige, skelettreiche Böden auf diversen Karbonatgesteinen (Kalk, Dolomit, Mergel, Konglomerat) und sind stark von den chemischen und physikalischen Eigenschaften des Gesteins abhängig. Im Anhang I der Fauna-Flora-Habitat-Richtlinie (Richtlinie 92/43/EWG) sind sie als Lebensraumtyp 6110 „Lückige basophile oder Kalk-Pionierrasen (*Alysso-Sedion albi*)“ gelistet. Mit der vorliegenden Studie soll die pflanzensoziologische Gliederung des *Alysso-Sedion* in der karpatisch-pannonischen Region sowie in der West-Ukraine und der Republik Moldau revidiert und vereinheitlicht, und so die Kenntnis dieser naturschutzfachlich wichtigen Gesellschaften verbessert werden.

Untersuchungsgebiet – Unsere Revision des Verbands *Alysso-Sedion* umfasst das östliche Mitteleuropa und den westlichsten Teil Osteuropas. Im Detail sind das Tschechien, Slowakei, Süd-Polen, Ost-Österreich, Ungarn, Rumänien, West-Ukraine und die Republik Moldau. Das Gebiet umspannt einen weiten klimatischen Gradienten, von subozeanischen Bedingungen im Westen zu stärker kontinentalen im Osten.

Methoden – In einem ersten Schritt wurden alle von Annuellen, Sukkulenten, Moosen und Flechten dominierten Vegetationsaufnahmen aus dem Untersuchungsgebiet in der EVA-Databank (Chytrý et al. 2016) selektiert. Aus diesem initialen Datensatz von 10.211 Aufnahmen wurden mit Hilfe eines Expertensystems jene Aufnahmen herausgefiltert, welche zur Klasse *Sedo-Scleranthetea* gehören. Um große regionale Unterschiede in der Dichte der Vegetationsaufnahmen zu vermeiden, wurde ein „Heterogeneity-constrained random resampling“ (Lengyel et al. 2011) mit Zellen von 3 × 5 Minuten durchgeführt. Aus jeder Zelle wurden maximal 5 Aufnahmen gewählt, was einen Datensatz von 620 Aufnahmen ergab. Zusätzlich wurden die nomenklatorischen Typusaufnahmen aller aus dem Unter-

suchungsgebiet angegebenen Assoziationen dem Datensatz hinzugefügt (Tab. 1). Die Aufnahmen wurden mit dem modifizierten TWINSPAN-Algorithmus (Hill 1979, Roleček et al. 2009) klassifiziert. Die optimale Anzahl an Clustern wurde mit OptimClass 1 (Tichý et al. 2010) bestimmt. Die diagnostischen Arten wurden mit dem *phi*-Koeffizienten und Exaktem Fisher-Test ermittelt (Schwellenwert *phi* = 0.25 bei standardisierter Gruppengröße und Signifikanzniveau $p < 0{,}05$; vgl. Chytrý et al. 2002, Tichý & Chytrý 2006). Standörtliche Unterschiede zwischen den Vegetationseinheiten wurden mit Hilfe der europäischen Zeigerwerte von Tichý et al. (2023) dargestellt. Für jede Aufnahme wurden die ungewichteten mittleren Licht-, Temperatur-, Feuchte-, Reaktions- und Stickstoffzahlen berechnet. Außerdem wurden eine DCA-Ordination durchgeführt, auf welche die mittleren Zeigerwerte mit Hilfe der Funktion *envfit* des R-Packages *vegan* v. 2.6-4 (Oksanen et al. 2022) projiziert wurden.

Ergebnisse – Die TWINSPAN-Klassifikation ergab 19 Cluster, von welchen acht als zur Ordnung *Alysso-Sedion* identifiziert wurden (Cluster A–H in Abb. 1). Diese acht Cluster entsprechen den folgenden Assoziationen (vgl. Tab. 2): A *Sempervivetum soboliferi*, B *Saxifrago tridactylitae-Poetum compressae*, C *Aurinio saxatilis-Allietum podolici*, D *Alysso petraei-Sedetum hispanici*, E *Alysso alyssoidis-Sedetum*, F *Alyssetum muralis*, G *Cerastietum pumili*, H *Sedo albi-Allietum montani*. Fotos typischer Beispiele dieser Gesellschaften sind in Abbildung 2 zusammengestellt. Die Gesellschaften differenzieren sich sowohl geographisch als auch entlang der Gradienten Bodenreaktion, Temperatur und Licht (Abb. 3–5).

Diskussion – In Österreich, Tschechien, Slowakei und Polen werden innerhalb der Ordnung *Alysso-Sedion* traditionell die Assoziationen *Alysso alyssoidis-Sedetum*, *Cerastietum pumili* und *Saxifrago tridactylitae-Poetum compressae* unterschieden (Mucina & Kolbek 1993, Valachovič et al. 1995, Matuszkiewicz 2001, Chytrý 2007). Seltener werden *Sempervivetum soboliferi* und *Sedo albi-Allietum montani* als eigenständige Assoziationen erwähnt, und dann oft im Rahmen der Ordnung *Stipo-Festucetalia pallentis* (Klasse *Festuco-Brometea*), zu der sie floristisch und ökologisch überleiten. Beide Gesellschaften stehen dem *Alysso alyssoidis-Sedetum* nahe und könnten bei einem weiteren Assoziationsbegriff auch in dieses integriert werden. Das *Erodio cicutarii-Brometum hordeacei* Mucina in Mucina et Kolbek 1993 gehört nach unserer Analyse nicht zu den *Alysso-Sedion.* Für die Ukraine nennt Didukh (2019) drei Assoziationen der *Alysso-Sedion*: *Aurinio saxatilis-Allietum podolici*, *Saxifrago tridactylitae-Poetum compressae* und *Minuartio auctae-Festucetum pallentis*, wobei letzteres inzwischen in die Ordnung *Stipo-Festucetalia pallentis* überstellt wurde (Vasheniak et al. 2021). Das *Alysso alyssoidis-Sedetum* ist in der West-Ukraine und in Moldau ebenfalls zu erwarten, doch liegen bislang keine sicheren Nachweise vor. Eine sehr eigenständige Artenkombination weisen die beiden weitgehend auf Rumänien beschränkten Assoziationen *Alysso petraei-Sedetum hispanici* und *Alyssetum muralis* auf (Sanda et al. 2008). In allen genannten Gesellschaften haben Moose und Flechten einen wesentlichen Anteil am Gesellschaftsaufbau, doch sind sie in den meisten Aufnahmen nur fragmentarisch oder überhaupt nicht erfasst.

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Authors contributions

I.V. conceived the research idea. I.V. performed the numerical analyses and wrote the manuscript, supervised by M.C., Y.D. and W.W. I.V. prepared the electronic supplements. O.P. prepared the DCA, box-and-whiskers plots, statistical analysis, distribution maps and figures. W.W. translated the abstract and captions into German. All the authors revised the drafts and agreed with the final manuscript version.

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Supplements

Additional supporting information may be found in the online version of this article.

Zusätzliche unterstützende Information ist in der Online-Version dieses Artikels zu finden.

Supplement E1. Nomenclatural types of the *Alysso-Sedion* associations occurring in the study area and close surroundings.
Anhang E1. Nomenklatorische Typen der *Alysso-Sedion*-Assoziationen im Untersuchungsgebiet und angrenzenden Gebieten.

Supplement E2. Species aggregates and their definitions.
Anhang E2. Definition der Aggregate.

Supplement E3. Interpretation and species lists for the first eleven clusters that were excluded from the further analysis.
Anhang E3. Interpretation und Artenlisten der elf von der weiteren Analyse exkludierten Cluster.

Supplement E4. Full synoptic table showing the percentage constancy and fidelity of species in clusters A–H.
Anhang E4. Ungekürzte Stetigkeitstabelle der Cluster A–H, einschließlich der Treuewerte.

Supplement E5. Header data for all relevés used in this analysis.
Anhang E5. Kopfdaten aller in dieser Arbeit verwendeten Vegetationsaufnahmen.

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Supplement E1. Nomenclatural types of the Alysso-Sedion associations occurring in the study area and close surroundings according to national overviews and regional publications. Taxon names are given according to the original publications.

Anhang E1. Nomenklatorische Typen der Alysso-Sedion-Assoziationen im Untersuchungsgebiet und angrenzenden Gebieten.

***Alyssetum muralis* Pop et Hodişan ex Vasheniak et al. 2024**
Original name: *Alyssetum muralis* Pop et Hodişan 1979
Holotypus: Pop & Hodişan 1979 (p. 3–4, Table 1, rel. 6)
Locality: Valea Someşului Cald, Romania. Date of recording: 1976-1978. Plot size: NA. Aspect: 150°. Slope: 40°. Total vegetation cover: NA. Cover herb layer: NA. Cover moss layer: NA.
Agropyron intermedium +, *Allium flavum* +, *Alyssum murale* 3, *Artemisia absinthium* 1, *Bromus sterilis* +, *Calamintha majoranifolia* +, *Centaurea micranthos* +, *Euphorbia cyparissias* +, *Fagopyrum convolvulus* +, *Festuca pallens* +, *Galium erectum* +, *Hypericum perforatum* +, *Melica ciliata* +, *Plantago lanceolata* +, *Poa nemoralis* +, *Potentilla argentea* +, *Sedum acre* +, *Sedum hispanicum* 1, *Sedum maximum* +, *Seseli devenyense* +, *Thymus comosus* +

***Alysso alyssoidis-Sedetum* Oberdorfer et T. Müller in T. Müller 1961**
Original name: *Alysso-Sedetum* Oberdorfer et T. Müller in T. Müller 1961
Neotypus (designated by Royer & Ferrez 2018): Korneck 1975 (p. 93, Table 33, rel. 1)
Locality: Between Kelheim (Danube) and Gronsdorf. Slopes above the Altmuehltal, Germany. Date of recording: 13.06.1965. Plot size: 0.7 m^2. Aspect: 180°. Slope: 10°. Total vegetation cover: NA. Cover herb layer: 95%. Cover moss layer: 80%.
Alyssum alyssoides +, *Arabis recta* 3, *Arenaria leptoclados* 4, *Artemisia campestris* juv. $+^0$, *Calamintha acinos* +, *Cerastium arvense* 2, *Helianthemum ovatum* juv. +, *Holosteum umbellatum* +, *Potentilla tabenaemontani* 1, *Sedum acre* +, *S. album* 1; *Cladonia alcicornis* 2, *C. furcata* 2, *C. pyxidata* 1, *Grimaldia fragrans* 3, *Pleurochaete squarrosa* 3 *Rhytidium rugosum* +

***Alysso petraei-Sedetum hispanici* Schneider-Binder et al. 1971**
Original name: *Alysso petraei-Sedetum hispanici* Schneider-Binder et al. 1971
Lectotypus *hoc loco*: Schneider-Binder et al. 1971 (p. 101–102, Table 2, rel. 2)
Locality: Rocks at the Cazanpas, near Dubova, Romania. Date of recording: 10.06.1967. Plot size: 8 m^2. Aspect: 180°. Slope: 45°. Total vegetation cover: 70%. Cover herb layer: NA. Cover moss layer: NA.
Achillea crithmifolia +, *Allium flavum* +, *Alyssum petraeum* +.3, *Bromus sterilis* +, *Centaurea atropurpurea* +, *Cerastium banaticum* +, *Ceterach officinarum* +, *Chondrilla juncea* +, *Dictamnus albus* +, *Euphorbia cyparissias* +, *Isatis tinctoria* +, *Medicago falcata* +, *Melica ciliata* v. *flavescens* +.2, *Oryzopsis holciformis* +, *Piptatherum holciforme* +, *Poa bulbosa* +, *Satureja kitaibelii* 3.5, *Scabiosa columbaria* +, *Sedum hispanicum* 3.5, *Stachys recta* +, *Stipa eriocaulis* +.2, *Verbascum nigrum* +

***Asplenio rutae-murariae-Allietum flavescentis* Pînzaru 2015**
Original name: *Asplenio rutae-murariae-Allietum flavescentis* Pînzaru 2015
Holotypus: Pînzaru 2015a (p. 77, Table 1, rel. 7)
Locality: Varvareuca and Starceni village, vicinity of Floreshti, Moldova. Date of recording: 29.07.2014. Plot size: 100 m^2. Aspect: 270º. Slope: 10°. Total vegetation cover: 60 %. Cover herb layer: NA. Cover moss layer: NA.
Achillea collina +, *Allium flavescens* 3, *Alyssum alyssoides* 1, *Arenaria serpyllifolia* 1, *Asperula cynanchica* +, *Asplenium ruta-muraria* +, *Asyneuma canescens* r, *Aurinia saxatilis* +, *Berteroa incana* r, *Bromus hordeaceus* +, *Bupleurum falcatum* +, *Campanula sibirica* r, *Centaurea biebersteinii* r, *Centaurea orientalis* r, *Chamaecytisus heuffelii* r, *Cleistogenes bulgarica* +, *Clinopodium acinos* 1, *Echium vulgare* r, *Eragrostis minor* r, *Eryngium campestre* r, *Erysimum odoratum* +, *Euphorbia cyparissias* 1, *Festuca rupicola* 1, *Hylotelephium maximum* r, *Lactuca serriola* r, *Linaria genistifolia* r, *Medicago falcata* +, *Melica transsilvanica* +, *Melilotus officinalis* r, *Origanum vulgare* r, *Poa bulbosa* 1, *Poa compressa* 1, *Potentilla arenaria* 1, *Scabiosa ochroleuca* r, *Securigera varia* +, *Sedum acre* 2, *Stachys recta* 1, *Stipa capillata* r, *Thalictrum minus* var. *saxatilis* r, *Thesium arvense* r, *Thlaspi perfoliatum* r, *Thymus pannonicum* s.l. +, *Verbascum nigrum* r, *Veronica spicata* +

***Aurinio saxatilis-Allietum podolici* Onyshchenko 2001**
Original name: *Aurinio saxatilis-Allietum podolici* Onyshchenko 2001
Holotypus: Onyshchenko 2001 (p. 92–95, Table 2, rel. 13)
Locality: vicinity of Kremenets, Ternopil region, Ukraine. Date of recording: 03.06.1997. Plot size: 6 m^2. Aspect: 225º. Slope: 10°. Total vegetation cover: 30%. Cover herb layer: NA. Cover moss layer: 5 %.
Acinos arvensis +, *Allium podolicum* +, *Asperula cynanchica* +, *Aurinia saxatilis* +, *Campanula sibirica* +, *Cardaminopsis arenosa* +, *Centaurea rhenana* +, , *Euphorbia cyparissias* +, *Festuca valesiaca* 2, *Galium campanulatum* +, *Hieracium cymosum* +, *H. pilosella* +, *Hypericum perforatum* +, *Koeleria cristata* +, *Melica transsilvanica* +, *Poa compressa* +, *Potentilla arenaria* 2, *Sedum acre* 2, *Thalictrum minus* +, *Trinia multicaulis* +, *Urtica dioica* +, *Verbascum lychnitis* +; *Encalypta streptocarpa* +, *E. vulgaris* +, *Pseudoleskea catenulata* +, *Tortula ruralis* +

***Cerastietum pumili* Oberdorfer et T. Müller in T. Müller 1961**
Original name: *Cerastietum* Oberdorfer et T. Müller in T. Müller 1961
Neotypus (designated by Royer & Ferrez 2018): Korneck 1975 (p. 86, Table 27, rel. 9)
Locality: Florimont bei Ingersheim (nahe Colmar), France. Date of recording: 23.04.1973. Plot size: 1.5 m^2. Aspect: 180°. Slope: 5º. Total vegetation cover: NA. Cover herb layer: 60%. Cover moss layer: 40%
Allium sphaerocephalon juv. 1, *Alyssum alyssoides* +, *Arabis recta* 2, *Arenaria leptoclados* 1, *Calamintha acinos* 1, *Cerastium pumilum* 1, *Erophila praecox* 1, *Hornungia petraea* 2, *Melica ciliata* +, *Potentilla arenaria* 2, *Saxifraga tridactylites* +, *Sedum acre* 2, *S. album* 2, *Stachys recta* juv. +, *Teucrium chamaedrys* 1, *Thlaspi perfoliatum* +, *Veronica praecox* 1*; Cladonia alcicornis* 1, *Grimmia pulvinata* +, *Pleurochaete squarrosa* 2, *Pottia lanceolata* 2, *Syntrichia ruralis* 1

***Erodio cicutarii-Brometum hordeacei* Mucina in Mucina et Kolbek 1993**
Original name: *Erodio cicutarii-Brometum hordeacei* Mucina in Mucina et Kolbek 1993
Holotypus: Mucina & Kolbek 1993 (p. 513)
Locality: Piešťany, Slovakia. Date of recording: 01.06.1977. Plot size: 9 m^2. Aspect: 153º. Slope: NA. Total vegetation cover: 95%. Cover herb layer: NA. Cover moss layer: NA.
Arenaria serpyllifolia 1, *Artemisia vulgaris* +, *Berteroa incana* +, *Bromus hordeaceus* 5, *Bromus tectorum* +, *Carduus acanthoides* juv. r, *Centaurea stoebe* +, *Chondrilla juncea* +, *Cichorium intybus* +, *Convolvulus arvensis* +, *Echium vulgare* +, *Erodium cicutarium* 1, *Eryngium campestre* +, *Festuca brevipila* +, *Lolium perenne* +, *Medicago lupulina* 2, *Plantago lanceolata* 1, *Poa angustifolia* +, *Potentilla argentea* +, *Silene latifolia* subsp. *alba* +

***Jovibarbo-Sedetum albi* Valachovič in Valachovič et al. 1995**
Original name: *Jovibarbo-Sedetum albi* Valachovič in Valachovič et al. 1995
Holotypus: Valachovič et al. 1995 (p. 100–102, Table 7, rel. 3)
Locality: Biele Karpaty, Vršatec-Babky, Slovakia. Date of recording: 20.05.1988. Plot size: 7 m^2. Aspect: 180º. Slope: 40°. Total vegetation cover: NA. Cover herb layer: 40%. Cover moss layer: 1%.
Allium montanum 1, *Festuca pallens* r, *Geranium robertianum* 1, *Jovibarba glabrescens* +, *Poa nemoralis* r, *Sedum album* 3, *Sedum maximum* +

***Medicagini lupulinae-Sedetum spurii* Mucina in Mucina et Kolbek 1993**
Original name: *Medicagini lupulinae-Sedetum spurii* Mucina in Mucina et Kolbek 1993
Holotypus: Bornkamm 1961 (p. 11, Table 7, rel. 25)
Locality: Leine-Aue near Göttingen, Germany. Date of recording: NA. Plot size: 9 m^2. Aspect: NA. Slope: NA. Total vegetation cover: 100%. Cover herb layer: NA. Cover moss layer: NA.
Arenaria serpyllifolia +, *Erigeron canadensis* 1, *Medicago lupulina* var. *glandulosa* 1, *Picris hieracioides* +, *Poa compressa* 1, *Sedum spurium* 5, *Solidago canadensis* +, *Sonchus oleraceus* +, *Taraxacum officinale* 1; *Bryum "capillare + caespiticum"* +

Saxifrago tridactylitae-Poetum compressae* Géhu 1961 *nom. invers.
Original name: Association á *Poa compressa* L. et *Saxifraga tridactylites* L.
Lectotypus (designated by Dengler et al. 2003): Géhu 1961 (p. 208, Table 25, rel. 2)
Locality: Bousignies-sur-Roc, France. Date of recording: 05-06.1956-1957. Plot size: 4 m^2. Aspect: NA. Slope: NA. Total vegetation cover: NA. Cover herb layer: NA. Cover moss layer: NA.
Arenaria serpyllifolia 1, *Bromus sterilis* 1, *Geranium columbinum* +, *Medicago lupulina* 1, *Myosotis collina* +, *Plantago lanceolata* 1, *Poa compressa* 1, *P. nemoralis* 1, *P. pratensis* var. *angustifolia* 1, *Polypodium vulgare* +, *Saxifraga tridactylites* 1, *Sedum acre* 1, *Sempervivum tectorum* 1, *Veronica arvensis* +, *Viola arvensis* +

***Sedo acri-Saxifragetum tridactylites* Pînzaru 2015**
Original name: *Sedo acri-Saxifragetum tridactylites* Pînzaru 2015
Holotypus: Pînzaru 2015b (p. 85, Table 1, rel. 17)
Locality: Tipova village, vicinity of Rezina, Moldova. Date of recording: 19.05.2009. Plot size: 100 m^2. Aspect: 0°. Slope: 2-5º. Total vegetation cover: 50-60%. Cover herb layer: NA. Cover moss layer: NA.
Alyssum alyssoides 1, *Arabis auriculata* r, *Bromus hordeaceus* +, *Clinopodium acinos* +, *Festuca rupicola* +, *Geranium pusillum* +, *Medicago minima* +, *Microthlaspi perfoliatum* +, *Poa bulbosa* var. *bulbosa* 1, *Poterium sanguisorba* r, *Saxifraga tridactylites* 2, *Sedum acre* 2, *Xeranthemum annuum* r

***Sedo sexangularis-Sempervivetum tectorum* Bornkamm 1961**
Original name: *Sedo-Sempervivetum* Bornkamm 1961
Lectotypus (designated by Mucina & Kolbek 1993): Bornkamm 1961 (p. 11, Table 7, rel. 15)
Locality: Leine-Aue near Göttingen, Germany. Date of recording: NA. Plot size: 3 m^2. Aspect: NA. Slope: NA. Total vegetation cover: 70%. Cover herb layer: NA. Cover moss layer: NA.
Cerastium pumilum +, *Erodium cicutarium* 2, *Poa compressa* 2!, *Sedum maximum* 1, , *Sempervivum tectorum* 3, *Senecio vulgaris* 1, *Sonchus asper* 1, *Taraxacum officinale* 1; *Bryum "capillare + caespiticum"* 2!, *Ceratodon purpureus* 2!

Supplement E2. List of aggregate species and definition of their combination.

Anhang E2. Liste der aggregierten Arten und Definition ihrer Kombination.

