# MASTERARBEIT

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„*Quercus pubescens* shrub forests of the Vienna basin“


verfasst von

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# Abstract

The *Quercus pubescens* shrub forests of the Vienna basin are found over limestone and dolomite, seldom flysch and schist. Stands occur on steep slopes with mostly eastern or southern exposition, except for the Hainburg hills, which show a continental influence on the floristic character, where they can also be found on the northern slopes. Due to the Pannonic climate and sheltered location from prevailing winds from the west, many submediterranean elements occur at the Thermenlinie. This habitat is characterized by dry and warm conditions while the trees provide shelter from desiccating winds. As they host an enormously rich biodiversity, *Quercus pubescens* shrub forests are a habitat of primary concern (91H0) listed in Annex I of the EU habitats directive.

In order to assign this rich mosaic of vegetation elements to a single association working at the correct scale is essential. Thus Braun-Blanquet relevés of 100 m² were created. Within those, nested subplots of 10 m² recorded areas of the most dense tree and shrub layer. An unambiguous assignment to an association following the key of Starlinger (2007) requires the presence of diagnostic species, many of which are species of fringe and xeric grassland vegetation, often found between clusters of dense wooden vegetation. Therefore, the deductive classification of subplots, inherently showing a low cover of the herb layer, proved to be problematic. The list of diagnostic species seems incomplete and the syntaxonomical system of the alliance Quercion pubescenti-petraeae of NE Austria requires further study.

DCA showed mostly close proximity between mainplots and nested subplots. Other than the locality Hackelsberg no distinct, separate groups could be recognized. There was a strong correlation between axis scores of main- and subplots, so both subsets of data showed the same ecological gradient.

TWINSPAN, including data from literature, clearly depicted the Geranio sanguinei-Quercetum pubescentis, which is characterized by many submediterranean and de-alpine diagnostic species. Relevés of the Inulo ensifoliae-Quercetum pubescentis, a local association of the Leopoldsberg, and Lithospermo-Quercetum pubescentis were both assigned to a central group, which had few diagnostic species. Most of my subplots were assigned to this central group as well. Higher growing stands of the Corno-Quercetum and Euphorbio-Quercetum might be consolidated into a single association with regional subassociations. The synoptic table clearly showed an ecological gradient from nutrient rich, slightly moist conditions to xeric habitats relatively low in nutrients. For the interpretation of TWINSPAN results locality, which is strongly correlated with soil and geology, proved to be very helpful. Re-assignment of relevés to groups according total cover of diagnostic species did not markedly improve the classification and was problematic especially for the central group with few diagnostic species.

## Zusammenfassung

In dieser Masterarbeit werden die Flaumeichen-Buschwälder des Wiener Beckens pflanzensoziologisch untersucht. Die Standorte befinden sich über Kalk und Dolomit, seltener Flysch und Schiefer, auf steilen Hängen mit überwiegend östlicher und südlicher Exposition. In den Hainburger Bergen, wo der kontinentale Einfluss des Pannonischen Klimas bemerkbar wird, wurden auch Bestände am Nordabhang untersucht. An der Thermenlinie finden sich viele Submediterrane Florenelemente, auch die Flaumeiche (*Quercus pubescens*) selbst kann als solches betrachtet werden. Dieser Lebensraum zeichnet sich durch Trockenheit und Wärme, bei gleichzeitig vorhandenem Windschutz, aus und ist daher sehr artenreich. Er wird im Anhang I der FFH-Richtlinie als prioritärer Lebensraum (91H0) gelistet.

Um dieses Mosaik an verschiedenen Vegetationselementen in einer Assoziation zu erfassen muss der richtige Maßstab gewählt werden. Daher wurden Aufnahmen nach Braun-Blanquet mit 100 m² erstellt. Innerhalb dieser wurden verschachtelte Subplots von 10 m² im Bereich der dichtesten Gehölze aufgenommen. Beschränkt man sich auf kleine Bereiche mit hoher Gehölzdeckung und spärlich entwickelter Krautschicht, so fällt die Zuordnung zu einer Assoziation, mangels diagnostischer Arten – oft Krautige, schwer. Die bestehende syntaxonomische Gliederung nach Starlinger (2007) setzt voraus, dass auch die kleinen Lichtungen - mit Trockenrasen- und Saumvegetation - zwischen den Flaumeichen betrachtet werden, um die Vegetationsaufnahmen sicher zu Assoziationen zuordnen zu können. Anhand meiner Daten erscheint die Liste der diagnostischen Arten nicht komplett. Die syntaxonomische Gliederung des Verbands Quercion pubescenti-petraeae im NO Österreichs erfordert weitere Forschung.

Die DCA zeigte eine enge Verbindung zwischen Main- und Subplots. Bis auf den Hackelsberg konnte keine Lokalität als eigenständige Gruppe ausgemacht werden. Die Achsen-Werte der Main- und Subplots wiesen eine starke Korrelation auf. Daraus lässt sich schließen, dass beide Datensets den gleichen ökologischen Gradienten aufzeigen.

Die TWINSPAN-Analyse inklusive Literaturdaten bildete die Assoziation Geranio sanguinei-Quercetum pubescentis, die sich durch viele submediterrane und de-alpine diagnostische Arten auszeichnet, gut ab. Relevés der lokalen Gesellschaft des Leopoldsberg, Inulo ensifoliae-Quercetum pubescentis, und des Lithospermo-Quercetum pubescentis wurden einer zentralen Gruppe, die nur wenige diagnostische Arten aufwies, zugeordnet. Viele meiner Subplots, die eine geringe Deckung an krautigen Arten aufweisen, wurden ebenfalls in diese Gruppe gestellt. Die höherwüchsigen Bestände des Corno-Quercetum und Euphorbio-Quercetum könnten als eine Assoziation, mit regional differenzierten Subassoziationen, zusammengefasst werden. Die synoptische Tabelle zeigte einen klaren Gradienten von frischen, relativ nährstoffreichen Standorten hin zu sehr trockenen, eher mageren Standorten auf. Für die Interpretation der TWINSPAN Ergebnisse war der Faktor Lokalität, der stark mit Boden bzw. Geologie korreliert, sehr hilfreich. Die erneute Zuordnung der Relevés anhand der neu ermittelten diagnostischen Arten brachte keine wesentliche Verbesserung. Insbesondere die zentrale Gruppe mit wenig diagnostischen Arten wurde dabei aufgeteilt und der ursprünglich deutlich sichtbare Zusammenhang mit der Lokalität verwischt.

# 1 Introduction

## 1.1 The “forest steppe” of the Vienna Basin

Wendelberger (1989) defined the term “forest steppe”, as applicable in the Vienna basin, as a vegetation mosaic composed of various plant communities along a gradient of soil depth. Xerothermic-sites, where this Pannonian “forest steppe” occurs due to edaphic conditions, are found over shallow soils, especially above limestone, sand, well drained gravel, upper parts of steep loess walls and soils containing high concentrations of salt. When edaphic conditions allow deep soil, forests belonging to the Corno-Quercetum, sensu Wendelberger (1989), occur. Shallower substrate leads to a shrub forest complex containing *Quercus pubescens* shrub forests, a mantle of low growing shrubs (*Prunus fruticosa* and *P. nana*) and a fringe of tall herbaceous vegetation. On very shallow soils steppe vegetation can be found. According to Wendelberger (1989) this sequence is most clearly observed over steep rocky slopes, e.g. in the Hainburg hills, while the shrub forest complex along the Thermenlinie, e.g. in Gumpoldskirchen, lacks distinct fringe vegetation, with the corresponding plants occurring within the shrub forest with a sparse canopy.

Jakucs (1972) investigated how the microclimate changes when following a transect from dry grasslands to fringe and mantle vegetation and shrub forests. The most significant difference in temperature occurred between open dry grasslands and herbaceous fringe vegetation. Especially the soil temperature decreased and therefore humidity increased due to the shade provided by plants, which usually spread vegetatively using rhizomes. This creates conditions favourable for the germination and growth of shrubs and trees, thereby facilitating the spread of woody vegetation and shrub forests at the expense of dry grasslands. Looking at the soil a similar gradient can be observed. Above dolomite bedrock a primary skeletal soil, black rendzina, forms a micro-mosaic of varying soil factors which may lead to a dynamic fluctuation of vegetation patterns on larger timescales. In contrast to microclimatic factors the change in soil factors is slower on both a temporal and spatial scale and differences between open grassland and herbaceous fringe vegetation is hardly measurable. Because fringe and shrub forest vegetation both occur at their very limit concerning physiology and water supply, a change in micro-climate may lead to rapid spatial gains of grasslands, leading to a dynamic change in vegetation patterns over longer periods (Jakucs 1972).

Chytrý (1997) argues that most remaining stands of *Quercus pubescens* shrub forests in the Czech Republic belong to azonal vegetation. They are confined to dry habitats such as south facing slopes in the *Carpinion* altitudinal range. Hence thermophilous oak forest are considered relict vegetation, having avoided competition with mesophilous trees due to extreme soil and microclimatic conditions. They possess a high floristic diversity and are rich in rare and endangered plant species. Floristic variation patterns are governed by the interaction of climate and bedrock type and are suitable for classification of the stands at lower syntaxonomical levels, the alliance and association. Two groups can be distinguished in the Czech Republic: first basiphilous communities of xeric and warm areas, characterized by a high proportion of submediterranean and subcontinental species and secondly stands with a higher proportion of Central European species, mainly above acidic bedrocks in the driest areas. The first group mostly belongs to the alliance Quercion pubescenti-petraeae, the association of Lithospermo-Quercetum pubescentis, or Pruno mahaleb-Quercetum pubescentis – a homotypic synonym, is also widespread in northeastern Austria (Chytrý 1997; Chytrý & Horák 1997; Wallnöfer 2003; Starlinger 2007; Chytrý 2013).

In a study about thermophilous oak forests of eastern Austria Wallnöfer (1998, 2003) recognizes eight vegetation types, which can be differentiated according to edaphic and climatic factors. Of the five associations dominated by *Quercus pubescens* in eastern Austria, as recognized by Wallnöfer (1998, 2003), four occur primarily over calcareous bedrock and shallow rendzina soils. The Geranio sanguinei-Quercetum pubescentis (shrub forest, Fig. 1) and Euphorbio angulatae-Quercetum pubescentis (high forest) are situated at the eastern edge of the Limestone Alps in Lower Austria. Diagnostic species are primarily taxa of submediterranean and pre-/de-alpine distribution. This is presumably due to a slightly more humid (subillyric) local climate and the vicinity to the Alps. These species are absent in the downy oak forests of the Weinviertel and the lowlands around Vienna and Eisenstadt, i.e. Pruno mahaleb-Quercetum pubescentis (shrub forest) and Corno-Quercetum pubescentis (high forest).

Fig. 1: Geranio sanguinei-Quercetum pubescentis above dolomite bedrock at the Thermenlinie, near Gumpoldskirchen.

Comparing the two types of shrub forest, both are characterized by a species-rich herb layer. The Geranio-Quercetum contains many species of the Trifolio-Geranietea and Festuco-Brometea, differentiating it against the Euphorbio-Quercetum. Wallnöfer (2003) recognizes two further types of the Geranio-Quercetum in her synoptic table, the shrub forests at the Eichkogel near Mödling host a distinctively different set of species due to the geology of the site (fresh water calcareous rock and loess) while the Bisamberg (marl) serves as a geographic and climatic intermediate to the Pruno mahaleb-Quercetum. The herb layer of the more continental downy oak forests is also dominated by species of steppe and fringe vegetation, i.e. *Peucedanum cervaria, Dictamnus albus, Anthericum ramosum* and *Carex humilis*, many of them occurring on calcareous soils. Therefore, apparently chorologic and climatic differences are of higher importance than geological ones. Intriguingly, both the Pruno mahaleb-Quercetum pubescentis and the Corno-Quercetum are differentiated in the synoptic table by a lack of species. This is likely due to the fact that many pontic-pannonic taxa, which might serve as differential species, occur mainly in rocky steppes and dry grasslands and hardly reach forest habitats due to ecological limitations. A similar situation has been described for Hungary, where vicarious associations of *Quercus pubescens* shrub forests with a submediterranean respectively a continental character are described (Jakucs 1961; Wallnöfer 2003).

Extrazonal occurrences of thermophilous oak forests on special sites are found up to the submontane zone. Only small patches of the zonal Pannonian oak woodlands of the planar-colline altitudinal belt remain. Many of them have been used on a long-term basis. It can be assumed that many thermophilous oak forests have been part of the grazing ecosystem during the late middle-ages, either as grazed woods or pastures free of woody vegetation. The locality of the Leopoldsberg (Fig. 2) in the north of Vienna has been documented to be mostly deforested in the 17th century. This makes it difficult to assess whether the current state can be considered to be a climax ecosystem or it should be viewed as a stage in the succession towards other types of forests. Some woods have also been considerably changed by the introduction of alien species. Yet thermophilous oak forests serve as an important refuge for rare animals and plants and are recognized as habitats of special interest to conservation for the Natura2000 network (EU habitats directive, priority habitats 91H0 and 91I0) due to their high biodiversity (Ellmauer & Traxler 2000; Wallnöfer 2003; Starlinger 2007).

Fig. 2: Inulo ensifoliae-Quercetum pubescentis at the Leopoldsberg, SW slope. *Laser trilobum* and *Inula ensifolia* are common at this locality over flysch.

## 1.2 Implications for conservation biology

*Quercus pubescens* shrub forests are part of the Natura2000 network and listed as priority habitats with the Natura2000 code 91H0. In official EU and Austrian documents (Ellmauer & Traxler 2000; Ellmauer 2005; European Commision 2007) they are characterized as xerophile white-oak woods occurring on shallow, calcareous soils on extremely dry, southern exposed locations of the periphery and hills of the Pannonic plain. Due to the extreme site conditions the woods are often fragmentary and low-growing. This results in a rich herb layer with xerothermic species of dry grasslands and fringe communities. The climate is continental-subcontinental or submediterranean with warm summers and low annual precipitation of 550-700[-900] mm. These shrub forests occur in Austria from the planar to the submontane zone at altitudes of 150-550[-700] m. Since the stands usually occupy only small areas on inaccessible terrain and offer little growth gain they mostly remain unused, only few were managed as coppice. Modern use is mostly recreational by botanists and hikers or hunters (Ellmauer & Traxler 2000; Ellmauer 2005; European Commision 2007).

The red list of forest biotopes of Austria lists *Quercus pubescens* shrub forests as category 3 (threatened). In the last decades considerable loss of area and qualitative change has been recorded. The major threats are invasion of neophytes (especially *Robinia pseudacacia* and *Ailanthus altissima*), game damage of both the woody and herbal layer and conversion of the tree composition by forestry. Quarries (Fig. 3), construction of infrastructure and eutrophication (nitrogen deposition from the air) also threaten these rare habitats. Management of threatened sites therefore consists of selective eradication of neophytes and ceasing the exploitation of natural resources (Ellmauer 2005).

The delimitation between Euro-Siberian steppic woods with Quercus spp. (91I0) and Pannonian woods with Quercus pubescens (91H0) is rather ambiguous due to a lack of a supra-national phytosociological revision. The predominant bedrock (dolomite, limestone and marl vs. loess and sand) as well as a host of frequent, diagnostic species may help in clearly assigning a stand to either habitat type (Ellmauer 2005; European Commision 2007; Willner 2013).

Fig. 3: *Quercus pubescens* shrub forest at the locality Nackter Sattel, near Gießhübl. This site is threatened by the expansion of a nearby quarry. A small but dense cluster of oaks surrounded by xeric grassland vegetation is shown.

## 1.3 Concerning plot size

In European phytosociology variable plot sizes, which are roughly proportional to vegetation height, are traditionally used to sample different vegetation types. Since vegetation-attributes are scale dependent, correlation among species might vary between positive and negative or disappear altogether when changing the plot size. Therefore, only comparisons among relevés of the same plot size would be a valid source of information for phytosociological classification (Chytrý & Otýpková 2003).

One historical cause for the variation in plot size may be the minimum area concept by Braun-Blanquet (1928), which postulated that each vegetation stand has a minimum area which contains all the relevant properties of the given vegetation type. Modern ecology on the other hand stresses, that vegetation may be studied at any scale and different patterns are recognized depending on the plot size. Intriguingly, vegetation is only sampled on finer scales in a few specific habitats (mostly very dry or humid ones) while other (mesic) habitats are usually sampled at coarse scales. Therefore it would be useful to define phytosociological classes as a phenomenon on a specific scale, consequently all the lower-rank syntaxa would be defined on the same scale (Chytrý & Otýpková 2003).

Chytrý & Otýpková (2003) argue that the size of vegetation relevés may influence their assignment to phytosociological classes or vegetation types in some situations. As previous studies on *Quercus pubescens* shrub forests have shown, some authors such as Wendelberger (1954, 1989) chose to differentiate between patches of fringe and steppe vegetation and shrub and woody vegetation while others such as Jakucs (1961, 1972) tried to classify the entire mosaic of small and patchy habitats as one phytosociological community. Therefore this study aims to bridge the gap between these approaches and tries to define vegetation and habitat types as scale dependent concept in line with Chytrý & Otýpková (2003). As Fig. 4 shows the relevé on the coarsest scale can be assigned to the class of thermophilous oak woodlands, a nested plot of medium scale taken in canopy openings to the class of dry grasslands and the smallest plot on rock outcrops to the class of dry pioneer vegetation. In this series of nested plots vegetation types sampled in small plots can be recognized as synusiae within vegetation types sampled in large plots.


Fig. 4: Scale-dependence of vegetation types in a series of nested plots. After: Chytrý & Otýpková (2003)
The photo shows a similar situation from the Hainburg hills, the relevé included *Dracocephalum austriacum*.

## 1.4 The association concept

There is no consensus among phytosociologists on how to define an association. Willner (2006) tried to shed some light on this question by re-examining the original definition of the association, which was accepted by the International Botanical Congress at Brussels in 1910.

The first and most important criterion of an association is the "definite floristic composition", satisfied by an adequate number of good diagnostic species. A species qualifies as a good diagnostic species if either the constancy or total cover value is at least ten times higher than that of the compared syntaxon. Total cover ratio (TCR) should only be used to determine good diagnostic species if the total cover of a species for the given syntaxon exceeds 15%, otherwise artifacts introduced by the fine differentiation at the lower end of the Braun-Blanquet scale will have too much impact and use of the constancy ratio (CR) is preferable (Willner 2006; Noroozi et al. 2014).