Aggregate	Euro+Med	Source for aggregate definition	Synonyms/Comments
Achillea millefolium aggr.	*Achillea arabica* Kotschy	Ad hoc	*Achillea setacea* var. *filifolia* Boiss. is a synonym of *Achillea arabica*
Achillea millefolium aggr.	*Achillea aspleniifolia* Vent.	Euro+Med (2024)	
Achillea millefolium aggr.	*Achillea collina* (Wirtg.) Heimerl	Euro+Med (2024)	
Achillea millefolium aggr.	*Achillea distans* Willd.	Euro+Med (2024)	
Achillea millefolium aggr.	*Achillea euxina* Klokov	Euro+Med (2024)	
Achillea millefolium aggr.	*Achillea millefolium* L.	Euro+Med (2024)	
Achillea millefolium aggr.	*Achillea pannonica* Scheele	Euro+Med (2024)	
Achillea millefolium aggr.	*Achillea setacea* Waldst. & Kit.	Euro+Med (2024)	
Achillea millefolium aggr.	*Achillea styriaca* Saukel & Danihelka	Euro+Med (2024)	
Aconitum lycoctonum aggr.	*Aconitum lycoctonum* L.	*Ad hoc*	
Aconitum lycoctonum aggr.	*Aconitum moldavicum* Hacq.	*Ad hoc*	*Aconitum lycoctonum* subsp. *moldavicum* (Hacq.) Jalas
Aconitum napellus aggr.	*Aconitum firmum* Rchb.	*Ad hoc*	*Aconitum napellus* subsp. *firmum* (Rchb.) Gáyer
Aconitum napellus aggr.	*Aconitum napellus* L.	Landolt et al. (2010)	
Aconitum napellus aggr.	*Aconitum plicatum* Rchb.	Landolt et al. (2010)	
Aconitum napellus aggr.	*Aconitum tauricum* Wulfen	Landolt et al. (2010)	
Agrimonia eupatoria aggr.	*Agrimonia eupatoria* L.	*Ad hoc*	
Agrimonia eupatoria aggr.	*Agrimonia procera* Wallr.	*Ad hoc*	*Agrimonia eupatoria* subsp. *procera* (Wallr.) Arrh. ex Fr.
Agropyron cristatum aggr.	*Agropyron cimmericum* Nevski	*Ad hoc*	*Agropyron cristatum* subsp. *birjutczense* (Lavrenko) Á.Löve
Agropyron cristatum aggr.	*Agropyron cristatum* (L.) Gaertn.	Mosyakin & Fedoronchuk (1999)	
Agropyron cristatum aggr.	*Agropyron desertorum* (Link) Schult.	Mosyakin & Fedoronchuk (1999)	
Alchemilla hybrida aggr.	*Alchemilla colorata* Buser	Ehrendorfer (1973)	
Alchemilla hybrida aggr.	*Alchemilla flabellata* Buser	Ehrendorfer (1973)	
Alchemilla hybrida aggr.	*Alchemilla glaucescens* Wallr.	Ehrendorfer (1973)	
Alchemilla hybrida aggr.	*Alchemilla hybrida* (L.) L.	Ehrendorfer (1973)	
Alchemilla hybrida aggr.	*Alchemilla plicata* Buser	Ehrendorfer (1973)	
Alchemilla vulgaris aggr.	*Alchemilla acutiloba* Opiz	Ehrendorfer (1973)	
Alchemilla vulgaris aggr.	*Alchemilla crinita* Buser	Ehrendorfer (1973)	
Alchemilla vulgaris aggr.	*Alchemilla monticola* Opiz	Ehrendorfer (1973)	
Alchemilla vulgaris aggr.	*Alchemilla straminea* Buser	Ehrendorfer (1973)	
Alchemilla vulgaris aggr.	*Alchemilla subcrenata* Buser	Ehrendorfer (1973)	
Alchemilla vulgaris aggr.	*Alchemilla xanthochlora* Rothm.	Ehrendorfer (1973)	
Alchemilla vulgaris aggr.	*Alchemilla vulgaris* Wight	Ehrendorfer (1973)	
Allium lusitanicum aggr.	*Allium lusitanicum* Lam.	*Ad hoc*	
Allium lusitanicum aggr.	*Allium senescens* L.	*Ad hoc*	
Alyssum montanum aggr.	*Alyssum gmelinii* Jord. & Fourr.	Landolt et al. (2010)	
Alyssum montanum aggr.	*Alyssum montanum* L.	Landolt et al. (2010)	
Alyssum montanum aggr.	*Alyssum rostratum* Steven	Landolt et al. (2010)	
Anthoxanthum odoratum aggr.	*Anthoxanthum aristatum* Boiss.	*Ad hoc*	*Anthoxanthum odoratum* subsp. *aristatum* (Boiss.) Trab.
Anthoxanthum odoratum aggr.	*Anthoxanthum odoratum* L.	*Ad hoc*	
Arabis hirsuta aggr.	*Arabis hirsuta* (L.) Scop.	Landolt et al. (2010)	
Arabis hirsuta aggr.	*Arabis nemorensis* (Wolf ex Hoffm.) W. D. J. Koch	Landolt et al. (2010)	
Arabis hirsuta aggr.	*Arabis sagittata* (Bertol.) DC.	Landolt et al. (2010)	
Arenaria serpyllifolia aggr.	*Arenaria leptoclados* (Rchb.) Guss.	Ehrendorfer (1973)	
Arenaria serpyllifolia aggr.	*Arenaria serpyllifolia* L.	Ehrendorfer (1973)	
Asperula cynanchica aggr.	*Asperula aristata* L. f.	Landolt et al. (2010)	
Asperula cynanchica aggr.	*Asperula cynanchica* L.	Landolt et al. (2010)	
Asperula cynanchica aggr.	*Asperula neilreichii* Beck	Landolt et al. (2010)	
Asperula montana aggr.	*Asperula graveolens* Schult. & Schult. f.	*Ad hoc*	*Asperula montana* subsp. *graveolens* (M. Bieb.) Borza
Asperula montana aggr.	*Asperula montana* Waldst. & Kit.	*Ad hoc*	
Astragalus alpinus aggr.	*Astragalus alpinus* L.	*Ad hoc*	
Astragalus alpinus aggr.	*Astragalus norvegicus* Grauer	*Ad hoc*	*Astragalus alpinus* subsp. *arcticus* Glehn
Camelina sativa aggr.	*Camelina alyssum* (Mill.) Thell.	Landolt et al. (2010)	
Camelina sativa aggr.	*Camelina rumelica* Velen.	Landolt et al. (2010)	
Camelina sativa aggr.	*Camelina sativa* (L.) Crantz	Landolt et al. (2010)	
Campanula patula aggr.	*Campanula abietina* Griseb.	*Ad hoc*	
Campanula patula aggr.	*Campanula patula* L.	*Ad hoc*	
Campanula rotundifolia aggr.	*Campanula kladniana* (Schur) Witasek	Landolt et al. (2010)	
Campanula rotundifolia aggr.	*Campanula rotundifolia* L.	Landolt et al. (2010)	
Cardamine pratensis aggr.	*Cardamine matthioli* Moretti	Landolt et al. (2010)	
Cardamine pratensis aggr.	*Cardamine pratensis* L.	Landolt et al. (2010)	
Carex muricata aggr.	*Carex muricata* L.	Landolt et al. (2010)	
Carex muricata aggr.	*Carex spicata* Huds.	Landolt et al. (2010)	
Carlina vulgaris aggr.	*Carlina biebersteinii* Hornem.	Juillerat et al. (2017)	
Carlina vulgaris aggr.	*Carlina vulgaris* L.	Juillerat et al. (2017)	
Centaurea arenaria aggr.	*Centaurea arenaria* Willd.	Euro+Med (2024)	
Centaurea arenaria aggr.	*Centaurea borysthenica* Gruner	Euro+Med (2024)	
Centaurea arenaria aggr.	*Centaurea odessana* Prodan	Euro+Med (2024)	
Centaurea arenaria aggr.	*Centaurea tauscheri* A. Kern.	Euro+Med (2024)	
Centaurea jacea aggr.	*Centaurea jacea* L.	Landolt et al. (2010)	
Centaurea jacea aggr.	*Centaurea thuillieri* J. Duvign. & Lambinon	Landolt et al. (2010)	
Centaurea macroptilon aggr.	*Centaurea macroptilon* Borbás	*Ad hoc* , based on Euro+Med (2024)	
Centaurea macroptilon aggr.	*Centaurea oxylepis* (Wimm. & Grab.) Hayek	*Ad hoc* , based on Euro+Med (2024)	
Centaurea macroptilon aggr.	*Centaurea subjacea* (Beck) Hayek	*Ad hoc* , based on Euro+Med (2024)	
Centaurea margaritacea aggr.	*Centaurea breviceps* Iljin	Euro+Med (2024)	
Centaurea margaritacea aggr.	*Centaurea konkae* Klokov	Euro+Med (2024)	
Centaurea margaritacea aggr.	*Centaurea margaritacea* Ten.	Euro+Med (2024)	
Centaurea margaritacea aggr.	*Centaurea protomargaritacea* Klokov	Euro+Med (2024)	
Centaurea stoebe aggr.	*Centaurea pseudomaculosa* Dobrocz.	*Ad hoc* , based on Euro+Med (2024)	
Centaurea stoebe aggr.	*Centaurea stoebe* L.	*Ad hoc* , based on Euro+Med (2024)	
Cotoneaster melanocarpus aggr.	*Cotoneaster melanocarpus* (Bunge) Loudon	Euro+Med (2024)	
Cotoneaster melanocarpus aggr.	*Cotoneaster niger* (Fr.) Fr.	Euro+Med (2024)	
Crataegus monogyna aggr.	*Crataegus monogyna* Jacq.	Juillerat et al. (2017)	
Crataegus monogyna aggr.	*Crataegus rhipidophylla* Gand.	Juillerat et al. (2017)	
Crataegus laevigata aggr.	*Crataegus laevigata* (Poir.) DC.	*Ad hoc*	
Crataegus laevigata aggr.	*Crataegus macrocarpa* Hegetschw.	*Ad hoc*	*Crataegus laevigata* subsp. *nemorensis* (Hrabětová) Dostál
Crepis tectorum aggr.	*Crepis ramosissima* d'Urv.	*Ad hoc* , based on Euro+Med (2024)	
Crepis tectorum aggr.	*Crepis tectorum* L.	*Ad hoc* , based on Euro+Med (2024)	

Continued on next page

Fortsetzung auf nächsten Seite

Aggregate	Euro+Med	Source for aggregate definition	Synonyms/Comments
Cyanus montanus aggr.	*Cyanus mollis* (Waldst. & Kit.) J. Presl & C. Presl	Landolt et al. (2010)	
Cyanus montanus aggr.	*Cyanus montanus* (L.) Hill	Landolt et al. (2010)	
Cyanus triumfetii aggr.	*Cyanus dominii* (Dostál) Holub	*Ad hoc* , based on Euro+Med (2024)	
Cyanus triumfetii aggr.	*Cyanus triumfettii* (All.) Á. Löve & D. Löve	*Ad hoc* , based on Euro+Med (2024)	
Cytisus hirsutus aggr.	*Cytisus graniticus* Rehmann	Ad hoc	*Chamaecytisus hirsutus* subsp. *hirsutissimus* (K. Koch) Ponert according to Euro+Med (2022)
Cytisus hirsutus aggr.	*Cytisus hirsutus* L.	Landolt et al. (2010)	
Cytisus hirsutus aggr.	*Cytisus leiocarpus* A. Kern.	*Ad hoc*	*Cytisus hirsutus* subsp. *leiocarpus* (A. Kern.) Briq.
Cytisus hirsutus aggr.	*Cytisus ratisbonensis* Schaeff.	Landolt et al. (2010)	
Dianthus campestris aggr.	*Dianthus campestris* M. Bieb.	*Ad hoc*	
Dianthus campestris aggr.	*Dianthus pallidiflorus* Ser.	*Ad hoc*	*Dianthus campestris* subsp. *pallidiflorus* (Ser.) Schmalh.
Dianthus carthusianorum aggr.	*Dianthus carthusianorum* L.	Ehrendorfer (1973)	
Dianthus carthusianorum aggr.	*Dianthus pontederae* A. Kern.	Ehrendorfer (1973)	
Dianthus membranaceus aggr.	*Dianthus dobrogensis* Prodan	Ad hoc	*Dianthus membranaceus* Stoj. & Stef. according to Euro+Med (2022)
Dianthus membranaceus aggr.	*Dianthus membranaceus* Borbás	*Ad hoc*	
Dianthus petraeus aggr.	*Dianthus petraeus* Waldst. & Kit.	*Ad hoc*	
Dianthus petraeus aggr.	*Dianthus spiculifolius* Schur	Ad hoc	*Dianthus petraeus* subsp. *spiculifolius* (Schur) Ciocârlan according to Euro+Med (2022)
Draba verna aggr.	*Draba praecox* Steven	Ehrendorfer (1973)	
Draba verna aggr.	*Draba verna* L.	Ehrendorfer (1973)	
Dryopteris carthusiana aggr.	*Dryopteris carthusiana* (Vill.) H. P. Fuchs	Wisskirchen & Haeupler (1998)	
Dryopteris carthusiana aggr.	*Dryopteris dilatata* (Hoffm.) A. Gray	Wisskirchen & Haeupler (1998)	
Erysimum hieracifolium aggr.	*Erysimum exaltatum* Andrz. ex Besser	Ad hoc	*Erysimum hieracifolium* subsp. *exaltatum* (Andrz. ex Besser) Borza
Erysimum hieracifolium aggr.	*Erysimum hieracifolium* L.	Ehrendorfer (1973)	
Erysimum hieracifolium aggr.	*Erysimum marschallianum* M. Bieb.	Ehrendorfer (1973)	
Euprasia picta aggr.	*Euphrasia kerneri* Wettst.	*Ad hoc*	
Euprasia picta aggr.	*Euphrasia picta* Wimm.	*Ad hoc*	*Euphrasia picta* subsp. *kerneri* (Wettst.) Yeo
Festuca ovina aggr.	*Festuca callieri* (Hack.) Markgr.	*Ad hoc*	*Festuca ovina* var. *callieri* Hack.
Festuca ovina aggr.	*Festuca dalmatica* (Hack.) K. Richt.	Ehrendorfer (1973)	
Festuca ovina aggr.	*Festuca filiformis* Pourr.	Ehrendorfer (1973)	
Festuca ovina aggr.	*Festuca laevigata* Gaudin	Ehrendorfer (1973)	
Festuca ovina aggr.	*Festuca ovina* L.	Ehrendorfer (1973)	
Festuca ovina aggr.	*Festuca psammophila* (Čelak.) R. M. Fritsch	Ehrendorfer (1973)	
Festuca ovina aggr.	*Festuca rupicaprina* (Hack.) A. Kern.	Ehrendorfer (1973)	
Festuca ovina aggr.	*Festuca vaginata* Willd.	Ehrendorfer (1973)	
Festuca ovina aggr.	*Festuca vivipara* (L.) Sm.	Ehrendorfer (1973)	
Festuca rubra aggr.	*Festuca nigrescens* Lam.	Juillerat et al. (2017)	
Festuca rubra aggr.	*Festuca norica* (Hack.) K. Richt.	*Ad hoc*	*Festuca rubra* var. *norica* Hack.
Festuca rubra aggr.	*Festuca rubra* L.	Juillerat et al. (2017)	
Festuca rubra aggr.	*Festuca trichophylla* (Gaudin) K. Richt.	Juillerat et al. (2017)	
Festuca valesiaca aggr.	*Festuca pseudodalmatica* Domin	Mosyakin & Fedoronchuk (1999)	
Festuca valesiaca aggr.	*Festuca stricta* Host	Mosyakin & Fedoronchuk (1999)	
Festuca valesiaca aggr.	*Festuca valesiaca* Gaudin	Mosyakin & Fedoronchuk (1999)	
Galeopsis tetrahit aggr.	*Galeopsis pubescens* Besser	Ehrendorfer (1973)	
Galeopsis tetrahit aggr.	*Galeopsis tetrahit* L.	Ehrendorfer (1973)	
Galium mollugo aggr.	*Galium album* Mill.	Juillerat et al. (2017)	
Galium mollugo aggr.	*Galium mollugo* L.	Juillerat et al. (2017)	
Galium pusillum aggr.	*Galium anisophyllon* Vill.	Ehrendorfer (1973)	
Galium pusillum aggr.	*Galium austriacum* Jacq.	Ehrendorfer (1973)	
Galium pusillum aggr.	*Galium pumilum* Murray	Ehrendorfer (1973)	
Galium pusillum aggr.	*Galium pusillum* L.	Ehrendorfer (1973)	
Galium sylvaticum aggr.	*Galium aristatum* L.	*Ad hoc*	*Galium sylvaticum* subsp. *aristatum* (L.) Rouy & E. G. Camus
Galium sylvaticum aggr.	*Galium laevigatum* L.	Ehrendorfer (1973)	
Galium sylvaticum aggr.	*Galium sylvaticum* L.	Ehrendorfer (1973)	
Galium verum aggr.	*Galium ruthenicum* Willd.	*Ad hoc*	
Galium verum aggr.	*Galium verum* L.	*Ad hoc*	
Glechoma hederacea aggr.	*Glechoma hederacea* L.	Landolt et al. (2010)	
Glechoma hederacea aggr.	*Glechoma hirsuta* Waldst. & Kit.	Landolt et al. (2010)	
Helianthemum canum aggr.	*Helianthemum canum* (L.) Baumg.	*Ad hoc* , based on Chusova & Didukh (2014)	
Helianthemum canum aggr.	*Helianthemum stevenii* Juz. & Pozdeeva	*Ad hoc* , based on Chusova & Didukh (2014)	*Helianthemum canum* subsp. *stevenii* (Juz. & Pozdeeva) M. Proctor
Hylotelephium maximum aggr.	*Hylotelephium maximum* (L.) Holub	Mosyakin & Fedoronchuk (1999)	
Hylotelephium maximum aggr.	*Hylotelephium polonicum* (Blocki) Holub	Mosyakin & Fedoronchuk (1999)	
Inula salicina aggr.	*Inula aspera* Poir.	FloraVeg (2024)	
Inula salicina aggr.	*Inula sabuletorum* Lavrenko	FloraVeg (2024)	
Inula salicina aggr.	*Inula salicina* L.	FloraVeg (2024)	
Isatis tinctoria aggr.	*Isatis praecox* Tratt.	Landolt et al. (2010)	
Isatis tinctoria aggr.	*Isatis tinctoria* L.	Landolt et al. (2010)	
Jurinea cyanoides aggr.	*Jurinea cyanoides* (L.) Rchb.	*Ad hoc*	
Jurinea cyanoides aggr.	*Jurinea tenuiloba* Bunge	*Ad hoc*	*Jurinea cyanoides* subsp. *tenuiloba* (Bunge) Nyman
Jurinea mollis aggr.	*Jurinea arachnoidea* Bunge	*Ad hoc* , based on Euro+Med (2024)	
Jurinea mollis aggr.	*Jurinea calcarea* Klokov	*Ad hoc* , based on Euro+Med (2024)	
Jurinea mollis aggr.	*Jurinea dobrogensis* Nyár.	*Ad hoc* , based on Euro+Med (2024)	
Jurinea mollis aggr.	*Jurinea glycacantha* (Sm.) DC.	*Ad hoc* , based on Euro+Med (2024)	
Jurinea mollis aggr.	*Jurinea ledebourii* Bunge	*Ad hoc* , based on Euro+Med (2024)	
Jurinea mollis aggr.	*Jurinea michelsonii* Iljin	*Ad hoc* , based on Euro+Med (2024)	
Jurinea mollis aggr.	*Jurinea mollis* (L.) Rchb.	*Ad hoc* , based on Euro+Med (2024)	
Jurinea mollis aggr.	*Jurinea mollissima* Klokov	*Ad hoc* , based on Euro+Med (2024)	
Jurinea mollis aggr.	*Jurinea roegneri* K. Koch	*Ad hoc* , based on Euro+Med (2024)	
Jurinea mollis aggr.	*Jurinea transylvanica* (Spreng.) Simonk.	*Ad hoc* , based on Euro+Med (2024)	
Koeleria brevis aggr.	*Koeleria brevis* Steven	*Ad hoc*	
Koeleria brevis aggr.	*Koeleria lobata* (M. Bieb.) Roem. & Schult.	*Ad hoc*	*Koeleria lobata* (M.Bieb.) Roem. & Schult.
Koeleria macrantha aggr.	*Koeleria macrantha* (Ledeb.) Schult.	*Ad hoc*	
Koeleria macrantha aggr.	*Koeleria splendens* C. Presl	*Ad hoc*	*Koeleria cristata* var. *splendens* (C. Presl) Halácsy
Koeleria pyramidata aggr.	*Koeleria grandis* Gorski	Landolt et al. (2010)	*Koeleria pyramidata* subsp. *pyramidata* : this name is the accepted name of an infraspecific taxon of the species *Koeleria pyramidata* (Lam.) P.Beauv.
Koeleria pyramidata aggr.	*Koeleria pyramidata* (Lam.) P. Beauv.	Landolt et al. (2010)	
Lathyrus pratensis aggr.	*Lathyrus hallersteinii* Baumg.	*Ad hoc*	*Lathyrus pratensis* subsp. *hallersteinii* (Baumg.) Nyman
Lathyrus pratensis aggr.	*Lathyrus pratensis* L.	*Ad hoc*	
Leontodon crispus aggr.	*Leontodon biscutellifolius* DC.	Euro+Med (2024)	
Leontodon crispus aggr.	*Leontodon crispus* Vill.	Euro+Med (2024)	
Leontodon hispidus aggr.	*Leontodon hispidus* L.	Landolt et al. (2010)	
Leontodon hispidus aggr.	*Leontodon hyoseroides* Rchb.	Landolt et al. (2010)	
Leucanthemum vulgare aggr.	*Leucanthemum adustum* (W. D. J. Koch) Gremli	Euro+Med (2024)	

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Aggregate	Euro+Med	Source for aggregate definition	Synonyms/Comments
Leucanthemum vulgare aggr.	*Leucanthemum ircutianum* DC.	Euro+Med (2024)	
Leucanthemum vulgare aggr.	*Leucanthemum maximum* (Ramond) DC.	Euro+Med (2024)	
Leucanthemum vulgare aggr.	*Leucanthemum vulgare* Lam.	Euro+Med (2024)	
Linaria vulgaris aggr.	*Linaria angustissima* (Loisel.) Borbás	Ehrendorfer (1973)	
Linaria vulgaris aggr.	*Linaria biebersteinii* Besser	Ehrendorfer (1973)	
Linaria vulgaris aggr.	*Linaria vulgaris* Mill.	Ehrendorfer (1973)	
Linaria vulgaris aggr.	*Linaria* × *kocianovichii* Asch.	*Ad hoc*	The hybrid formula is *L. genistifolia* × *L. vulgaris*
Linum flavum aggr.	*Linum basarabicum* (Săvul. & Rayss) Juz.	Mosyakin & Fedoronchuk (1999)	
Linum flavum aggr.	*Linum flavum* L.	Mosyakin & Fedoronchuk (1999)	
Linum flavum aggr.	*Linum pallasianum* Schult.	*Ad hoc*, based on Didukh et al. (2021)	*Linum czerniaevii* Klokov
Linum flavum aggr.	*Linum tauricum* Willd.	Mosyakin & Fedoronchuk (1999)	
Linum perenne aggr.	*Linum extraaxillare* Kit.	*Ad hoc*	*Linum perenne* subsp. *extraaxillare* (Kit.) Nyman
Linum perenne aggr.	*Linum perenne* L.	Landolt et al. (2010)	
Lotus corniculatus aggr.	*Lotus alpicola* (Beck) Miniaev & al.	*Ad hoc*	*Lotus corniculatus* var. *alpicola* Beck
Lotus corniculatus aggr.	*Lotus borbasii* Ujhelyi	Ehrendorfer (1973)	
Lotus corniculatus aggr.	*Lotus corniculatus* L.	Ehrendorfer (1973)	
Luzula multiflora aggr.	*Luzula alpina* Hoppe	Juillerat et al. (2017)	
Luzula multiflora aggr.	*Luzula multiflora* (Ehrh.) Lej.	Juillerat et al. (2017)	
Luzula multiflora aggr.	*Luzula pallescens* Sw.	Mosyakin & Fedoronchuk (1999)	
Malus sylvestris aggr.	*Malus pumila* Mill.	Juillerat et al. (2017)	
Malus sylvestris aggr.	*Malus sylvestris* (L.) Mill.	Juillerat et al. (2017)	
Molinia caerulea aggr.	*Molinia arundinacea* Schrank	Ehrendorfer (1973)	
Molinia caerulea aggr.	*Molinia caerulea* (L.) Moench	Ehrendorfer (1973)	
Myosotis arvensis aggr.	*Myosotis arvensis* (L.) Hill	*Ad hoc*	
Myosotis arvensis aggr.	*Myosotis discolor* Pers.	*Ad hoc*	
Nonea pulla aggr.	*Nonea atra* Griseb.	*Ad hoc*	
Nonea pulla aggr.	*Nonea pulla* DC.	*Ad hoc*	
Odontarrhena tortuosa aggr.	*Odontarrhena borzaeana* (Nyár.) D. A. German	Mosyakin & Fedoronchuk (1999)	
Odontarrhena tortuosa aggr.	*Odontarrhena tortuosa* (Waldst. & Kit. ex Willd.) C. A. Mey.	Mosyakin & Fedoronchuk (1999)	
Papaver dubium aggr.	*Papaver albiflorum* (Elkan) Pacz.	Ehrendorfer (1973)	
Papaver dubium aggr.	*Papaver dubium* L.	Ehrendorfer (1973)	
Phleum alpinum aggr.	*Phleum alpinum* L.	Juillerat et al. (2017)	
Phleum alpinum aggr.	*Phleum rhaeticum* (Humphries) Rauschert	Juillerat et al. (2017)	
Phleum phleoides aggr.	*Phleum montanum* K. Koch	*Ad hoc*	*Phleum phleoides* subsp. *montanum* (K.Koch) Tzvelev
Phleum phleoides aggr.	*Phleum phleoides* (L.) H. Karst.	*Ad hoc*	
Phleum pratense aggr.	*Phleum nodosum* L.	Juillerat et al. (2017)	
Phleum pratense aggr.	*Phleum pratense* L.	Juillerat et al. (2017)	
Pilosella bifurca aggr.	*Pilosella bifurca* (M. Bieb.) F. W. Schultz & Sch. Bip.	Euro+Med (2024)	
Pilosella bifurca aggr.	*Pilosella rothiana* (Wallr.) F. W. Schultz & Sch. Bip.	Euro+Med (2024)	
Pilosella cymosa aggr.	*Pilosella cymosa* (L.) F. W. Schultz & Sch. Bip.	Landolt et al. (2010)	
Pilosella piloselloides aggr.	*Pilosella bauhini* (Schult.) Arv.-Touv.	Euro+Med (2024)	
Pilosella piloselloides aggr.	*Pilosella pavichii* (Heuff.) Arv.-Touv.	Euro+Med (2024)	
Pilosella piloselloides aggr.	*Pilosella piloselloides* (Vill.) Soják	Euro+Med (2024)	
Pilosella ziziana aggr.	*Pilosella densiflora* (Tausch) Soják	Euro+Med (2024)	
Pilosella ziziana aggr.	*Pilosella ziziana* (Tausch) F. W. Schultz & Sch. Bip.	Euro+Med (2024)	
Pimpinella saxifraga aggr.	*Pimpinella nigra* Mill.	Juillerat et al. (2017)	
Pimpinella saxifraga aggr.	*Pimpinella saxifraga* L.	Juillerat et al. (2017)	
Poa badensis aggr.	*Poa badensis* Willd.	Landolt et al. (2010)	
Poa badensis aggr.	*Poa molinerii* Balb.	Landolt et al. (2010)	
Poa pratensis aggr.	*Poa angustifolia* L.	Landolt et al. (2010)	
Poa pratensis aggr.	*Poa pratensis* L.	Landolt et al. (2010)	
Poa pratensis aggr.	*Poa stiriaca* Dörfl.	Landolt et al. (2010)	
Polygala amara aggr.	*Polygala amara* L.	Juillerat et al. (2017)	
Polygala amara aggr.	*Polygala amarella* Crantz	Juillerat et al. (2017)	
Polygonum aviculare aggr.	*Polygonum aviculare* L.	Euro+Med (2024)	
Polygonum aviculare aggr.	*Polygonum depressum* Meisn.	Euro+Med (2024)	
Polygonum aviculare aggr.	*Polygonum rurivagum* Boreau	Euro+Med (2024)	
Polypodium vulgare aggr.	*Polypodium vulgare* L.	Ehrendorfer (1973)	
Polypodium vulgare aggr.	*Polypodium interjectum* Shivas	Ehrendorfer (1973)	
Potentilla argentea aggr.	*Potentilla argentea* L.	Landolt et al. (2010)	
Potentilla argentea aggr.	*Potentilla inclinata* Vill.	Landolt et al. (2010)	
Potentilla cinerea aggr.	*Potentilla cinerea* Vill.	*Ad hoc*, based on Didukh et al. (2021)	
Potentilla cinerea aggr.	*Potentilla incana* G. Gaertn. & al.	*Ad hoc*, based on Didukh et al. (2021)	
Potentilla cinerea aggr.	*Potentilla tabernaemontani* Asch.	*Ad hoc*, based on Didukh et al. (2021)	*Potentilla incana* Moench
Potentilla cinerea aggr.	*Potentilla tommasiniana* F. W. Schultz	*Ad hoc*, based on Didukh et al. (2021)	*Potentilla cinerea* subsp. *tommasiniana* (F. W. Schultz) Velen.
Potentilla collina aggr.	*Potentilla collina* Wibel	Euro+Med (2024)	
Potentilla collina aggr.	*Potentilla leucopolitana* P. J. Müll.	Euro+Med (2024)	
Potentilla collina aggr.	*Potentilla wimanniana* Günther & Schummel	Euro+Med (2024)	
Potentilla recta aggr.	*Potentilla hirta* L.	Ehrendorfer (1973)	
Potentilla recta aggr.	*Potentilla pedata* Willd.	*Ad hoc*	*Potentilla hirta* subsp. *pedata* (Willd.) Holmboe
Potentilla recta aggr.	*Potentilla recta* L.	Ehrendorfer (1973)	
Prunella vulgaris aggr.	*Prunella laciniata* (L.) L.	Ad hoc	*Prunella vulgaris* subsp. *lanceolata* (W.P.C.Barton) Piper & Beattie
Prunella vulgaris aggr.	*Prunella vulgaris* L.	Landolt et al. (2010)	
Puccinellia distans aggr.	*Puccinellia distans* (Jacq.) Parl.	Landolt et al. (2010)	
Puccinellia distans aggr.	*Puccinellia peisonis* (Beck) Jáv.	*Ad hoc*	*Puccinellia distans* subsp. *peisonis* (Beck) Soó
Pulmonaria officinalis aggr.	*Pulmonaria obscura* Dumort.	Juillerat et al. (2017)	
Pulmonaria officinalis aggr.	*Pulmonaria officinalis* L.	Juillerat et al. (2017)	
Rhinanthus glacialis aggr.	*Rhinanthus glacialis* Personnat	*Ad hoc*	
Rhinanthus glacialis aggr.	*Rhinanthus aristatus* Čelak.	*Ad hoc*	*Rhinanthus glacialis* subsp. *aristatus* (Čelak.) Rauschert
Rosa canina aggr.	*Rosa canina* L.	Juillerat et al. (2017)	
Rosa canina aggr.	*Rosa dumalis* Bechst.	Juillerat et al. (2017)	
Rosa canina aggr.	*Rosa subcanina* (Christ) Vuk.	Juillerat et al. (2017)	
Rosa rubiginosa aggr.	*Rosa agrestis* Savi	Landolt et al. (2010)	
Rosa rubiginosa aggr.	*Rosa inodora* Fr.	Landolt et al. (2010)	
Rosa rubiginosa aggr.	*Rosa micrantha* Sm.	Landolt et al. (2010)	
Rosa rubiginosa aggr.	*Rosa rubiginosa* L.	Landolt et al. (2010)	
Rubus fruticosus aggr.	*Rubus grabowskii* Weihe	Juillerat et al. (2017)	
Rubus fruticosus aggr.	*Rubus koehleri* Weihe	Juillerat et al. (2017)	
Rubus fruticosus aggr.	*Rubus plicatus* Weihe & Nees	Juillerat et al. (2017)	
Rubus hirtus aggr.	*Rubus hirtus* Hegetschw.	Euro+Med (2024)	
Rubus hirtus aggr.	*Rubus schleicheri* Tratt.	*Ad hoc*	*Rubus hirtus* subsp. *schleicheri* (Weihe ex Tratt.) P.Fourn.
Salsola kali aggr.	*Salsola kali* L.	Euro+Med (2024)	