Secondly, associations of the same formation should have clearly distinguishable site conditions or distributions. The border between two associations usually not only lies between a different set of character species, but coincides with the occurrence or domination of new ecological factors such as climate, bedrock and soil. If floristical difference can not be interpreted as a consequence of different habitat or vegetation history it does not contain useful information for the classification of syntaxa (Jakucs 1961; Barkman 1989; Willner 2006).

## 1.5 Syntaxonomy of thermophilous oak forests in central Europe.

Several, slightly differing, syntaxonomical systems for the thermophilous oak forests in central Europe have been published (Jakucs 1961; Chytrý 1997; Wallnöfer 1998; Wallnöfer 2003; Starlinger 2007).

There are two possible ways to investigate the syntaxonomy of a habitat. The first one tries to explore the entirety of phyto-associations within a given, uniform geographical context, usually a nation or region. The second one investigates a group of associations within the entire area of distribution, usually spanning several countries. In order to find and create a syntaxonomical system, which most closely mirrors the conditions in the field and is practical from a conservation biology point of view, likely both paths have to be taken (Jakucs 1961).

The following is the syntaxonomical system of Quercus pubescens forests of NE Austria as proposed by Starlinger (2007):

Class: Querco-Fagetea Br.-Bl. & Vlieger 1937
- Order: Quercetalia pubescentis Klika 1933
  - Alliance: Quercion pubescenti-petraeae Br.-Bl. 1932
    - Association: Inulo-ensifoliae-Quercetum pubescentis
    - Association: Geranio sanguinei-Quercetum pubescentis
    - Association: Lithospermo-Quercetum pubescentis
    - Association: Euphorbio angulatae-Quercetum
    - Association: Corno-Quercetum

With his monograph on *Quercus pubescens* shrub forests Jakucs (1961) was one of the first and most important vegetation scientists to propose a classification for thermophilous oak forests in the south-eastern part of central Europe. He recognized shrub forests with a continental character, the alliance Aceri tatarici-Quercion with the associations Corno-Quercetum and Ceraso mahaleb-Quercetum pubescentis. The latter is found on steep, southward facing slopes in the north-eastern Hungarian uplands, north of the Danube. Good diagnostic species are few and as such the Ceraso mahaleb-Quercetum is negatively defined (Jakucs 1961; Wallnöfer 1998).

The alliance Ostryo-Carpinion orientalis – or Orno-Cotinion as Jakucs (1961) proposed - with the associations Cotino-Quercetum pubescentis and Orno-Quercetum, is characterized by more submediterranean elements. It is found on Dolomite bedrock and ranges from the Hungarian uplands south of the Danube towards the Vienna basin in the west and the small Carpathians in western Slovakia. The subassociation Cotino-Quercetum pubescentis chamaebuxetosum (vindobonense) is identical with the Geranio sanguinei-Quercetum pubescentis first recognized by Wagner (1941). Character species are for example *Carex humilis, Geranium sanguineum, Coronilla coronata, Hippocrepis (Coronilla) emerus, Amelanchier ovalis, Carex halleriana* and *Galium lucidum* (Jakucs 1961). All of these species are also listed as diagnostic species in the key of Starlinger (l.c.).

Comparing the phytosociological system of Jakucs (1961) to those of Starlinger (2007) and Wallnöfer (1998, 2003) the basic differentiation between high forests and shrub forests, each with a continental and submediterranean association, remains. The current system however does not recognize two different alliances but groups them all into the Quercion pubescenti-petraeae, the thermophilous oak forests of central Europe.

Chytrý (1997) follows the same direction and also recognizes the Pruno mahaleb-Quercetum and Corno-Quercetum in the Czech Republic. The submediterranean associations are absent but the Lathyro versicoloris-Quercetum pubescentis is described as an endemic association of central and northern Bohemia.

Comparing the classification of Starlinger (l.c.) to the one published by Wallnöfer (1998, 2003) one can find the same associations. The Pruno-mahaleb Quercetum pubescentis sensu Wallnöfer (l.c.) corresponds to the Lithospermo-Quercetum pubescentis sensu Starlinger (l.c.).

However taking a closer look at the two associations with a submediterranean character, which are characteristic for the “Thermenlinie” (Geranio sanguinei-Quercetum pubescentis and Euphorbio angulatae-Quercetum) reveals some differences. The two associations are not well defined in the synoptic table of Wallnöfer (2003). Starlinger (l.c.), more strongly considering floristic differences rather than those in physiognomy, re-assigned many of the relevés from the Euphorbio angulatae-Quercetum to the Geranio sanguinei-Quercetum pubescentis. They contained many species from the ass.-grp. with *Carex humilis*, namely *Buphthalmum salicifolium, Asperula cynanchica, Galium lucidum, Sesleria albicans* and *Seseli libanotis*. This resulted in the Euphorbio angulatae-Quercetum sensu Starlinger (l.c.) gaining a more mesic focus.

Whether the two high forest associations Euphorbio angulatae-Quercetum and Corno-Quercetum sensu Starlinger (l.c.) are indeed well defined associations requires further study. As the high forest types Corno-Quercetum and Euphorbio angulatae-Quercetum form comparatively dense canopies many species from fringe and dry grassland vegetation do not occur within them. However, when looking at the shrub forest associations Lithospermo-Quercetum pubescentis and Geranio sanguinei-Quercetum pubescentis it is those species that play an important role in differentiating the local variants of downy oak shrub forests in NE Austria (Wallnöfer 2003; Starlinger 2007).

## 1.6 Study Questions

Considering the apparent difficulties in defining the associations of Quercus pubescens shrub forests in the Vienna basin (Fig. 5) and neighboring regions and resulting differences in published classifications from literature in the past decades this thesis poses the following questions:

(1) What influence does the size of the relevé have when assigning it to an association of the Quercion pubescenti-petraeae?
(2) What floristic types (associations) of *Quercus pubescens* shrub forests can be distinguished within the Vienna basin and what are the decisive factors for their differentiation?
(3) Is the floristic variability adequately depicted in the current syntaxonomical system?

Fig. 5: A shrub forest at the upper slope of the Hackelsberg above schist bedrock. Many diagnostic species in the key of Starlinger (2007) are missing at this locality, making it difficult to clearly assign it to an association.

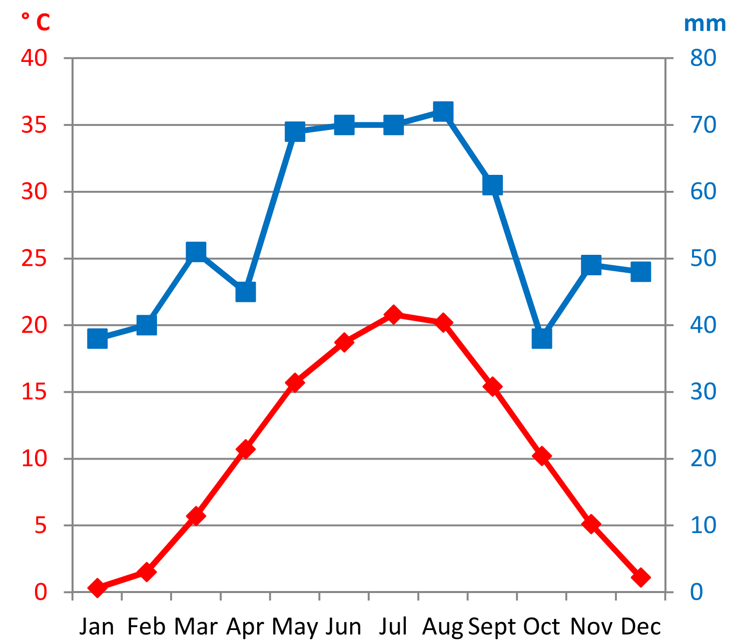
# 2 Study Area

The study area covers the southern Vienna basin, a highly agriculturally cultivated and industrialized area. On its fringes, however, natural treasures can be found. The study sites detail 4 regions: East of Vienna is the Natura2000 area of the Hainburg hills, to the south-east lie the Leitha hills, in the south-west the Thermenlinie stretches from Bad Vöslau to Perchtoldsdorf and on the northern border lie the Leopoldsberg and Bisamberg.

The exact range of study sites was chosen in the field with the aim of representing the entire physiognomic variability of *Quercus pubescens* shrub forests within the study area while fulfilling the criteria of homogeny regarding site characteristics. The selection of study areas was based on literature and expert opinion of conservation biologists (Hübl, 1959; Kiridus, 1987; Niklfeld, 1964; Uhlmann, 1938; Wallnöfer, 2003; Zukrigl, 2005; Willner, pers. comm.). A strictly objective, GIS-based, sampling design was not feasible due to the very limited extent of *Quercus pubescens* shrub forests in the study area and the required number of relevés.

## 2.1 Climate

The Vienna basin is part of the Pannonian climate region. It is characterized by a subcontinental, dry and warm climate. The average annual temperature is higher than 8° C. Summers are warm (average July temperature 18°-21° C) while winters can be relatively cold (Fig. 6). Due to prevalent south-eastern exposition the Thermenlinie may warm up even more, making the lower slopes one of the warmest regions in Austria, ideally suited to cultivate wine with mean annual temperatures higher than 9° C. The eastward facing fringe of the alps in this region is comparatively warm and dry because it is exposed to the arid Pannonian region (Wallnöfer 1998).




| Month | Temp. (° C) | Precip. (mm) |
|---|---|---|
| Jan | 0.3 | 38 |
| Feb | 1.5 | 40 |
| Mar | 5.7 | 51 |
| Apr | 10.7 | 45 |
| May | 15.7 | 69 |
| Jun | 18.7 | 70 |
| Jul | 20.8 | 70 |
| Aug | 20.2 | 72 |
| Sept | 15.4 | 61 |
| Oct | 10.2 | 38 |
| Nov | 5.1 | 49 |
| Dec | 1.1 | 48 |

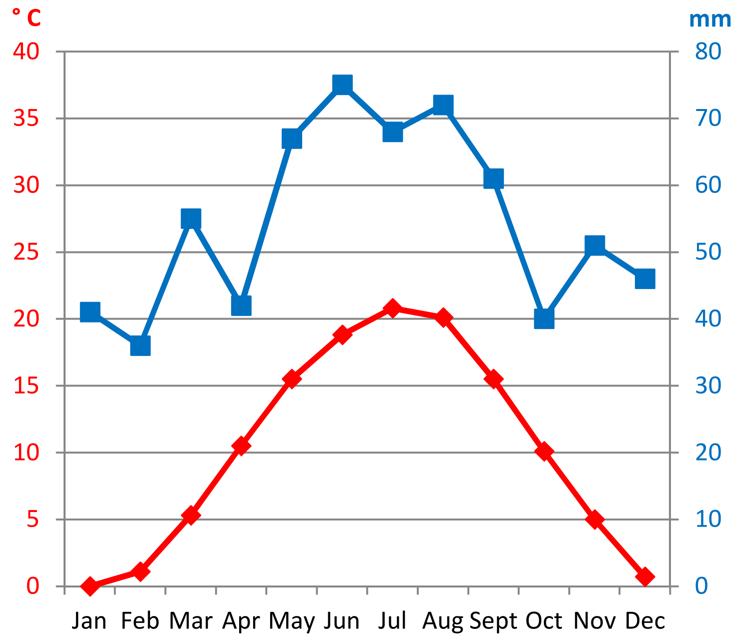
Average annual temperature
10.4 ° C
Annual precipitation
651 mm

Fig. 6: Climate diagram of Vienna, Hohe Warte, 48.2486 N / 16.3564 E, 198 m a.s.l. Data from ZAMG (1981-2010).

Annual precipitation is low and mostly below 600 mm. It can be slightly higher at the Thermenlinie due to an illyric influence coming with higher precipitation in autumn (Fig. 7). Dry periods in summer are more common than in other regions in Austria even though most of the rain falls in this season.

Precipitation is usually very low in spring and autumn and winters seldom bring snow lasting for more than a few days (Wallnöfer 1998).

Frequent winds contribute to droughts, usually prevailing from the west. Winds from the south-east bring continental cold air masses in the winter, often resulting in fog, and hot and dry air in the summer. Geology also plays a major role in the availability of water to plants as localities over limestone and dolomite are well drained and thus conditions are even more extreme on such stands (Wallnöfer 1998).




| Month | Temp (° C) | Precip (mm) |
|---|---|---|
| Jan | 0 | 41 |
| Feb | 1.1 | 36 |
| Mar | 5.3 | 55 |
| Apr | 10.5 | 42 |
| May | 15.5 | 67 |
| Jun | 18.8 | 75 |
| Jul | 20.8 | 68 |
| Aug | 20.1 | 72 |
| Sept | 15.5 | 61 |
| Oct | 10.1 | 40 |
| Nov | 5 | 51 |
| Dec | 0.7 | 46 |

Average annual temperature
10.3 ° C
Annual precipitation
653 mm

Fig. 7: Climate diagram of Gumpoldskirchen, 48.0403 N / 16.2822 E, 219 m a.s.l. Data from ZAMG (1981-2010).

## 2.2 Geology

The Vienna basin lies between the Alps and the Carpathians. At its western border lies a fault line ranging from Brunn am Steinfelde in the south to Leobersdorf, Baden, Mödling, into the city of Vienna and further. It is characterized by several thermal springs which gave birth to the region of the "*Thermenlinie*". As it borders the Northern Limestone Alps the bedrock is mainly dolomite and limestone. However, during the quaternary loess was deposited by wind, and gravel terraces were elevated by the Danube and smaller rivers. This results in a complex geology and a highly textured landscape as can be seen in Fig. 8. Also shown are three fault lines in the right half of the figure going from north to south. The northern border of the study area is made up of flysch, consisting of sandstone and marl. As these types of bedrock are rather soft and weather quite easily they release more nutrients than limestone or dolomite and are able to store more water. Most importantly they are very vulnerable to erosion, as can be seen at the "Nasenweg" at the Leopoldsberg (Fig. 2) (Wallnöfer 1998; Zukrigl 2005).

A detailed list of the geology of the study sites is shown in the annex (**Table A10**). Most of the relevés gathered in 2012 were above flysch (13 relevés: Bisamberg, Leopoldsberg, Königsberg), limestone (13 relevés: Hainburg, Nackter Sattel, Thermenlinie, Winden) and dolomite (9 relevés: Thermenlinie and Winden) with only two on schist (Hackelsberg).

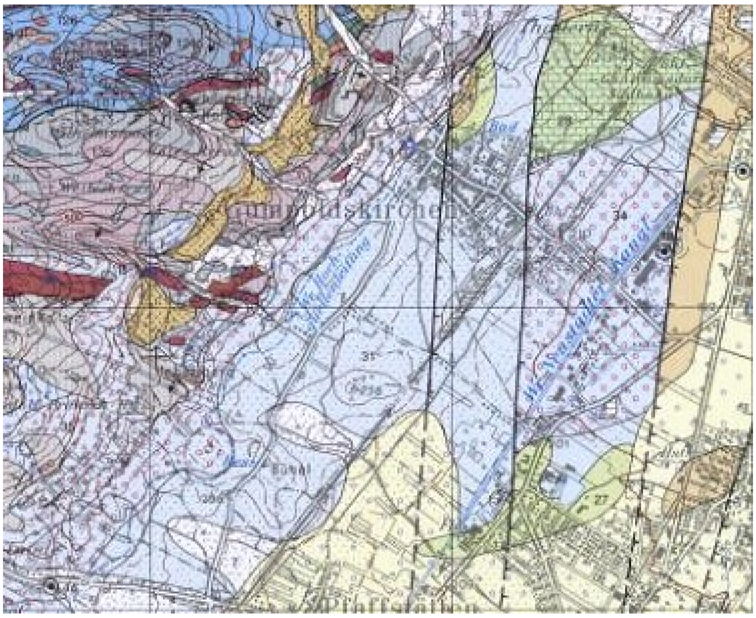


Fig. 8: Detail of the geological map of Baden. Part of the Thermenlinie between Gumpoldskirchen and Pfaffstätten is shown. 6 relevés were gathered in this region in the nature reserve "Glaslauterriegel-Heferlberg-Fluxberg". After: Schnabel (1997).

# 3 Methods

## 3.1 Field work

Field work was undertaken in the vegetation period of 2012. Spring geophytes were determined in March. From the end of May until the middle of September, 36 sites were studied all over the Vienna basin. A modified Braun-Blanquet scale (see **Table 1**) was used to estimate the abundance of species. In comparison to the traditional Braun-Blanquet scale the modified version does not rely on highly erratic numbers of individuals, varying greatly with relevé size, and allows arithmetic operations to be used with the mean cover values, thereby simplifying statistical analysis. At each site with a tree cover of at least 10% a relevé of 100 m² (typically 10 x 10 m) was recorded. Within each 100 m² plot a nested subplot of 10 m² was recorded at the area of densest tree and shrub layer (Fig. 9). Additional sketches depicting the patterns of woody and herbaceous vegetation from a birds-eye perspective, similar to those in Zukrigl (2005), were created (Fig. 9). This approach aims to reduce artifacts created by the choice of relevé area and provides additional information about ecological conditions for the nested plots.

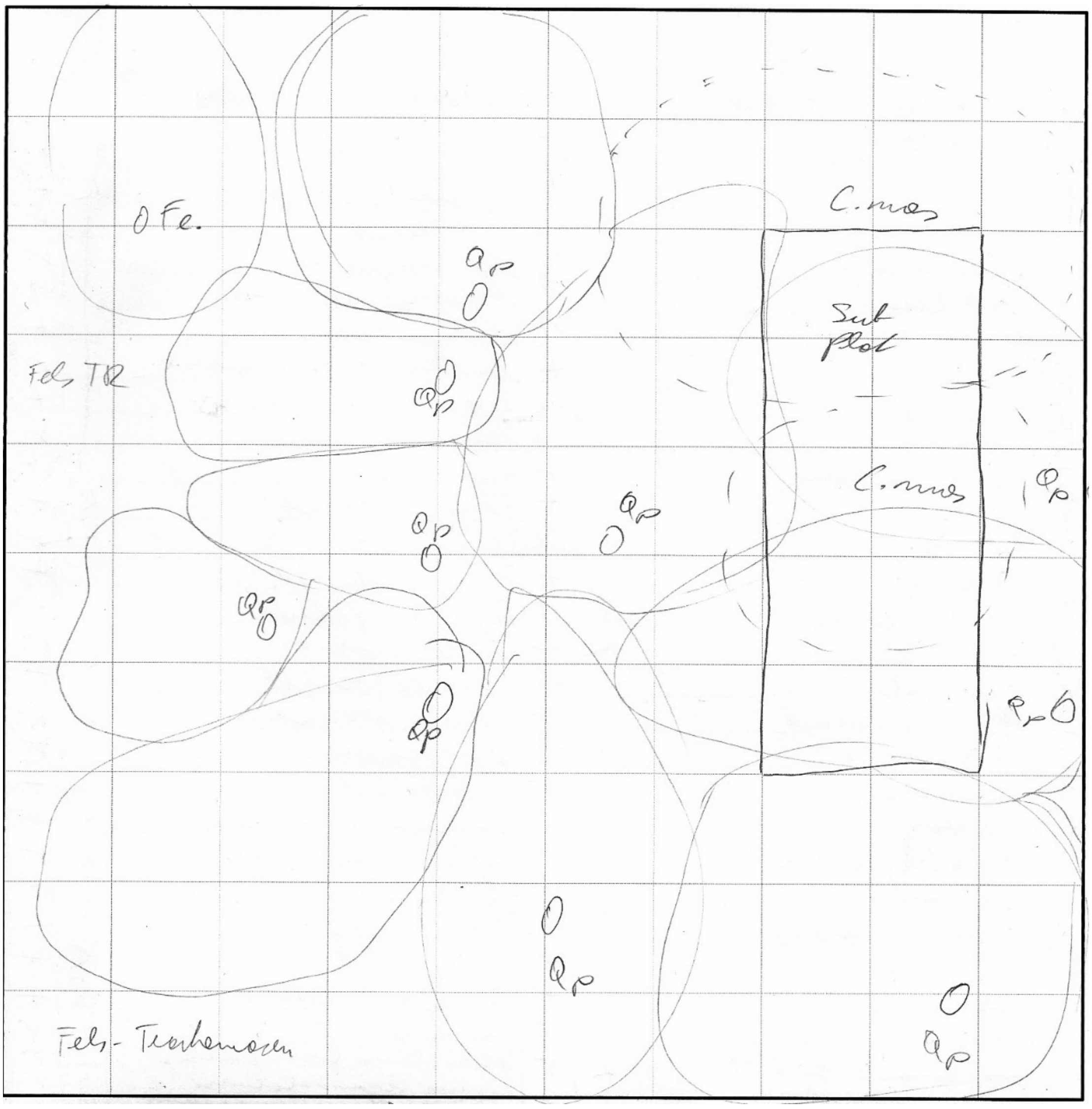



Fig. 9: Sketch depicting the patterns of woody and herbaceous vegetation from a birds-eye perspective. Relevé number 71 in the Hainburg hills is shown. Q.p. = *Quercus pubescens*, C. mas = *Cornus mas*, F.e. = *Fraxinus excelsior*, Fels TR = dry grassland.

**Table 1:** Modified Braun-Blanquet Scale

| Value | Cover | Average |
|---|---|---|
| 5 | 75% - 100% | 87.5% |
| 4 | 50% - 75% | 62.5% |
| 3 | 25% - 50% | 37.5% |
| 2b | 15% - 25% | 20% |
| 2a | 5% - 15% | 10% |
| 1 | 1% - 5% | 2.5% |
| + | 0.2% - 1% | 0.6% |
| r | < 0.2% | 0.1 % |

## 3.2 Numerical classification of phytosociological data

In order to help simplify complex multivariate ecological datasets numerical classification methods remain a widespread tool. In community ecology hierarchical classifications are popular because they facilitate the interpretation of structures within the datasets in accordance to the traditional view of hierarchical relationships among communities. Agglomerative techniques follow a bottom up approach, clustering the most similar sites and aggregating these until a single cluster, containing all sites, emerges. Divisive techniques start from the top down by successively dividing a single cluster containing all sites until either individual sites are separated, a certain amount of clusters or a minimum of sites per cluster is reached (Gauch & Whittaker 1981; Roleček et al. 2009).

Two-way Indicator Species Analysis (TWINSPAN) is a widely employed hierarchical divisive classification technique developed in FORTRAN by Hill (1979). Nowadays stand-alone DOS and WINDOWS versions are available (Hill & Šmilauer 2005). TWINSPAN is especially useful when seeking a classification mirroring the main gradients of variability of a dataset, especially when sites are dispersed quite regularly in dissimilarity space. It does not, however, extract natural groups of the most similar sites as discontinuities between groups are ignored leading to possible miss-classifications. A major limitation of TWINSPAN is that the number of clusters cannot be set manually but increases in powers of two. In order to overcome this constraint Roleček et al. (2009) improved the algorithm by incorporating a measure of heterogeneity, which is calculated for both clusters of the first TWINSPAN division. Subsequently, only the more heterogeneous cluster is divided by TWINSPAN resulting in three clusters. Next heterogeneity of each cluster is quantified and again the most heterogeneous cluster is divided. The same process is repeated until the user defined number of clusters is reached. The difference between the classical (a) and modified (b) TWINSPAN algorithms is shown in Fig. 10.

Despite the improvements of the modified TWINSPAN algorithm it is still an unsupervised classification method. Therefore it is not possible to include a priori information on site membership in groups. That implies that each classification of a new dataset creates new groups which might not correspond well with those established by previous classifications. Additionally results of unsupervised classifications depend on the choice of classification algorithm and between-site resemblance measure as well as the transformation of species quantities and data set structure. Consequently, even if unsupervised classifications have clear ecological meaning, they may be poorly compatible with previously established classifications containing similar sites or even those sharing a number of identical sites (Tichý et al. 2014).

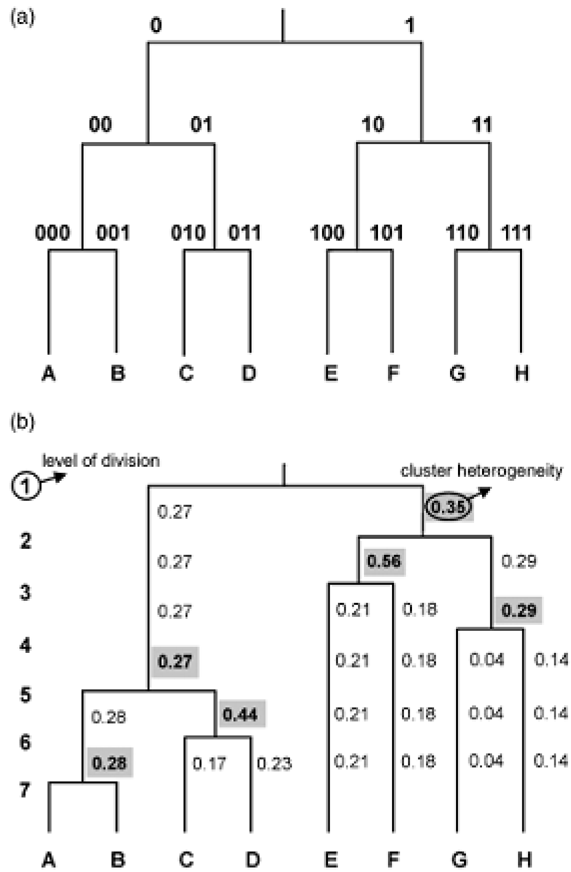



Fig. 10: Differences between classical (a) and modified (b) TWINSPAN algorithms. Classical TWINSPAN produces classifications by dividing each cluster in two on each hierarchical level. Modified TWINSPAN only divides the most heterogeneous cluster until the pre-defined number of clusters is reached. After: Roleček et al. (2009)

## 3.3 Dataset

Relevés were stored in a TurboVeg database (Hennekens & Schaminée 2001). Data was exported in .xml-format and imported into JUICE for TWINSPAN analysis and fidelity calculations using synoptic tables (Hill 1979; Tichý 2002). Additional (multivariate) statistical analysis was performed in R.

In addition to the 36 relevés (and 36 subplots) gathered in 2012, literature data of thermophilous oak forests of north-eastern Austria were included in the dataset (Hübl 1959; Jelem et al. 1965; Kiridus 1987; Reichenberger 1990; Wallnöfer 1998; Zukrigl 2005; Haudek et al. 2006). Its consideration helps in finding diagnostic species, facilitates the interpretation of the data analysis and puts newly gathered data into a geographical and historical perspective. The resulting vegetation dataset is composed of 351 relevés containing 562 species (**Table A14**).

## 3.4 Data analysis

### 3.4.1 Ordination analysis

Detrended Correspondence Analysis (DCA) was performed using R and the vegan package (Oksanen & Kindt 2007). The data were directly imported from TurboVeg using the vegdata package (Jansen & Dengler 2010). The layers were combined into one. Percentage cover values were transformed by calculating their square root. All commands and parameters used are documented in the R-script with extensive inline comments.

### 3.4.2 Deductive classification

Following the key of Starlinger (2007) all relevés were assigned to an association of the Quercion pubescenti-petraeae by calculating the total cover (TC) value of all diagnostic species, including those found in the synoptic table. Only if the TC was higher than 1% it was considered to be an unambiguous assignment. This evaluation was done for each step in the dichotomous key (Willner 2011).

### 3.4.3 Data analysis in JUICE – TWINSPAN algorithm

The first step after loading the vegetation data into JUICE was to combine the same species of all layers, resulting into entries with layer 0. Next the nomenclature of all species was checked and updated to correspond with Fischer et al. (2008). Same species, which were filed under different names due to differences in age of the relevé (literature data), were combined as well. The same process was applied to species and groups of species where taxonomical ambiguities or potential misidentifications in the field prevented determination on the species level. In such cases, they were combined into aggregates (e.g. *Dianthus carthusianorum* and *Dianthus pontedere* → *Dianthus carthusianorum agg*.).

The traditional TWINSPAN algorithm as implemented in JUICE was applied (Hill 1979; Tichý 2002). When working exclusively with my own data, 5 pseudospecies cut levels with values of 0, 2, 5, 25 and 50 were used. Minimum Group size was set to 2, maximum level of divisions was 6, separators were made and species sorted (Fig. 11).

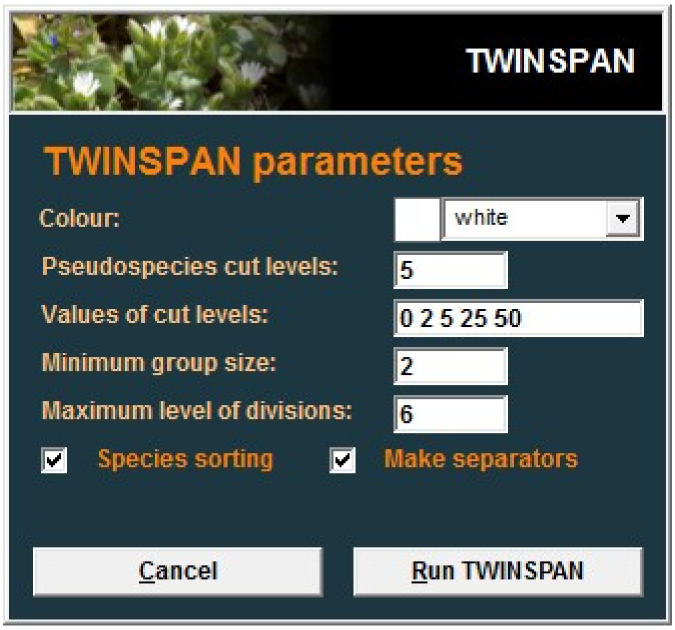



Fig. 11: TWINSPAN parameters used when analysing my own data

During the analysis process it soon became clear, that mainplots and subplots had to be treated separately. A TWINSPAN analysis was performed for both subsets of the data. For the interpretation of the analysis typically 6-8 groups were considered to be a meaningful start. This number, however, was reduced to only 4 groups later in the process to facilitate the recognition of diagnostic species.

When working with data from the literature only 3 pseudospecies cut levels with values of 0, 5 and 25 were used for the TWINSPAN analysis. This was done to reduce the error introduced by estimating the cover of plants in the field. Especially at the lower end of the scale, between Braun-Blanquet cover values of r, + and 1, there are subjective differences between people estimating the cover.

Fidelity of a species to a group was calculated using the phi-coefficient with the parameters shown in Fig. 12 (Chytrý et al. 2002; Willner et al. 2009).

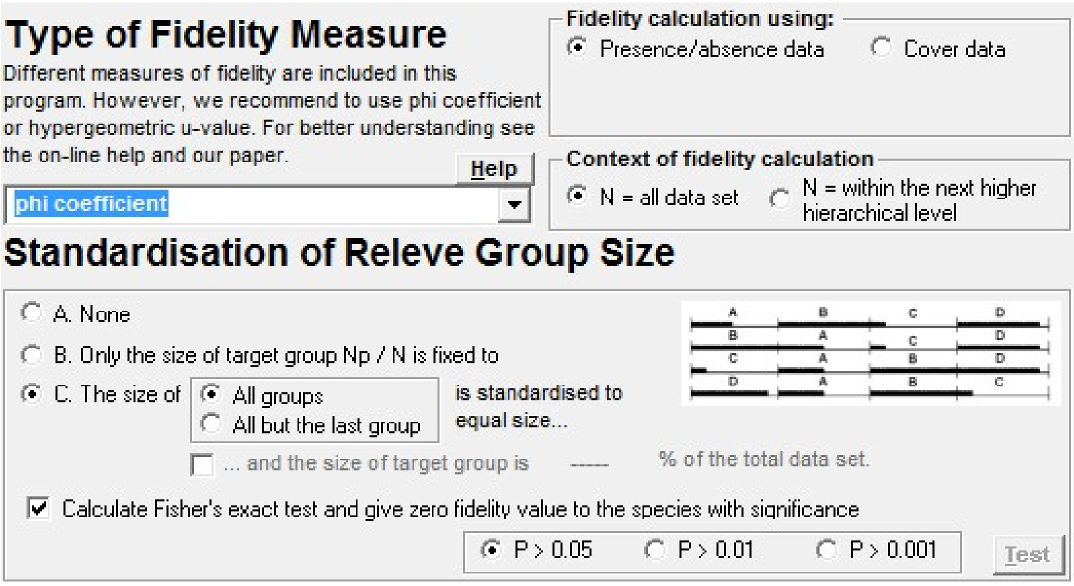



Fig. 12: parameters used for the calculation of the phi-coefficient in JUICE (Tichý 2002)

In order to find good diagnostic species for each group a hierarchical approach was followed. At first only the first separator dividing the data into two groups was considered. Species were sorted according to fidelity with a cut level of phi = 0.3, resulting in a preliminary list of potential diagnostic species. It was refined by eliminating species with constancy below 15% and constancy ratio below two. This yielded 22 good diagnostic species for the first group and 23 good diagnostic species for the second group.

Next, the separator hierarchy was increased to four groups. The same process using the same cut levels was applied again. Some species having a phi-coefficient higher than 0.3 in two groups were only considered to be diagnostic for the group with the highest phi-coefficient. Additionally the context of fidelity calculation (see Fig. 12) was changed to calculate the fidelity measure *within the next higher hierarchical level* in order to find any good diagnostic species which were not detected using the previously employed method. However no additional good diagnostic species were revealed by this step.

To refine and review the initial TWINSPAN classification of my relevés the total percentage cover of each diagnostic species group calculated and appended to the header data. Next, each of my relevés was classified by first comparing the cover values of group 1 and 2 of the first division and re-assigning it to the respective group and secondly by comparing the corresponding values of group 1 and 2 or 3 and 4.

# 4 Results

The complete data of my relevés are listed in the annex (**Table A11**) together with the header data (**Table A12**).

## 4.1 Detrended Correspondence Analysis – DCA

The joint DCA of the main- and subplots is shown in Fig. 13. The mainplots and their corresponding nested subplots were mostly closely together.

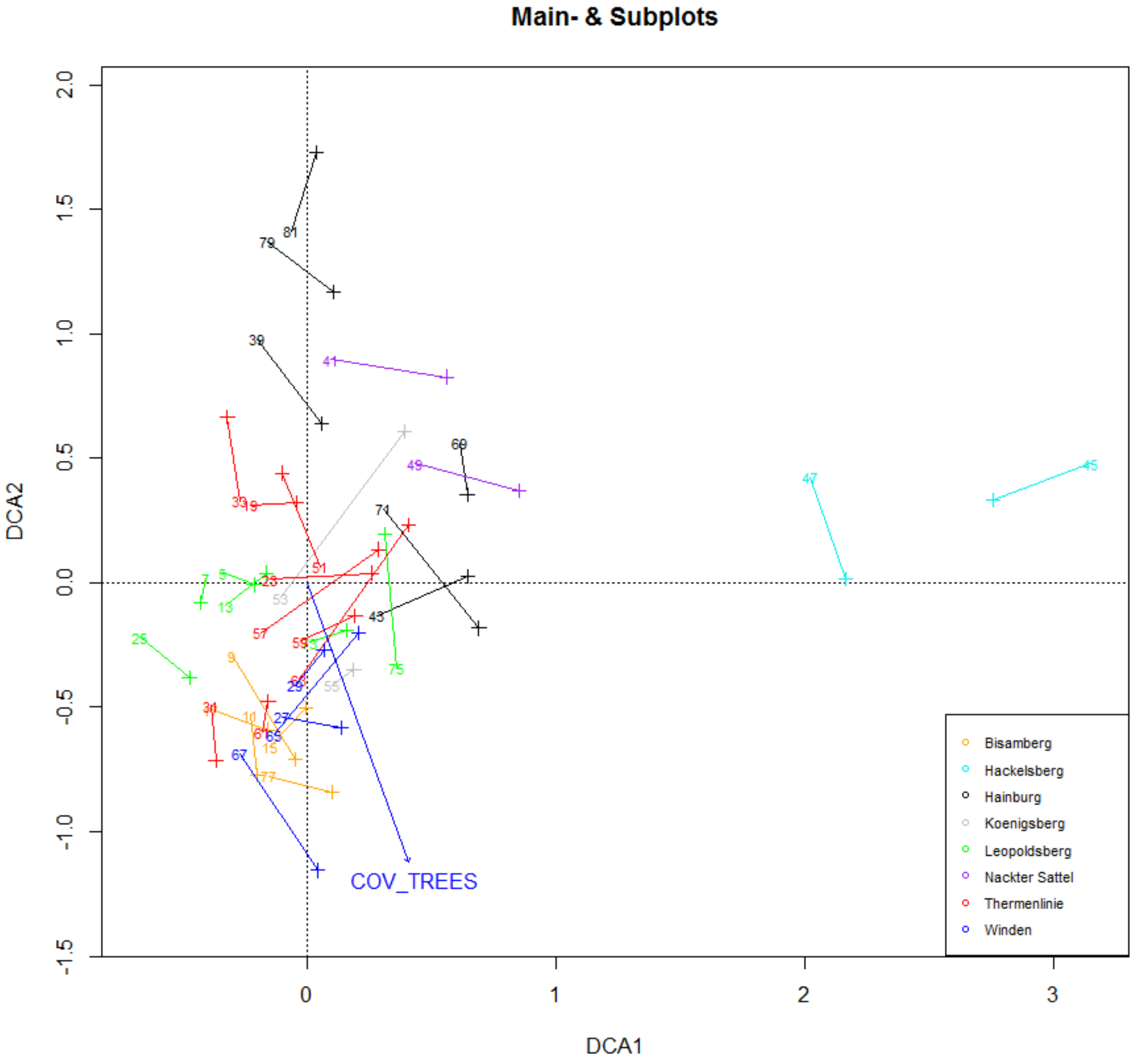



Fig. 13: DCA showing mainplots (numbers) and subplots (crosses), each pair linked with a line. Tree cover was the only significant environmental factor.