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Aggregate	Euro+Med	Source for aggregate definition	Synonyms/Comments
Salsola kali aggr.	*Salsola tragus* L.	Euro+Med (2024)	
Salvia pratensis aggr.	*Salvia dumetorum* Andrz. ex Besser	*Ad hoc*	*Salvia pratensis* var. *dumetorum* (Andrz. ex Besser) Briq.
Salvia pratensis aggr.	*Salvia pratensis* L.	*Ad hoc*	
Salvia pratensis aggr.	*Salvia transsylvanica* (Schur ex Griseb. & Schenk) Schur	*Ad hoc*	*Salvia pratensis* var. *transsylvanica* Schur ex Griseb. & Schenk
Scleranthus annuus aggr.	*Scleranthus annuus* L.	Landolt et al. (2010)	
Scleranthus annuus aggr.	*Scleranthus polycarpos* L.	Landolt et al. (2010)	
Scleranthus annuus aggr.	*Scleranthus verticillatus* Tausch	Landolt et al. (2010)	
Senecio doria aggr.	*Senecio doria* L.	Landolt et al. (2010)	
Senecio doria aggr.	*Senecio umbrosus* Waldst. & Kit.	Landolt et al. (2010)	
Sesleria caerulea aggr.	*Sesleria caerulea* (L.) Ard.	Landolt et al. (2010)	
Sesleria caerulea aggr.	*Sesleria sadlerana* Janka	Landolt et al. (2010)	
Sesleria caerulea aggr.	*Sesleria uliginosa* Opiz	Landolt et al. (2010)	
Silene otites aggr.	*Silene borysthenica* (Gruner) Walters	Ehrendorfer (1973)	
Silene otites aggr.	*Silene chersonensis* (Zapałł.) Kleopow	*Ad hoc*	*Otites chersonensis* (Zapał.) Klokov
Silene otites aggr.	*Silene densiflora* d'Urv.	Ehrendorfer (1973)	
Silene otites aggr.	*Silene dolichocarpa* Czerep.	Ehrendorfer (1973)	
Silene otites aggr.	*Silene donetzica* Kleopow	Ehrendorfer (1973)	
Silene otites aggr.	*Silene eugeniae* Kleopow	*Ad hoc*	*Otites eugeniae* (Kleopow) Klokov
Silene otites aggr.	*Silene exaltata* Friv.	*Ad hoc*	*Otites chersonensis* (Zapał.) Klokov
Silene otites aggr.	*Silene hellmannii* Claus	*Ad hoc*	*Otites graniticola* Klokov
Silene otites aggr.	*Silene otites* (L.) Wibel	Ehrendorfer (1973)	
Silene otites aggr.	*Silene wolgensis* (Hornem.) Otth	Ehrendorfer (1973)	
Sorbus aria aggr.	*Sorbus aria* (L.) Crantz	Ehrendorfer (1973)	
Sorbus aria aggr.	*Sorbus austriaca* (Beck) Prain & al.	Ehrendorfer (1973)	
Sorbus aria aggr.	*Sorbus intermedia* (Ehrh.) Pers.	Ehrendorfer (1973)	
Stachys recta aggr.	*Stachys atherocalyx* K. Koch	*Ad hoc*	*Stachys recta* subsp. *atherocalyx* (K. Koch) Stoj. & Stef.
Stachys recta aggr.	*Stachys recta* L.	*Ad hoc*	
Thymus serpyllum aggr.	*Thymus kosteleckyanus* Opiz	Landolt et al. (2010)	
Thymus serpyllum aggr.	*Thymus longicaulis* C. Presl	Landolt et al. (2010)	
Thymus serpyllum aggr.	*Thymus odoratissimus* Mill.	Landolt et al. (2010)	
Thymus serpyllum aggr.	*Thymus praecox* Opiz	Landolt et al. (2010)	
Thymus serpyllum aggr.	*Thymus serpyllum* L.	Landolt et al. (2010)	
Valeriana officinalis aggr.	*Valeriana excelsa* Poir.	Euro+Med (2024)	
Valeriana officinalis aggr.	*Valeriana officinalis* L.	Euro+Med (2024)	
Valeriana officinalis aggr.	*Valeriana stolonifera* Czern.	Euro+Med (2024)	
Valerianella locusta aggr.	*Valerianella carinata* Loisel.	Landolt et al. (2010)	
Valerianella locusta aggr.	*Valerianella coronata* (L.) DC.	Landolt et al. (2010)	
Valerianella locusta aggr.	*Valerianella dentata* (L.) Pollich	Landolt et al. (2010)	
Valerianella locusta aggr.	*Valerianella locusta* (L.) Laterr.	Landolt et al. (2010)	
Valerianella locusta aggr.	*Valerianella rimosa* Bastard	Landolt et al. (2010)	
Verbascum nigrum aggr.	*Verbascum lanatum* Schrad.	Landolt et al. (2010)	
Verbascum nigrum aggr.	*Verbascum nigrum* L.	Landolt et al. (2010)	
Verbascum phlomoides aggr.	*Verbascum densiflorum* Bertol.	*Ad hoc*	*Verbascum phlomoides* subsp. *thapsiforme* (Schrad.) Rouy
Verbascum phlomoides aggr.	*Verbascum phlomoides* L.	*Ad hoc*	
Veronica chamaedrys aggr.	*Veronica chamaedrys* L.	Landolt et al. (2010)	
Veronica chamaedrys aggr.	*Veronica vindobonensis* (M. A. Fisch.) M. A. Fisch.	Landolt et al. (2010)	
Veronica hederifolia aggr.	*Veronica hederifolia* L.	Landolt et al. (2010)	
Veronica hederifolia aggr.	*Veronica sublobata* M. A. Fisch.	Landolt et al. (2010)	
Veronica hederifolia aggr.	*Veronica triloba* (Opiz) Opiz	Landolt et al. (2010)	
Veronica spicata aggr.	*Veronica orchidea* Crantz	Landolt et al. (2010)	
Veronica spicata aggr.	*Veronica spicata* L.	Landolt et al. (2010)	
Veronica spuria aggr.	*Veronica bachofenii* Heuff.	*Ad hoc*	*Veronica spuria* subsp. *bachofenii* (Heuff.) Stoj. & Stef.
Veronica spuria aggr.	*Veronica spuria* L.	*Ad hoc*	
Veronica verna aggr.	*Veronica dillenii* Crantz	Ehrendorfer (1973)	
Veronica verna aggr.	*Veronica verna* L.	Ehrendorfer (1973)	
Viola arvensis aggr.	*Viola arvensis* Murray	Landolt et al. (2010)	
Viola arvensis aggr.	*Viola kitaibeliana* Schult.	Landolt et al. (2010)	
Xeranthemum annum aggr.	*Xeranthemum annuum* L.	*Ad hoc*	
Xeranthemum annum aggr.	*Xeranthemum inapertum* (L.) Mill.	*Ad hoc*	*Xeranthemum annuum* var. *inapertum* L.

Vasheniak et al. (2024): Vegetation of annuals and succulents on dry calcareous substrates (*Alysso alyssoidis-Sedion*) in eastern Central Europe, western Ukraine and Moldova. – Tuexenia 44 (2024).

Supplement E3. Description of the first eleven clusters that were excluded from the further analysis.

Anhang E3. Interpretation und Artenlisten der elf von der weiteren Analyse exkludierten Cluster.

Cluster 1. Ruderal communities - outlier: 14 relevés
Diagnostic species: *Achillea millefolium* aggr., *Agrostis* sp., *Arctium* sp., *Bellis perennis, Calamagrostis epigejos, Capsella bursa-pastoris, Cerastium fontanum, Cerastium pumilum, Draba verna aggr., Holcus lanatus, Hypochaeris radicata, Iris x germanica, Lolium perenne, Lysimachia nummularia, Ochlopoa annua, Oxalis stricta, Stellaria graminea, Taraxacum* sect. *Taraxacum, Trifolium diffusum,* ***Trifolium repens,*** *Veronica arvensis, Vicia sepium*
Constant species: ***Achillea millefolium aggr.,*** *Arabidopsis thaliana, Arenaria serpyllifolia aggr., Capsella bursa-pastoris,* ***Cerastium pumilum, Draba verna*** **aggr.,** *Erigeron canadensis, Ochlopoa annua, Plantago lanceolata, Poa pratensis* aggr., *Potentilla argentea* aggr., ***Taraxacum*** **sect.** ***Taraxacum, Trifolium repens,*** *Veronica arvensis, Veronica verna* aggr.

Cluster 2. Ruderal communities – outlier: 4 relevés
Diagnostic species: *Anthriscus sylvestris,* ***Arabidopsis arenosa*** **aggr.,** *Cruciata glabra,* ***Draba nemorosa,*** *Echium vulgare,* ***Equisetum arvense,*** *Erigeron canadensis, Festuca sp., Leucanthemum vulgare* aggr., ***Lotus corniculatus*** **aggr.,** ***Myosotis arvensis*** **aggr.,** ***Pastinaca sativa,*** *Poa compressa, Poa pratensis* aggr., ***Rumex acetosella, Schedonorus pratensis, Silene latifolia, Silene nutans, Tragopogon pratensis,*** *Trifolium pratense,* ***Viola tricolor***
Constant species: ***Arabidopsis arenosa*** **aggr.,** ***Arenaria serpyllifolia*** **aggr.,** *Draba nemorosa,* ***Echium vulgare,*** *Equisetum arvense, Erigeron canadensis,* ***Lotus corniculatus*** **aggr.,** ***Myosotis arvensis*** **aggr.,** *Pastinaca sativa,* ***Poa compressa,*** *Poa pratensis* aggr., ***Rumex acetosella,*** *Schedonorus pratensis, Silene latifolia, Silene nutans, Tragopogon pratensis,* ***Viola tricolor***

Cluster 3. Transitional ruderal communities to the *Medicagini lupulinae-Sedetum spurii* outlier: 7 relevés (no. 617 – *Medicagini-Sedetum spurii* nomenclatural type).
Diagnostic species: *Anisantha tectorum, Arrhenatherum elatius, Atriplex patula, Berteroa incana, Calystegia sepium, Cerastium tomentosum, Crepis biennis, Elytrigia repens, Euphorbia esula, Medicago lu pulina, Polygonum aviculare* aggr., *Potentilla argentea* aggr., *Potentilla grandiflora,* ***Sedum spurium,*** *Sonchus oleraceus, Taraxacum* sect. *Taraxacum*
Constant species: *Achillea millefolium* aggr., *Anisantha tectorum, Arenaria serpyllifolia* aggr., *Arrhenatherum elatius, Berteroa incana, Cerastium arvense, Elytrigia repens, Festuca valesiaca aggr., Medicago lupulina,* ***Poa compressa,*** *Polygonum aviculare* aggr., ***Potentilla argentea*** **aggr.,** ***Sedum spurium, Taraxacum*** **sect.** ***Taraxacum***

Cluster 4. Outlier: 8 relevés
Diagnostic species: *Cytisus scoparius, Jovibarba globifera, Poa compressa, Rhamnus cathartica, Sedum acre, Tanacetum parthenium, Trisetum flavescens, Veronica persica*
Constant species: *Arenaria serpyllifolia aggr.,* ***Jovibarba globifera, Poa compressa, Sedum acre,*** *Thymus pulegioides*

Cluster 5. Ruderal communities similar to *Sedo-Sempervivetum tectorum*: 65 relevés (no. 616 – *Sedo sexangulari-Sempervivetum tectori* nomenclatural type)
Diagnostic species: *Artemisia vulgaris, Chelidonium majus, Lamium album, Poa compressa, Sempervivum tectorum, Taraxacum* sect. *Taraxacum*
Constant species: *Achillea millefolium* aggr., *Arenaria serpyllifolia* aggr., *Artemisia vulgaris,* ***Poa compressa,*** *Potentilla argentea* aggr., *Sedum acre,* ***Taraxacum*** **sect.** ***Taraxacum***
Dominant species: *Arenaria serpyllifolia* aggr., *Bromus hordeaceus, Poa compressa, Poa pratensis* aggr., *Sedum acre, Sedum album, Sedum rupestre, Sedum sexangulare*

Cluster 6. Outlier 1 relevé.
Diagnostic species: ***Gypsophila muralis, Polycnemum arvense***
Constant species: ***Gypsophila muralis, Polycnemum arvense***

Cluster 7. *Thero-Airion* alliance: 12 relevés
Diagnostic species: *Agrostis capillaris, Agrostis vinealis,* ***Aira praecox,*** *Carex ericetorum, Carlina vulgaris aggr.,* ***Cerastium semidecandrum,*** *Cirsium arvense, Corynephorus canescens, Draba verna* aggr., *Helichrysum arenarium, Lolium perenne, Ochlopoa annua,* ***Pinus sylvestris,*** *Prunus* sp., ***Spergula morisonii,*** *Spergula* sp., *Spergularia rubra, Vulpia myuros*
Constant species: *Agrostis capillaris,* ***Aira praecox, Cerastium semidecandrum, Draba verna*** **aggr.,** *Ochlopoa annua, Pinus sylvestris, Poa bulbosa,* ***Spergula morisonii***

Cluster 8. *Sedo albi-Veronicion dillenii* alliance: 71 relevés.
Diagnostic species: *Draba verna* aggr., *Gagea bohemica, Myosotis stricta, Rumex acetosella, Scleranthus perennis, Trifolium arvense, Veronica verna* aggr.
Constant species: *Arenaria serpyllifolia* aggr., *Centaurea stoebe* aggr., *Cerastium pumilum,* ***Draba verna*** **aggr.,** *Euphorbia cyparissias, Festuca valesiaca* aggr., *Gagea bohemica, Koeleria macrantha* aggr., *Myosotis stricta, Pilosella officinarum, Poa bulbosa, Potentilla cinerea* aggr., ***Rumex acetosella,*** *Scleranthus perennis, Sedum acre, Sedum sexangulare, Thymus serpyllum* aggr., *Trifolium arvense,* ***Veronica verna aggr.,*** *Viola arvensis* aggr.

Cluster 9. Outlier: 4 relevés (*Pimpinello-Thymion zygoidis* alliance).
Diagnostic species: ***Allium saxatile, Anthemis ruthenica, Asperula tenella, Campanula romanica, Crepis sancta, Dianthus nardiformis,*** *Koeleria brevis* aggr., ***Minuartia adenotricha,*** *Paronychia cephalotes,* ***Sedum urvillei, Seseli pallasii,*** *Thymus zygioides*
Constant species: *Allium saxatile, Anthemis ruthenica, Arenaria serpyllifolia* aggr., ***Asperula tenella,*** *Campanula romanica,* ***Clinopodium acinos,*** *Crepis sancta, Dianthus nardiformis, Melica ciliata, Minuartia adenotricha,* ***Poa bulbosa, Sedum urvillei, Seseli pallasii***

Cluster 10. *Erodio cicutarii-Brometum hordeacei*: 53 releves (no. 613 – *Erodio cicutarii-Brometum hordeacei* nomenclatural type)
Diagnostic species: *Carex liparocarpos, Carex stenophylla, Cerastium pumilum, Cynodon dactylon, Erodium cicutarium, Eryngium campestre, Festuca valesiaca* aggr., *Ornithogalum orthophyllum, Petrorhagia saxifraga, Taraxacum* sect. *Erythrosperma, Veronica praecox, Vicia sativa*
Constant species: *Achillea millefolium* aggr.*, Alyssum alyssoides,* ***Arenaria serpyllifolia* aggr.,** *Centaurea stoebe* aggr., ***Cerastium pumilum,*** *Cerastium semidecandrum, Draba verna* aggr., *Erodium cicutarium, Eryngium campestre, Euphorbia cyparissias,* ***Festuca valesiaca* aggr.,** *Medicago minima, Plantago lanceolata,* ***Poa bulbosa,*** *Potentilla cinerea* aggr., *Saxifraga tridactylites, Sedum acre, Sedum sexangulare, Taraxacum* sect. *Erythrosperma, Thymus serpyllum* aggr., *Veronica arvensis*

Cluster 11. *Hyperico perforati-Scleranthion perennis:* 65 relevés (no. 593 – *Sedo acri-Saxifragetum tridactylitae* nomenclatural type)
Diagnostic species: *Alyssum alyssoides, Artemisia austriaca, Astragalus austriacus, Minuartia setacea, Poa bulbosa, Saxifraga tridactylites, Xeranthemum annum* aggr.
Constant species: ***Alyssum alyssoides, Arenaria serpyllifolia* aggr.,** *Artemisia austriaca, Asperula cynanchica* aggr., *Clinopodium acinos,* ***Draba verna* aggr., *Festuca valesiaca* aggr.,** *Holosteum umbellatum, Medicago minima,* ***Poa bulbosa, Potentilla cinerea* aggr., *Saxifraga tridactylites, Sedum acre,*** *Thymus pulegioides.*

Supplement E4. Full synoptic table showing the percentage constancy and fidelity of species (superscript) in eight clusters. Species are ranked by decreasing fidelity measured with the *phi*-coefficient. Species with a *phi*-value greater than 0.2 are considered diagnostic; species with a *phi*-value greater than 0.5 are considered highly diagnostic. Species that are highly diagnostic or diagnostic in one cluster are accepted as diagnostic for associations; species that are highly diagnostic or diagnostic in more than one cluster are accepted as diagnostic for high-rank syntaxa. Bryophyte and lichen taxa are placed separately on the bottom of the table.

Anhang E4. Vollständige Stetigkeitstabelle, die die prozentuale Frequenz und Treue der Arten (hochgestellt) in acht Clustern zeigt. Die Arten werden nach abnehmender Treue, gemessen mit dem *phi*-Koeffizienten, eingestuft. Arten mit einem *phi*-Wert größer als 0,2 gelten als diagnostisch; Arten mit einem *phi*-Wert größer als 0,5 gelten als hochdiagnostisch. Arten, die in einem Cluster hochdiagnostisch oder diagnostisch sind, werden als diagnostisch für Assoziationen akzeptiert; Arten, die in mehr als einem Cluster hochdiagnostisch oder diagnostisch sind, werden als diagnostisch für hochrangige Syntaxa akzeptiert. Bryophyten- und Flechtentaxa sind separat am unteren Ende der Tabelle aufgeführt.

Syntaxon ID	A	B	C	D	E	F	G	H
No. of relevés	33	47	81	4	45	5	50	51
No. of relevés with records of cryptogar	18	34	74	0	33	0	37	33
Plot size, m^2 (min)	1	1	1	1	1	4	1	1
Plot size, m^2 (max)	100	100	100	25	100	100	45	80
Plot size, m^2 (mean)	14	16	13	12	26	36	7	13
Ass. *Sempervivetum soboliferi*								
Jovibarba globifera	45 $^{33.1}$	6	1	.	18	20	18	18
Lactuca muralis	9 $^{28.1}$	.	.	.	.	.	.	.
Arabidopsis arenosa aggr.	21 $^{26.7}$	4	12 $^{12.0}$	.	2	.	2	.
Ass. *Saxifrago tridactylitae-Poetum compressae*								
Poa compressa	6	62 $^{44.8}$	16	.	11	20	8	14
Achillea millefolium aggr.	3	47 $^{37.5}$	15	.	16	.	4	22
Plantago media	.	13 $^{31.8}$	1	.	.	.	.	.
Clinopodium acinos	12	83 $^{29.7}$	58	.	51	20	64	67
Pilosella officinarum	.	30 $^{29.4}$	4	.	22 $^{19.3}$	.	8	2
Anthyllis vulneraria	.	13 $^{29.6}$	1	.	2	.	.	2
Ass. *Aurinio saxatilis-Allietum podolici*								
Allium podolicum	.	.	38 $^{59.3}$	.	.	.	.	.
Rostraria cristata	.	2	28 $^{48.5}$	.	.	.	.	.
Sempervivum ruthenicum	.	.	19 $^{40.7}$	.	.	.	.	.
Poa versicolor	.	.	15 $^{36.3}$	.	.	.	.	.
Draba nemorosa	.	.	14 $^{34.8}$	.	.	.	.	.
Gypsophila thyraica	.	.	12 $^{33.1}$	.	.	.	.	.
Veronica incana	.	.	12 $^{33.1}$	.	.	.	.	.
Erysimum diffusum	.	.	12 $^{30.1}$	.	.	.	2	.
Bothriochloa ischaemum	.	4	20 $^{28.7}$	.	7	.	.	4
Lappula squarrosa	.	.	12 $^{27.6}$	.	.	.	.	4
Minuartia setacea	.	.	15 27.6	.	.	.	6	2
Thalictrum minus	3	.	11 $^{26.8}$	.	.	.	.	.
Aurinia saxatilis	15	.	21 $^{26.7}$	.	.	.	.	6
Stipa pulcherrima	.	.	10 $^{26.2}$	.	.	.	2	.
Galium humifusum	.	.	7 $^{25.6}$	.	.	.	.	.
Ass. *Alysso petraei-Sedetum hispanici*								
Aurinia petraea	.	.	.	75 $^{85.1}$	.	.	.	.
Satureja kitaibelii	.	.	.	75 $^{85.1}$	.	.	.	.
Piptatherum holciforme	.	.	.	75 $^{85.1}$	.	.	.	.
Achillea crithmifolia	.	.	.	75 $^{85.1}$	.	.	.	.
Orlaya grandiflora	.	.	.	75 $^{83.8}$	.	.	2	.
Verbascum nigrum aggr.	.	2	1	75 $^{82.9}$	.	.	.	.
Hippocrepis emerus	.	.	.	50 $^{68.3}$	.	.	.	.
Scabiosa columbaria	.	.	.	50 $^{68.3}$	.	.	.	.
Lactuca quercina	.	.	.	50 $^{68.3}$	.	.	.	.
Centaurea atropurpurea	.	.	.	50 $^{68.3}$	.	.	.	.
Tragopogon dubius	.	.	.	50 $^{66.7}$	.	.	2	.
Veronica austriaca	.	.	1	50 $^{65.8}$	.	.	.	2
Anisantha sterilis	3	2	.	75 $^{58.7}$	7	40 $^{23.4}$	2	6
Linaria genistifolia	.	2	6	50 $^{56.0}$	2	.	4	4
Campanula sibirica	3	2	12 $^{1.4}$	50 $^{47.3}$	.	20	2	.
Silene vulgaris	12	11	.	50 $^{46.5}$	9	.	.	6
Chondrilla juncea	.	.	.	25 $^{45.3}$	.	.	2	.
Stipa eriocaulis	.	.	.	25 $^{45.3}$	.	.	2	.
Asplenium ceterach	.	.	.	25 $^{45.3}$	.	.	2	.
Dictamnus albus	.	.	1	25 $^{44.0}$	.	.	2	.
Stachys recta aggr.	9	11	19	75 $^{43.2}$	2	20	24	43 $^{15.5}$
Ass. *Alysso alyssoidis-Sedetum* (central association)								
Festuca ovina aggr.	.	4	1	.	27 $^{41.9}$	.	.	2
Ass. *Alyssetum muralis*								
Odontarrhena muralis	.	2	.	.	.	60 $^{73.8}$	.	.
Clinopodium alpinum	3	.	.	.	.	60 $^{73.1}$	.	.
Thymus comosus	.	.	.	.	.	40 $^{60.7}$	.	.
Artemisia absinthium	6	.	7 $^{1.1}$	.	.	40 $^{50.4}$	.	.
Seseli osseum	33 $^{10.8}$	.	1	.	9	80 $^{50.2}$	38 $^{12.8}$	27 $^{3.4}$
Poa nemoralis	9	2	.	.	2	40 $^{48.1}$	.	4
Fallopia convolvulus	6	.	4	.	.	40 $^{48.0}$	.	8
Minuartia verna	.	.	.	.	.	20 $^{42.4}$	.	.
Draba lasiocarpa	.	.	.	.	.	20 $^{42.4}$	.	.
Cornus mas	.	.	.	.	.	20 $^{42.4}$	.	.
Hylotelephium maximum aggr.	21	4	15	.	22	60 $^{42.2}$	2	16
Sesleria heuflerana	.	.	1	.	.	20 $^{40.8}$	.	.
Festuca pallens	33 $^{15.5}$	.	4	.	13	60 $^{39.9}$	22	18
Quercus pubescens	.	.	.	.	.	20 $^{39.9}$	.	2
Sempervivum marmoreum	.	.	.	.	.	20 $^{39.9}$	2	.
Ass. *Cerastietum pumili*								
Draba verna aggr.	.	9	19	.	18	.	46 $^{38.7}$	8