The relevés from Hackelsberg were sharply separated from all other relevés, greatly expanding the first axis of the DCA. Relevés from the Hainburg hills, especially the northern slope (79, 81), and the Nackter Sattel formed a group occupying the upper part of the 2$^{nd}$ DCA axis while all other localities clustered around the centre and lower half of the diagram. The cover of the tree layer was the only environmental variable which was significantly correlated with the DCA axes. It was more closely associated with the 2$^{nd}$ DCA axis than the first one. The direction from main- to subplot did not follow a general pattern but changed wildly between relevés, when looking at relevés from the same locality (compare, e.g., 7 and 13, both Leopoldsberg).

Fig. 14 shows the linear correlation of DCA-Scores for the 1st axis between main- and subplots. Again the relevés from Hackelsberg played a major role in shaping the curve. The adjusted $R^2 = 0.805$ was much higher when these relevés were included than when they were omitted (adjusted $R^2 = 0.507$, $p = 1.41e-6$ ***, graphic not shown). In either case there was a clear linear correlation, meaning both main- and subplots follow the same gradient.

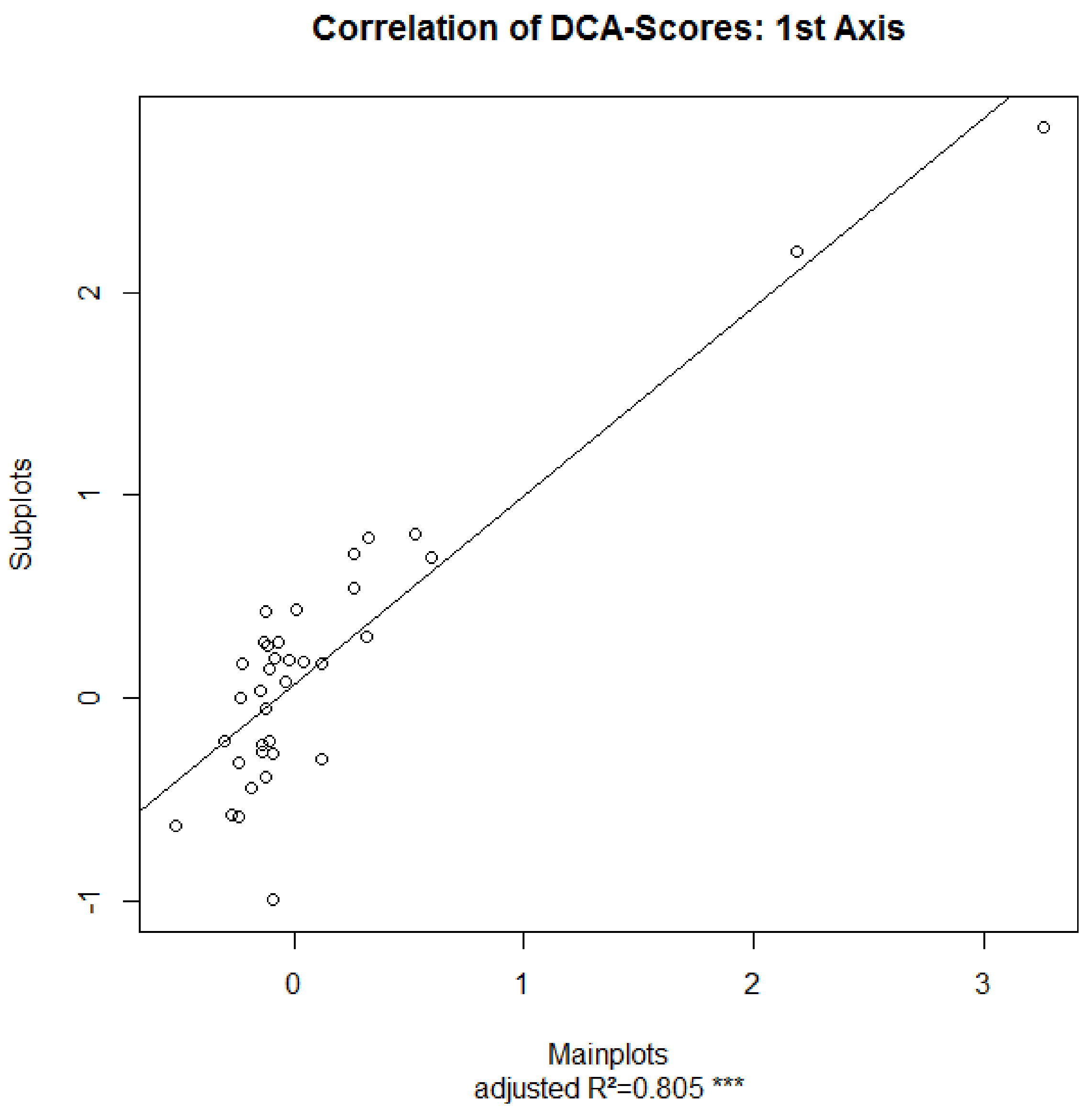



Fig. 14: Correlation of DCA scores of the 1st axis. Adjusted $R^2 = 0{,}805$, $p = 7.62e-14$.

The same is also true for the correlation of DCA-scores of the 2nd axis between main- and subplots (Fig. 15), although the result is not as visually striking.

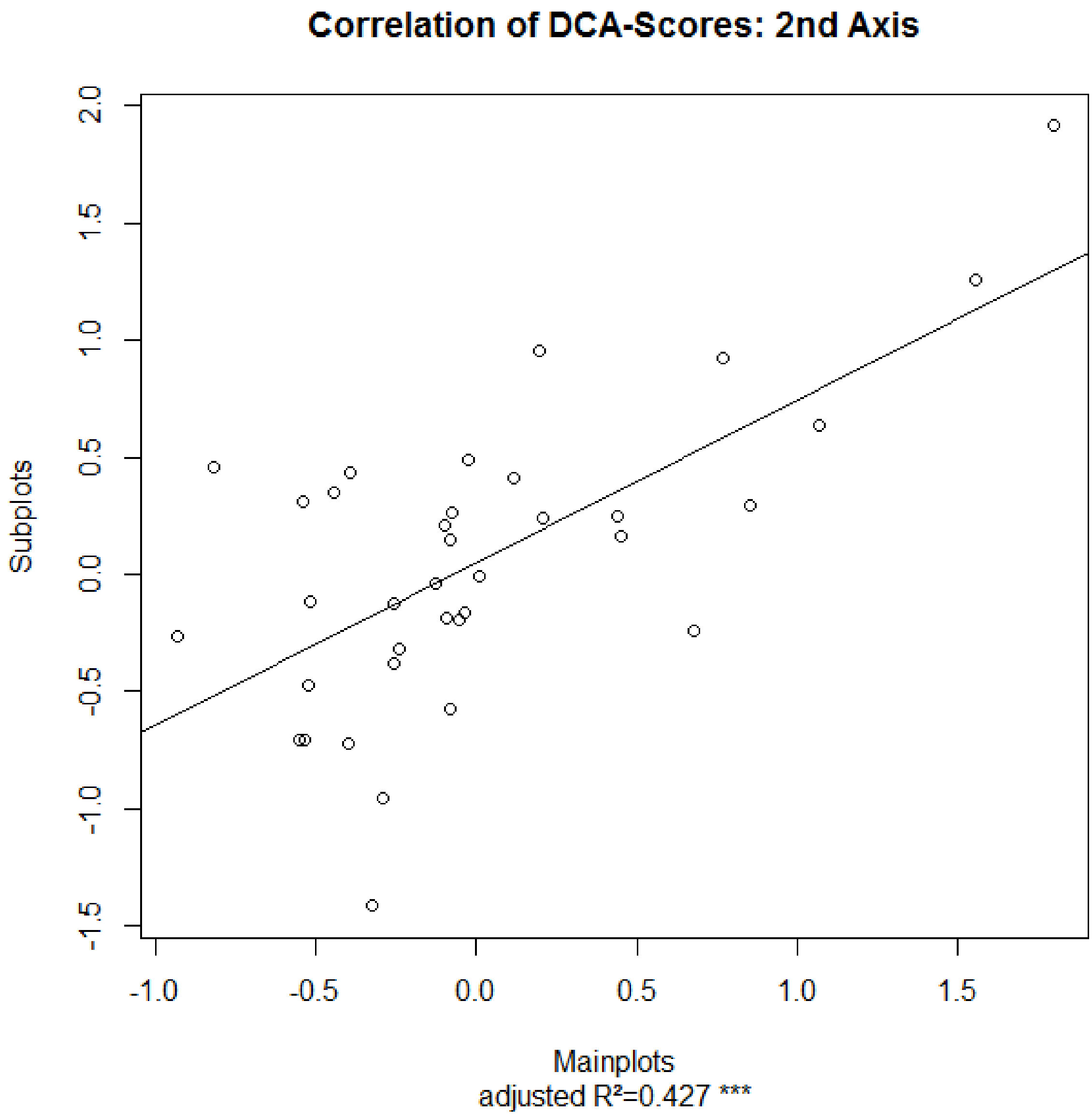



Fig. 15: Correlation of DCA scores of the 1st axis. Adjusted $R^2 = 0.427$, $p = 9.41e-06$.

## 4.2 Deductive classification

Following the key of Starlinger (2007) all main- and subplots were assigned to an association of the alliance Quercion pubescenti-petraeae.

Of the mainplots most relevés were assigned to the association Geranio sanguinei-Quercetum pubescentis (Fig. 1) followed by Inulo ensifoliae-Quercetum pubescentis (Fig. 2) and Lithospermo-Quercetum pubescentis. Only three relevés were assigned to the Euphorbio angulatae-Quercetum. Two relevés could be assigned to both Geranio sanguinei-Quercetum and Lithospermo-Quercetum, because they had the same total cover for both diagnostic species groups. One relevé, from Hackelsberg, could only be assigned to the association group with *Buglossoides purpurocaerulea* but neither to the Corno-Quercetum or Euphorbio angulatae-Quercetum because it was lacking in diagnostic species. Out of 36 relevés 32 could be clearly assigned to an association while the classification of 4 relevés was problematic due to missing diagnostic species or identical total cover values.

Deductive classification of the subplots yielded a very colorful picture. Again most of the relevés were assigned to Geranio sanguinei-Quercetum followed by Inulo ensifoliae-Quercetum. Euphorbio angulatae-Quercetum was more common than Lithospermo-Quercetum and one relevé was assigned to Corno-Quercetum. Roughly a third of the relevés which were assigned to an association had very low total cover values for the diagnostic species, below the threshold of 1%, at least once during the deductive classification process. This highlights the lack of floristic information in the subplots which makes it almost impossible to clearly assign them to an association. Consequently only 20 out of 36 subplots could be unambiguously assigned to an association.

An overview of the results is presented in **Table 2**.

**Table 2:** Deductive classification sensu Starlinger (2007). Associations marked with an asterisk (*) are ambiguous assignments as a total cover of diagnostic species > 1% was not reached. "*Quercus pubescens* shrub forests" refers to both Geranio sanguinei-Quercetum pubescentis and Lithospermo-Quercetum pubescentis as the relevés assigned to this group either lacked diagnostic species of the associations or the total cover of diagnostic species was exactly the same for both.

| Locality | Hackelsberg | | Hundsheimer Berg | | Nackter Sattel | | Königsberg | | Winden | | Thermenlinie | | Bisamberg | | Leopoldsberg | | Sum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Main-/Subplot | m | s | m | s | m | s | m | s | m | s | m | s | m | s | m | s | m | s |
| Ass. of the Pannonian area | | | | 1 | | | | 1 | | | | | | 1 | | | 0 | 3 |
| Inulo ensifoliae-Quercetum pubescentis | | | | | | | | | | | 1 | | 1 | 1 | 5 | 4 | 7 | 5 |
| Inulo ensifoliae-Quercetum pubescentis* | | | | | | | | | | | | | | 1 | | 2 | 0 | 3 |
| *Quercus pubescens* shrub forest | | | | | | | | 1 | | 1 | | | 2 | | | | 2 | 2 |
| *Quercus pubescens* shrub forest* | | | | | | | | | | | | | | 1 | | | 0 | 1 |
| Geranio sanguinei-Quercetum pubescentis | | | 4 | 1 | 2 | 2 | 2 | | 1 | 1 | 7 | 5 | 1 | | | | 17 | 9 |
| Geranio sanguinei-Quercetum pubescentis* | | | | 1 | | | | | | 1 | | 2 | | | | | 0 | 4 |
| Lithospermo-Quercetum pubescentis | 1 | | | 1 | | | | | 3 | | 1 | 1 | 1 | | | | 6 | 2 |
| Ass. Grp. *Buglossoides purpurocaerulea* | 1 | 2 | | | | | | | | | | | | | | | 1 | 2 |
| Euphorbio angulatae-Quercetum | | | 1 | 1 | | | | | | | | 1 | | 1 | 1 | | 2 | 3 |
| Euphorbio angulatae-Quercetum* | | | 1 | 1 | | | | | | | | | | | | | 1 | 1 |
| Corno-Quercetum | | | | | | | | | | 1 | | | | | | | 0 | 1 |

## 4.3 Inductive classification

### 4.3.1 TWINSPAN – new data gathered in 2012

**Table 3:** Mainplots of *Quercus pubescens* shrub forests (QPSF) in the Vienna Basin. The first block are the most common species. The second block are species are indicative of the physiognomy. The third block are species are typical of QPSF and occur mainly on Dolomite bedrock.

| Relevé number | 45 | 79 | 81 | 47 | 39 | 69 | 71 | 41 | 49 | 19 | 43 | 53 | 55 | 27 | 29 | 65 | 67 | 61 | 59 | 51 | 33 | 31 | 63 | 23 | 57 | 77 | 9 | 15 | 11 | 17 | 75 | 7 | 73 | 25 | 5 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quercus pubescens s.str. | b | 3 | a | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 3 | 4 | 4 | 5 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 |
| Teucrium chamaedrys | . | 1 | . | + | 1 | + | + | 1 | + | 1 | . | + | + | 1 | r | r | + | r | + | + | + | . | r | + | r | + | + | . | + | 1 | . | 1 | r | + | a | 1 |
| Crataegus monogyna | . | + | a | . | 1 | + | 1 | 1 | 1 | + | 1 | r | + | 1 | 1 | b | + | 1 | 1 | + | + | . | . | . | . | b | 1 | b | 3 | b | 1 | + | + | 1 | + | a |
| Dictamnus albus | . | a | + | . | a | 1 | 1 | 1 | 1 | a | . | 1 | + | + | + | . | 1 | + | + | 1 | + | 1 | + | + | 1 | + | a | . | a | . | + | r | . | + | 1 | a |
| Euonymus verrucosus | . | 1 | 3 | . | 1 | a | a | . | 1 | 1 | b | b | 1 | 1 | 1 | 1 | r | + | 3 | a | 1 | 1 | b | 1 | r | . | a | a | . | 1 | . | + | a | . | . | a |
| Fraxinus excelsior | . | r | b | . | + | r | b | a | r | a | . | . | . | + | 1 | 1 | + | + | 1 | b | . | . | + | a | b | + | 1 | 1 | + | + | 1 | + | + | . | + | a |
| Rosa sp. | . | . | r | + | r | r | + | + | + | + | 1 | . | + | . | + | . | + | 1 | r | r | . | r | . | . | + | + | 1 | 1 | + | 1 | + | r | + | r | + | + |
| Polygonatum odoratum | . | a | . | + | 1 | r | + | a | 1 | . | 1 | 1 | + | a | a | a | 1 | 1 | + | 1 | + | 1 | . | a | a | + | a | 1 | 1 | + | . | . | r | . | . | . |
| Vincetoxicum hirundinaria | . | + | r | . | + | + | r | + | . | 1 | . | 1 | 1 | r | r | + | + | 1 | . | . | r | r | 1 | 1 | 1 | . | + | . | + | + | 1 | 1 | r | . | 1 | 1 |
| Rhamnus cathartica | . | 1 | b | . | 1 | 1 | + | + | a | + | + | + | . | r | . | + | + | + | . | + | + | + | . | + | + | + | b | . | r | . | 1 | . | + | . | . | b |
| Cornus mas | . | a | b | . | . | a | b | b | a | b | a | . | . | b | b | b | + | . | 1 | 1 | . | . | . | . | b | + | . | 1 | 1 | . | a | a | 1 | . | a | b |
| Euphorbia cyparissias | . | 1 | . | r | + | r | r | 1 | . | + | . | + | r | + | r | + | + | r | r | r | r | r | r | + | + | r | + | . | + | + | r | 1 | r | + | + | 1 |
| Ligustrum vulgare | . | . | . | . | . | 1 | b | 1 | r | 1 | b | r | + | 1 | 1 | + | 1 | + | + | + | + | + | r | 1 | + | + | 1 | b | 1 | 1 | . | . | + | + | . | + |
| Viburnum lantana | . | . | a | . | . | + | 1 | . | . | + | 1 | + | + | 1 | 1 | . | + | r | 1 | 1 | + | 1 | r | . | + | 1 | a | a | 1 | 1 | r | + | 1 | + | . | a |
| Carex humilis | . | 1 | . | . | 1 | + | 1 | . | . | . | . | a | b | a | 1 | 1 | 1 | 1 | a | + | 1 | a | 1 | 1 | b | b | 3 | 1 | b | 4 | . | . | . | 3 | . | 3 |
| Inula ensifolia | . | + | . | . | + | . | + | . | . | 1 | . | . | . | 1 | 1 | 1 | + | + | r | r | + | + | . | . | . | + | 1 | + | 1 | a | r | b | + | 1 | 3 | a |
| Anthericum ramosum | . | . | . | . | r | r | r | . | 1 | . | . | . | . | a | a | + | r | 1 | . | r | + | a | + | r | r | + | + | + | + | 1 | . | 1 | 1 | 1 | . | b |
| Berberis vulgaris | . | 1 | . | . | 1 | . | + | . | . | . | 1 | + | + | r | + | + | + | r | . | . | r | r | 1 | . | + | 1 | 1 | 1 | + | 1 | r | . | . | . | . | 1 |
| Bupleurum falcatum | . | + | . | . | + | . | + | . | . | + | . | . | . | + | . | r | r | . | . | 1 | r | + | r | + | r | r | + | . | . | + | + | + | r | + | + | + |
| Sorbus torminalis | . | . | . | . | . | . | . | . | + | r | . | r | . | + | + | + | + | a | . | r | . | a | . | a | . | + | 1 | + | + | + | . | + | + | r | + | + |
| Tanacetum corymbosum | . | + | . | . | . | . | . | + | . | + | . | . | . | . | . | + | r | r | . | 1 | + | . | r | + | r | r | + | + | + | 1 | r | 1 | r | . | 1 | . |
| Cervaria rivini | . | . | r | . | . | . | . | . | . | 1 | . | . | . | r | r | r | + | r | r | + | + | + | . | + | . | r | + | + | + | 1 | . | . | + | a | . | 1 |
| Brachypodium pinnatum | . | + | . | r | . | . | . | . | 1 | b | . | . | . | r | + | r | 1 | r | . | + | 1 | . | . | 1 | . | + | . | . | 1 | . | r | b | 1 | 3 | . | 1 |
| Galium glaucum | . | + | . | . | r | . | r | . | . | . | . | . | . | r | . | r | + | + | . | . | + | . | . | 1 | . | r | + | . | + | + | . | 1 | + | . | 1 | 1 |
| Geranium sanguineum | . | . | . | . | . | + | . | . | + | + | . | . | . | + | . | . | 1 | r | r | . | r | r | r | 1 | . | + | + | . | 1 | a | . | . | . | . | . | . |
| Centaurea scabiosa | . | r | . | . | + | . | . | . | . | . | . | . | . | r | . | r | + | r | r | r | + | . | . | r | . | + | . | . | + | 1 | . | . | . | . | . | . |
| Staphylea pinnata | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | a | 1 | . | 1 | a | + | 1 | . | . | . | . | . | . | . | . | . | . | . | . |
| Sorbus aria | . | . | . | . | . | . | . | . | + | + | . | . | . | . | . | . | . | 1 | 1 | 1 | . | 1 | + | + | 1 | 1 | a | a | 1 | b | + | b | a | a | 1 | a |
| Cornus sanguinea | r | . | . | . | . | . | . | . | . | + | . | 1 | + | b | . | . | . | a | a | . | . | 1 | a | . | . | b | 3 | b | . | a | + | + | + | a | + | a |
| Elymus hispidus | . | + | . | 1 | . | . | . | . | . | 1 | . | . | . | . | . | . | r | . | r | . | + | . | . | 1 | . | r | 1 | . | 1 | 1 | . | a | r | . | 1 | 1 |
| Hippocrepis emerus | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | + | a | a | + | + | 1 | . | + | . | r | . | . | . | . | a | r | r | + | a |
| Viola hirta | . | . | . | . | . | . | . | . | . | 1 | . | 1 | + | 1 | + | + | + | + | r | . | . | 1 | . | + | r | . | + | . | . | . | . | . | . | + | . | . |
| Aster amellus | . | . | . | . | . | . | . | . | . | . | . | 1 | r | . | . | . | . | r | r | . | r | . | . | . | . | + | . | . | 1 | . | r | 1 | r | 1 | 1 | . |
| Melica nutans | . | + | . | . | . | . | . | . | . | . | . | r | . | r | r | r | . | . | . | . | r | . | . | . | r | r | . | . | r | 1 | . | r | . | . | . | . |
| Laser trilobum | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | + | 1 | . | r | . | . | . | . | . | . | . | 1 | b | + | 1 | b | a |
| Clematis recta | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | r | r | + | r | 1 | . | . | . | r | + | 1 | . | 1 | . | . | . | . | . | . |
| Asperula tinctoria | . | . | . | . | . | . | . | . | . | . | . | . | . | + | + | r | . | r | . | . | . | . | . | + | . | r | + | . | r | + | . | . | . | . | . | . |
| Loranthus europaeus | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | 1 | . | + | . | . | + | + | . | + | 1 | + | 1 | . | . | . | . | . | . | . |
| Mercurialis ovata | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | r | . | + | r | . | + | + | r | + | . | . | . | . | . | . | . | . | . | . |
| Rosa pimpinellifolia | . | . | . | . | . | . | . | . | . | . | . | . | . | r | r | 1 | . | . | . | . | . | . | + | . | . | 1 | . | . | + | 1 | . | . | . | . | . | + |
| Cytisus nigricans | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | + | r | . | r | . | . | . | . | . | . | + | . | 1 | 1 | 1 |
| Amelanchier ovalis | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | + | 1 | + | a | + | . | + | . | . | . | . | . | . | . | . | . | . | . |
| Campanula bononiensis | . | . | . | . | . | . | . | . | . | . | . | r | . | r | . | + | . | . | . | . | . | + | + | . | . | r | . | . | . | r | . | . | . | . | . | . |
| Sesleria albicans | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | + | 1 | a | 1 | 1 | a | . | . | . | . | . | . | . | . | . | . | . |
| Origanum vulgare | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | r | + | + | . | . | . | . | . | . | . | r | . | + | . | . | r | . |
| Coronilla coronata | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | 1 | . | . | . | . | . | . | 1 | + | 1 | 1 | 1 |
| Pyrus pyraster | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | a | . | . | a | 3 | 1 | . | . | r | . | + |
| Buphthalmum salicifolium | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | r | + | . | r | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . |
| Acer platanoides | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | r | + | . | r | r | . | . | . |
| Campanula rapunculoides | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | r | 1 | . | . | + | + |
| Euphorbia angulata | . | . | . | . | . | . | . | . | . | . | . | . | . | + | r | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . |

The result of the TWINSPAN analysis performed with JUICE for main- and subplots separately is shown above. **Table 3** shows the most common species across all releves. At first two blocks of species with diagnostic information were identified. Species of the second block are quite widespread but correlate with the physiognomy of a stand, most indicating rather open, sunny and dry spots. Hence their constancy is much higher in the mainplots than the subplots. Species grouped in the third block on the other hand are typical elements of *Quercus pubescens* shrub forests of the Thermenlinie to the west of the study area. They are all but absent in the Hainburg hills, some are almost exclusive for the Thermenlinie while others prefer the loess substrate of the Leopoldsberg and Bisamberg.

**Table 4:** Mainplots of *Quercus pubescens* shrub forests (QPSF) in the Vienna Basin. The first block are species of xeric grasslands. The second block are springtime geophytes and/or characteristic for two relevés in the Hainburg hills.

| Relevé number | 45 | 79 | 81 | 47 | 39 | 69 | 71 | 41 | 49 | 19 | 43 | 35 | 55 | 27 | 29 | 65 | 67 | 61 | 59 | 51 | 33 | 31 | 63 | 23 | 57 | 77 | 9 | 15 | 11 | 17 | 75 | 7 | 73 | 25 | 5 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allium flavum | . | + | . | . | r | r | r | r | r | . | . | . | . | r | . | . | . | . | + | r | . | . | . | . | r | r | + | . | . | . | . | . | r | . | . | . |
| Melica ciliata | . | a | . | r | + | r | + | a | . | 1 | . | . | . | . | . | r | . | . | . | . | 1 | . | . | . | r | . | . | . | . | + | r | . | . | . | . | . |
| Helianthemum nummularium | . | r | . | . | r | . | . | r | r | + | . | . | r | . | . | . | . | . | . | . | . | . | . | . | r | . | + | . | . | + | . | . | r | + | . | . |
| Prunus mahaleb | . | . | + | . | a | 1 | 1 | . | . | a | + | . | . | . | . | . | . | + | r | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . |
| Allium lusitanicum | . | b | . | . | r | + | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | r | r | . | . | . | + | . | . | . | . | . | . |
| Sedum maximum | . | . | . | r | . | r | r | r | r | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | + | . |
| Potentilla incana | . | 1 | . | . | + | r | r | r | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . |
| Thymus sp. | . | + | . | . | + | r | r | 1 | r | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Centaurea stoebe s.lat. | . | r | . | . | r | r | . | r | . | + | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . |
| Dianthus carthusianorum agg. | . | r | . | . | . | . | . | + | r | + | . | . | . | . | . | . | . | . | . | . | r | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . |
| Medicago falcata | . | . | . | . | . | . | . | + | r | + | . | . | . | . | . | . | . | . | . | . | + | . | . | + | . | . | . | . | . | . | . | . | . | . | + | . |
| Clinopodium vulgare | . | r | . | . | r | r | . | . | . | + | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Galium pycnotrichum | . | 1 | . | . | 1 | 1 | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Verbascum lychnitis | . | + | . | . | + | . | . | + | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Teucrium montanum | . | r | . | . | + | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . |
| Peucedanum oreoselinum | . | r | . | . | r | r | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Sedum album | . | r | . | . | . | r | r | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Hypericum perforatum | . | . | . | r | . | . | . | 1 | + | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Asplenium trichomanes | . | . | . | . | . | r | r | . | + | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Melampyrum nemorosum | . | + | . | . | . | + | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Echium vulgare | . | r | . | . | r | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Scorzonera austriaca | . | . | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Linum tenuifolium | . | . | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . |
| Petrorhagia saxifraga | . | . | . | . | . | r | r | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Sesleria sadleriana | . | b | . | . | 3 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Helianthemum canum | . | . | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Jovibarba hirta sensu LGM | . | . | . | . | r | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Asplenium ruta-muraria | . | . | . | . | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Thesium bavarum | . | . | . | . | . | . | . | r | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Primula veris | . | 1 | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | r | 1 | . | . | . | . | . | . | . | . |
| Convallaria majalis | . | 1 | r | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Galanthus nivalis | . | a | a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Corydalis cava | . | 1 | b | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Laserpitium latifolium | . | + | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

Further analysis revealed a block of species which can usually be found on xeric grasslands and has high constancy with the relevés of the Hainburg hills. They are found in **Table 4** within the first block, while species of the second block are partly springtime geophytes and very characteristic for a subset of the relevés of the Hainburg hills found on the northern slopes.

Groups 2 and 3 (Hainburg & Nackter Sattel) were merged resulting in 4 groups. Group 2 only consisted of two relevés, which additionally contained springtime geophytes (**Table 4**, second block and dashed line), and merging the groups facilitated the comparison with literature data.

All four species blocks are less common in subplots (**Table 5** and **Table 6**) than in mainplots. As many of these species were later identified to be diagnostic within the context of literature data, only mainplots were studied further in order to assign them to one of the existing associations.

**Table 5:** Subplots of *Quercus pubescens* shrub forests (QPSF) in the Vienna Basin. The first block are the most common species. The second block are species are indicative of the physiognomy. The third block are species are typical of QPSF and occur mainly on Dolomite bedrock. Double line marks the 1st TWINSPAN division, single line the 2nd, dashed line the 3rd.

| Relevé number | 46 | 42 | 82 | 48 | 32 | 60 | 62 | 52 | 58 | 16 | 20 | 66 | 28 | 56 | 30 | 76 | 78 | 68 | 54 | 44 | 64 | 80 | 72 | 50 | 40 | 74 | 24 | 70 | 6 | 14 | 8 | 10 | 26 | 18 | 12 | 34 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quercus pubescens s.str. | 5 | 5 | 3 | 5 | 3 | 4 | 4 | b | 4 | 5 | 5 | 3 | 5 | 4 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 3 | 5 | 5 | 3 |
| Teucrium chamaedrys | . | 1 | . | . | . | . | . | . | . | . | a | . | . | . | r | . | . | . | r | . | . | . | . | . | + | . | . | . | 1 | + | . | . | . | + | . | + |
| Crataegus monogyna | . | . | . | . | . | + | . | . | . | a | 1 | b | 1 | + | 1 | . | 3 | + | . | . | . | a | . | + | . | + | 1 | + | . | 1 | 1 | 1 | 1 | b | b | . |
| Dictamnus albus | . | . | + | . | + | . | . | r | r | . | 1 | . | . | + | 1 | . | + | + | r | . | . | 1 | r | r | b | . | . | r | 1 | a | . | 1 | + | . | 1 | + |
| Euonymus verrucosus | . | . | 3 | . | . | 3 | b | 3 | r | . | + | b | a | 1 | a | . | . | + | 5 | b | 4 | . | . | a | a | b | a | 3 | . | b | . | b | . | a | . | r |
| Fraxinus excelsior | . | . | a | . | . | 1 | 1 | 3 | a | 1 | b | . | + | . | 1 | r | r | r | . | . | . | + | + | + | a | a | a | . | . | a | 1 | . | . | 1 | . | . |
| Rosa sp. | . | . | + | . | . | . | r | . | . | . | + | . | . | 1 | r | . | 1 | 1 | . | . | . | . | . | . | . | + | . | . | . | . | . | . | + | + | . | . |
| Polygonatum odoratum | . | + | . | r | + | r | 1 | + | 1 | 1 | + | + | 1 | + | a | . | r | 1 | + | . | 1 | a | r | + | a | . | a | r | . | . | . | . | . | . | . | . |
| Vincetoxicum hirundinaria | . | r | . | . | . | . | . | . | + | . | 1 | + | . | 1 | r | 1 | . | . | + | . | r | + | . | + | 1 | + | . | . | a | . | a | . | . | . | . | + |
| Rhamnus cathartica | . | + | 3 | . | 1 | . | 1 | r | 1 | . | b | . | . | . | . | 1 | r | . | r | . | . | a | . | 1 | . | r | + | . | . | b | . | . | . | . | . | + |
| Cornus mas | . | 3 | . | . | . | . | . | . | 5 | b | 4 | 3 | 1 | . | 3 | 3 | . | . | . | b | 3 | . | 4 | 1 | . | a | . | 3 | b | a | 3 | . | . | . | 3 | . |
| Euphorbia cyparissias | . | . | . | r | . | . | . | . | . | . | + | . | . | + | . | r | . | . | . | . | . | . | . | . | r | . | r | . | . | + | . | . | . | 1 | + | . |
| Ligustrum vulgare | . | . | . | . | 1 | 1 | + | . | 1 | 1 | 1 | + | . | r | 1 | . | 1 | 1 | . | 1 | . | . | 1 | . | . | . | a | . | . | 1 | . | 1 | 1 | . | . | . |
| Viburnum lantana | . | . | . | . | . | a | a | . | . | 1 | . | . | . | 1 | a | . | a | 1 | . | . | . | . | . | . | . | 1 | . | . | . | a | a | a | a | a | a | + |
| Carex humilis | . | . | . | . | . | 1 | . | . | + | . | . | + | 1 | 1 | 1 | . | 1 | + | . | . | . | 1 | . | . | 1 | . | . | . | . | a | . | a | a | . | b | 1 |
| Inula ensifolia | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | + | . | . | 1 | . | . | . | a | 1 | a | . | + | a | . | . |
| Anthericum ramosum | . | . | . | . | + | . | + | . | r | + | . | r | a | . | + | . | . | . | . | . | . | . | . | 1 | . | + | . | . | . | b | 1 | . | . | 1 | + | 1 |
| Berberis vulgaris | . | . | . | . | . | . | + | . | . | 1 | . | . | . | 1 | . | . | a | 1 | . | r | . | . | . | . | 1 | . | . | . | . | 1 | . | . | . | . | a | r |
| Bupleurum falcatum | . | . | . | . | + | . | . | . | r | . | + | . | . | . | . | + | . | . | . | . | . | r | . | . | . | r | . | . | + | + | . | . | . | r | . | r |
| Sorbus torminalis | . | . | . | . | 3 | . | . | . | . | . | r | . | . | . | 1 | . | + | r | . | . | . | . | . | . | . | + | + | . | 1 | . | . | 1 | . | + | a | . |
| Tanacetum corymbosum | . | . | . | . | . | . | . | . | . | + | r | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | + | . | 1 | . | 1 | . | . | 1 | 1 | + |
| Cervaria rivini | . | . | . | . | r | . | r | . | . | . | 1 | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | 1 | . | 1 |
| Brachypodium pinnatum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | 1 | . | . | . | r | . | . | . | . | a | . | 4 | . | . | . |
| Galium glaucum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | 1 | 1 | . |
| Geranium sanguineum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | + | 1 | + |
| Centaurea scabiosa | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | 1 | . |
| Staphylea pinnata | . | . | . | . | 4 | r | 3 | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Sorbus aria | . | . | . | . | 1 | . | + | . | . | a | . | . | . | . | . | r | 1 | . | . | . | . | . | . | . | . | 1 | 1 | . | b | + | 3 | a | 3 | a | a | . |
| Cornus sanguinea | . | . | . | . | a | + | b | . | . | b | . | . | 5 | . | . | + | b | . | r | . | . | . | . | . | . | a | . | . | 1 | a | 1 | 3 | b | 1 | . | . |
| Elymus hispidus | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | 1 | . | . | . | . | 1 | . |
| Hippocrepis emerus | . | . | . | . | a | 1 | + | a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | a | b | . | r | . | . | + |
| Viola hirta | . | . | . | . | . | . | + | . | . | . | + | + | . | r | + | . | . | + | + | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . |
| Aster amellus | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | a | . | . | . | r | . |
| Melica nutans | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + |
| Laser trilobum | . | . | . | . | . | . | . | + | . | . | 1 | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | b | a | a | . | a | . | . | a |
| Clematis recta | . | . | . | . | 1 | . | r | + | . | 1 | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | r |
| Asperula tinctoria | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . |
| Loranthus europaeus | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | b | . |
| Mercurialis ovata | . | . | . | . | . | . | . | + | r | . | . | . | . | . | . | . | r | . | . | . | + | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . |
| Rosa pimpinellifolia | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . |
| Cytisus nigricans | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | 1 | . | 1 | . | . | . |
| Amelanchier ovalis | . | . | . | . | b | 1 | . | + | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Campanula bononiensis | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Sesleria albicans | . | . | . | . | a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Origanum vulgare | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | + |
| Coronilla coronata | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | + | . | . | . |
| Pyrus pyraster | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | b | a | . |
| Buphthalmum salicifolium | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . |
| Acer platanoides | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . |
| Campanula rapunculoides | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | a | . | . | . | . | + |
| Euphorbia angulata | . | . | . | . | . | . | . | . | r | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