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No. of relevés with records of cryptogar	18	34	74	0	33	0	37	33
Plot size, m^2 (min)	1	1	1	1	1	4	1	1
Plot size, m^2 (max)	100	100	100	25	100	100	45	80
Plot size, m^2 (mean)	14	16	13	12	26	36	7	13
Continuation of other vascular species								
Daucus carota	3	2	1	.	.	.	.	2
Artemisia pontica	3	.	.	.	.	.	.	.
Picris hieracioides	.	2	.	.	.	.	.	.
Pilosella auriculoides	.	.	.	.	.	.	2	.
Galatella linosyris	.	.	1	.	.	.	2	2
Potentilla x adulterina	.	.	.	.	2	.	.	.
Vicia grandiflora	3	.	.	.	.	.	.	.
Acer pseudoplatanus	3	.	.	.	.	.	.	.
Turritis glabra	.	2	4	.	2	.	.	.
Iris aphylla	.	2	.	.	.	.	.	.
Crepis tectorum aggr.	.	.	1	.	.	.	.	.
Campanula rotundifolia aggr.	9	2	2	.	2	.	.	.
Sedum rupestre	9	4	.	.	4	.	2	8
Lithospermum officinale	.	.	1	.	.	.	.	.
Fumana procumbens	3	2	.	.	.	.	4	.
Jasione montana	.	2	.	.	.	.	.	.
Carex montana	.	.	1	.	.	.	.	2
Setaria sp.	.	.	4	.	.	.	2	.
Nigella arvensis	.	.	1	.	.	.	.	.
Teucrium botrys	12 $^{18.3}$	9	.	.	4	.	2	.
Arabis hirsuta aggr.	.	13 $^{19.1}$	11 $^{15.7}$	.	.	.	4	.
Rosa rubiginosa aggr.	.	.	2	.	.	.	.	2
Camelina sp.	.	.	.	.	.	.	2	.
Pilosella piloselloides aggr.	.	4	12 $^{18.7}$	.	4	.	6	.
Polygala comosa	.	2	1	.	2	.	.	.
Silene chlorantha	.	.	.	.	2	.	.	.
Euphorbia cyparissias	18	51	52 $^{8.3}$	25	53	60	30	39
Euphorbia helioscopia	.	2	.	.	.	.	.	.
Carduus nutans	.	2	.	.	.	.	.	.
Agropyron cristatum aggr.	.	.	4 $^{18.0}$	.	.	.	.	.
Asperula cynanchica aggr.	.	11	23 $^{11.6}$	.	11	20	24	16
Silene csereii	.	.	2	.	.	.	.	.
Galium pusillum aggr.	3	.	.	.	2	.	.	.
Seseli libanotis	3	2	7 $^{14.2}$	.	.	.	.	4
Buglossoides arvensis	.	4	.	.	2	.	2	2
Capsella bursa-pastoris	.	2	.	.	.	.	2	.
Potentilla recta aggr.	3	.	5 $^{15.0}$	.	.	.	.	.
Bromus squarrosus	.	.	6 $^{13.9}$	.	4	.	2	.
Salvia verticillata	9	13	15 $^{14.4}$	.	2	.	4	4
Cerastium arvense	.	4	1	25	11 $^{9.4}$	.	2	.
Lactuca saligna	.	.	.	.	.	.	2	.
Camelina microcarpa	.	.	5 $^{20.9}$	.	.	.	.	.
Potentilla argentea aggr.	.	19 $^{12.2}$	2	.	13 $^{4.8}$	40	.	2
Galium lucidum	3	.	.	.	.	.	2	.
Cytisus blockianus	.	.	5 $^{20.9}$	.	.	.	.	.
Vicia tetrasperma	.	2	.	.	.	.	.	2
Erysimum sp.	.	.	1	.	.	.	.	.
Rosa canina aggr.	3	4	6	.	4	.	.	2
Hypericum perfoliatum	.	21 $^{9.4}$	6	.	20 $^{8.0}$	40	8	8
Carlina vulgaris aggr.	.	4	6 $^{14.1}$	.	.	.	2	.
Filago arvensis	.	.	.	.	.	.	.	2
Lactuca viminea	9 $^{20.1}$	.	.	.	.	.	4	2
Fragaria vesca	.	2	.	.	4	.	.	.
Allium obliquum	.	.	1	.	.	.	.	.
Verbascum thapsus	.	4	.	.	2	.	.	.
Teucrium montanum	3	.	9 $^{9.1}$	.	.	20	.	.
Odontarrhena tortuosa aggr.	.	2	.	.	.	.	.	.
Silene otites aggr.	3	6	21 $^{21.2}$	.	7	.	2	16
Geranium robertianum	21 $^{20.1}$	4	.	25	4	.	2	2
Anisantha tectorum	.	4	.	.	2	.	8 $^{15.5}$	2
Setaria viridis	3	.	6	.	.	.	10	4
Geranium columbinum	3	4	.	.	4	20	10 $^{8.1}$	.
Bromopsis erecta	.	2	.	.	7	.	10 $^{14.1}$	8
Allium sphaerocephalon	.	2	.	.	2	.	8 $^{17.7}$	2
Arabis auriculata	.	2	22 $^{19.0}$	.	2	20	20 $^{16.0}$	.
Artemisia austriaca	.	6	12 $^{21.3}$	.	4	.	.	.
Asparagus officinalis	.	.	1	.	7 $^{18.6}$	.	.	2
Petrorhagia prolifera	.	11 $^{18.6}$	.	.	9 $^{14.5}$	.	.	2

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Syntaxon ID	A	B	C	D	E	F	G	H
Cerastium pumilum	.	.	.	.	2	.	20 37.5	2
Noccaea perfoliata	.	11	9	.	9	.	36 36.4	6
Thymus serpyllum aggr.	18	17	1	.	16	20	60 35.9	37 14.9
Sanguisorba minor	3	40 20.2	.	.	36 15.5	.	56 35.1	20
Holosteum umbellatum	.	15	12	.	7	.	32 29.8	8
Polycnemum arvense	.	.	.	.	.	.	10 29.8	.
Alyssum alyssoides	3	45	48 16.4	.	27	20	62 28.8	24
Veronica praecox	.	.	2	.	.	.	12 26.5	2
Erodium cicutarium	3	4	1	.	9	.	22 25.8	8
Ass. *Sedo albi-Allietum montani*								
Melica transsilvanica	9	.	12	.	7	.	.	39 41.9
Erysimum crepidifolium	.	.	.	.	.	.	4	20 37.2
Dianthus carthusianorum aggr.	.	28 22.9	.	.	9	.	4	37 35.1
Koeleria macrantha aggr.	3	6	4	.	16	.	20	35 30.6
Pulsatilla pratensis	.	.	1	.	.	.	.	12 30.3
Allium lusitanicum aggr.	36	9	38 19.9	.	2	.	12	47 28.5
Alyssum montanum aggr.	9	.	4	.	2	.	2	20 27.2
Festuca valesiaca aggr.	6	36	57 21.4	.	40	.	44	63 26.2
All. *Alysso-Sedion*, ord. *Alysso-Sedetalia*								
Sedum hispanicum	.	2	7	100 67.8	.	80 50.1	.	.
Allium flavum	6	.	.	75 45.7	.	80 50.2	26 2.1	2
Melica ciliata	3	4	.	75 40.3	13	100 61.5	22	2
Sedum album	94 55.2	6	1	.	13	20	80 32.8	88 39.2
Saxifraga tridactylites	3	4	20 29.7	.	7	.	20 29.7	.
Cl. *Sedo-Scleranthetea*								
Thymus pulegioides aggr.	3	51 31.6	56 30.6	.	29	.	.	10
Sedum acre	12	87 32.8	84 30.3	.	24	60	54	31
Sedum sexangulare	6	21	11	.	93 54.5	.	36	59 25.6
Other vascular species								
Galium mollugo aggr.	12	11	9	75 47.6	11	60 34.0	.	2
Seseli hippomarathrum	.	.	5	.	.	.	2	12 23.6
Thymus sp.	.	.	.	.	.	.	.	6 22.8
Leopoldia tenuiflora	.	.	.	.	.	.	.	6 22.8
Echium vulgare	15	21	21	25	20	20	40 11.1	53 22.2
Trifolium arvense	.	9	1	.	11	.	10	20 20.7
Cyanus triumfettii aggr.	.	.	1	.	.	.	.	6 20.1
Iris pumila	.	.	.	.	.	.	4	8 19.9
Centaurea stoebe aggr.	12	53	38	.	47	20	44	59 19.7
Scleranthus perennis	.	.	.	.	.	.	2	6 18.7
Carex praecox	.	.	.	.	.	.	.	4 18.6
Myosotis ramosissima	.	.	.	.	.	.	.	4 18.6
Bromopsis ramosa	.	.	.	.	.	.	.	4 18.6
Cotoneaster integerrimus	.	2	.	.	.	.	.	6 18.5
Vicia hirsuta	.	.	1	.	2	.	.	6 16.6
Teucrium chamaedrys	.	11	22	.	18	20	14	29 16.4
Galium glaucum	9	2	11	.	.	.	8	16 16.1
Phleum phleoides aggr.	6	21 12.8	.	.	11	20	4	24 15.6
Helianthemum canum aggr.	9 21.8	.	.	.	.	.	.	8 15.0
Centaurea scabiosa	.	4	4	.	7	.	.	10 14.8
Allium oleraceum	3	4	.	.	2	.	.	8 14.7
Sesleria caerulea aggr.	3	.	.	.	.	.	2	6 14.7
Arrhenatherum elatius	3	15 13.1	.	.	16 14.1	.	2	16 14.4
Lactuca perennis	6	.	.	.	.	.	4	8 14.3
Veronica verna aggr.	9	6	6	.	2	.	20 17.5	18 14.1
Galeopsis angustifolia	9 19.3	.	.	.	2	.	.	8 13.5
Poa bulbosa	6	4	15	25	16	.	26 12.1	25 11.6
Medicago minima	.	17	9	25	7	.	36 22.5	25 11.3
Convolvulus arvensis	.	13 9.5	7	.	4	20	.	8
Euphorbia illirica	.	.	1	.	.	.	.	.
Centaurea orientalis	.	.	1	.	.	.	.	.
Polypodium vulgare aggr.	3	2	.	.	.	.	.	.
Cornus sanguinea	.	.	.	.	2	.	.	2
Allium vineale	.	2	.	.	2	.	.	.
Knautia arvensis	.	4	1	.	2	.	.	.
Poa pratensis aggr.	.	13 19.6	4	.	7	.	.	.
Veronica sp.	.	.	.	.	.	.	.	2
Peucedanum oreoselinum	3	4	2	.	.	.	.	.
Vincetoxicum hirundinaria	3	15	6	.	9	.	.	2
Artemisia campestris	18	32	21	.	13	40	16	31
Scabiosa ochroleuca	6	38 16.2	15	50	18	20	10	10
Ononis spinosa	.	4 19.3	.	.	.	.	.	.
Festuca rubra aggr.	.	9 19.3	1	.	4	.	.	.
Medicago sativa	.	6 23.7	.	.	.	.	.	.
Vicia cracca	.	.	.	.	2	.	.	.
Carex hirta	.	.	.	.	2	.	.	.
Seseli austriacum	.	.	.	.	.	.	2	.
Potentilla heptaphylla	.	9 16.6	.	.	7	.	2	.
Allium denudatum	.	.	1	.	.	.	.	.
Sisymbrium orientale	.	.	.	.	.	.	2	.
Primula veris	.	.	.	.	2	.	.	.
Hyacinthella leucophaea	.	.	1	.	.	.	.	.
Veronica chamaedrys aggr.	.	9 21.2	.	.	.	.	4	.
Brachypodium pinnatum	.	4 19.3	.	.	.	.	.	.
Allium scorodoprasum	.	.	1	.	.	.	.	2
Campanula rapunculoides	.	4 19.3	.	.	.	.	.	.
Fragaria viridis	.	15 22.2	2	.	7	.	4	2
Agrimonia eupatoria aggr.	.	4	1	.	2	.	.	.

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Syntaxon ID	A	B	C	D	E	F	G	H
Linum catharticum	.	4	.	.	7 15.1	.	2	.
Lamium amplexicaule	.	.	.	.	.	.	4	.
Minuartia rubra	6	.	.	.	2	.	14 22.8	4
Potentilla cinerea aggr.	9	26	46 14.4	.	27	20	56 23.0	45
Medicago monspeliaca	.	.	.	.	.	.	6 23.0	.
Taraxacum sect. *Erythrosperma*	.	.	.	.	2	.	10 19.7	6
Arenaria serpyllifolia aggr.	6	64	68 20.2	.	40	40	68 20.2	47
Cerastium brachypetalum	.	.	.	.	.	.	4 18.8	.
Poa badensis aggr.	6	.	.	.	.	.	12 21.4	4
Myosotis stricta	.	.	1	.	4	.	12 20.2	6
Cleistogenes serotina	.	.	10 23.3	.	2	.	2	.
Camelina sativa aggr.	.	.	1	.	.	.	.	.
Cotoneaster melanocarpus aggr.	.	.	6 23.3	.	.	.	.	.
Inula ensifolia	.	.	5 20.9	.	.	.	.	.
Cichorium intybus	.	4	2	.	.	.	.	.
Stipa capillata	.	.	11 21.5	.	2	.	2	4
Melilotus officinalis	3	2	10 22.3	.	.	.	.	.
Asyneuma canescens	.	.	1	.	.	.	.	.
Rumex acetosella	3	11 14.2	.	.	13 19.7	.	.	2
Cruciata glabra	.	.	.	.	2	.	.	.
Euphorbia esula	.	.	.	.	4 19.8	.	.	.
Bromus hordeaceus	.	4	2	.	9 17.2	.	2	.
Securigera varia	3	9	11	.	18 13.5	20	.	4
Verbascum phoeniceum	.	.	1	.	.	.	.	.
Viola arvensis aggr.	6	6	.	.	18 20.3	.	6	8
Petrorhagia saxifraga	.	.	.	.	9 21.9	.	.	4
Quercus robur	.	.	.	.	4 19.8	.	.	.
Plantago lanceolata	.	21 24.2	1	.	18 18.6	.	6	2
Pimpinella saxifraga aggr.	3	19 15.4	2	.	20 16.6	.	14	6
Carex caryophyllea	.	.	.	.	7 20.7	.	.	2
Prunus mahaleb	3	.	.	.	.	.	.	.
Ranunculus bulbosus	.	2	.	.	.	.	.	.
Hieracium virosum	.	.	2	.	.	.	.	.
Adonis vernalis	.	.	1	.	.	.	.	.
Crepis foetida	.	.	4	.	.	.	.	4
Dactylis glomerata	.	6	.	.	2	.	.	6
Astragalus danicus	.	.	6 23.3	.	.	.	.	.
Astragalus monspessulanus	.	.	1	.	.	.	.	.
Elytrigia intermedia	.	13	19 24.7	.	2	.	2	2
Galeopsis ladanum	6	.	.	.	.	.	.	4
Pinus nigra	.	2	.	.	.	.	.	.
Carpinus betulus	.	.	.	.	.	.	2	.
Senecio leucanthemifolius subsp. *verna*	.	2	.	.	.	.	.	.
Polygonum aviculare aggr.	.	.	.	.	.	.	.	2
Avenula pubescens	.	.	.	.	.	.	.	2
Salvia pratensis aggr.	3	2	6	.	4	.	4	8
Androsace septentrionalis	.	2	.	.	2	.	.	.
Crataegus monogyna aggr.	.	4	2	.	2	20	.	.
Prunella vulgaris aggr.	.	.	.	.	2	.	.	.
Cerastium semidecandrum	3	9	.	.	7	.	2	8
Allium flavescens	.	.	2	.	.	.	.	.
Lembotropis nigricans	.	2	.	.	.	.	.	.
Anthericum ramosum	6	2	4	.	2	.	6	.
Dianthus gratianopolitanus	.	.	.	.	.	.	.	2
Alliaria petiolata	3	.	.	.	.	.	.	.
Hieracium sp.	.	.	.	.	.	.	2	2
Viola hirta	3	4	.	.	.	.	.	.
Corynephorus canescens	.	2	.	.	.	.	.	.
Galeopsis tetrahit aggr.	3	.	.	.	.	.	.	.
Dianthus membranaceus aggr.	.	2	.	.	.	.	.	.
Festuca sp.	.	2	.	.	.	.	.	.
Sempervivum tectorum	.	2	.	.	.	.	2	.
Thlaspi arvense	.	.	1	.	.	.	.	.
Rosa sp.	3	.	.	.	2	.	2	4
Stellaria holostea	.	.	.	.	2	.	.	.
Ceratocephala orthoceras	.	.	1	.	.	.	.	.
Draba sp.	.	.	1	.	.	.	.	.
Minuartia laricifolia	3	.	.	.	.	.	.	.
Prunus avium	.	2	.	.	.	.	.	.
Galium boreale	.	2	4	.	.	.	.	.
Lamium purpureum	3	.	.	.	.	.	.	.
Caucalis platycarpos	.	2	.	.	.	.	.	.
Seseli longifolium	.	.	.	.	.	.	.	2
Verbascum phlomoides aggr.	3	11	6	.	2	.	2	4
Carex michelii	.	.	2	.	.	.	.	.
Cerinthe minor	.	.	.	.	.	.	2	.
Cotinus coggygria	.	.	1	.	.	.	.	.
Astragalus onobrychis	.	4	1	.	.	.	2	.
Ajuga genevensis	3	.	.	.	4	.	.	.
Sempervivum sp.	3	.	.	.	.	.	.	.
Leontodon incanus	6 22.9	.	.	.	.	.	.	.
Euthamia graminifolia	.	.	.	.	.	.	2	.
Lactuca serriola	.	4	7 18.8	.	.	.	.	.
Sideritis montana	.	.	7 19.1	.	.	.	2	2
Verbascum lychnitis	6	15	23 20.0	.	7	.	4	14
Polygonatum odoratum	3	2	.	.	.	.	.	4
Euphorbia tyraica	.	.	1	.	.	.	.	.

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Syntaxon ID	A	B	C	D	E	F	G	H
Carlina acaulis	.	4 [19.3]	.	.	.	.	.	.
Muscari neglectum	.	2	.	.	4	.	2	.
Fumaria vaillantii	.	.	.	.	2	.	.	.
Carex humilis	.	4	10	.	.	.	6	10
Campanula trachelium	3	.	.	.	.	.	.	.
Jacobaea vulgaris	.	4	2	.	.	.	.	.
Rhinanthus minor	.	.	.	.	2	.	.	.
Scabiosa lucida	3	.	.	.	.	.	.	.
Reseda lutea	.	2	1	.	.	.	.	.
Trifolium alpestre	.	2	.	.	.	.	2	2
Ulmus laevis	.	.	1	.	.	.	.	.
Verbascum chaixii	.	.	1	.	2	20	.	6
Echinops sphaerocephalus	.	2	1	.	.	.	.	.
Anthriscus cerefolium	3	.	.	.	.	.	.	.
Veronica spicata aggr.	.	4	7	.	7	20	0	8
Eragrostis minor	.	.	1	.	.	.	.	.
Bromopsis inermis	.	4	1	.	.	.	.	.
Dianthus sylvestris	3	.	.	.	.	.	.	2
Cytisus hirsutus aggr.	3	2	.	.	.	.	.	.
Euonymus europaeus	.	.	.	.	2	.	.	.
Anthemis sp.	.	.	.	.	.	.	.	2
Crepis biennis	.	2	.	.	.	.	.	.
Sinapis arvensis	.	.	.	.	.	.	.	2
Inula oculus-christi	.	2	.	.	.	.	.	4
Cerastium fontanum	.	.	1	.	.	.	.	.
Allium carinatum	.	.	.	.	2	.	.	.
Erigeron acris	.	2	.	.	.	.	.	.
Orobanche alba	.	.	1	.	.	.	.	.
Lepidium campestre	.	.	.	.	2	.	.	.
Doronicum hungaricum	.	2	.	.	.	.	.	.
Falcaria vulgaris	.	.	1	.	.	.	.	4
Trinia multicaulis	.	.	1	.	.	.	.	.
Cytisus albus	.	.	2	.	.	.	.	.
Agrostis gigantea	.	.	1	.	.	.	.	.
Anchusa officinalis	.	.	.	.	2	.	.	.
Ribes uva-crispa	3	.	.	.	.	.	.	.
Arabidopsis thaliana	.	4	11	.	13	.	12	12
Onobrychis arenaria	.	2	1	.	.	.	.	.
Pulsatilla vulgaris	.	.	.	.	.	.	2	.
Asplenium trichomanes	.	.	.	.	.	.	2	.
Clematis vitalba	.	.	.	.	2	.	.	.
Sorbus aucuparia	.	2	.	.	.	.	.	.
Hieracium racemosum	3	.	.	.	.	.	.	.
Cota tinctoria	.	4	2	.	4	.	.	8
Triticum sp.	.	.	.	.	.	.	.	2
Silene nemoralis	.	.	.	.	.	.	.	2
Astragalus glycyphyllos	.	6 [23.7]	.	.	.	.	.	.
Fraxinus ornus	3	.	.	.	.	.	.	.
Papaver dubium aggr.	.	6 [23.7]	.	.	.	.	.	.
Clinopodium vulgare	.	4 [19.3]	.	.	.	.	.	.
Leopoldia comosa	.	.	1	.	.	.	.	.
Potentilla pusilla	.	.	.	.	4	.	.	4
Asparagus tenuifolius	.	.	1	.	.	.	.	.
Centaurea jacea aggr.	.	.	.	.	4	.	2	.
Pilosella floribunda	.	.	.	.	2	.	.	.
Sagina nodosa	.	.	.	.	2	.	.	.
Veronica arvensis	.	2	.	.	.	.	2	.
Silene viscaria	3	4	5	.	4	.	.	.
Fumaria officinalis	.	.	.	.	.	.	2	.
Echinops ritro	.	.	1	.	.	.	.	.
Medicago prostrata	.	4	.	.	2	.	6	2
Calystegia sepium	.	.	.	.	2	.	.	.
Digitalis grandiflora	.	.	.	.	2	.	.	.
Veronica prostrata	.	2	5	.	7	.	8	6
Stipa pennata	.	.	1	.	.	.	2	.
Cytisus procumbens	.	.	1	.	.	.	.	.
Rhamnus saxatilis	3	.	.	.	.	.	.	.
Medicago falcata	.	19	9	25	9	.	.	8
Origanum vulgare	6	4	5	.	2	.	6	4
Inula salicina aggr.	.	.	.	.	2	.	.	.
Euphorbia seguieriana	3	.	4	.	.	.	.	2
Salvia nemorosa	.	2	.	.	.	.	.	.
Solidago gigantea	.	.	.	.	.	.	2	.
Helianthemum nummularium	3	9	6	.	2	20	6	4
Androsace maxima	.	2	.	.	.	.	.	.
Anemone sylvestris	.	.	.	.	.	.	.	2
Polygala sibirica	.	.	1	.	.	.	.	.
Ballota nigra	.	2	.	.	.	.	.	.
Stipa sp.	.	.	.	.	.	.	2	.
Rubus idaeus	.	.	1	.	.	.	.	2
Stachys annua	.	2	.	.	.	.	.	.
Linum tenuifolium	3	.	.	.	.	.	.	.
Scleranthus annuus aggr.	.	.	.	.	2	.	.	.
Artemisia vulgaris	.	2	.	.	2	.	.	4
Thesium ramosum	.	.	1	.	.	.	2	.
Bupleurum falcatum	.	4	4	.	.	.	.	2
Jurinea mollis aggr.	.	.	4	.	.	20	2	.

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Syntaxon ID	A	B	C	D	E	F	G	H
Diplotaxis sp.	3	.	.	.	.	.	.	.
Gagea bohemica	3	.	.	.	.	.	2	2
Hypericum elegans	.	.	5 [20.9]	.	.	.	.	.
Betula pendula	.	2	.	.	.	.	.	.
Silene latifolia	.	.	.	.	2	.	.	2
Euphorbia amygdaloides	3	.	.	.	.	.	.	.
Geranium pusillum	.	.	.	.	2	.	.	.
Cerastium sp.	.	2	.	.	.	.	.	.
Ajuga chamaepitys	.	.	1	.	.	.	.	.
Asperula tinctoria	.	.	1	.	.	.	.	2
Leontodon hispidus aggr.	.	4	6	.	2	.	2	.
Erysimum rhaeticum	3	.	5	.	7	.	4	2
Quercus sp.	.	2	.	.	.	.	.	.
Trifolium campestre	.	2	.	.	2	.	.	2
Poa pannonica	.	.	.	.	.	.	.	2
Carduus collinus	.	2	.	.	2	.	2	.
Valerianella locusta aggr.	.	2	1	.	.	.	2	.
Rumex thyrsiflorus	.	2	.	.	2	.	.	.
Linum austriacum	.	.	1	.	4	.	.	.
Ligustrum vulgare	.	.	.	.	.	.	.	2
Sorbus aria aggr.	3	.	.	.	.	.	.	.
Veronica polita	.	.	.	.	.	.	.	2
Medicago lupulina	.	11	5	.	4	.	6	6
Berberis vulgaris	3	2	.	.	.	.	.	.
Rubus caesius	.	.	.	.	2	.	2	.
Myosotis sp.	.	.	.	.	.	.	2	.
Pilosella echioides	.	6	4	.	.	.	.	2
Eryngium campestre	.	6	6	.	9	.	6	6
Hornungia petraea	3	.	.	.	.	.	2	.
Inula hirta	.	.	1	.	.	.	.	.
Pilosella cymosa aggr.	3	.	1	.	.	.	.	.
Hieracium lachenalii	.	.	.	.	2	.	.	.
Minuartia glaucina	3	.	.	.	.	.	.	.
Drabella muralis	3	.	.	.	.	.	.	.
Euphorbia exigua	.	.	.	.	.	.	2	.
Anthericum liliago	.	.	.	.	.	.	.	2
Veronica hederifolia aggr.	.	2	.	.	2	.	2	2
Silene nutans	.	2	4	.	.	20	.	.
Bryophytes and lichens								
Enchylium tenax	.	9	32 [45.6]	.	.	.	.	.
Xanthoria elegans	.	2	19 [38.1]	.	.	.	.	.
Syntrichia ruralis	15	28	69 [35.9]	.	24	.	54 [23.0]	25
Schistidium apocarpum	.	4	26 [30.9]	.	16	.	.	4
Bryum argenteum	12	4	30 [27.2]	.	4	.	10	12
Physcia caesia	.	.	.	.	.	.	8 [26.6]	.
Allantoparmelia alpicola	.	.	.	.	.	.	10 [26.5]	2
Xanthoparmelia stenophylla	.	.	.	.	.	.	10 [19.9]	8 [14.4]
Catapyrenium squamulosum	.	4 [19.3]	.	.	.	.	.	.
Orthotrichum cupulatum	3	.	.	.	.	.	2	.
Cladonia chlorophaea	.	.	.	.	2	.	0	.
Ptilium crista-castrensis	.	.	.	.	2	.	0	.
Pohlia nutans	.	6 [19.4]	.	.	2	.	0	.
Polyozosia agardhiana	.	.	1	.	.	.	0	.
Cetraria aculeata	.	.	.	.	4	.	4	.
Cladonia rangiformis	.	6	.	.	9	.	10	8
Barbula unguiculata	3	4	2	.	2	.	0	.
Pseudoleskeella catenulata	3	.	1	.	.	.	0	.
Gyalolechia bracteata	.	.	1	.	.	.	0	.
Lecidea sp.	.	.	.	.	.	.	0	2
Cladonia cariosa	.	.	.	.	.	.	0	2
Syntrichia montana	.	.	.	.	2	.	2	.
Didymodon fallax	.	.	.	.	.	.	2	.
Hypnum lacunosum	.	.	.	.	.	.	2	.
Racomitrium lanuginosum	3	.	.	.	.	.	0	.
Weissia controversa	.	.	.	.	.	.	0	2
Cladonia fimbriata	.	2	1	.	4	.	0	2
Dicranum scoparium	3	.	.	.	.	.	0	.
Peltigera malacea	.	2	1	.	.	.	0	.
Tortula truncata	.	.	.	.	2	.	0	.
Microbryum rectum	.	2	.	.	.	.	0	.
Streblotrichum convolutum	.	.	.	.	.	.	2	.
Orthotrichum anomalum	9 [20.6]	.	1	.	2	.	2	.
Thalloidima candidum	6 [23.1]	.	.	.	.	.	0	.
Tortula muralis	9 [17.7]	2	.	.	4	.	2	.
Collema sp.	3	.	7 [17.9]	.	.	.	2	.
Zeroviella papillifera	.	.	1	.	.	.	0	.
Ptychostomum capillare	.	2	6 [16.4]	.	.	.	0	2
Fissidens dubius	3	.	.	.	.	.	0	.
Nostoc sp.	.	.	.	.	.	.	0	2
Cladonia pocillum	3	.	9 [18.2]	.	.	.	4	.
Tortula acaulon	.	.	.	.	2	.	0	.
Candelariella vitellina	.	.	5 [13.5]	.	2	.	0	2
Gyalolechia fulgens	.	.	2	.	.	.	2	.
Peltigera didactyla	.	.	1	.	.	.	0	2
Xanthoria sp.	.	.	4 [18.0]	.	.	.	0	.
Cladonia rangiferina	.	.	.	.	.	.	2	.
Rhytidium rugosum	.	15	16 [14.9]	.	2	.	14	4

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Syntaxon ID	A	B	C	D	E	F	G	H
Campanula bononiensis	.	.	1	.	.	.	.	2
Genista tinctoria	.	4	.	.	4	.	.	.
Caragana frutex	.	.	1	.	.	.	.	.
Berteroa incana	.	4	1	.	2	.	2	2
Gymnocarpium robertianum	3	.	.	.	.	.	.	.
Asplenium ruta-muraria	.	.	1	.	.	.	2	.
Astragalus australis	.	.	1	.	.	.	.	.
Morus alba	.	.	1	.	.	.	.	.
Leontodon crispus aggr.	.	.	1	.	.	.	.	.
Sempervivum arachnoideum	.	.	.	.	.	.	.	2
Scorzonera austriaca	3	.	.	.	.	.	4	.
Elytrigia repens	.	4	1	.	2	.	.	2
Tanacetum corymbosum	.	.	1	.	.	.	.	2
Veronica triphyllos	.	2	.	.	.	.	2	.
Lotus corniculatus aggr.	3	9	5	.	.	.	4	2
Avenella flexuosa	.	.	.	.	2	.	.	.
Thalictrum foetidum	.	.	.	.	.	.	.	2
Xeranthemum annum aggr.	.	.	2	.	.	.	2	.
Nonea pulla aggr.	.	2	4	.	.	.	.	.
Campanula glomerata	.	2	.	.	.	.	.	.
Veronica officinalis	.	.	.	.	2	.	.	.
Agrostis capillaris	.	2	.	.	.	.	.	.
Hieracium murorum	.	.	.	.	.	.	.	2
Inula conyzae	.	.	.	.	.	.	2	2
Geranium rotundifolium	3	.	.	.	.	.	.	.
Viola tricolor	3	.	5	.	.	20	.	4
Papaver rhoeas	.	.	4	.	.	.	4	.
Vicia sativa	.	2	.	.	.	.	.	.
Sedum sp.	3	.	.	.	.	.	.	.
Achillea nobilis	.	.	.	.	2	.	4	.
Erigeron annuus	.	4	1	.	.	.	.	.
Carduus acanthoides	.	.	.	.	2	.	2	4
Papaver argemone	.	.	.	.	.	.	2	.
Urtica dioica	6	2	1	.	.	.	.	.
Consolida regalis	.	2	1	.	.	.	.	.
Ornithogalum orthophyllum	.	.	.	.	.	.	2	.
Thymus moldavicus	.	2	1	.	.	.	.	.
Luzula campestris	.	.	.	.	2	.	.	.
Biscutella laevigata	3	.	.	.	.	.	.	2
Campanula persicifolia	3	.	.	.	.	.	.	.
Potentilla collina aggr.	.	2	.	.	.	.	.	.
Taraxacum sect. *Taraxacum*	3	.	1	.	.	.	2	.
Tragopogon sp.	.	.	.	.	2	.	.	.
Trifolium montanum	.	.	1	.	.	.	.	.
Dorycnium pentaphyllum	.	2	.	.	.	.	2	4
Myosotis arvensis aggr.	3	6 [15.8]	.	.	.	.	2	.
Prunus spinosa	.	2	5	.	.	.	2	4
Geranium sanguineum	6	4	2	.	4	.	.	4
Bromus japonicus	.	2	.	.	.	.	.	2
Globularia bisnagarica	.	.	.	.	.	.	.	2
Carex digitata	.	2	.	.	.	.	.	.
Potentilla sp.	.	4	1	.	4	.	.	.
Koeleria pyramidata aggr.	3	4	.	.	2	.	.	2
Trifolium medium	.	.	1	.	.	.	.	.
Microrrhinum minus	.	.	.	.	2	.	.	.
Cephalaria uralensis	.	.	1	.	.	.	.	.
Melampyrum arvense	.	2	5	.	4	.	.	2
Seseli annuum	.	2	1	.	.	.	2	2
Filago minima	.	.	1	.	.	.	.	.
Tragopogon podolicus	.	.	1	.	.	.	.	.
Vicia lathyroides	.	6 [14.4]	.	.	4	.	.	2
Hypochaeris maculata	.	.	1	.	.	.	.	.
Hieracium schmidtii	3	.	.	.	.	.	.	.
Viola ambigua	.	.	2	.	.	.	.	.
Erigeron canadensis	3	9 [16.8]	1	.	2	.	.	2
Helichrysum arenarium	.	2	1	.	.	.	.	2
Galium verum aggr.	.	13	7	.	11	.	6	6
Rhamnus cathartica	.	.	2	.	.	.	.	.
Allium rotundum	.	.	1	.	.	.	.	.
Potentilla grandiflora	.	.	.	.	2	.	.	.
Lolium perenne	.	.	.	.	2	.	.	.
Viola rupestris	3	.	.	.	2	.	.	.
Chenopodium album	.	4	1	.	.	.	2	2
Veronica persica	.	.	.	.	.	.	2	.
Briza media	.	.	.	.	2	.	.	.
Linaria vulgaris aggr.	.	2	1	.	4	.	.	.
Gagea pratensis	.	2	1	.	.	.	.	2
Androsace elongata	.	.	.	.	.	.	2	.
Draba podolica	.	.	1	.	.	.	.	.

Syntaxon ID	A	B	C	D	E	F	G	H
Tortella tortuosa	12	11	17	.	4	.	20	10
Ptychostomum imbricatulum	.	11	15 [21.2]	.	.	.	4	2
Tortella sp.	.	4	1	.	.	.	0	.
Mannia fragrans	.	2	1	.	2	.	0	2
Polytrichum juniperinum	.	.	.	.	.	.	2	.
Anomodon viticulosus	.	.	.	.	2	.	0	.
Schistidium sp.	.	.	5 [20.9]	.	.	.	0	.
Cladonia magyarica	.	.	.	.	.	.	2	.
Parmelia protomatrae	.	.	.	.	.	.	2	.
Weissia longifolia	.	.	5 [20.9]	.	.	.	0	.
Encalypta vulgaris	3	.	11 [20.6]	.	2	.	4	.
Hylocomium sp.	.	.	.	.	.	.	0	2
Cladonia symphycarpa	.	.	.	.	.	.	6	6
Brachythecium albicans	3	6	10	.	9	.	0	4
Peltigera rufescens	.	4	4	.	7	.	14 [18.0]	6
Tortula lindbergii	.	2	.	.	.	.	6 [16.1]	2
Dermatocarpon miniatum	3	.	.	.	2	.	0	2
Cladonia coniocraea	.	.	.	.	.	.	2	2
Grimmia tergestina	3	.	.	.	.	.	0	.
Hypnum cupressiforme	9	2	5	.	16 [16.0]	.	12	2
Abietinella abietina	6	34	43 [18.8]	.	27	.	48 [23.2]	22
Physcia dubia	.	.	.	.	2	.	8 [22.6]	.
Tortella inclinata	.	4	1	.	2	.	12 [23.2]	.
Cladonia furcata	.	4	1	.	4	.	12 [21.4]	.
Schistidium brunnescens	.	.	.	.	.	.	6 [23.0]	.
Tortella squarrosa	3	2	.	.	2	.	8 [16.7]	.
Racomitrium canescens	9	.	.	.	4	.	14 [20.7]	2
Toninia sp.	.	.	.	.	.	.	4	2
Encalypta streptocarpa	3	2	6 [15.2]	.	.	.	.	.
Cladonia rei	.	.	6 [23.3]	.	.	.	.	.
Cladonia pyxidata	3	19	28 [21.3]	.	4	.	24	8
Grimmia ovalis	.	.	.	.	.	.	.	2
Leptogium sp.	.	.	2	.	.	.	.	.
Homalothecium sp.	.	.	6 [23.3]	.	.	.	.	.
Catapyrenium rufescens	3	.	.	.	.	.	.	2
Peltigera sp.	.	2	.	.	.	.	.	.
Grimmia pulvinata	3	13	7	.	7	.	16	8
Tortella fragilis	.	.	.	.	2	.	.	2
Polytrichum piliferum	3	2	.	.	13 [18.8]	.	8	4
Homalothecium philippeanum	.	.	1	.	.	.	.	.
Buckia vaucheri	.	.	5 [20.9]	.	.	.	.	.
Homalothecium lutescens	3	9	7	.	2	.	4	4
Thalloidima sedifolium	3	.	.	.	.	.	.	.
Encalypta sp.	.	.	1	.	.	.	.	.
Rhizocarpon geographicum	.	.	4	.	2	.	.	.
Bryum sp.	.	11	7	.	7	.	8	6
Leucodon sciuroides	3	.	.	.	2	.	.	.
Xanthoparmelia conspersa	.	.	.	.	4	.	.	4
Caloplaca sp.	.	.	.	.	2	.	.	.
Physcia sp.	.	.	1	.	.	.	.	2
Parmelia sp.	.	.	.	.	2	.	2	4
Protoparmeliopsis muralis	3	.	4	.	2	.	.	.
Weissia condensa	.	.	.	.	2	.	2	.
Catapyrenium sp.	.	.	1	.	.	.	.	.
Hedwigia ciliata	6	2	2	.	4	.	2	2
Flexitrichum flexicaule	9	2	7	.	.	.	4	2
Homalothecium sericeum	12	6	12 [11.4]	.	9	.	4	.
Pterygoneurum ovatum	.	.	.	.	2	.	.	2
Diploschistes scruposus	.	.	.	.	2	.	.	.
Barbula sp.	.	.	1	.	.	.	.	2
Riccia sp.	.	.	.	.	2	.	.	2
Ptychostomum moravicum	3	.	.	.	.	.	.	.
Cladonia foliacea	.	9	10	.	7	.	14	10
Diploschistes muscorum	.	.	.	.	.	.	2	.
Lecanora sp.	.	.	.	.	2	.	.	4
Ditrichum heteromallum	.	.	.	.	2	.	.	.
Romjularia lurida	.	.	.	.	.	.	.	2
Grimmia sp.	3	2	1	.	2	.	.	.
Plagiochila asplenioides	.	.	.	.	2	.	.	.
Ceratodon purpureus	18	23	14	.	20	.	22	24
Catapyrenium cinereum	.	.	.	.	.	.	2	.
Hylocomium splendens	.	.	.	.	2	.	.	.
Riccia ciliata	.	.	.	.	2	.	.	.
Orthotrichum sp.	.	.	.	.	2	.	.	.
Plagiomnium affine	.	.	.	.	2	.	.	.
Lecidea grisella	.	.	.	.	2	.	.	2
Cladonia sp.	.	6	1	.	2	.	2	4
Trichostomum crispulum	.	.	1	.	.	.	2	.
Physcia tenella	.	.	2	.	.	.	.	.
Brachythecium sp.	.	.	1	.	.	.	.	.

Supplement E5. Header data for all relevés of the vegetation of annuals and succulents on dry calcareous substrates used in this analysis.

Anhang E5. Kopfdaten für alle Vegetationsaufnahmen mit Annuellen uns Sukkulenten auf trockenen Kalksubstraten, die für diese Analyse benutzt wurden.

Sequence No	Relevé No	Group No	EVA-ID	Country	Biblioreference	Nr. table in publ.	Nr. relevé in table	Author	Date of recording	Relevé area (m^2)	Altitude (m)	Aspect (°)	Cover total (%)	Cover tree layer (%)	Cover shrub layer (%)
1	3816	A	350416	Czech Republic	Brabec E.	V.	17	Brabec E.		9	302	180	50		
2	7710	A	1375592	Slovak Republic	Valachovič M. (ed.)	7	1	Valachovič M.	08.06.1989	6	880	180			
3	7711	A	1375593	Slovak Republic	Valachovič M. (ed.)	7	2	Valachovič M.	18.05.1989	3	750	225			
4	4242	A	361160	Czech Republic	Sádlo J.		18	Sádlo J.	01.01.1981	10	311				
5	3662	A	349786	Czech Republic	Kolbek J.	1	15	Kolbek J.	12.05.1971	9	270	225			
6	3775	A	350225	Czech Republic	Sádlo J.	17	1	Sádlo J.	01.10.1982	10	371	135			
7	10205	A	2354144	NR (*Jovibarbo-Sedetum albi* Valachovič in Valachovič et al. 1995)	Valachovič M. (ed.)	7, p. 99	3	Valachovič M.	20.05.1988	7		180	40		
8	5457	A	1154878	Poland	Berdowski W.	2	9		12.06.1975	0,03	246		80		
9	3877	A	353106	Czech Republic	Kolbek J.	9	7	Kolbek J.	03.06.1976	10	250	158			
10	2263	A	316718	Czech Republic	Kotouč L.	11	21	Kotouč L.	01.01.2001	4	399	203	30		
11	7716	A	1375598	Slovak Republic	Valachovič M. (ed.)	7	7	Valachovič M.	11.07.1989	7	320	135			
12	10202	A	2354141	Hungary	Bauer N.	2, p. 250	2	Bauer N.	05.05.2004	20		270			
13	4434	A	369570	Czech Republic	Kolbek J. et al.	4,3	7	Kolbek J.	03.06.1976	10	250	158			
14	7721	A	1375603	Slovak Republic	Valachovič M. (ed.)	7	12	Valachovič M.	04.08.1988	6	520	225			
15	3872	A	353098	Czech Republic	Kolbek J.	7	7	Kolbek J.	09.06.1977	12	250	180			
16	5596	A	1169493	Poland	Nowak A., Nowak S.	1	5		11.07.2006	4	360				
17	2269	A	316724	Czech Republic	Kotouč L.	11	27	Kotouč L.	01.01.2001	4	423	180	40		
18	7720	A	1375602	Slovak Republic	Valachovič M. (ed.)	7	11	Valachovič M.	19.05.1989	25	850	225			
19	1186	A	81993	Austria	Thurner W.	3	2			15	645	180			
20	3666	A	349813	Czech Republic	Kolbek J.	8	3	Kolbek J.	03.06.1976	4	250	180			
21	7725	A	1375607	Slovak Republic	Valachovič M. (ed.)	7	16	Valachovič M.	02.08.1989	40	450	135			
22	2271	A	316727	Czech Republic	Kotouč L.	11	30	Kotouč L.	01.01.2001	4	487	315	50		
23	3486	A	344015	Czech Republic	Klika J.	p.513		Klika J.		1	466	135			
24	7715	A	1375597	Slovak Republic	Valachovič M. (ed.)	7	6	Valachovič M.	20.05.1988	5	650	90			
25	4129	A	360194	Czech Republic	Unar J.	p.28	2	Unar J.	12.05.1966	1	400		70		
26	7948	A	1380504	Slovak Republic	Futák J.	p.84	2	Futák J.	01.01.1947		545				
27	1741	A	295635	Czech Republic	Pantůček R.	p.34	1	Pantůček R.	30.07.1985	2	489	180			
28	5832	A	1177597	Poland	Szcześniak E.	2	2		04.07.1996	3	372	248			
29	7947	A	1380503	Slovak Republic	Futák J.	p.84	1	Futák J.	01.01.1947		221				
30	3369	A	340924	Czech Republic	Klika J.	p.716	1	Klika J.		100	234				
31	7952	A	1380514	Slovak Republic	Futák J.	p.88	13	Futák J.	01.01.1947		511				
32	2635	A	329893	Czech Republic				Boublík K.	23.04.2003	1	320	90			
33	265	A	50319	Austria	Tracey R. H.	1	3		10.05.1980	6	260	180	25		
34	10000	B	2353939	Ukraine		17	17		18.04.2020	10		10	70		2
35	5866	B	1177763	Poland	Babczycska-Sendek B.	8	9		10.07.1996	5	330				
36	5873	B	1177770	Poland	Babczycska-Sendek B.	8	16		08.07.1993	6	297	135			
37	3980	B	353867	Czech Republic	Unar J.	4	5	Unar J.	23.06.1977	1,5	225		70		
38	491	B	51569	Austria	Eijsink J.G.H.M., Ellenbroek G.A., Holzner W. & Werger M.J.A.	2	10		24.05.1976	4	440	90			
39	10005	B	2353944	Ukraine		22	22		02.05.2020	10		290	80		
40	6099	B	1207283	Poland	Szcześniak E.	7	4		27.05.1995	4	280	248			
41	6076	B	1203164	Poland	Hereśniak J., Krasowska H., Jawrynowicz M.	2	4		31.07.1967	20	237	225			
42	3318	B	339610	Czech Republic	Jaroś V.	p.80	4	Jaroś V.	12.06.1976	4	431	135			
43	5536	B	1165997	Poland	Głowacki Z.	10	6		24.05.1969	100	114	180			
44	10190	B	2354137	NR (*Saxifrago tridactylitae-Poetum compressae* Géhu 1961 *nom. invers.*)	Gehú J.M.	25, p. 208	2	Gehú J.M.	01.01.1961	2					
45	10019	B	2353958	Ukraine		36	36	Vasheniak Yu.	03.05.2020	10		60	30		
46	9378	B	1603756	Ukraine		1		Vasheniak Yu.	10.06.2017	4	193	50	60		
47	9363	B	1603716	Ukraine		1		Vasheniak Yu.	15.05.2017	10	234	180	60		
48	4913	B	398807	Czech Republic		p.8	1	Gerša M.	07.09.2003	4	330				
49	10015	B	2353954	Ukraine		32	32		03.05.2020	10		270	50		
50	3983	B	353870	Czech Republic	Unar J.	4	8	Unar J.	23.06.1977	1,5	210		60		
51	485	B	51563	Austria	Eijsink J.G.H.M., Ellenbroek G.A., Holzner W. & Werger M.J.A.	2	44		02.06.1976	16	470	135			
52	4780	B	384748	Czech Republic				Hédl R.	11.06.2004	4	540	248			
53	5864	B	1177761	Poland	Babczycska-Sendek B.	8	7		21.07.1994	8	270				
54	5552	B	1166052	Poland	Giowacki Z.	9	1		26.08.1967	50	180	180			
55	5862	B	1177759	Poland	Babczycska-Sendek B.	8	5		28.06.1993	8	311				
56	9383	B	1603761	Ukraine		1		Vasheniak Yu.	10.06.2017	1	170	310	80		
57	5592	B	1169489	Poland	Nowak A., Nowak S.	1	1		11.07.2006	3	320				
58	7788	B	1376935	Slovak Republic	Hrivák R.	p. 52		Hrivnák R.	12.06.1996	9	562	23			
59	6184	B	1220376	Poland	Berdowski W.	8	4		05.07.1988	1	590				
60	9389	B	1603767	Ukraine		1		Vasheniak Yu.	10.06.2017	10	252	262	80		
61	3313	B	339600	Czech Republic	Jaroś V.	p.75	1	Jaroś V.	05.06.1977	4	465	225			
62	5559	B	1166059	Poland	Giowacki Z.	9	9		28.06.1964	45	147	225			
63	7876	B	1378390	Slovak Republic	Klika J.	1	3	Klika J.		50	170	180	40		
64	5560	B	1166060	Poland	Giowacki Z.	9	10		28.06.1964	50	147	225			
65	6128	B	1210414	Poland	Celicski F., Wika S.	10	1		18.07.1973	30	307	135			
66	5595	B	1169492	Poland	Nowak A., Nowak S.	1	4		11.07.2006	4	360				
67	5542	B	1166004	Poland	Giowacki Z.	10	13		20.07.1967	60	114				
68	5507	B	1162344	Poland				Zygmunt K№cki	01.06.2007	16	158	135			
69	6638	B	1243754	Romania		145	8		01.01.1979		450				
70	6096	B	1207280	Poland	Szczкњniak E.	7	1		27.05.1995	8	280	225			
71	5867	B	1177764	Poland	Babczycska-Sendek B.	8	10		07.07.1994	20	263				
72	5558	B	1166058	Poland	Giowacki Z.	9	8		29.08.1964	10	108				
73	5871	B	1177768	Poland	Babczycska-Sendek B.	8	14		08.08.1993	10	297	135			
74	9483	B	1606606	Ukraine			338	Kontar I.	10.07.1998	2	204	180	55		
75	10038	B	2353977	Ukraine		55	55		16.05.2020	10		50	40		
76	3981	B	353868	Czech Republic	Unar J.	4	6	Unar J.	23.06.1977	1	200		90		
77	5594	B	1169491	Poland	Nowak A., Nowak S.	1	3		11.07.2006	3	320				
78	2931	B	2354131	Czech Republic				Chytrý M.	12.05.1987	3	360	180			

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Fortsetzung auf nächsten Seite