**Table 6:** Subplots of *Quercus pubescens* shrub forests (QPSF) in the Vienna Basin. The first block are species of xeric grasslands. The second block are springtime geophytes and/or characteristic for two relevés in the Hainburg hills. Double line marks the 1st TWINSPAN division, single line the 2nd, dashed line the 3rd.

| Relevé number | 46 | 42 | 82 | 48 | 32 | 60 | 62 | 52 | 58 | 16 | 20 | 66 | 28 | 56 | 30 | 76 | 78 | 68 | 54 | 44 | 64 | 80 | 72 | 50 | 40 | 74 | 24 | 70 | 6 | 14 | 8 | 10 | 26 | 18 | 12 | 34 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allium flavum | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Melica ciliata | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Helianthemum nummularium | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Prunus mahaleb | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | + | . | . | . | . | . | . | . | . | . |
| Allium lusitanicum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Sedum maximum | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | r | r | . | . | . | . | . | . | . | . | . | . | . | . |
| Potentilla incana | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Thymus sp. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . |
| Centaurea stoebe s.lat. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Dianthus carthusianorum agg. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . |
| Medicago falcata | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Clinopodium vulgare | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Galium pycnotrichum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . |
| Verbascum lychnitis | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Teucrium montanum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Peucedanum oreoselinum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Sedum album | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Hypericum perforatum | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Asplenium trichomanes | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . |
| Melampyrum nemorosum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | + | . | . | . | . | . | . | . | . |
| Echium vulgare | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Scorzonera austriaca | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Linum tenuifolium | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Petrorhagia saxifraga | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Sesleria sadleriana | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | a | . | . | . | . | . | . | . | . | . | . | . |
| Helianthemum canum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Jovibarba hirta sensu LGM | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Asplenium ruta-muraria | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Thesium bavarum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Primula veris | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | a | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . |
| Convallaria majalis | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Galanthus nivalis | . | . | b | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 3 | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Corydalis cava | . | . | a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Laserpitium latifolium | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

While the underlying gradient revealed by the TWINSPAN algorithm is similar for both main- and subplots, subtle differences remain and can be explained by the decrease of herbal species in subplots (compare **Table 3** to **Table 5** and **Table 4** to **Table 6**). This is due to the high cover of woody species, both *Quercus pubescens* and several other tree and shrub species, which creates unfavourable conditions for species that usually occur in xeric grasslands and wood fringes. This means less floristic information can be extracted from the subplots, making it harder to interpret the underlying gradient and to identify relevés assigned to the wrong group.

Comparing the TWINSPAN classification of my relevés with the current phytosociological system by Starlinger (2007) revealed no new insights at first. Only when sorting the classification with a "locality vector" within each group, a new and striking pattern emerged. Looking at just my mainplots the 4 TWINSPAN groups almost perfectly match the locality vector of **Hackelsberg – Hainburg – Nackter Sattel – Königsberg – Winden – Thermenlinie – Bisamberg – Leopoldsberg** with only 2 "mis-classifications".

A detailed table of my relevés grouped by this location vector is listed in the annex (**Table A11**). A comparison between the TWINSPAN groups and the locality vector can be found in **Table A15**. Taking a closer look at each locality within my data set, some species show interesting distribution patterns.

The Hackelsberg shows ruderal tendencies, indicated by *Anthriscus cerefolium* and *Sisymbrium orientale. Fallopia dumetorum* prefers soils relatively moist and rich in nutrients with sand and clay, thus it can be found at the Hackelsberg but also at the Hainburg hills and Nackter Sattel, which share a similar geology. *Prunus mahaleb* and *Allium lusitanicum* have a high fidelity to the Hainburg hills, although they occur at the Thermenlinie as well. *Galium pycnotrichum* and *Peucedanum oreoselinum* are exclusive to the Hainburg hills and typical elements of fringe vegetation. Within my data set *Festuca valesiaca*, *Thesium bavarum* and *Phleum phleoides* are characteristic for the locality of Nackter Sattel. Species usually found in more mesic habitats such as *Dactylis glomerata* and *Geum urbanum* also have high fidelity to this locality and highlight the diverse mosaic of ecological conditions found at a small scale. Two relevés at Königsberg contained *Lonicera xylosteum*, exclusive to this locality, while *Brachypodium sylvaticum* and *Viola hirta* act as intermediaries towards the localities of Thermenlinie and Winden am See. The latter is characterized by *Pipthatherum virescens, Juniperum communis* and *Euphorbia angulata*. The Thermenlinie is the locality with the best set of diagnostic species. *Melittis melissophyllum, Amelanchier ovalis, Sesleria albicans* and *Cuscuta epithymum* were exclusive to this locality. Other typical species such as *Geranium sanguineum*, *Clematis recta*, *Hippocrepis emerus* and *Sorbus aria* are also found at the Bisamberg and Leopoldsberg. Acting as a linking element in the phytosociological spectrum the Bisamberg has species which show a high fidelity, such as *Loranthus europaeus, Cervaria rivini, Tanacetum corymbosum* and *Acer campestre*, but are not unique to this locality and can be frequently found in Winden am See and at the Thermenlinie. It also shares many species with the nearby Leopoldsberg, *Pyrus pyraster* is exclusive to these localities. *Laser trilobum*, *Coronilla coronata, Campanula rapunculoides* and *Cytisus nigricans* are typical elements of relevés at the Leopoldsberg, *Lathyrus pannonicus* s. lat. was unique to this locality.

### 4.3.2 TWINSPAN including data from literature

Within the context of data from literature the mainplots revealed further insight (Hübl 1959; Jelem et al. 1965; Kiridus 1987; Reichenberger 1990; Wallnöfer 1998; Zukrigl 2005; Haudek et al. 2006).

Looking at the first TWINSPAN division (**Table 7**) the second group has a lot of species which are diagnostic for the Ass. Grp. with *Carex humilis* sensu Starlinger (2007). Three species are also diagnostic further down in the key when looking at associations of the Pannonian area.

The synoptic table clearly showed an ecological gradient from nutrient rich, slightly moist conditions to xeric habitats relatively low in nutrients. Looking at the second division, 4 groups with quite clearly defined ecological and floristic contents could be recognized (**Table 8**).

**Table 7:** Diagnostic species of the second group of the first TWINSPAN division, second group. Diagnostic species of the ass. group *Carex humilis* (Starlinger 2007) are in **bold**, those of associations of the Pannonian area in *italic*.
Constancy > 15 in **bold**.

| | Constancy | | Barkman's TCV | | phi-coeff, PA fisher's > 0.05 | |
|---|---|---|---|---|---|---|
| Number of relevés | 178 | 173 | 178 | 173 | 178 | 173 |
| **Amelanchier ovalis** | 0 | **28** | 0.00 | 1.80 | 0 | 40 |
| **Anthericum ramosum** | 12 | **69** | 0.30 | 3.70 | 0 | 58 |
| **Aster amellus** | 6 | **28** | 0.10 | 0.70 | 0 | 28 |
| Berberis vulgaris | **16** | **45** | 0.50 | 1.20 | 0 | 31 |
| Bupleurum falcatum | **22** | **67** | 0.50 | 2.10 | 0 | 44 |
| **Carex humilis** | 9 | **56** | 0.80 | 6.50 | 0 | 50 |
| **Centaurea scabiosa** | 1 | **22** | 0.00 | 0.30 | 0 | 33 |
| **Cervaria rivini** | 14 | **58** | 0.40 | 3.20 | 0 | 45 |
| Cytisus nigricans | 2 | **24** | 0.00 | 0.50 | 0 | 32 |
| **Elymus hispidus** | 1 | **16** | 0.00 | 0.40 | 0 | 27 |
| Euphorbia cyparissias | **30** | **65** | 0.70 | 1.20 | 0 | 35 |
| *Galium glaucum* | 8 | **43** | 0.10 | 1.00 | 0 | 40 |
| **Galium lucidum** | 0 | **17** | 0.00 | 0.40 | 0 | 30 |
| **Geranium sanguineum** | 9 | **40** | 0.20 | 1.50 | 0 | 36 |
| *Hippocrepis emerus* | 2 | **38** | 0.00 | 1.70 | 0 | 44 |
| *Inula ensifolia* | 8 | **51** | 0.20 | 2.20 | 0 | 47 |
| Melittis melissophyllum | 5 | **29** | 0.10 | 1.10 | 0 | 32 |
| Polygonatum odoratum | **30** | **66** | 0.80 | 3.20 | 0 | 33 |
| Rhamnus saxatilis | 0 | **24** | 0.00 | 0.50 | 0 | 37 |
| **Sesleria albicans** | 0 | **24** | 0.00 | 1.70 | 0 | 37 |
| Sorbus aria | 8 | **61** | 0.20 | 4.40 | 0 | 56 |
| **Stachys recta** | 7 | **36** | 0.10 | 0.60 | 0 | 36 |
| Teucrium chamaedrys | **34** | **71** | 1.40 | 2.50 | 0 | 36 |

**Table 8:** Synoptic table of my relevés and literature data. Values for diagnostic species are shaded. Left side: percentage constancy, right side: fidelity (phi coeff. x 100). The fifth and sixth block of species represent diagnostic species of the 1st TWINSPAN division, only those not re-assigned to groups 1-4 are shown.

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Number of relevés | 78 | 100 | 90 | 83 | 78 | 100 | 90 | 83 |
| Polygonatum latifolium | 45 | 13 | 1 | 2 | 47 | --- | --- | --- |
| Lonicera xylosteum | 44 | 20 | 9 | 1 | 38 | --- | --- | --- |
| Sambucus nigra | 36 | 4 | . | . | 50 | --- | --- | --- |
| Acer campestre | 86 | 47 | 49 | 58 | 31 | --- | --- | --- |
| Viola alba | 24 | 2 | 1 | 1 | 39 | --- | --- | --- |
| Chaerophyllum temulum | 24 | 1 | 1 | . | 41 | --- | --- | --- |
| Lamium maculatum | 29 | 1 | . | . | 48 | --- | --- | --- |
| Bryonia dioica | 28 | 3 | . | . | 44 | --- | --- | --- |
| Impatiens parviflora | 19 | 2 | 1 | 1 | 33 | --- | --- | --- |
| Corydalis cava | 21 | . | 3 | . | 36 | --- | --- | --- |
| Viola suavis | 42 | 9 | 21 | 2 | 35 | --- | --- | --- |
| Fallopia dumetorum | 42 | 2 | 16 | . | 44 | --- | --- | --- |
| Elymus caninus | 22 | 3 | 6 | . | 31 | --- | --- | --- |
| Galium aparine | 54 | 21 | 3 | 2 | 49 | --- | --- | --- |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Astragalus glycyphyllos | 6 | 40 | 2 | . | --- | 49 | --- | --- |
| Clinopodium vulgare | 13 | 63 | 9 | 12 | --- | 52 | --- | --- |
| Fragaria moschata | 8 | 38 | 3 | 2 | --- | 43 | --- | --- |
| Carex michelii | 5 | 61 | 23 | 28 | --- | 40 | --- | --- |
| Hieracium sabaudum | 1 | 34 | 13 | 6 | --- | 34 | --- | --- |
| Rosa gallica | . | 16 | . | . | --- | 35 | --- | --- |
| Veronica chamaedrys agg. | 4 | 31 | 4 | 6 | --- | 36 | --- | --- |
| Galium pycnotrichum | 3 | 51 | 9 | 14 | --- | 47 | --- | --- |
| Vicia pisiformis | . | 16 | . | . | --- | 35 | --- | --- |
| Prunus spinosa | 28 | 65 | 23 | 34 | --- | 33 | --- | --- |
| Potentilla alba | . | 18 | . | 2 | --- | 34 | --- | --- |
| Heracleum sphondylium | 5 | 22 | . | 1 | --- | 34 | --- | --- |
| Quercus petraea s.lat. | 14 | 60 | 4 | 28 | --- | 44 | --- | --- |
| Convolvulus arvensis | 1 | 25 | 1 | . | --- | 42 | --- | --- |
| Rubus fruticosus agg. | 3 | 28 | 1 | 5 | --- | 38 | --- | --- |
| Pulmonaria officinalis | 4 | 19 | 1 | . | --- | 32 | --- | --- |
| Inula salicina | 1 | 22 | . | 8 | --- | 30 | --- | --- |
| Valeriana wallrothii | . | 20 | 2 | 2 | --- | 33 | --- | --- |
| Lathyrus niger | 9 | 53 | . | 5 | --- | 56 | --- | --- |
| Elymus hispidus | 1 | . | 24 | 6 | --- | --- | 35 | --- |
| Coronilla coronata | . | . | 26 | 1 | --- | --- | 44 | --- |
| Melica ciliata | . | . | 17 | 4 | --- | --- | 31 | --- |
| Laser trilobum | 24 | . | 41 | 13 | --- | --- | 31 | --- |
| Erysimum odoratum | 4 | . | 19 | 1 | --- | --- | 31 | --- |
| Cornus mas | 64 | 23 | 79 | 30 | 17 | --- | 35 | --- |
| Anthericum ramosum | 1 | 21 | 53 | 87 | --- | --- | 15 | 54 |
| Cervaria rivini | 3 | 23 | 28 | 90 | --- | --- | --- | 66 |
| Amelanchier ovalis | . | . | 9 | 49 | --- | --- | --- | 57 |
| Sesleria albicans | . | . | 9 | 41 | --- | --- | --- | 50 |
| Rhamnus saxatilis | . | . | 4 | 46 | --- | --- | --- | 58 |
| Geranium sanguineum | . | 16 | 16 | 67 | --- | --- | --- | 57 |
| Centaurea scabiosa | . | 1 | 10 | 35 | --- | --- | --- | 43 |
| Melittis melissophyllum | . | 9 | 11 | 48 | --- | --- | --- | 48 |
| Staphylea pinnata | 6 | 4 | 12 | 37 | --- | --- | --- | 36 |
| Clematis recta | . | 15 | 16 | 43 | --- | --- | --- | 37 |
| Mercurialis ovata | . | 8 | 9 | 34 | --- | --- | --- | 37 |
| Asperula tinctoria | . | . | 4 | 18 | --- | --- | --- | 31 |
| Melampyrum cristatum | 1 | 9 | 8 | 37 | --- | --- | --- | 39 |
| Melampyrum nemorosum | 3 | 5 | 9 | 29 | --- | --- | --- | 32 |
| Dianthus carthusianorum agg. | . | 3 | 6 | 23 | --- | --- | --- | 32 |
| Cyclamen purpurascens | . | . | . | 19 | --- | --- | --- | 39 |
| Carex halleriana | . | . | 2 | 16 | --- | --- | --- | 31 |
| Seseli libanotis | . | 5 | . | 30 | --- | --- | --- | 44 |
| Polygala chamaebuxus | . | . | 1 | 16 | --- | --- | --- | 33 |
| Inula hirta | 3 | 6 | 4 | 25 | --- | --- | --- | 31 |
| Hierochloe australis | . | 4 | . | 17 | --- | --- | --- | 30 |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Carex muricata agg. | 42 | 37 | 8 | . | 29 | 21 | --- | --- |
| Buglossoides purpurocaerulea | 55 | 64 | 24 | 20 | 17 | 27 | --- | --- |
| Brachypodium sylvaticum | 55 | 61 | 14 | 29 | 18 | 25 | --- | --- |
| Festuca heterophylla | 23 | 32 | 3 | . | 14 | 28 | --- | --- |
| Viola mirabilis | 33 | 43 | 4 | 12 | 14 | 27 | --- | --- |
| Ulmus minor | 29 | 38 | 9 | 2 | 14 | 27 | --- | --- |
| Polygonatum multiflorum | 27 | 19 | 2 | . | 26 | 12 | --- | --- |
| Dactylis polygama | 50 | 45 | 9 | 27 | 21 | 15 | --- | --- |
| Prunus avium | 37 | 43 | 6 | 20 | 14 | 22 | --- | --- |
| Inula ensifolia | 12 | 6 | 52 | 51 | --- | --- | 28 | 26 |
| Hippocrepis emerus | 3 | 2 | 36 | 40 | --- | --- | 23 | 29 |
| Cytisus nigricans | 1 | 3 | 20 | 29 | --- | --- | 11 | 27 |
| Galium lucidum | . | . | 11 | 23 | --- | --- | --- | 30 |
| Aster amellus | 4 | 8 | 22 | 34 | --- | --- | --- | 26 |

The first group included the ruderal and humid end of *Quercus* woods in eastern Austria. It contained only 5 of my relevés, two of them mainplots, namely the very ruderal stand on the lower Hackelsberg, a subplot near the summit of the Hackelsberg and a stand with very high cover of shrub vegetation and low cover of the herb layer in the Hainburg hills.

The second and biggest group included stands of drier and slightly acidic habitats. Only two of my own relevés (main- and subplot) from the Königsberg were in this group. These are likely misclassified as further assignment of the relevés according to total cover of the diagnostic species moved them to group 4. The typus of the Euphorbio-Quercetum was assigned to this group as well (Hübl 1959).

The third group was characterized by relatively few diagnostic species. It might be interpreted as a central group containing relevés which do not fit into any other, floristically more distinct, group. It contained the majority of my relevés (52), most of which were subplots (29) which are inherently lacking diagnostic species due to low herb layer cover.

The fourth group quite clearly represented relevés from the Thermenlinie and contained 13 of my relevés, only two of which were subplots.

Literature references, localities and original classifications are listed in the annex (**Table A13**), the synoptic table in its entirety is shown in **Table A14**.

**Table 9:** Crosstable showing the number of matches between the original TWINSPAN classification (oTW) and the groups as defined by the total cover of diagnostic species (Grp_diagn)

| **oTW** | **Grp_diagn** | | | |
|---|---|---|---|---|
| | **1** | **2** | **3** | **4** |
| **1** | 71 | 5 | 1 | 1 |
| **2** | 6 | 84 | 2 | 8 |
| **3** | 11 | 4 | 49 | 26 |
| **4** | . | 5 | 3 | 75 |

The total cover of the new set of diagnostic species was calculated and appended to the header data. A comparison between original and re-assigned groups of my relevés is shown in **Table 9**. While groups 1 (14), 2 (19) and 4 (21) had many diagnostic species, group 3 (6) had very few (**Table 8**). This resulted in many relevés which were originally in group 3 to be re-classified and moved to group 4, 1 and 2. The other groups remained relatively stable and only a small percentage of relevés was re-assigned to other groups.

Re-assignment of relevés according to the total cover of diagnostic species did improve the correlation between locality and group membership for the Thermenlinie relevés, which are very rich in diagnostic species, and Königsberg. It yielded poor results, increasing the number of misclassifications, for relevés of Winden, Bisamberg, Leopoldsberg and especially Hainburg.

The crosstables of locality versus TWINSPAN-classification are shown in the annex (**Table A15**- **Table A20**).

# 5 Discussion & Conclusions

## 5.1 Deductive classification

The results of the deductive classification of my relevés show that the list of diagnostic species found in the current phytosociological literature for Austria is not yet complete. This is especially evident when trying to assign the subplots, which usually lack a marked herb layer, to an association. In my effort to contribute to the improvement and applicability of the current associations I tried to work out a new set of diagnostic species by using both relevés from literature and my own data (Starlinger 2007; Willner et al. 2009; Willner 2011).

Comparing the efforts of Starlinger (2007) to my own, many species are found to be diagnostic in both systems and thus can be assumed to be of good quality (**Table 7**). They likely contain valuable information for delineating the associations within the phytosociological system. However when trying to re-assign my relevés to the four groups according to the total cover value of the diagnostic species, I ran into the same problems I encountered with the original key. My list of diagnostic species also proved to be incomplete and/or lacking in important information. This raises the question as to whether the current system of four to five different associations for *Quercus pubescens* shrub forests is meaningful and practical. One might argue the consideration of physiognomy and ecology is indispensable when trying to classify thermophilous oak forests (Grabherr et al. 2003; Willner 2006; Willner 2011).

The presence of the herb layer is essential for a clear deductive classification following the key of Starlinger (2007), especially for the ass. group with *Carex humilis*. The same phenomenon was also observed for downy oak shrub forests of the Czech Republic (Chytrý 1997). As the information the herb layer can provide is incomplete in subplots it is quite impossible to correctly classify them with the current key. This raises the question whether deductive classification of shrub forests works mainly by looking at the gaps between stands of woody vegetation.

As Dengler et al. (2009) state, species constancy depends on plot size just as species richness does. My subplots are only 10 m², a size that would usually be considered too small for woodlands. This factor definitely adds to the difficulties I encountered when trying to assign them to an association. The same, albeit to a lesser degree, is true for my relevés of 100 m² size, with relevé sizes from literature usually ranging from 200-800 m² for woodlands (Hübl 1959; Chytrý & Otýpková 2003; Zukrigl 2005; Haudek et al. 2006).

A possible solution to the problems detailed in the previous paragraphs is proposed by Chytrý & Otýpková (2003). By seeing the mosaic of vegetation types for what it is, a geo-sigmetum (Fig. 4), and defining vegetation classes as scale-dependent concepts the plot-size has less influence on the assignment of relevés to a syntaxon.

Regardless of plot size, the floristical information provided by the herb layer is essential for an unambiguous classification of habitats to the Quercion pubescenti-petraeae. Therefore the entire mosaic belonging to xeric grasslands, fringe- and shrub forest-vegetation should be recorded when studying *Quercus pubescens* shrub forests.

## 5.2 TWINSPAN

The results of the TWINSPAN analysis show, that both main- and subplots follow the same general gradient - soil and physiognomy, which are both strongly correlated with locality. Subplots lack finer information about soil and bedrock geology, which is only apparent with herbaceous species. Therefore, the physiognomy is the dominant gradient. This raises the question whether *Quercus pubescens* shrub forests can be seen as a „fractal system“, as classification follows similar patterns on both observed scales.

When comparing my relevés to published data the only association that is quite clearly defined is the Geranio sanguinei-Quercetum pubescentis with many submediterranean and de-alpine diagnostic species (Wallnöfer 2003; Starlinger 2007). It can be found mainly at the Thermenlinie and mostly corresponds to the 4th group (**Table A14**).

The third group is lacking diagnostic species and may be seen as a central association (**Table A14**). It partly corresponds to the Pannonic association Lithospermo-Quercetum pubescentis, which is also negatively defined by the lack of many good diagnostic species. Most of the relevés formerly assigned to the Inulo ensifoliae-Quercetum pubescentis are assigned to this group as well, as are some of the Euphorbio angulatae-Quercetum. The localities are mostly the Hainburg hills and Leopoldsberg and Bisamberg. Some relevés from the Thermenlinie were also included in this group, but were re-assigned to group 4 according to the total cover of diagnostic species (Wallnöfer 2003; Zukrigl 2005; Starlinger 2007).

Groups one and two are thermophilous forests composed of several oak species (**Table A14**). Most were assigned to the Euphorbio angulatae-Quercetum by Starlinger (2007) with only a few being assigned to the Corno-Quercetum. The typus of the Euphorbio-Quercetum by Hübl (1959) was assigned to group 2. New literature from the Czech Republic recently re-named the Corno-Quercetum to Euphorbio-Quercetum. The former is not well defined in the synoptic table of Starlinger (2007) with only 33 relevés, so it might be best to classify all thermophilous high oak forests in Austria as Euphorbio-Quercetum. Regional and subtle differences probably are better suited to subassociations (Starlinger 2007; Chytrý 2013).

Even when looking at the big picture, the classification of my relevés within the context of literature data, the locality vector could still be observed, albeit not as clearly and with a few blemishes. Groups 3 and 4 had more or less swapped places and 4 of my relevés at the Thermenlinie had been placed in Group 4. Overall the subgroups “Leopoldsberg & Bisamberg” and “Thermenlinie & Winden” were still present and mostly cohesive.

Locality proved to be a factor with high explanatory value for the TWINSPAN classification of my relevés but also for data from literature. With the exception of the Geranio sanguinei-Quercetum pubescentis floristic types were rather difficult to distinguish. Hence I suggest to consider simplifying the current syntaxonomical system so that only the submediterranean and Pannonic associations of shrub forests and one association of high forest remain. This would aid in making the current system easier to apply, especially for conservation efforts. In order to work out the subtle regional differences – at the level of subassociation – further data and analysis is required.

## 5.3 Implications for conservation biology and the Natura2000 network

Can phytosociology help in improving the Natura2000 network? As vegetation scientists examine habitats very thoroughly in order to understand their place in the syntaxonomical system they can help in creating a foundation and tools for conservation biologists to work with. Plant communities are usually the basis for including a (semi-)natural habitat in the Natura2000 network. They help to translate the catalogue of priority habitats in Annex I, which sometimes lack clear definition and leave room for interpretation, from the European to the national level. As vegetation ecologists spend a lot of time in the field they acquire expert knowledge on the conservation status of endangered habitats and can help in identifying suitable indicators for evaluating their condition. As nature knows no borders, supra-national collaboration can help in improving national classifications. This leads to an improved awareness of deficits regarding national declarations of protected habitats, thereby improving the Natura2000 network (Ellmauer & Traxler 2000; Willner 2013).

The deeper mysteries of the syntaxonomy of Quercus pubescens shrub forests in Austria and neighbouring countries remain elusive to this day. This highlights the immense richness and diversity that makes them a priority habitat in the Natura2000 network and a prime target for conservation efforts. Luckily many stands have survived to this day because they occupy terrain that is mostly unsuitable for intensive human use. Current threats should be relatively easy to manage and the effort required to maintain a good ecological condition is negligible in most cases. The continued survival of this habitat type is most easily achieved by abandoning forestry, managing recreational use and game by keeping populations low and mobile (Ellmauer 2005).

A question of high importance for practical conservation biology is, whether the current criteria of Ellmauer (2005) to determine the conservation status of *Quercus pubescens* shrub forests (91H0) are adequate. Most stands visited during the fieldwork for this thesis are significantly smaller than 1 ha, many of them barely reaching the proposed 625 m² required for determining the mixture of tree species and intensity of land use. In most locations it was difficult to find an area of 100 m² with homogenous physiognomy required for my Braun-Blanquet relevés. Therefore I propose to drastically lower the minimum area required to record an area for evaluation to 200 m² (0,02 ha) in accordance with syntaxonomical research (Jakucs 1961; Wallnöfer 1998; Chytrý & Otýpková 2003).

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# 7 Annex

**Table A10:** Geology of relevés gathered in 2012. Source: Geologische Bundesanstalt (2013)

| Relevé number | Region | Geology | Simplified geology |
|---|---|---|---|
| 9 | Bisamberg | Mergel | Flysch |
| 11 | Bisamberg | Mergel | Flysch |
| 15 | Bisamberg | Mergel | Flysch |
| 17 | Bisamberg | Mergel | Flysch |
| 77 | Bisamberg | Mergel | Flysch |
| 5 | Leopoldsberg | Mergel | Flysch |
| 7 | Leopoldsberg | Mergel | Flysch |
| 13 | Leopoldsberg | Mergel | Flysch |
| 25 | Leopoldsberg | Mergel | Flysch |
| 73 | Leopoldsberg | Mergel | Flysch |
| 75 | Leopoldsberg | Mergel | Flysch |
| 53 | Königsberg | Ton, Sand | Flysch |
| 55 | Königsberg | Ton, Sand | Flysch |
| 65 | Winden | Kalk | Kalk |
| 67 | Winden | Kalk | Kalk |
| 27 | Winden | Dunkler Dolomit | Dolomit |
| 29 | Winden | Dunkler Dolomit | Dolomit |
| 23 | Thermenlinie | Brekzie | Dolomit |
| 31 | Thermenlinie | Brekzie | Dolomit |
| 33 | Thermenlinie | Brekzie | Dolomit |
| 61 | Thermenlinie | Brekzie | Dolomit |
| 57 | Thermenlinie | Dolomit | Dolomit |
| 63 | Thermenlinie | Hauptdolomit | Dolomit |
| 59 | Thermenlinie | Dachsteinkalk | Kalk |
| 19 | Thermenlinie | Plattenkalk | Kalk |
| 51 | Thermenlinie | Plattenkalk | Kalk |
| 41 | Nackter Sattel | Kalk | Kalk |
| 49 | Nackter Sattel | Kalk | Kalk |
| 39 | Hainburg | Kalk, Dolomit | Kalk |
| 43 | Hainburg | Kalk, Dolomit | Kalk |
| 69 | Hainburg | Kalk, Dolomit | Kalk |
| 71 | Hainburg | Kalk, Dolomit | Kalk |
| 79 | Hainburg | Kalk, Dolomit | Kalk |
| 81 | Hainburg | Kalk, Dolomit | Kalk |
| 45 | Hackelsberg | Quarzit-Schiefer | Schiefer |
| 47 | Hackelsberg | Quarzit-Schiefer | Schiefer |

**Table A11:** Mainplots grouped by locality. Shaded areas have a phi-value > 0.3.

| Relevé number | 45 | 47 | 39 | 69 | 71 | 79 | 81 | 43 | 41 | 49 | 53 | 55 | 27 | 29 | 65 | 67 | 19 | 23 | 31 | 33 | 51 | 57 | 59 | 61 | 63 | 77 | 9 | 15 | 11 | 17 | 5 | 7 | 13 | 25 | 73 | 75 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cover tree layer (%) | 40 | 70 | 30 | 75 | 65 | 45 | 40 | 70 | 45 | 75 | 45 | 60 | 65 | 65 | 55 | 40 | 60 | 80 | 70 | 45 | 75 | 80 | 75 | 75 | 65 | 65 | 60 | 85 | 70 | 60 | 60 | 70 | 55 | 40 | 70 | 45 |
| Height (highest) trees (m) | 5 | 4 | 5 | 4 | 5 | 4 | 5 | 5 | 4 | 5 | 7 | 7 | 7 | 7 | 8 | 5 | 4 | 7 | 5 | 4 | 7 | 6 | 6 | 7 | 7 | 6 | 8 | 8 | 6 | 7 | 5 | 6 | 5 | 5 | 5 | 6 |
| Locality | Hackelsberg | | Hundsheimer Berg | | | | | | Nackter Sattel | | Königsberg | | Winden | | | | Thermenlinie | | | | | | | | | Bisamberg | | | | | Leopoldsberg | | | | | |
| Group | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 |
| Sisymbrium orientale | 1 | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Anthriscus cerefolium | 1 | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Ulmus minor | 3 | + | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Galium pycnotrichum | . | . | 1 | 1 | + | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Peucedanum oreoselinum | . | . | r | r | r | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Prunus mahaleb | . | . | a | 1 | 1 | . | + | + | . | . | . | . | . | . | . | . | a | + | . | . | . | . | r | + | . | . | . | . | . | . | . | . | . | . | . | . |
| Melampyrum nemorosum | . | . | . | + | 1 | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Festuca pallens s.lat. | . | . | r | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Corydalis cava | . | . | . | . | . | 1 | b | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Laserpitium latifolium | . | . | . | . | . | + | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Helianthemum canum | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Galanthus nivalis | . | . | . | . | . | a | a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Sesleria sadleriana | . | . | 3 | . | . | b | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Clinopodium vulgare | . | . | r | r | . | r | . | . | . | . | . | . | . | . | . | . | + | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Allium lusitanicum | . | . | r | + | r | b | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | r | r | . | . | . | + | . | . | . | . | . | . |
| Sedum album | . | . | . | r | r | r | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Viola odorata | . | . | + | . | . | + | 1 | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Potentilla incana | . | . | + | r | r | 1 | . | . | r | . | . | r | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Fallopia dumetorum | 1 | 1 | . | 1 | + | r | + | r | r | r | . | . | . | . | . | . | . | . | . | . | + | r | . | . | . | . | . | . | . | . | . | . | . | . | r | + |
| Festuca valesiaca | . | . | . | . | . | . | . | . | a | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Thesium bavarum | . | . | . | . | . | . | . | . | r | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Phleum phleoides | . | . | . | . | . | . | . | . | 1 | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Verbascum lychnitis | . | . | + | . | . | + | . | . | + | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Medicago falcata | . | . | . | . | . | . | . | . | + | r | . | . | . | . | . | . | + | + | . | + | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . |
| Hypericum perforatum | . | r | . | . | . | . | . | . | 1 | + | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Dactylis glomerata | . | . | . | . | . | . | . | . | r | a | + | . | . | . | . | . | . | 1 | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . |
| Securigera varia | r | . | . | . | . | . | . | . | + | r | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . |
| Bromus erectus | . | . | . | . | . | . | . | . | b | + | . | . | . | . | . | . | . | a | . | . | . | . | . | r | . | r | . | . | . | + | . | . | . | 1 | r | . |
| Achillea millefolium agg. | . | . | . | r | . | . | . | . | + | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | + | . | . | + | + | . | . | . | r | . |
| Sedum maximum | . | r | . | r | r | . | . | . | r | r | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | + |
| Geum urbanum | . | . | . | r | . | . | + | . | r | r | 1 | . | r | . | . | . | r | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Lonicera xylosteum | . | . | . | . | . | . | . | . | . | . | 1 | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Brachypodium sylvaticum | . | . | . | . | . | . | . | . | . | a | r | r | . | . | . | . | . | . | r | . | . | r | . | r | . | r | . | . | . | . | . | . | . | . | . | . |
| Piptatherum virescens | . | . | . | . | . | . | . | . | . | . | . | . | + | . | + | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Juniperus communis | . | . | . | . | . | . | . | . | . | . | . | . | . | + | + | 3 | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . |
| Quercus cerris | . | . | . | . | . | . | . | . | . | . | . | . | r | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Serratula tinctoria | . | . | . | . | . | . | . | . | . | . | . | . | + | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Viola mirabilis | . | . | . | . | . | . | . | . | . | . | . | . | . | r | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