Sequence No	Relevé No	Group No	EVA-ID	Country	Biblioreference	Nr. table in publ.	Nr. relevé in table	Author	Date of recording	Relevé area (m^2)	Altitude (m)	Aspect (°)	Cover total (%)	Cover tree layer (%)	Cover shrub layer (%)
79	3982	B	353869	Czech Republic	Unar J.	4	7	Unar J.	23.06.1977	2	200		90		
80	5464	B	1156742	Poland	Kwiatkowski P.	1	5		20.06.1994	10	201	225			
81	10084	C	2354023	Ukraine		8		Vasheniak Yu.	11.05.2021	10		205	40		
82	9348	C	1603690	Ukraine		1		Vasheniak Yu.	07.05.2017	10	234	160	90		
83	10010	C	2353949	Ukraine		27	27	Vasheniak Yu.	02.05.2020	10		243	40		
84	10100	C	2354039	Ukraine		25		Vasheniak Yu.	12.05.2021	10		158	50		
85	5593	C	1169490	Poland	Nowak A., Nowak S.	1	2		11.07.2006	3	320				
86	10025	C	2353964	Ukraine		42	42	Vasheniak Yu.	09.05.2020	10		351	70		
87	9964	C	2353903	Ukraine		12	14	Vasheniak Yu.	09.05.2018	10		225	50		
88	9988	C	2353927	Ukraine		4	4	Vasheniak Yu.	11.04.2020	10		210	60		
89	10014	C	2353953	Ukraine		31	31	Vasheniak Yu.	02.05.2020	10		230	40		
90	10096	C	2354035	Ukraine		21		Vasheniak Yu.	12.05.2021	10		245	60		
91	10055	C	2353994	Ukraine		76	76	Vasheniak Yu.	21.06.2020	10		210	30		
92	10069	C	2354008	Ukraine		96	96	Vasheniak Yu.	08.08.2020	10		210	30		
93	10102	C	2354041	Ukraine		27		Vasheniak Yu.	13.05.2021	10		242	40		
94	9966	C	2353905	Ukraine		16	18	Vasheniak Yu.	12.05.2018	10		15	50		
95	10094	C	2354033	Ukraine		19		Vasheniak Yu.	12.05.2021	10		205	50		
96	9358	C	1603700	Ukraine		1		Vasheniak Yu.	08.05.2017	10	241	220	90		
97	9319	C	1603627	Ukraine				Vasheniak Yu.	29.07.2016	10	227	250	80		
98	9987	C	2353926	Ukraine		3	3	Vasheniak Yu.	11.04.2020	10		190	30		1
99	9970	C	2353909	Ukraine		21	21	Vasheniak Yu.	12.05.2018	10		338	60		
100	9215	C	1603474	Ukraine				Vasheniak Yu.	07.06.2016	10	233	170	70		
101	10037	C	2353976	Ukraine		54	54	Vasheniak Yu.	16.05.2020	10		210	50		
102	10095	C	2354034	Ukraine		20		Vasheniak Yu.	12.05.2021	10		270	50		
103	10001	C	2353940	Ukraine		18	18	Vasheniak Yu.	18.04.2020	10		11	30		
104	10092	C	2354031	Ukraine		17		Vasheniak Yu.	12.05.2021	10		123	50		
105	10099	C	2354038	Ukraine		24		Vasheniak Yu.	12.05.2021	10		290	60		
106	10013	C	2353952	Ukraine		30	30	Vasheniak Yu.	02.05.2020	10		280	40		
107	10031	C	2353970	Ukraine		48	48	Vasheniak Yu.	09.05.2020	10		205	50		
108	9325	C	1603652	Ukraine				Vasheniak Yu.	05.08.2016	10	325	300	50		
109	10090	C	2354029	Ukraine		15		Vasheniak Yu.	11.05.2021	10		285	60		
110	10098	C	2354037	Ukraine		23		Vasheniak Yu.	12.05.2021	10		220	50		
111	10155	C	2354094	Moldova		23		Pînzaru P.	01.01.2006	100					
112	10087	C	2354026	Ukraine		12		Vasheniak Yu.	11.05.2021	10		252	40		
113	10081	C	2354020	Ukraine		5		Vasheniak Yu.	10.05.2021	10		242	30		
114	9298	C	1603597	Ukraine				Vasheniak Yu.	21.07.2016	10	213	230	50		
115	9371	C	1603736	Ukraine		1		Vasheniak Yu.	03.06.2017	10	305		90		
116	9984	C	2353923	Ukraine		81	80	Vasheniak Yu.	06.06.2019	10		250	60		
117	10051	C	2353990	Ukraine		72	72	Vasheniak Yu.	07.06.2020	10		190	20		
118	9240	C	1603510	Ukraine				Vasheniak Yu.	16.06.2016	10	139	180	70		
119	9434	C	1603840	Ukraine		1		Vasheniak Yu.	19.07.2017	10	142	285	50		
120	9365	C	1603718	Ukraine		1		Vasheniak Yu.	15.05.2017	10	235	220	60		
121	9995	C	2353934	Ukraine		12	12	Vasheniak Yu.	18.04.2020	10		60	40		
122	9398	C	1603780	Ukraine		1		Vasheniak Yu.	10.06.2017	10	355	220	80		
123	9994	C	2353933	Ukraine		11	11	Vasheniak Yu.	18.04.2020	10		190	50		
124	9200	C	1603450	Ukraine		38	38	Vasheniak Yu.	14.07.2015	10	251	20	50		
125	9295	C	1603594	Ukraine				Vasheniak Yu.	21.07.2016	10	226	241	60		
126	9224	C	1603489	Ukraine				Vasheniak Yu.	08.06.2016	10	179	215	90		
127	9431	C	1603837	Ukraine		1		Vasheniak Yu.	19.07.2017	10	123	305	50		
128	10050	C	2353989	Ukraine		71	71	Vasheniak Yu.	07.06.2020	10		160	40		
129	9459	C	1605007	Ukraine	Onyschenko V.A.	2	9	Onyschenko V.A.	03.06.1997	3		270			
130	9339	C	1603680	Ukraine		1		Vasheniak Yu.	06.05.2017	10		225	80		
131	9320	C	1603629	Ukraine				Vasheniak Yu.	29.07.2016	10	227	240	70		
132	10049	C	2353988	Ukraine		70	70	Vasheniak Yu.	07.06.2020	10		160	30		1
133	9211	C	1603469	Ukraine				Vasheniak Yu.	30.05.2016	10	246	53	70		
134	9501	C	1613523	Ukraine				Vasheniak Yu.	24.09.2017	5			50		
135	9404	C	1603787	Ukraine		1		Vasheniak Yu.	22.06.2017	10	126	120	60		
136	10064	C	2354003	Ukraine		91	91	Vasheniak Yu.	04.08.2020	10		150	20		
137	9391	C	1603771	Ukraine		1		Vasheniak Yu.	10.06.2017	10	205	220	70		
138	9433	C	1603839	Ukraine		1		Vasheniak Yu.	19.07.2017	10	142	285	50		
139	10026	C	2353965	Ukraine		43	43	Vasheniak Yu.	09.05.2020	10		193	40		
140	9216	C	1603480	Ukraine				Vasheniak Yu.	08.06.2016	10	264	150	70		
141	9287	C	1603577	Ukraine				Vasheniak Yu.	17.07.2016	10	251	140	60		
142	10008	C	2353947	Ukraine		25	25	Vasheniak Yu.	02.05.2020	10		210	50		
143	9973	C	2353912	Ukraine		92	95	Vasheniak Yu.	11.08.2018	10		220	40		
144	9258	C	1603539	Ukraine				Vasheniak Yu.	28.06.2016	10	160		60		
145	9418	C	1603820	Ukraine		1		Vasheniak Yu.	07.07.2017	10	121	30	60		
146	9180	C	1603422	Ukraine		10	10	Vasheniak Yu.	27.06.2015	1	221	180	50		
147	9500	C	1613516	Ukraine				Vasheniak Yu.	23.09.2017	4			40		
148	9300	C	1603599	Ukraine				Vasheniak Yu.	21.07.2016	10	225	220	50		
149	9436	C	1603843	Ukraine		1		Vasheniak Yu.	19.07.2017	10	142	180	50		
150	10188	C	2354127	NR (*Asplenio rutae-murariae-Allietum flavescentis* Pînzaru 2015)	Pînzaru P.	1	17	Pînzaru P.	29.07.2014	100		270	60		
151	10189	C	2354128	NR (*Aurinio saxatilis-Allietum podolici* Onyshchenko 2001)	Onyshschenko V.	2, p. 93	13	Onyshschenko V.	01.01.2001	6		225	30		
152	9362	C	1603715	Ukraine		1		Vasheniak Yu.	15.05.2017	10	292	208	70		
153	9990	C	2353929	Ukraine		6	6	Vasheniak Yu.	11.04.2020	10		140	40		
154	9209	C	1603466	Ukraine				Vasheniak Yu.	28.05.2016	10	135	50	70		
155	7868	C	1378375	Slovak Republic	Májovský J.		2	Májovský J.			262	135	65		
156	10211	C	2354150	Hungary		1			17.05.1996				60		
157	9996	C	2353935	Ukraine		13	13	Vasheniak Yu.	18.04.2020	10		190	40		2
158	9311	C	1603615	Ukraine				Vasheniak Yu.	26.07.2016	10	144	320	60		
159	9967	C	2353906	Ukraine		17	17	Vasheniak Yu.	12.05.2018	10		330	80		
160	10072	C	2354011	Ukraine		99	99	Vasheniak Yu.	08.08.2020	10		212	60		
161	9393	C	1603773	Ukraine		1		Vasheniak Yu.	10.06.2017	10	237	228	60		
162	10208	D	2354147	NR (*Alysso petraei-Sedetum hispanici* Schneider-Binder et al. 1971)	Schneider-Binder et al.	2, p. 102	2	Schneider-Binder et al.	10.06.1967	8		180	70		
163	7434	D	1276539	Romania	Grigore, S., Coste, I.	2	3	St. Grigore	10.06.1975	1	613		85		
164	7322	D	1268091	Romania	Mataca, S.	6	4	S. Mataca	10.06.1967	25	221	180	60		
165	7321	D	1268089	Romania	Mataca, S.	6	2	S. Mataca	10.06.1967	25	288	180	60		
166	5563	E	1166063	Poland	Głowacki Z.	9	13		27.06.1964	100	134	113			
167	7546	E	1371534	Slovak Republic	Maglocký Š., Mucina L.	1	28	Maglocký Š.	04.07.1974	1,5	325	225	15		
168	7772	E	1376143	Slovak Republic	Valachovič M.	18	6	Valachovič M.	12.07.1989	12	300	90	75		

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169	5884	E	1178370	Poland	Koiodziejek J.				06.05.2004	25	173				
170	6156	E	1216902	Poland	Kwiatkowski P.	2	4		17.07.1993	6	372	180			
171	1322	E	333041	Austria	Kurz P.	16	26				699				
172	6088	E	86383	Poland	Olaczek R.	2	5		05.07.1966	16	226	225			
173	6102	E	1204454	Poland	Szcześniak E.	7	7		30.04.1995	6	280	248			
174	5456	E	1207286	Poland	Berdowski W.	2	1		12.06.1975	0,06	246	180	50		
175	6101	E	1154870	Poland	Szcześniak E.	7	6		30.04.1995	6	280	248			
176	5839	E	1207285	Poland	Szcześniak E.	2	9		06.06.1996	8	372	248			
177	5463	E	1177604	Poland	Kwiatkowski P.	1	4		20.06.1994	20	201	225			
178	10192	E	1156741	NR (*Alysso alyssoidis-Sedetum* Oberdorfer et T. Müller in T. Müller 1961)	Korneck D.	33, p. 179	1	Korneck D.	13.06.1965	0,7		180	95		
179	1730	E	295554	Czech Republic			5	Ekrt L.	08.06.2004	2	543	225			
180	6098	E	1207282	Poland	Szcześniak E.	7	3		27.05.1995	4	280	225			
181	4542	E	372935	Czech Republic				Otýpková Z.	08.06.2004	2	543	225			
182	6157	E	1216903	Poland	Kwiatkowski P.	2	5		17.07.1993	6	372	135			
183	5544	E	1166007	Poland	Głowacki Z.	10	16		23.06.1964	100	133	180			
184	4968	E	400884	Czech Republic				Černý T.	18.06.2004	2	226	100			
185	7770	E	1376140	Slovak Republic	Valachovič M.	18	3	Valachovič M.	16.07.1988	10	225	180			
186	6131	E	1210417	Poland	Celiński F., Wika S.	10	4		18.07.1973	30	307	135			
187	7901	E	1378513	Slovak Republic	Májovský J., Jurko A.	p.293	2	Májovský J.	01.01.1956		246				
188	7336	E	1268636	Romania	Mihai, G., Sirbu, I., Horeanu, C.	2	5	Gheorge Mihai	01.01.1972	30	360		70		
189	7593	E	1374263	Slovak Republic	Vozárová M.	1	8	Vozárová M.	21.05.1975	16	356	180	80		
190	6606	E	1243529	Romania						50	400		70		
191	6609	E	1243533	Romania						30	480		70		
192	3169	E	335939	Czech Republic	Klika J.	p.492		Klika J.		16	530				
193	7773	E	1376144	Slovak Republic	Valachovič M.	18	7	Valachovič M.	23.06.1990	9	475	248			
194	5546	E	1166009	Poland	Głowacki Z.	10	18		18.07.1965	80	162	180			
195	6610	E	1243534	Romania						50	320		50		
196	1283	E	83459	Austria	Essl F. & Weissmair W.		B10	Essl, Franz	13.06.2001	10	250	180			
197	589	E	52714	Austria				Schratt-Ehrendorfer, Luise	01.06.1994	2	153		90		
198	6608	E	1243531	Romania						100	350		60		
199	1784	E	295853	Czech Republic	Šmeralová Z.	3	3	Šmeralová Z.	12.07.1979	1	416	135			
200	4284	E	365585	Czech Republic	Mudra P. et Sladkə J.		7	Mudra P.	26.09.1995	10	440	270			
201	5541	E	1166003	Poland	Głowacki Z.	10	12		19.05.1963	100	115	135			
202	3986	E	353873	Czech Republic	Unar J.	4	11	Unar J.	26.05.1980	4	280	90	60		
203	670	E	53096	Austria				Sauberer, Norbert	25.06.2019	25	151	0	88		2
204	8165	E	1388860	Slovak Republic	Jurko A.	p.223		Jurko A.	13.07.1956	9	132				
205	2867	E	332933	Czech Republic	Chytrý M.,Mucina L.,Vicherek J.,Pokorny-Strudl M.,Strudl M.,Koó A.J.,Maglocký Š.	7	26	Chytrý M.	19.07.1987	8	420				
206	7774	E	1376145	Slovak Republic	Valachovič M.	18	8	Valachovič M.	28.06.1990	6	465	180			
207	6607	E	1243530	Romania						40	410		80		
208	7771	E	1376142	Slovak Republic	Valachovič M.	18	5	Valachovič M.	17.05.1990	2	485	180			
209	7335	E	1268634	Romania	Mihai, G., Sirbu, I., Horeanu, C.	2	3	Gheorge Mihai	01.01.1972	100	360		60		
210	660	E	53041	Austria				Beiser, Andreas	27.06.2011	25	150	0	95		
211	10199	F	2354138	NR (*Alyssetum muralis* Pop et Hodişan ex Vasheniak et al. ass. nov.)	Pop et Hodişan	1, p. 3	6	Pop et Hodişan				150			
212	6511	F	1242485	Romania	Boscaiu, N., Gergely, I., Codoreanu, V., Ratiu, O., Micle, F.	20	1	Nicolae Boscaiu	16.07.1965	100	500	225	80		
213	5403	F	860608	Hungary	Vojtkó A.	1	9	Vojtkó András	22.07.1991	4	590	180	30		
214	6637	F	1243753	Romania		145	7		01.01.1979		450				
215	6636	F	1243752	Romania		145	6		01.01.1979	4	505				
216	8231	G	860480	Slovak Republic	Šuňalová K.		2	Šuňalová K.	22.04.1998	1	430	180	85		
217	8232	G	1392006	Slovak Republic	Šuňalová K.		3	Šuňalová K.	22.04.1998	3	430	180	70		
218	5383	G	1392007	Hungary	Penksza K., Benyovszky B. M., Ötvös E., ,Asztalos J.	1	13	Penksza Károly	20.06.1990	4	316		40		
219	8230	G	1392008	Slovak Republic	Šuňalová K.		1	Šuňalová K.	14.04.1998	4	420	180	70		
220	3796	G	350263	Czech Republic	Sádlo J.	19	7	Sádlo Jiří	01.10.1982	10	453				
221	3778	G	303049	Czech Republic		17	4	Sádlo Jiří	01.06.1982	6	238	225			
222	2497	G	350229	Czech Republic	Sedláček V.	p.7	2	Sedláček Vojtéch	01.06.2017	16	232		55		
223	2013	G	325267	Czech Republic	Preis K.	p.501	3	Preis K.		20	347		50		
224	2498	G	325264	Czech Republic	Sedláček V.	p.7	5	Sedláček Vojtéch	02.06.2017	16	253		50		
225	3779	G	350228	Czech Republic	Sádlo J.	17	5	Sádlo Jiří	01.06.1982	6	238	225			
226	2715	G	332995	Czech Republic	Chytrý M. et Vicherek J.	7	21	Vicherek Jiří	22.05.1966	2	260	180			
227	4691	G	331774	Czech Republic	Klika J.	p.358		Klika J.	01.01.1930	4	216		90		
228	2713	G	331768	Czech Republic	Chytrý M. et Vicherek J.	7	19	Vicherek Jiří	22.05.1966	2	240	225			
229	2901	G	331778	Czech Republic	Korneck D.	12	4	Korneck D.		3	240	225			
230	2705	G	331776	Czech Republic	Chytrý M. et Vicherek J.	7	11	Vicherek Jiří	22.05.1966	2	290	225			
231	2711	G	331781	Czech Republic	Chytrý M. et Vicherek J.	7	17	Vicherek Jiří	22.05.1966	2	280	225			
232	2718	G	378716	Czech Republic	Chytrý M. et Vicherek J.	7	24	Vicherek Jiří	22.05.1966	2	250	135			
233	8708	G	2354148	Slovak Republic	Krippel E.	4	1	Krippel E.		25	357	225	90		
234	10209	G	333056	Hungary		1									
235	571	G	49743	Austria				Schratt-Ehrendorfer, Luise	01.06.1994	45	155		55		
236	7598	G	52654	Slovak Republic	Vozárová M.	1	14	Vozárová M.	02.06.1981	25	201	180	70		
237	2944	G	49742	Czech Republic				Chytrý M.	09.05.1991	1	301	225			
238	168	G	329767	Austria	Karrer G.	1	15			8	285	180	35		
239	1915	G	2354130	Czech Republic				Vymyslický T.	27.04.2005	4	307	180			
240	167	G	332483	Austria	Karrer G.	1	14			2	285	158	50		
241	3410	G	1403101	Czech Republic	Šmarda J.	p.25	3	Šmarda J.	25.04.1946	1	285	180	60		
242	2787	G	378715	Austria	Chytrý M. et Vicherek J.	4	12	Chytrý M.	19.04.1992	2	370	225			
243	4782	G	1380505	Czech Republic				Kočí M.	01.07.1997	9	310	180	80		
244	2619	G	300892	Czech Republic				Boublík K.	30.04.2002	2	300	203			
245	4690	G	353881	Czech Republic	Klika J.	p.357		Klika J.	01.01.1930	1	439		90		
246	4628	G	341994	Czech Republic				Danihelka J.	21.04.1992	1	300	203			
247	10191	G	333054	NR (*Cerastietum pumili* Oberdorfer et T. Müller in T. Müller 1961)	Korneck D.	27, p. 86	9	Korneck D.	23.04.1973	1,5		180	60		
248	2784	G	378255	Austria	Chytrý M. et Vicherek J.	4	9	Chytrý M.	19.04.1992	1	360	180			
249	2946	G	353879	Czech Republic				Chytrý M.	01.05.1992	1	379	135			

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250	3992	G	1374269	Czech Republic	Unar J.	5	2	Unar J.	27.05.1980	3	360	270	70		
251	3994	G	385860	Czech Republic	Unar J.	5	4	Unar J.	27.05.1980	4,5	360	158	70		
252	2788	G	332480	Austria	Chytrý M. et Vicherek J.	4	13	Chytrý M.	19.04.1992	1	370	225			
253	1743	G	316728	Czech Republic	Pantůček R.	p.40	1	Pantůček R.	10.07.1985	0,1	489	180	80		
254	7949	G	333053	Slovak Republic	Futák J.	p.84	3	Futák J.	01.01.1947		221				
255	2943	G	332484	Czech Republic				Chytrý M.	08.05.1991	1	343	270			
256	218	G	295644	Austria				Sauberer, Norbert	27.05.2005	8	330	180			
257	3988	G	50155	Czech Republic	Unar J.	4	13	Unar J.	22.06.1978	6	250	360	80		
258	3979	G	353876	Czech Republic	Unar J.	4	4	Unar J.	31.05.1977	2	220	225	50		
259	3984	G	353874	Czech Republic	Unar J.	4	9	Unar J.	28.06.1977	1,5	300		60		
260	3990	G	353877	Czech Republic	Unar J.	4	15	Unar J.	26.06.1979	3	280		80		
261	3987	G	353875	Czech Republic	Unar J.	4	12	Unar J.	11.05.1978	2	290	203	80		
262	2272	G	353866	Czech Republic	Kotouč L.	12	1	Kotouč L.	01.01.2001	3	495	180	15		
263	3989	G	353865	Czech Republic	Unar J.	4	14	Unar J.	26.06.1979	1,5	290	180	70		
264	5615	G	353871	Poland				Arkadiusz Nowak	07.07.2003	25	236				
265	3978	H	1173698	Czech Republic	Unar J.	4	3	Unar J.	31.05.1977	2	220	135	60		
266	3783	H	350230	Czech Republic	Sádlo J.	17	9	Sádlo Jiří	01.10.1982	5	446	135			
267	3777	H	350232	Czech Republic	Sádlo J.	17	3	Sádlo Jiří	01.10.1982	20	371	135			
268	3782	H	350233	Czech Republic	Sádlo J.	17	8	Sádlo Jiří	01.09.1982	5	306	180			
269	503	H	350227	Austria	Eijsink J.G.H.M., Ellenbroek G.A., Holzner W. & Werger M.J.A.	2	43		02.06.1976	42	460	158			
270	3780	H	51581	Czech Republic	Sádlo J.	17	6	Sádlo Jiří	01.06.1982	10	330	225			
271	3977	H	353864	Czech Republic	Unar J.	4	2	Unar J.	13.05.1977	3	260	203	60		
272	3976	H	353863	Czech Republic	Unar J.	4	1	Unar J.	13.05.1977	1,5	260	270	70		
273	4312	H	1378515	Czech Republic	Klika J.	p.256		Klika J.		1	808				
274	3363	H	332586	Czech Republic	Kubíková J.	3	6	Kubíková J.	01.06.1979	50	248	180			
275	3781	H	353882	Czech Republic	Sádlo J.	17	7	Sádlo Jiří	01.09.1982	10	230	180			
276	2964	H	350406	Czech Republic	Kolbek J.	5	6	Kolbek J.	29.06.1972	1	224				
277	2967	H	342018	Czech Republic	Kolbek J.	5	10	Kolbek J.	14.06.1972	1	313				
278	3361	H	367431	Czech Republic	Kubíková J.	2	22	Kubíková J.	01.05.1972	9	236	135			
279	3995	H	370568	Czech Republic	Unar J.	5	5	Unar J.	27.05.1980	3	360	158	60		
280	3668	H	367482	Czech Republic	Kolbek J.	8	5	Kolbek J.	19.06.1978	12	300	158			
281	4281	H	364744	Czech Republic	Klika J.	p.8		Klika J.		8	549	180	30		
282	4156	H	332584	Czech Republic	Šimr J.	p.126	1	Šimr J.		3	409		60		
283	2813	H	350231	Austria	Tichý L., Chytrý M., Pokorny-Strudl M., Strudl M. et Vicherek J.	1	38	Tichý L.	06.07.1993	16	380	248			5
284	5005	H	333043	Czech Republic	Klika J.	p.16	5	Klika J.		1	408	135	70		
285	4318	H	401059	Czech Republic	Studničková I. et Studnička M.	p.19		Studničková I.	21.07.1977	4	244	180			
286	3806	H	349815	Czech Republic	Brabec E.	V.	1	Brabec E.		9	426	270	80		
287	3425	H	295589	Czech Republic	Šmarda J.	p.38	6	Šmarda J.	01.08.1961	20	509	180	40		
288	2933	H	339109	Czech Republic				Chytrý M.	13.05.1987	2	250	158			
289	3667	H	340624	Czech Republic	Kolbek J.	8	4	Kolbek J.	19.06.1978	20	300	180			
290	3381	H	340969	Czech Republic	Klika J.	p.732	1	Klika J.		20	560				
291	3241	H	333079	Czech Republic	Kolbek J.	9	8	Kolbek J.	06.06.1973	9	270	315			
292	2937	H	353122	Czech Republic				Chytrý M.	24.04.1989	1	246	180			
293	1733	H	339075	Czech Republic			1	Čechová J.	08.08.1998	16	319	180	70		
294	2815	H	333075	Czech Republic	Tichý L., Chytrý M., Pokorny-Strudl M., Strudl M. et Vicherek J.	1	40	Tichý L.	04.07.1993	8	410	113			
295	4255	H	340614	Czech Republic	Knížetová L.		1	Knížetová L.		1	338	203			
296	7903	H	360382	Slovak Republic	Májovský J., Jurko A.	p.294	2	Májovský J.	01.01.1956		482	113			
297	4481	H	362725	Czech Republic	Klika J.		5	Klika J.		1	408	135			
298	3230	H	333047	Czech Republic	Kolbek J.	6	3	Kolbek J.	13.04.1972	12	570	158			
299	3887	H	349814	Czech Republic	Kolbek J.	13	7	Kolbek J.	14.05.1975	10	210	135			
300	5317	H	857938	Hungary	Szerdahelyi T.	1	94	Szerdahelyi Tibor	01.07.1988	4	453	225			
301	5318	H	857961	Hungary	Szerdahelyi T.	1	95	Szerdahelyi Tibor	01.07.1988	4	453	225			
302	4425	H	857962	Czech Republic	Kolbek J. et al.	4,2	4	Kolbek J.	13.04.1971	4	250	135			
303	3284	H	339336	Czech Republic	Toman M.	9	7	Toman M.	11.07.1963	25	478	225			
304	5307	H	339342	Hungary	Szerdahelyi T.	1	71	Szerdahelyi Tibor	01.07.1988	4	453	225			
305	3281	H	339330	Czech Republic	Toman M.	9	1	Toman M.	11.07.1963	16	367	135			
306	3289	H	369557	Czech Republic	Toman M.	9	13	Toman M.	25.07.1975	16	253	225			
307	3487	H	83354	Czech Republic	Klika J.	p.513		Klika J.		2	440	90	70		
308	1248	H	51357	Austria	Magnes M. et al.	S2	26		11.07.2018	10	997	195	40		
309	406	H	344016	Austria	Koy A. J.	17	1		01.01.1991	8	150	135	75		
310	3812	H	350413	Czech Republic	Brabec E.	V.	8	Brabec E.		9	476	225	50		
311	3813	H	350412	Czech Republic	Brabec E.	V.	9	Brabec E.		9	476	225	50		
312	3376	H	401056	Czech Republic	Klika J.	4	7	Klika J.		50	350				
313	4480	H	370565	Czech Republic	Klika J.		2	Klika J.		2	408	135			
314	3181	H	340928	Czech Republic	Zlatník A.	II	28	Zlatník A.	05.07.1927	80	230	360			
315	3371	H	340952	Czech Republic	Klika J.	p.717	3	Klika J.		20	234				
316	5004	H	336167	Czech Republic	Klika J.	p.16	2	Klika J.		2	408	135	55		

Continuation of Supplement E5. Header data for all relevés of the vegetation of annuals and succulents on dry calcareous substrates used in this analysis.

Fortsetzung von Anhang E5. Kopfdaten für alle Vegetationsaufnahmen mit Annuellen uns Sukkulenten auf trockenen Kalksubstraten, die für diese Analyse benutzt wurden.

Sequence No	Cover herb layer (%)	Cover moss layer (%)	Cover lichen layer (%)	Mosses identified (Y/N)	Lichens identified (Y/N)	EUNIS-Esy	DEG_LAT	DEG_LON	Dataset (Database = DB)	Class	Light	Temperature	Salinity	Moisture	Soil reaction	Nutrients	Number of species
1				Y	Y	R	50,55167	14,06139	Czechia_nvd	SedSc	7,93	6,05	3,66	6,44	4,2	0,1	10
2	30	1		N	N	R16	49,06250	19,26667	Slovakia_nvd	SedSc	7,65	5,62	3,68	7,07	3,13	0,03	12
3	20	5		N	N	U37	48,87222	18,49444	Slovakia_nvd	SedSc	8,47	5,6	2,53	7,1	2,07	0,03	5
4	20					U27	49,99028	14,33806	Czechia_nvd	SedSc	8,42	6,07	2,78	7,18	2,7	0,02	5
5	30			Y	Y	R13	50,00139	14,01250	Czechia_nvd	SedSc	8,14	6,07	2,88	6,44	2,43	0,09	18
6	60	25		Y	Y	R	49,95917	14,19639	Czechia_nvd	SedSc	7,8	6,27	3,48	6,47	3,97	0,18	11
7		1				R13	49,06834	18,15458	Alysso_Sedetalia_nomtypes	SedSc	8,67	6	3,78	6,72	3	0,02	6
8				Y	N	R14	50,49139	18,12000	Poland	SedSc	8,6	6,3	2,6	7	1,9	0,1	5
9	70	10		Y	Y	R16	50,02778	13,91806	Czechia_nvd	SedSc	8,21	6,31	2,85	7,24	2,45	0,09	19
10	15	20		Y	Y	R13	49,36222	16,71750	Czechia_nvd	SedSc	7,9	6,3	4,33	6,47	4,7	0,07	6
11	90	80		N	N	R	48,61667	20,85000	Slovakia_nvd	SedSc	7,2	6,05	3,93	7,05	4,18	0,03	8
12						R13	46,79642	17,49043	Alysso_Sedetalia_nomtypes	?	6,99	6,3	3,9	6,41	4,43	0	17
13	70	10		Y	Y	R16	50,02722	13,91806	Czechia_nvd	SedSc	8,21	6,31	2,85	7,24	2,45	0,09	19
14	35	25		Y	Y	R	48,45000	17,25000	Slovakia_nvd	SedSc	7,57	5,55	3,7	7,35	2,87	0,05	5
15	50	2		Y	Y	R13	50,00000	14,01389	Czechia_nvd	SedSc	7,95	6,06	3,01	6,36	2,93	0,09	20
16	40					R13	50,46180	18,16674	Poland	SedSc	7,86	5,78	3,6	6,81	3,7	0,3	11
17	30	10		Y	Y	R16	49,36250	16,71528	Czechia_nvd	SedSc	8,22	6,57	3,14	6,88	2,3	0,08	15
18	35	50		N	N	R	49,23333	18,70833	Slovakia_nvd	SedSc	6,96	5,63	4,26	6,7	4,97	0,03	7
19	30	10		Y		R16	46,55185	13,87844	Austria_VINCA	SedSc	7,33	6	3,4	7,3	2,38	0,01	18
20	70	5		Y	Y	R13	50,03056	13,87361	Czechia_nvd	SedSc	8,1	6,32	2,76	6,5	2,3	0,11	12
21	55	20		Y	Y	R13	49,12778	18,51111	Slovakia_nvd	SedSc	8,15	5,28	3,2	6,73	2,78	0,15	14
22	40	10		Y	Y	R13	49,38361	16,68444	Czechia_nvd	SedSc	8,43	6,1	2,65	6,88	2	0,05	17
23				N	N	R13	50,43444	13,75722	Czechia_nvd	SedSc	8,5	6,3	2,97	7,2	2,6	0,73	4
24	35			N	N	R16	49,06944	18,15556	Slovakia_nvd	SedSc	6,57	5,46	4,37	6,95	4,45	0,01	15
25	40	40		Y	Y	R13	48,84861	16,63194	Czechia_nvd	SedSc	8,64	6,71	2,46	7,16	1,53	0,09	12
26				N	N	R13	48,86111	18,25000	Slovakia_nvd	SedSc	8,27	6,57	2,91	7,3	2,17	0,07	10
27	10	45		Y	Y	R13	49,37278	16,75306	Czechia_nvd	SedSc	8,46	6,24	2,62	6,88	1,68	0,02	20
28	30	20		Y	N	R16	50,90251	16,20665	Poland	SedSc	8	5,73	3,08	7,13	1,78	0	9
29				N	N	R13	48,70000	18,40000	Slovakia_nvd	SedSc	8,64	6,7	2,46	7,34	1,58	0,1	7
30	28					R13	49,93944	14,13889	Czechia_nvd	SedSc	8,3	6,32	2,88	6,82	2,39	0,14	10
31				N	N	R16	48,71667	18,40000	Slovakia_nvd	SedSc	8,63	4,8	2,87	4,75	1,8	0,03	6
32	35	70		Y	Y	R12	49,13667	16,23500	Czechia_nvd	SedSc	8,45	6,58	2,65	6,1	1,78	0,17	16
33				N		R16	48,12113	16,93525	Austria_VINCA	SedSc	8,18	6,62	2,72	7,57	2,04	0,06	25
34	30	40		N	N	R13	48,67696	27,20472	Alysso_Sedetalia_fin	SedSc	8,09	6,22	3,27	7,18	3,06	0,26	19
35	70	60		Y	N	R13	50,40261	19,25543	Poland	SedSc	7,81	6,34	3,47	7,03	3,81	0,17	18
36	80	30		Y	N	R13	50,36583	19,03793	Poland	SedSc	7,64	5,73	3,66	7,03	3,2	0,14	23
37	65	20		Y	Y	R13	49,51528	17,31944	Czechia_nvd	SedSc	8,19	5,8	3,18	7,03	2,97	0,1	18
38	50	25		N		R13	48,57833	16,39028	Austria_VINCA	SedSc	7,78	6,37	3,4	6,98	2,76	0,15	26
39	40	40		N	N	R13	48,76497	27,20103	Alysso_Sedetalia_fin	SedSc	8,09	5,8	3,29	7,11	2,66	0,26	30
40	30			N	Y	R16	50,88311	16,28311	Poland	SedSc	7,58	5,49	3,33	6,7	2,38	0,1	21
41	100			N	N	R	50,82833	19,23646	Poland	SedSc	7,7	5,63	3,55	6,37	2,68	0,18	29
42	70	5		Y	Y	R13	49,89556	14,83028	Czechia_nvd	SedSc	7,69	6,04	3,28	6,73	2,62	0,25	20
43						R	51,36583	16,63667	Poland	SedSc	7,83	6	3,12	6,2	2,27	0,21	20
44						R13	4,17376	50,25822	Alysso_Sedetalia_nomtypes	SedSc	8,44	5,54	2,96	6,38	2,35	0,16	19
45	20	10		N	N	R13	48,80148	26,83180	Alysso_Sedetalia_fin	SedSc	8,06	6,21	2,89	6,84	2,38	0,1	24
46	40	20		Y	Y	R13	48,57240	26,98513	Ukraine Grassland DB A	SedSc	8,21	5,67	3,15	6,59	2,26	0,3	19
47	50	10		Y	Y	R13	49,14394	26,65361	Ukraine Grassland DB A	SedSc	7,83	5,94	3,53	6,71	3,13	0,22	22
48	30	30		N	N	R	50,30500	16,16075	Czechia_nvd	SedSc	8,4	5,8	2,7	7,1	2,23	0,57	5
49	30	20		N	N	R13	48,64080	27,08870	Alysso_Sedetalia_fin	SedSc	8,11	5,96	3,19	6,96	2,59	0,12	33
50	50	30		Y	Y	R13	49,51528	17,31944	Czechia_nvd	SedSc	8,06	6,23	3,03	7,09	2,49	0,25	22
51	80	5		N		R1A	48,57833	16,39028	Austria_VINCA	SedSc	7,61	6,05	3,51	7,01	3,35	0,15	38
52	50			N	N	R13	49,53111	16,50194	Czechia_nvd	SedSc	7,56	5,98	3,66	6,17	3,52	0,16	20
53	60			Y	N	R13	50,18119	19,14282	Poland	SedSc	7,78	5,53	3,63	6,93	3,14	0,21	28
54						R13	51,45000	16,61333	Poland	SedSc	8,17	5,93	3,27	6,51	2,94	0,23	13
55	60	10		Y	N	R13	50,38729	19,07896	Poland	SedSc	7,87	5,92	3,25	7,19	2,86	0,08	23
56	50	75		Y	Y	R13	48,57281	26,98561	Ukraine Grassland DB A	SedSc	7,87	5,78	3,45	6,82	3,06	0,28	24
57	70	5				R13	50,49493	18,12099	Poland	SedSc	8,11	6,08	3	7,16	2,24	0,2	14
58	70	80		N	N	R13	48,67083	19,90556	Slovakia_nvd	SedSc	7,5	6,36	3,35	6,82	2,92	0,06	18
59	80			Y	N	R13	50,93647	15,93966	Poland	SedSc	7,13	5,3	3,57	6,59	2,84	0,09	15
60	60	40		Y	Y	R12	48,58366	26,75152	Ukraine Grassland DB A	SedSc	7,93	6,3	3,46	6,74	3,23	0,22	18
61	50	5		Y	Y	R13	49,73417	15,31000	Czechia_nvd	SedSc	8,21	5,77	3,22	6,42	2,43	0,17	19
62						R13	51,40889	16,77250	Poland	SedSc	8,25	6,21	2,95	6,62	2,31	0,14	20
63				N	N	R13	47,83056	18,72778	Slovakia_nvd	SedSc	7,81	6,58	3,22	7,36	2,67	0,09	23
64						R13	51,40889	16,77250	Poland	SedSc	8,24	6,22	2,93	6,46	2,56	0,13	20
65	70	20		Y	N	R13	50,77674	19,23642	Poland	SedSc	7,8	5,98	3,38	6,7	2,68	0,17	36
66	25					R13	50,46180	18,16674	Poland	SedSc	8,12	5,93	3,19	6,81	3,8	0,29	12
67						R13	51,36583	16,63667	Poland	SedSc	7,94	6,22	3,57	6,25	3,41	0,25	20
68	40	20				R13	51,24889	17,07917	Poland	SedSc	8,22	5,88	3,2	6,73	2,87	0,27	21
69						R1B	46,73000	23,35000	Romania Grassland DB	SedSc	7,69	5,92	3,54	6,79	2,79	0,17	26
70	40			N	N	R13	50,88311	16,28311	Poland	SedSc	7,67	5,64	3,33	7,16	2,8	0,05	30
71	70	40		Y	N	R1A	50,14600	19,18556	Poland	SedSc	7,78	5,76	3,62	6,71	3	0,14	30
72						R13	51,33972	16,65417	Poland	SedSc	7,74	6,06	3,43	6,63	2,54	0,21	21
73	85	50		Y	N	R13	50,36583	19,03793	Poland	SedSc	7,77	5,66	3,75	7,11	3,17	0,17	24
74	55			N	N	R13	49,50951	29,32601	Ukraine Grassland DB A	SedSc	8,09	5,81	2,98	6,62	2,37	0,17	20
75	30	10		N	N	R13	48,63504	27,18098	Alysso_Sedetalia_fin	SedSc	8,12	6,35	3,27	6,73	3,21	0,2	27
76	70	30		Y	Y	R13	49,51528	17,31944	Czechia_nvd	SedSc	8,09	6	3,12	6,76	2,49	0,29	17
77	50	5				R16	50,49493	18,12099	Poland	SedSc	7,83	5,98	3,37	7,08	2,54	0,16	17
78	40	40		Y	Y	R13	49,37194	16,53694	Czechia_nvd	SedSc	7,51	6,23	3,59	6,06	3,29	0,05	25

Continued on next page

Fortsetzung auf nächsten Seite

Sequence No	Cover herb layer (%)	Cover moss layer (%)	Cover lichen layer (%)	Mosses identified (Y/N)	Lichens identified (Y/N)	EUNIS-Esy	DEG_LAT	DEG_LON	Dataset (Database = DB)	Class	Light	Temperature	Salinity	Moisture	Soil reaction	Nutrients	Number of species
79	80	30		Y	Y	R13	49,51528	17,31944	Czechia_nvd	SedSc	7,81	6	3,6	6,5	3,58	0,28	21
80	60	5				R13	51,05139	16,19194	Poland	SedSc	7,9	6,01	3,22	6,67	2,71	0,13	21
81	30	10		N	N	R13	48,16794	24,24017	Alysso_Sedetalia_fin	SedSc	7,9	6,23	3,39	7,04	2,97	0,19	19
82	85	5		Y	Y	R13	48,78035	25,84484	Ukraine Grassland DB A	SedSc	8,14	5,97	2,75	7,15	2,11	0,08	23
83	20	20		N	N	R13	48,68027	27,07360	Alysso_Sedetalia_fin	SedSc	8,19	6,19	3,06	6,77	2,24	0,2	30
84	45	5		N	N	R13	48,27641	24,74084	Alysso_Sedetalia_fin	SedSc	7,91	6,03	3,19	7,02	2,21	0,2	19
85	75	5				R13	50,49493	18,12099	Poland	SedSc	8,12	6,2	2,94	6,86	2,12	0,42	13
86	50	20		N	N	R13	49,10759	26,24890	Alysso_Sedetalia_fin	SedSc	8,09	5,93	3,34	7,11	2,38	0,19	33
87	20	30		Y	Y	R13	48,56790	25,76484	Alysso_Sedetalia_fin	SedSc	8,16	6,03	3,16	7,23	2,36	0,15	18
88	50	10		N	N	R13	49,13144	26,37676	Alysso_Sedetalia_fin	SedSc	8,11	6,15	2,99	6,99	3	0,15	28
89	30	10		N	N	R13	48,64076	27,09959	Alysso_Sedetalia_fin	SedSc	8,24	6,37	3,06	7,09	2,37	0,22	21
90	50	10		N	N	R13	48,27513	24,74013	Alysso_Sedetalia_fin	SedSc	8,22	6,19	3	7,03	2,26	0,13	17
91	20	10		N	N	R13	48,50132	27,44637	Alysso_Sedetalia_fin	SedSc	8,29	6,39	2,94	7,02	2,29	0,19	30
92	20	10		N	N	R13	49,40454	26,07422	Alysso_Sedetalia_fin	SedSc	7,98	5,75	2,77	6,9	2,35	0,3	21
93	30	10		N	N	R13	48,84281	25,07023	Alysso_Sedetalia_fin	SedSc	7,79	6,3	3,18	7,28	2,4	0,09	28
94	20	30		Y	Y	R13	48,55168	26,79307	Alysso_Sedetalia_fin	SedSc	7,97	6,14	2,94	6,76	2,19	0,23	21
95	40	10		N	N	R13	48,23995	24,75600	Alysso_Sedetalia_fin	SedSc	8,19	5,84	3,17	7,11	2,48	0,2	25
96	85	5		Y	Y	R13	48,69011	25,87328	Ukraine Grassland DB A	SedSc	7,94	5,96	3,07	7,14	2,29	0,16	24
97	50	30		Y	Y	R13	48,64345	26,83417	Ukraine Grassland DB A	SedSc	8,04	5,98	3,25	7,24	2,34	0,21	29
98	20	10		N	N	R13	49,10144	26,37727	Alysso_Sedetalia_fin	SedSc	8,42	6,3	2,81	7,26	2,64	0,23	19
99	20	40		Y	Y	R13	48,55148	26,79216	Alysso_Sedetalia_fin	SedSc	8,15	6,41	2,79	7,29	2,08	0,13	19
100	60	50		Y	Y	U37	48,66899	25,80782	Ukraine Grassland DB A	SedSc	7,84	5,49	3,39	7,28	2,36	0,18	26
101	30	20		N	N	R13	48,63416	27,19106	Alysso_Sedetalia_fin	SedSc	8,32	6,28	3,13	6,8	2,17	0,11	22
102	40	10		N	N	R13	48,27519	24,74013	Alysso_Sedetalia_fin	SedSc	8,33	6,16	2,95	6,93	2,15	0,04	23
103	20	10		N	N	R13	48,67633	27,20528	Alysso_Sedetalia_fin	SedSc	8,22	5,97	3,1	7,12	2,61	0,19	21
104	20	30		N	N	R13	48,24020	24,75391	Alysso_Sedetalia_fin	SedSc	7,74	5,9	3,12	6,68	3,5	0,08	14
105	40	20		N	N	R13	48,27610	24,74081	Alysso_Sedetalia_fin	SedSc	7,71	5,88	3,33	7,21	2,49	0,22	24
106	20	20		N	N	R13	48,68205	27,07549	Alysso_Sedetalia_fin	SedSc	8,01	5,85	3,4	7,05	2,94	0,08	31
107	40	10		N	N	R13	49,35660	26,07842	Alysso_Sedetalia_fin	SedSc	7,86	5,99	3,26	7,28	2,24	0,03	27
108	30	20		Y	Y	U37	48,40251	24,66245	Ukraine Grassland DB A	SedSc	7,87	5,67	3,18	7,18	2,58	0,15	24
109	40	20		N	N	R13	48,25308	24,86685	Alysso_Sedetalia_fin	SedSc	7,68	5,55	3,43	6,97	2,99	0,22	30
110	30	20		N	N	R13	48,27513	24,74105	Alysso_Sedetalia_fin	SedSc	8,19	6,04	3,14	7,03	2,43	0,15	21
111						R13	47,79613	27,33734	Alysso_Sedetalia_fin	SedSc	8,32	5,67	2,72	6,44	2,13	0,24	14
112	20	20		N	N	R13	48,28172	24,67004	Alysso_Sedetalia_fin	SedSc	8,14	5,98	3,03	7,23	2,33	0,2	19
113	20	10		N	N	R13	48,92412	24,39194	Alysso_Sedetalia_fin	SedSc	8,29	5,97	3,21	7,09	2,15	0,29	18
114	45	5		Y	Y	R12	48,64561	25,83131	Ukraine Grassland DB A	SedSc	8,01	5,73	3,38	6,85	2,01	0,17	22
115	60	30		Y	Y	R13	48,80900	26,60328	Ukraine Grassland DB A	SedSc	8,11	5,84	3,13	6,93	2,48	0,15	20
116	40	20		Y	Y	R13	48,35559	28,08098	Alysso_Sedetalia_fin	SedSc	8,2	5,96	3,33	6,62	3,98	0,21	17
117	15	5		N	N	R13	48,59074	27,16229	Alysso_Sedetalia_fin	SedSc	7,89	6,43	3,12	6,85	2,96	0,22	27
118	60	20		Y	Y	R13	48,51078	26,34534	Ukraine Grassland DB A	SedSc	8,18	6,4	3,08	7,2	3,08	0,05	19
119	40	10		Y	Y	R	48,58214	26,97892	Ukraine Grassland DB A	SedSc	7,82	5,66	3,44	7,21	2,56	0,15	25
120	50	10		Y	Y	R13	49,14285	26,66284	Ukraine Grassland DB A	SedSc	8,14	6,06	3	7,09	2,38	0,08	19
121	20	20		N	N	R13	48,67815	27,20623	Alysso_Sedetalia_fin	SedSc	7,89	6,03	3,27	6,51	3,11	0,05	21
122	60	20		Y	Y	R13	48,98001	26,45593	Ukraine Grassland DB A	SedSc	7,64	6,08	3,32	6,89	3,05	0,12	25
123	40	10		N	N	R13	48,67800	27,20624	Alysso_Sedetalia_fin	SedSc	7,97	6,28	2,96	6,82	2,67	0,11	29
124	40	80				R	48,57906	26,79293	Ukraine Grassland DB A	SedSc	7,72	6,09	3,38	6,95	3,09	0,14	34
125	40	20		Y	Y	R13	48,64551	25,83124	Ukraine Grassland DB A	SedSc	7,77	5,8	3,49	6,97	2,57	0,13	30
126	60	50		Y	Y	U27	48,78233	25,58033	Ukraine Grassland DB A	SedSc	7,66	6,28	3,54	7,07	2,9	0,17	21
127	40	10		Y	Y	R13	48,61012	26,97327	Ukraine Grassland DB A	SedSc	7,7	5,76	3,56	7	3,09	0,15	31
128	30	10		N	N	R13	48,59087	27,16208	Alysso_Sedetalia_fin	SedSc	8,08	6,27	3,01	7,26	2,1	0,05	25
129	42	17		Y	Y	U37	49,36306	26,07363	Ukraine Grassland DB A	SedSc	8,4	5,3	2,98	7,13	2,03	0,2	9
130	75	5		Y	N	R13	48,63173	25,73726	Ukraine Grassland DB A	SedSc	7,97	5,28	3,48	6,81	3,56	0,06	21
131	60	10		Y	Y	U37	48,64269	26,83524	Ukraine Grassland DB A	SedSc	8,09	5,97	3,23	6,9	2,51	0,12	22
132	20	10		N	N	R13	48,59095	27,16181	Alysso_Sedetalia_fin	SedSc	8,25	5,98	3,2	7,24	2,28	0,05	26
133	60	50		Y	Y	R13	48,67902	25,27127	Ukraine Grassland DB A	SedSc	7,75	6,13	3,62	6,88	3,55	0,08	26
134	50	15				R13	46,69618	30,64182	Ukraine Halophytic Coastal VDB	SedSc	8,22	6,3	2,84	6,34	2,6	0,24	7
135	50	10		Y	Y	R1B	48,58763	26,73837	Ukraine Grassland DB A	SedSc	8,01	5,81	3,39	7,19	3,33	0,04	24
136	10	10		N	N	R13	49,40927	26,06308	Alysso_Sedetalia_fin	SedSc	8	5,88	3,16	6,87	2,86	0,1	15
137	68	2		Y	Y	R	48,58438	26,74890	Ukraine Grassland DB A	SedSc	8,03	5,88	3,46	6,95	3,41	0,09	17
138	40	10		Y	Y	R	48,58213	26,97890	Ukraine Grassland DB A	SedSc	7,89	5,04	3,97	6,88	3,33	0,24	20
139	30	10		N	N	R13	49,35658	26,07699	Alysso_Sedetalia_fin	SedSc	7,72	5,69	3,55	7,12	2,71	0,13	24
140	60	50		Y	Y	R13	48,70881	25,65400	Ukraine Grassland DB A	SedSc	7,66	5,66	3,51	7,2	3,1	0,25	24
141	50	10		Y	Y	R	48,58264	26,75156	Ukraine Grassland DB A	SedSc	7,84	5,8	3,44	7,16	2,94	0,08	31
142	30	20		N	N	R13	48,76853	27,19951	Alysso_Sedetalia_fin	SedSc	8,1	6,19	3,31	7,19	3,04	0,33	25
143	30	10		Y	N	R13	49,36679	26,05557	Alysso_Sedetalia_fin	SedSc	7,9	6,07	3,19	7,14	2,53	0,13	17
144	40	20		Y	Y	R13	48,57730	26,64319	Ukraine Grassland DB A	SedSc	7,99	5,92	3,42	7,32	2,86	0,13	29
145	50	10		Y	Y	R13	48,54008	26,61738	Ukraine Grassland DB A	SedSc	7,93	5,77	3,24	7,03	2,89	0,07	22
146	20	80				R13	48,59640	28,87817	Ukraine Grassland DB A	SedSc	7,83	6,31	2,99	7,39	2,38	0,13	26
147	40	10				R13	46,71235	30,59562	Ukraine Halophytic Coastal VDB	SedSc	8,54	6,2	2,52	6,72	1,76	0,24	6
148	40	10		Y	Y	R13	48,64781	25,83131	Ukraine Grassland DB A	SedSc	8,06	6,07	3,13	7	2,33	0,15	20
149	40	10		Y	Y	R13	48,58443	27,15198	Ukraine Grassland DB A	SedSc	8,31	6,21	3,05	7,39	2,53	0,04	19
150						R13	48,01947	27,14055	Alysso_Sedetalia_nomtypes	?	8,04	6,18	3,24	7,09	2,64	0,14	44
151		5				R13	49,39904	26,07108	Alysso_Sedetalia_nomtypes	?	7,72	6,03	3,24	6,76	2,98	0,15	28
152	60	10		Y	Y	R13	49,14393	26,65836	Ukraine Grassland DB A	SedSc	8,21	6,26	3,06	7,04	3,37	0,09	20
153	30	10		N	N	R13	49,10501	26,37697	Alysso_Sedetalia_fin	SedSc	8,03	5,75	3,27	6,92	2,05	0,09	26
154	60	50		Y	Y	R	48,55231	26,48652	Ukraine Grassland DB A	SedSc	7,79	6,26	3,37	6,11	3,11	0,36	30
155				Y	N	R1B	49,05000	21,33056	Slovakia_nvd	SedSc	7,68	6,25	3,31	7,19	3,02	0,14	32
156						R13				SedSc	7,87	6,3	3,31	7,31	2,36	0,2	18
157	30	10		N	N	R13	48,67808	27,20641	Alysso_Sedetalia_fin	SedSc	8,13	6,13	2,95	6,84	2,59	0,06	21
158	50	10		Y	Y	R	48,56891	26,99941	Ukraine Grassland DB A	SedSc	7,83	5,3	3,51	6,93	2,47	0,09	22
159	60	20		Y	Y	R13	48,51165	26,79283	Alysso_Sedetalia_fin	SedSc	8,17	6,3	3,01	7,32	2,45	0,07	27
160	30	30		N	N	R13	49,39682	26,07560	Alysso_Sedetalia_fin	SedSc	7,74	5,62	3,42	7,26	2,69	0,13	34
161	40	20		Y	Y	R12	48,58465	26,74936	Ukraine Grassland DB A	SedSc	7,99	5,81	3,27	6,96	2,65	0,13	18
162						R13	22,27004	44,61637	Alysso_Sedetalia_nomtypes	?	7,92	6,66	3,26	6,72	2,92	0,07	19
163						R	45,15639	21,96128	Romania Grassland DB	SedSc	8,12	6,35	3,68	6,7	4,38	0,12	6
164						R16	44,59810	22,26180	Romania Grassland DB	SedSc	7,61	6,5	3,57	7,07	3,23	0,03	21
165						R16	44,59540	22,26010	Romania Grassland DB	SedSc	7,61	6,5	3,57	7,07	3,23	0,03	22
166						R	51,41806	16,74861	Poland	SedSc	7,77	6,1	3,35	6,34	2,79	0,13	28
167				N	N	U27	48,57222	17,59444	Slovakia_nvd	SedSc	8,03	5,98	3,32	6,69	3,58	0,17	12
168	55	60		Y	N	R13	48,61111	20,84167	Slovakia_nvd	SedSc	8,1	5,1	2,5	6,67	1,5	0,13	9

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Fortsetzung auf nächsten Seite

Sequence No	Cover herb layer (%)	Cover moss layer (%)	Cover lichen layer (%)	Mosses identified (Y/N)	Lichens identified (Y/N)	EUNIS-Esy	DEG_LAT	DEG_LON	Dataset (Database = DB)	Class	Light	Temperature	Salinity	Moisture	Soil reaction	Nutrients	Number of species
169	90	10		Y	N	R1A	51,30574	17,19023	Poland	SedSc	7,54	5,38	3,51	6,79	2,66	0,11	23
170	65	5		Y	N	R13	50,98137	16,04412	Poland	SedSc	7,69	5,79	3,61	6,15	2,99	0,15	19
171	50					R13	48,31319	14,76443	Austria_VINCA	SedSc	7,4	5,66	4,1	5,69	2,91	0,1	11
172	40	20		Y	N	R13	51,08908	18,79692	Poland	SedSc	7,92	5,35	3,57	6,55	2,36	0,29	23
173	50	20		Y	N	R13	50,88311	16,28311	Poland	SedSc	7,71	5,44	3,43	6,36	2,67	0,04	20
174				Y	N	R13	50,49139	18,12000	Poland	SedSc	7,3	5,3	2,7	6,3	1,5	0	6
175	40	20		Y	N	R13	50,88311	16,28311	Poland	SedSc	7,59	5,45	3,5	6,52	2,33	0,08	25
176	30	20		Y	Y	R16	50,90251	16,20665	Poland	SedSc	7,76	5,85	3,54	6,18	2,71	0,08	18
177	50	25				R13	51,05139	16,19194	Poland	SedSc	7,87	6,03	3,28	6,83	2,4	0,02	20
178		70				R13	48,92574	11,86417	Alysso_Sedetalia_nomtypes	SedSc	8,31	6,13	2,9	6,83	2,11	0,14	17
179	40	5		N	N	R13	49,14111	15,56681	Czechia_nvd	SedSc	7,7	5,97	3,38	5,61	2,41	0,07	11
180	40	3		Y	N	R13	50,88311	16,28311	Poland	SedSc	7,82	5,36	3,51	6,74	2,88	0,05	31
181	40	5		N	Y	R13	49,14111	15,56667	Czechia_nvd	SedSc	7,7	5,97	3,38	5,61	2,41	0,07	11
182	55	5		Y	N	R	50,98137	16,04412	Poland	SedSc	7,87	5,91	3,7	6,43	3,23	0,18	16
183						R	51,25833	16,63583	Poland	SedSc	7,81	5,68	3,4	6,54	2,92	0,19	20
184	65	15		Y	Y	R	50,24278	14,43528	Czechia_nvd	SedSc	7,23	5,87	3,88	6,91	4,35	0,2	12
185	75	40		N	N	R16	48,48333	17,25833	Slovakia_nvd	SedSc	8,09	6,05	2,89	7,01	2,21	0,01	18
186	80	20		Y	Y	R13	50,77674	19,23642	Poland	SedSc	7,79	5,91	3,57	6,6	2,58	0,18	36
187	25			Y	Y	R13	48,42722	18,63694	Slovakia_nvd	SedSc	7,92	6,66	3,01	6,71	2,89	0,2	36
188				Y		R13	47,08590	27,64570	Romania Grassland DB	SedSc	7,96	6,15	2,68	6,7	1,74	0,34	9
189				Y	Y	R16	48,35139	18,20000	Slovakia_nvd	SedSc	8,19	6,2	2,86	6,81	2,06	0,09	26
190						R	47,05000	27,38000	Romania Grassland DB	SedSc	8,09	6,12	3,08	6,98	2,3	0,17	13
191						R13	47,05000	27,38000	Romania Grassland DB	SedSc	7,96	6,15	2,68	6,7	1,74	0,34	9
192	30	40		Y	N	R13	50,52750	14,01778	Czechia_nvd	SedSc	7,75	5,78	3,83	7,12	3,63	0,17	14
193	65	5		N	N	R13	48,42500	17,23889	Slovakia_nvd	SedSc	7,65	5,98	2,86	6,9	2,8	0,02	6
194						R13	51,38806	16,79306	Poland	SedSc	8,05	6,06	3,27	6,49	2,79	0,13	30
195						R	47,05000	27,38000	Romania Grassland DB	SedSc	7,93	5,3	3,38	6,9	2,83	0,3	7
196	25	3				R	48,23162	14,69609	Austria_VINCA	SedSc	7,88	5,48	3,33	6,76	2,87	0,32	13
197	80	30		N	N	R13	48,14313	16,59710	Austria_VINCA	SedSc	8,02	5,44	3,19	6,39	2,75	0,18	18
198						R	47,05000	27,38000	Romania Grassland DB	SedSc	7,68	5,92	3,22	6,5	2,77	0,3	11
199	60			N	N	R	49,23167	16,71583	Czechia_nvd	SedSc	7,7	5,73	3,51	7,36	2,68	0,14	15
200	70	5		Y	Y	R13	49,58167	12,74750	Czechia_nvd	SedSc	7,72	5,46	3,61	6,51	2,86	0,17	18
201						R	51,30139	16,59972	Poland	SedSc	7,97	5,79	2,97	6,44	2,15	0,14	25
202	50	20		Y	Y	R13	49,30417	16,41528	Czechia_nvd	SedSc	7,89	6,14	3,33	6,72	3,22	0,13	31
203	55	40	2	N	N	R1A	48,14329	16,59848	Austria_VINCA	SedSc	8,09	6,46	3,18	6,87	2,61	0,14	22
204	50	30		Y		R13	48,09889	17,17333	Slovakia_nvd	SedSc	8,02	6,45	3,28	6,73	2,87	0,2	32
205	70	30		Y	Y	R	49,21281	15,97067	Czechia_nvd	SedSc	7,89	5,82	3,13	6,55	2,61	0,18	23
206	80			N	N	R16	48,27500	17,08611	Slovakia_nvd	SedSc	8,04	5,88	2,83	6,4	2,73	0,02	19
207						R13	47,05000	27,38000	Romania Grassland DB	SedSc	7,87	6,12	2,87	6,96	2,08	0,3	12
208	75			N	N	R	48,49722	18,42639	Slovakia_nvd	SedSc	7,76	5,88	3,14	7,02	2,63	0	9
209				Y		R13	47,08910	27,64410	Romania Grassland DB	SedSc	7,68	5,92	3,22	6,5	2,77	0,3	11
210	70	60	1	N	N	R1A	48,14326	16,59811	Austria_VINCA	SedSc	8,22	6,08	3,09	7	2,61	0,14	18
211						R13			Alysso_Sedetalia_nomtypes	SedSc	7,99	6,64	3,51	6,51	3,09	0,13	18
212						R16	46,93330	22,55000	Romania Grassland DB	SedSc	7,85	6,52	3,29	7,07	2,85	0,05	29
213						U37	48,13622	20,50599	Hungary	SedSc	8,32	6,4	2,75	7,43	1,67	0,08	15
214						U37	46,73000	23,35000	Romania Grassland DB	SedSc	8,14	6,45	3,38	6,27	4,25	0,1	8
215						R16	46,73000	23,35000	Romania Grassland DB	SedSc	7,97	6,58	3,62	6,59	3,4	0,09	19
216	60	30		Y	Y	R13	49,03611	18,17889	Slovakia_nvd	SedSc	7,77	5,95	3,22	6,95	2,88	0,1	22
217	50	30		Y	Y	R13	49,03556	18,18028	Slovakia_nvd	SedSc	7,82	5,81	3,38	6,95	3,05	0,15	26
218						R13	47,72761	18,78870	Hungary	SedSc	8,25	6,56	2,84	7,14	2,15	0,12	26
219	50	30		Y	Y	R13	49,03556	18,17833	Slovakia_nvd	SedSc	8,04	5,95	3	6,91	2,49	0,11	19
220	25	75		Y	Y	R13	49,91722	14,06694	Czechia_nvd	SedSc	7,88	5,77	3,13	6,97	2,44	0,1	17
221	35	35		Y	Y	R13	49,94944	14,12972	Czechia_nvd	SedSc	8,26	6,43	2,92	7,1	2,76	0,24	15
222	45	10		Y	N	R13	49,06947	16,34614	Czechia_nvd	SedSc	8,3	6,6	2,97	6,84	3,02	0,24	14
223				Y	Y	R13	50,52972	14,09333	Czechia_nvd	SedSc	8,37	6,51	2,88	6,99	2,3	0,16	15
224	30	20		Y	N	R13	49,06569	16,33728	Czechia_nvd	SedSc	8,04	6,56	3,09	6,37	3,03	0,26	22
225	25	35		Y	Y	R13	49,94944	14,12972	Czechia_nvd	SedSc	8,3	6,68	2,96	6,9	2,34	0,31	14
226	60	30		Y	Y	R13	49,08889	16,34250	Czechia_nvd	SedSc	8,2	6,16	2,93	6,49	2,42	0,1	46
227	90			Y		R16	48,78889	16,63056	Czechia_nvd	SedSc	8,31	6,37	3,06	7,08	2,47	0,1	20
228	90	70		Y	Y	R13	49,06861	16,34528	Czechia_nvd	SedSc	8,22	6,53	2,86	6,63	2,54	0,1	44
229	50	90		Y	Y	R13	49,04139	16,31417	Czechia_nvd	SedSc	8,21	6,28	2,79	6,35	2,48	0,09	29
230	80	20		Y	Y	R13	49,04833	16,31972	Czechia_nvd	SedSc	8,21	6,19	2,95	6,36	2,41	0,11	45
231	60	60		Y	Y	R13	49,06111	16,32778	Czechia_nvd	SedSc	8,21	6,09	2,98	6,39	2,44	0,1	48
232	80	70		Y	Y	R13	49,09667	16,33556	Czechia_nvd	SedSc	8,19	6,45	2,89	6,55	2,62	0,11	44
233				N	N	R	48,48889	17,26667	Slovakia_nvd	SedSc	8,17	6,18	3,04	6,8	2,66	0,14	30
234						R13				SedSc	7,88	6,43	3,06	6,82	2,75	0,04	25
235	50	15		N	N	R	48,16562	16,52711	Austria_VINCA	SedSc	8,07	5,89	2,99	7,21	2,48	0,2	26
236				Y	Y	R16	48,35833	18,06111	Slovakia_nvd	SedSc	8,2	6,34	2,82	6,95	2,16	0,16	34
237	50	60		Y	Y	R13	49,32611	16,49500	Czechia_nvd	SedSc	8,19	6,58	2,76	7,08	2,25	0,14	19
238				Y		R16	48,08239	16,27085	Austria_VINCA	SedSc	8,31	6,32	2,96	7,29	2,19	0,03	23
239	40					R13	49,05178	16,31850	Czechia_nvd	SedSc	8,03	6,66	2,98	6,63	2,65	0,14	23
240				Y		R16	48,08239	16,27085	Austria_VINCA	SedSc	8,29	6,56	2,96	7,18	2,37	0,07	21
241				Y	Y	R13	48,85722	16,62667	Czechia_nvd	SedSc	8,4	6,74	2,68	6,89	1,91	0,23	19
242	20	5		Y	Y	R13	48,84306	15,88194	Czechia_nvd	SedSc	8,38	6,21	2,85	7,13	2,17	0,03	17
243	50	80		Y	Y	R16	49,32639	16,49583	Czechia_nvd	SedSc	8,12	6,31	2,89	6,85	2,36	0,21	20
244	50	30		Y	Y	R13	50,04417	14,34750	Czechia_nvd	SedSc	8,23	6,24	2,8	6,93	2,21	0,19	25
245				Y		R13	48,84028	16,63611	Czechia_nvd	SedSc	8,34	6,47	2,88	6,86	2,34	0,35	12
246	50	10				R16	48,80583	16,64306	Czechia_nvd	SedSc	8,41	6,59	2,53	7,3	1,96	0,04	15
247		40				R13	48,10092	7,29101	Alysso_Sedetalia_nomtypes	SedSc	8,25	6,4	2,53	7,35	1,84	0,06	21
248	50	1		Y	Y	R13	48,84306	15,88194	Czechia_nvd	SedSc	8,45	6,74	2,76	7,23	1,98	0,09	17
249	50	20		Y	Y	R13	48,85611	16,64222	Czechia_nvd	SedSc	8,35	6,44	2,84	7,06	2,22	0,15	16

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Fortsetzung auf nächsten Seite

Sequence No	Cover herb layer (%)	Cover moss layer (%)	Cover lichen layer (%)	Mosses identified (Y/N)	Lichens identified (Y/N)	EUNIS-Esy	DEG_LAT	DEG_LON	Dataset (Database = DB)	Class	Light	Temperature	Salinity	Moisture	Soil reaction	Nutrients	Number of species
250	30	60		Y	Y	R13	49,32222	16,48333	Czechia_nvd	SedSc	8,19	6,26	2,88	6,58	2,38	0,19	26
251	30	50		Y	Y	R16	49,32222	16,48333	Czechia_nvd	SedSc	8,42	6,66	2,74	6,89	2,01	0,24	20
252	50	30		Y	Y	R13	48,84306	15,88194	Czechia_nvd	SedSc	8,61	6,63	2,68	7,09	2,1	0,04	15
253				Y	Y	R13	49,37278	16,75306	Czechia_nvd	SedSc	8,55	6,23	2,45	6,38	1,73	0,03	12
254				N	N	U37	48,68611	18,37917	Slovakia_nvd	SedSc	8,35	6,6	2,88	6,83	1,63	0,33	7
255	60	80		Y	Y	R13	48,82611	16,64250	Czechia_nvd	SedSc	8,44	6,68	2,77	7,1	1,86	0,13	20
256	30			N		R13	48,03005	16,25123	Austria_VINCA	SedSc	8,16	6,59	2,66	7,89	2,05	0,11	18
257	75	10		Y	Y	R13	49,19167	16,67639	Czechia_nvd	SedSc	8,23	6,54	2,83	7,31	2,3	0,16	22
258	30	30		Y	Y	R13	49,51806	17,32361	Czechia_nvd	SedSc	8,03	5,7	3,06	6,91	2,27	0,07	21
259	30	40		Y	Y	R13	49,52917	17,08417	Czechia_nvd	SedSc	8,08	5,53	2,98	6,67	2,28	0,28	16
260	60	30		Y	Y	R13	49,19167	16,67500	Czechia_nvd	SedSc	8,13	6,07	3,19	7,07	2,83	0,33	19
261	50	40		Y	Y	R13	49,19028	16,67361	Czechia_nvd	SedSc	8,09	6,38	3,25	6,93	2,98	0,22	21
262	10	5		Y	Y	U37	49,36583	16,72472	Czechia_nvd	SedSc	8,12	6,7	2,92	7,05	2,37	0,08	13
263	50	20		Y	Y	R13	49,19028	16,67500	Czechia_nvd	SedSc	8,39	6,54	2,68	7,33	2,1	0,19	15
264	40			N	N	R13	50,51121	18,30154	Poland	SedSc	7,7	5,72	3,89	6,88	3,96	0,22	15
265	40	30		Y	Y	R13	49,51806	17,32361	Czechia_nvd	SedSc	8,13	6,53	2,99	6,77	2,52	0,11	16
266	75	25		Y	Y	R13	49,91306	14,08083	Czechia_nvd	SedSc	7,87	5,7	3,29	6,85	2,58	0,25	19
267	90	20		Y	Y	R16	49,95917	14,19639	Czechia_nvd	SedSc	8,11	6,06	3,16	6,56	2,82	0,1	14
268	50			Y	Y	R	50,02972	14,32667	Czechia_nvd	SedSc	8,07	5,83	3,43	6,74	3,47	0,31	10
269	50	10		N		R1B	48,57833	16,39028	Austria_VINCA	SedSc	7,96	6,25	3,1	7,22	2,37	0,17	27
270	25	15		Y	Y	R13	49,94722	14,13500	Czechia_nvd	SedSc	7,75	6,11	3,27	6,86	2,86	0,25	19
271	50	30		Y	Y	R13	49,55833	17,17083	Czechia_nvd	SedSc	8,16	5,95	3	7,03	3,98	0,14	15
272	60	20		Y	Y	R13	49,55833	17,17083	Czechia_nvd	SedSc	7,97	6,48	3,13	7,13	3,2	0,26	20
273	30			Y		R13	50,55500	13,93083	Czechia_nvd	SedSc	7,69	5,46	3,32	6,74	2,66	0,04	12
274	50			N	N	R	50,10361	14,35194	Czechia_nvd	SedSc	8,09	6,39	2,98	6,75	2,39	0,12	37
275	20			Y	Y	R16	49,93778	14,13750	Czechia_nvd	SedSc	8,32	6,48	2,8	6,84	2,38	0,04	13
276				Y	Y	R13	50,54722	14,05556	Czechia_nvd	SedSc	8,34	6,2	2,93	6,71	2,81	0,17	19
277				Y	Y	R13	50,55139	14,06167	Czechia_nvd	SedSc	8,06	6,4	2,91	6,73	2,53	0,12	31
278	80			N	N	R13	50,11861	14,39028	Czechia_nvd	SedSc	7,97	6,79	2,96	6,72	2,71	0,23	29
279	30	40		Y	Y	R16	49,32222	16,48333	Czechia_nvd	SedSc	8,49	6,46	2,79	6,63	2,17	0,17	16
280	60			Y	Y	R13	50,09917	14,31944	Czechia_nvd	SedSc	8,11	6,61	2,9	7,15	2,74	0,18	18
281				Y	Y	R13	50,55000	13,93111	Czechia_nvd	SedSc	7,96	5,73	3,09	6,79	2,69	0,05	15
282				Y	Y	R13	50,49000	13,98306	Czechia_nvd	SedSc	8,08	6,05	2,9	6,57	2,05	0,33	17
283	65	30		Y	Y	R13	48,84647	15,58151	Czechia_nvd	SedSc	7,8	6,08	3,34	6,82	3,16	0,08	27
284				Y	Y	R16	49,95000	14,15833	Czechia_nvd	SedSc	8,11	6,5	2,79	6,67	2,38	0,18	13
285	40	50		Y		R13	50,44417	14,00722	Czechia_nvd	SedSc	8,33	6,25	2,74	6,84	2,28	0,31	18
286				Y	Y	R	50,45361	13,85639	Czechia_nvd	SedSc	8,09	6,1	3,05	6,38	2,89	0,24	20
287	40					R16	48,86694	16,64917	Czechia_nvd	SedSc	8,2	6,78	2,83	7,31	2,15	0,07	17
288	60	50		Y	Y	R13	49,29306	16,47556	Czechia_nvd	SedSc	7,89	6,24	3,25	6,71	3,21	0,17	25
289	65	10		Y	Y	R13	50,09917	14,31944	Czechia_nvd	SedSc	7,89	6,25	3,14	6,93	3,06	0,28	21
290	70			Y		R13	50,57972	14,11333	Czechia_nvd	SedSc	8,07	6,2	2,99	7,08	2,47	0,22	20
291	60	10		Y	Y	R	50,58333	14,04028	Czechia_nvd	SedSc	7,98	6,3	3,07	6,99	2,44	0,17	35
292	60	90		Y	Y	R13	49,22639	16,66306	Czechia_nvd	SedSc	7,99	6,39	3,05	6,85	2,78	0,17	30
293	70	5		N	N	R13	50,09472	14,32111	Czechia_nvd	SedSc	7,99	6,64	3,11	6,62	2,95	0,23	21
294	70	15		Y	Y	R16	48,89136	15,63678	Czechia_nvd	SedSc	7,99	7,03	3,14	6,59	2,94	0,12	27
295	60			N	N	R13	49,96444	14,28556	Czechia_nvd	SedSc	8,19	6,28	2,66	6,72	1,85	0,01	11
296	25	60		Y	Y	R16	48,59167	19,00139	Slovakia_nvd	SedSc	7,96	6,61	2,86	6,36	2,6	0,11	30
297	70			Y	Y	R16	49,95056	14,15833	Czechia_nvd	SedSc	8,16	6,36	2,81	6,96	2,31	0,18	13
298	65	20		Y	Y	R16	50,57917	14,11528	Czechia_nvd	SedSc	8,05	6,1	3,01	6,59	2,26	0,1	25
299	50	20		Y	Y	R13	50,19500	14,37833	Czechia_nvd	SedSc	8,14	6,24	2,85	6,7	2,12	0,11	42
300						R1B	47,72323	18,91720	Hungary	SedSc	8,11	6,18	2,88	6,87	2,37	0,14	19
301						R1B	47,72323	18,91720	Hungary	SedSc	8,18	5,96	2,95	6,81	2,24	0,18	16
302	60	30		Y	Y	R	50,03417	13,91528	Czechia_nvd	SedSc	8,11	6,29	3,02	6,56	2,74	0,12	28
303	50			N	N	R13	50,56944	14,11250	Czechia_nvd	SedSc	8,04	6,22	2,95	6,91	2,83	0,16	26
304						R1B	47,72323	18,91720	Hungary	SedSc	7,91	5,91	3,1	7,06	2,59	0,09	26
305	60			N	N	R	50,59167	14,08194	Czechia_nvd	SedSc	7,99	6,47	3	6,52	2,45	0,18	33
306	50			N	N	R1B	50,44444	14,00694	Czechia_nvd	SedSc	8,21	6,1	2,96	6,95	2,49	0,2	21
307				Y	Y	R1B	50,42083	13,82222	Czechia_nvd	SedSc	8,26	6,2	2,84	6,7	1,93	0,48	12
308	38			Y	Y	R	47,11602	10,62844	Austria_VINCA	SedSc	7,98	5,69	3,06	6,51	2,34	0,19	30
309				Y		R13	47,78056	16,58333	Austria_VINCA	SedSc	8,25	6,39	2,84	7,07	2,16	0,12	24
310				Y	Y	R12	50,56861	14,11194	Czechia_nvd	SedSc	7,98	5,75	3,25	6,06	2,6	0,12	15
311				Y	Y	R12	50,56861	14,11194	Czechia_nvd	SedSc	7,9	5,71	2,9	5,96	2,18	0,16	13
312	30	80		Y		R16	49,94167	14,18611	Czechia_nvd	SedSc	8,06	6,16	2,9	7,25	2,14	0,02	24
313	55			Y	Y	R13	49,95056	14,15833	Czechia_nvd	SedSc	7,88	6,21	2,76	7,41	1,78	0,01	14
314				Y	Y	R16	50,04111	14,37361	Czechia_nvd	SedSc	7,89	6,13	3,23	7,2	2,58	0,06	25
315	25					R13	49,93944	14,13889	Czechia_nvd	SedSc	8,23	5,91	2,78	6,93	1,88	0,04	13
316				Y	Y	R13	49,95000	14,15833	Czechia_nvd	SedSc	7,83	6,31	2,74	7,16	1,84	0,01	14