| Relevé number | 45 | 47 | 39 | 69 | 71 | 79 | 81 | 43 | 41 | 49 | 53 | 55 | 27 | 29 | 65 | 67 | 19 | 23 | 31 | 33 | 51 | 57 | 59 | 61 | 63 | 77 | 9 | 15 | 11 | 17 | 5 | 7 | 13 | 25 | 73 | 75 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Galium mollugo agg. | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Euphorbia angulata | . | . | . | . | . | . | . | . | . | . | . | . | + | r | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Corylus avellana | . | . | . | . | + | . | . | . | . | . | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Rosa pimpinellifolia | . | . | . | . | . | . | . | . | . | . | . | . | r | r | 1 | . | . | . | . | . | . | . | . | . | + | 1 | . | . | + | 1 | . | . | + | . | . | . |
| Viola hirta | . | . | . | . | . | . | . | . | . | . | 1 | + | 1 | + | + | + | 1 | + | 1 | . | . | r | r | + | . | . | + | . | . | . | . | . | . | + | . | . |
| Salvia pratensis | . | r | . | r | r | r | . | . | . | . | . | . | r | r | + | r | . | + | . | . | . | . | . | . | . | + | + | . | r | + | . | . | + | . | . | . |
| Prunus spinosa | . | r | . | . | . | . | . | . | . | . | r | . | + | + | + | + | + | . | . | . | . | . | . | a | . | r | + | . | . | . | 1 | + | . | . | . | r |
| Melittis melissophyllum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | a | + | + | + | + | r | r | 1 | + | . | . | . | . | . | . | . | . | . | . | . |
| Amelanchier ovalis | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | a | + | 1 | + | + | . | + | . | . | . | . | . | . | . | . | . | . | . |
| Sesleria albicans | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | a | 1 | + | a | . | r | 1 | . | . | . | . | . | . | . | . | . | . | . |
| Staphylea pinnata | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | 1 | a | 1 | . | . | 1 | a | + | . | . | . | . | . | . | . | . | . | . | . |
| Cuscuta epithymum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | r | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Thlaspi perfoliatum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | + | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Silene vulgaris | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | r | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . |
| Galium lucidum | . | . | . | . | . | . | . | . | 1 | 1 | . | . | . | . | . | . | 1 | 1 | + | + | + | + | r | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Mercurialis ovata | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | + | . | r | + | r | . | r | + | + | . | . | . | . | . | . | . | . | . | . |
| Melampyrum cristatum | . | . | + | . | . | . | . | . | . | . | . | . | . | . | r | + | + | 1 | 1 | a | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . |
| Silene nutans s.lat. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | r | + | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . |
| Origanum vulgare | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | + | r | . | r | . | . | . | . | . | . | r | r | + | . | . | . | . |
| Geranium sanguineum | . | . | . | + | . | . | . | . | . | + | . | . | + | . | . | 1 | + | 1 | r | r | . | . | r | r | r | + | + | . | 1 | a | . | . | . | . | . | . |
| Festuca rupicola | . | 1 | . | r | + | . | . | . | . | . | . | . | + | . | r | . | 1 | a | r | b | . | . | . | r | 1 | r | . | . | . | . | . | . | . | . | . | . |
| Asperula cynanchica | . | . | r | . | . | . | . | . | . | + | . | r | . | . | . | . | + | . | . | r | r | r | r | . | . | . | . | . | . | . | r | . | . | . | . | . |
| Loranthus europaeus | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | + | . | . | + | . | . | 1 | + | + | 1 | + | 1 | . | . | . | . | . | . | . |
| Cervaria rivini | . | . | . | . | . | . | r | . | . | . | . | . | r | r | r | + | 1 | + | + | + | + | . | r | r | . | r | + | + | + | 1 | . | . | 1 | a | + | . |
| Clematis vitalba | . | . | . | . | + | . | . | . | . | . | 1 | + | . | . | . | . | 1 | . | . | . | . | . | r | . | . | . | 1 | a | + | + | . | . | . | . | . | + |
| Tanacetum corymbosum | . | . | . | . | . | + | . | . | + | . | . | . | . | . | + | r | + | + | . | + | 1 | r | . | r | r | r | + | + | + | 1 | 1 | 1 | . | . | r | r |
| Acer campestre | r | r | . | . | . | . | . | . | r | r | . | . | + | + | + | + | . | a | . | . | + | . | r | 1 | . | + | 1 | 1 | + | + | . | . | . | . | r | + |
| Laser trilobum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | 1 | + | . | . | . | r | . | . | . | . | . | b | b | a | 1 | + | 1 |
| Coronilla coronata | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | 1 | . | . | . | . | . | . | . | . | 1 | 1 | 1 | 1 | + | . |
| Campanula rapunculoides | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | + | 1 | + | . | . | r |
| Lathyrus pannonicus s.lat. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | 1 | . | . | . | . |
| Cytisus nigricans | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | + | . | . | r | . | . | r | . | . | . | . | . | 1 | + | 1 | 1 | . | . |
| Aster amellus | . | . | . | . | . | . | . | . | . | . | 1 | r | . | . | . | . | . | . | . | r | . | . | r | r | . | + | . | . | 1 | . | 1 | 1 | . | 1 | r | r |
| Bupleurum falcatum | . | . | + | . | + | + | . | . | . | . | . | . | + | . | r | r | + | + | + | r | 1 | r | . | . | r | r | + | . | . | + | + | + | + | + | r | + |
| Cornus sanguinea | r | . | . | . | . | . | . | . | . | . | 1 | + | b | . | . | . | + | . | 1 | . | . | . | a | a | a | b | 3 | b | . | a | + | + | a | a | + | + |
| Carex muricata agg. | + | 1 | . | . | . | . | . | . | 1 | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . |
| Thymus sp. | . | . | + | r | r | + | . | . | 1 | r | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Dianthus carthusianorum agg. | . | . | . | . | . | r | . | . | + | r | . | . | . | . | . | . | + | r | r | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Rhamnus saxatilis | . | . | + | r | . | . | . | . | . | . | . | . | r | + | + | + | + | + | 1 | 1 | . | r | . | + | . | . | . | . | . | . | . | . | . | . | . | . |
| Asperula tinctoria | . | . | . | . | . | . | . | . | . | . | . | . | + | + | r | . | . | + | . | . | . | . | . | r | . | r | + | . | r | + | . | . | . | . | . | . |
| Clematis recta | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | 1 | r | + | . | r | r | . | r | + | 1 | . | 1 | . | . | . | . | . | . |
| Hippocrepis emerus | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | + | + | a | + | a | + | 1 | . | r | . | . | . | + | a | a | r | r | . |
| Pyrus pyraster | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | a | . | . | a | 3 | . | . | + | r | . | 1 |
| Sorbus aria | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | + | + | 1 | . | 1 | 1 | 1 | 1 | + | 1 | a | a | 1 | b | 1 | b | a | a | a | + |

| Relevé number | 45 | 47 | 39 | 69 | 71 | 79 | 81 | 43 | 41 | 49 | 53 | 55 | 27 | 29 | 65 | 67 | 19 | 23 | 31 | 33 | 51 | 57 | 59 | 61 | 63 | 77 | 9 | 15 | 11 | 17 | 5 | 7 | 13 | 25 | 73 | 75 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Viola sp. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . |
| Carex caryophyllea | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Crataegus sanguinea | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Stipa joannis | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . |
| Linum flavum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | a | . | . |
| Carex halleriana | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 3 | a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Campanula bononiensis | . | . | . | . | . | . | . | . | . | . | r | . | r | . | + | . | . | . | + | . | . | . | . | . | + | r | . | . | . | r | . | . | . | . | . | . |
| Pulsatilla sp. | . | . | r | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Allium sphaerocephalon | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Campanula persicifolia | . | . | . | . | . | + | . | . | . | r | . | . | . | . | . | . | r | + | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . |
| Crataegus monogyna | . | . | 1 | + | 1 | + | a | 1 | 1 | 1 | r | + | 1 | 1 | b | + | + | . | . | + | + | . | 1 | 1 | . | b | 1 | b | 3 | b | + | + | a | 1 | + | 1 |
| Hieracium umbellatum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Veronica sp. | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Tilia cordata | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | r | r | . | . | a | . | . | . | . | . | . | + | . |
| Carex humilis | . | . | 1 | + | 1 | 1 | . | . | . | . | a | b | a | 1 | 1 | 1 | . | 1 | a | 1 | + | b | a | 1 | 1 | b | 3 | 1 | b | 4 | . | . | 3 | 3 | . | . |
| Dracocephalum austriacum | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Eryngium campestre | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Bromus inermis | . | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . |
| Iris pumila | . | . | . | . | . | a | . | . | a | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . |
| Echium vulgare | . | . | r | . | . | r | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Inula conyza | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | r | r |
| Centaurea scabiosa | . | . | + | . | . | r | . | . | . | . | . | . | r | . | r | + | . | r | . | + | r | . | r | r | . | + | . | . | + | 1 | . | . | . | . | . | . |
| Ilex aquifolium | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Ligustrum vulgare | . | . | . | 1 | b | . | . | b | 1 | r | r | + | 1 | 1 | + | 1 | 1 | 1 | + | + | + | + | + | + | r | + | 1 | b | 1 | 1 | . | . | + | + | + | . |
| Solidago virgaurea | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Polygonatum latifolium | . | . | . | . | . | . | r | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Primula veris | . | . | . | . | . | 1 | 1 | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | r | 1 | . | . | . | . | . | . | . | . |
| Carlina vulgaris | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . |
| Muscari neglectum | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | r | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Asplenium ruta-muraria | . | . | . | . | r | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Tussilago farfara | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . |
| Elymus caninus | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Verbascum sp. | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Pimpinella saxifraga agg. | . | . | . | . | r | . | . | . | r | . | . | . | r | . | . | . | r | . | . | . | . | r | r | . | . | r | . | . | . | . | . | . | . | . | . | . |
| Carpinus betulus | . | . | . | . | . | . | . | . | . | . | . | r | . | r | . | . | . | . | r | r | . | . | . | 1 | . | . | . | . | . | . | . | + | . | . | + | . |
| Campanula sibirica | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Linum tenuifolium | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . |
| Cotoneaster integerrimus | . | . | . | . | + | + | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | 1 | + | . | . | . | . | + | . | . | . | . | . | . | . | . | . |
| Erysimum sp. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . |
| Galium aparine | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Scabiosa ochroleuca | . | . | r | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . |
| Sedum acre | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | + | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Stipa eriocaulis | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Cotoneaster divaricatus | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Calamagrostis arundinacea | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | b | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

| Relevé number | 45 | 47 | 39 | 69 | 71 | 79 | 81 | 43 | 41 | 49 | 53 | 55 | 27 | 29 | 65 | 67 | 19 | 23 | 31 | 33 | 51 | 57 | 59 | 61 | 63 | 77 | 9 | 15 | 11 | 17 | 5 | 7 | 13 | 25 | 73 | 75 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Verbascum speciosum | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Euphorbia dulcis | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Sambucus nigra | b | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Viola suavis | + | . | . | 1 | 1 | r | . | . | . | + | . | . | . | . | . | . | + | r | . | . | 1 | . | . | . | . | + | . | . | . | . | r | . | . | . | + | + |
| Anthyllis vulneraria | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Teucrium montanum | . | . | + | . | . | r | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Erysimum sylvestre | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Rhamnus cathartica | . | . | 1 | 1 | + | 1 | b | + | + | a | + | . | r | . | + | + | + | + | + | + | + | + | . | + | . | + | b | . | r | . | . | . | b | . | + | 1 |
| Glechoma hederacea | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r |
| Hedera helix | . | . | . | . | . | 1 | . | . | . | + | . | . | . | r | . | . | . | . | r | r | . | . | . | + | . | . | . | . | . | . | . | . | . | . | 1 | . |
| Galium sp. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . |
| Galium austriacum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . |
| Rosa canina s.latiss. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Hieracium sabaudum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . |
| Jovibarba hirta sensu LGM | . | . | r | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Trinia glauca | . | . | + | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Arabis hirsuta agg. | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | r | . | . | . | . | . | r | . | . | . | r | + | . | . | . | . | . |
| Onosma visianii | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Veronica vindobonensis | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Cirsium pannonicum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . |
| Humulus lupulus | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Seseli hippomarathrum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Lepidium campestre | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . |
| Melampyrum subalpinum s.lat. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . |
| Alliaria petiolata | . | . | . | . | . | r | r | . | . | . | . | . | . | . | + | . | . | + | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | + | 1 |
| Ornithogalum sp. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Allium flavum | . | . | r | r | r | + | . | . | r | r | . | . | r | . | . | . | . | . | . | . | r | r | + | . | . | r | + | . | . | . | . | . | . | . | r | . |
| Conringia austriaca | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Euphorbia polychroma | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Hippocrepis comosa | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + |
| Poa pratensis | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Dictamnus albus | . | . | a | 1 | 1 | a | + | . | 1 | 1 | 1 | + | + | + | . | 1 | a | + | 1 | + | 1 | 1 | + | + | + | + | a | . | a | . | 1 | r | a | + | . | + |
| Carex digitata | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | a | . | . | . | . |
| Melica ciliata | . | r | + | r | + | a | . | . | a | . | . | . | . | . | r | . | 1 | . | . | 1 | . | r | . | . | . | . | . | . | . | + | . | . | . | . | . | r |
| Convallaria majalis | . | . | . | . | . | 1 | r | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . |
| Acer platanoides | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | r | + | . | r | . | . | r | . |
| Taraxacum officinale agg. | . | . | . | . | . | . | . | . | . | . | r | . | . | . | r | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Erigeron annuus | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Quercus pubescens s.lat. | b | 4 | 3 | 4 | 4 | 3 | a | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 5 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 3 |
| Juglans regia | r | . | . | . | . | . | . | . | . | . | 1 | r | r | . | + | r | . | . | . | r | . | . | . | r | . | . | . | + | . | . | . | . | . | . | . | + |
| Centaurea jacea | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | r | . | . | . | . | . | . | r | . | . | . | . | . | . |
| Melica uniflora | . | . | . | . | . | r | a | . | r | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Pseudoturritis turrita | . | . | . | + | r | . | . | . | + | + | . | . | r | r | . | . | + | . | . | r | 1 | . | . | . | + | . | . | . | . | . | . | . | . | . | r | . |
| Inula hirta | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Melica nutans | . | . | . | . | . | + | . | . | . | . | r | . | r | r | r | . | . | . | . | r | . | r | . | . | . | r | . | . | r | 1 | . | r | . | . | . | . |

| Relevé number | 45 | 47 | 39 | 69 | 71 | 79 | 81 | 43 | 41 | 49 | 53 | 55 | 27 | 29 | 65 | 67 | 19 | 23 | 31 | 33 | 51 | 57 | 59 | 61 | 63 | 77 | 9 | 15 | 11 | 17 | 5 | 7 | 13 | 25 | 73 | 75 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Helianthemum nummularium | . | . | r | . | . | r | . | . | r | r | . | r | . | . | . | . | + | . | . | . | . | r | . | . | . | . | + | . | . | + | . | . | . | + | r | . |
| Prunus avium | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | r | . | . | . | + | . | . | . | . | . | . | . | . |
| Polygonatum odoratum | . | + | 1 | r | + | a | . | 1 | a | 1 | 1 | + | a | a | a | 1 | . | a | 1 | + | 1 | a | + | 1 | . | + | a | 1 | 1 | + | . | . | . | . | r | . |
| Erysimum odoratum | . | . | . | + | + | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | r | . | . | . | . | . | . | . | r | . | . | . | r | . |
| Seseli osseum | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Thesium linophyllon | . | . | + | . | . | 1 | . | . | . | . | . | . | . | . | . | . | 1 | . | . | + | . | . | . | . | . | . | 1 | . | . | + | . | . | . | . | . | . |
| Muscari tenuiflorum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Fragaria viridis | . | . | . | . | . | . | . | . | + | . | + | . | . | . | + | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Poa nemoralis | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Neottia nidus-avis | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Anemone ranunculoides | . | . | . | . | . | . | b | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Hieracium maculatum | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Cyclamen purpurascens | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . |
| Carex michelii | . | . | . | . | . | . | 1 | . | . | . | 1 | 1 | . | + | + | 1 | . | 1 | . | + | 1 | . | . | + | . | . | . | . | . | . | . | . | 1 | + | 1 | . |
| Dactylis polygama | . | . | . | . | . | r | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Senecio sp. | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . |
| Buglossoides purpurocaerulea | . | . | . | 1 | 1 | 1 | . | + | . | . | + | r | . | . | . | . | + | . | . | . | . | . | + | + | . | r | r | . | . | r | . | . | . | . | . | . |
| Galium glaucum | . | . | r | . | r | + | . | . | . | . | . | . | r | . | r | + | . | 1 | . | + | . | . | . | + | . | r | + | . | + | + | 1 | 1 | 1 | . | + | . |
| Arabis auriculata | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Bromus ramosus | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Carex praecox | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Centaurea stoebe s.lat. | . | . | r | r | . | r | . | . | r | . | . | . | . | . | . | . | + | . | . | r | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . |
| Berberis vulgaris | . | . | 1 | . | + | 1 | . | 1 | . | . | + | + | r | + | + | + | . | . | r | r | . | + | . | r | 1 | 1 | 1 | 1 | + | 1 | . | . | 1 | . | . | r |
| Polygala chamaebuxus | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Globularia bisnagarica | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Euphorbia cyparissias | . | r | + | r | r | 1 | . | . | 1 | . | + | r | + | r | + | + | + | + | r | r | r | + | r | r | r | r | + | . | + | + | + | 1 | 1 | + | r | r |
| Viburnum lantana | . | . | . | + | 1 | . | a | 1 | . | . | + | + | 1 | 1 | . | + | + | . | 1 | + | 1 | + | 1 | r | r | 1 | a | a | 1 | 1 | . | + | a | + | 1 | r |
| Sorbus torminalis | . | . | . | . | . | . | . | . | . | + | r | . | + | + | + | + | r | a | a | . | r | . | . | a | . | + | 1 | + | + | + | + | + | + | r | + | . |
| Valeriana wallrothii | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Teucrium chamaedrys | . | + | 1 | + | + | 1 | . | . | 1 | + | + | + | 1 | r | r | + | 1 | + | . | + | + | r | + | r | r | + | + | . | + | 1 | a | 1 | 1 | + | r | . |
| Rosa elliptica | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Bromus tectorum | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Genista pilosa | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . |
| Robinia pseudacacia | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + |
| Inula ensifolia | . | . | + | . | + | + | . | . | . | . | . | . | 1 | 1 | 1 | + | 1 | . | + | + | r | . | r | + | . | + | 1 | + | 1 | a | 3 | b | a | 1 | + | r |
| Euonymus europaeus | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | + | . | . | . | . | r | . | . | . | . | . | . | . | . |
| Urtica dioica | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Glechoma hirsuta | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Stachys recta | . | . | . | + | + | + | . | . | + | + | r | . | r | . | r | r | r | . | . | r | + | r | r | . | r | . | . | . | . | . | + | . | 1 | . | + | . |
| Petrorhagia saxifraga | . | . | . | r | r | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Anthericum ramosum | . | . | r | r | r | . | . | . | . | 1 | . | . | a | a | + | r | . | r | a | + | r | r | . | 1 | + | + | + | + | + | 1 | . | 1 | b | 1 | 1 | . |
| Brachypodium pinnatum | . | r | . | . | . | + | . | . | . | 1 | . | . | r | + | r | 1 | b | 1 | . | 1 | + | . | . | r | . | + | . | . | 1 | . | . | b | 1 | 3 | 1 | r |
| Buphthalmum salicifolium | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | r | . | + | . | r | . | . | . | . | . | . | . | . | . | . | 1 | . | . |
| Polygonatum multiflorum | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Sanguisorba minor | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

| Relevé number | 45 | 47 | 39 | 69 | 71 | 79 | 81 | 43 | 41 | 49 | 53 | 55 | 27 | 29 | 65 | 67 | 19 | 23 | 31 | 33 | 51 | 57 | 59 | 61 | 63 | 77 | 9 | 15 | 11 | 17 | 5 | 7 | 13 | 25 | 73 | 75 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laserpitium siler | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Adonis vernalis | . | . | . | r | . | . | . | . | . | . | . | . | . | . | r | + | + | r | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . |
| Vincetoxicum hirundinaria | . | . | + | + | r | + | r | . | + | . | 1 | 1 | r | r | + | + | 1 | 1 | r | r | . | 1 | . | 1 | 1 | . | + | . | + | + | 1 | 1 | 1 | . | r | 1 |
| Phyteuma orbiculare | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . |
| Elymus hispidus | . | 1 | . | . | . | + | . | . | . | . | . | . | . | . | . | r | 1 | 1 | . | + | . | . | r | . | . | r | 1 | . | 1 | 1 | 1 | a | 1 | . | r | . |
| Scorzonera austriaca | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Asplenium trichomanes | . | . | . | r | r | . | . | . | . | + | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Hepatica nobilis | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . |
| Fraxinus excelsior | . | . | + | r | b | r | b | . | a | r | . | . | + | 1 | 1 | + | a | a | . | . | b | b | 1 | + | + | + | 1 | 1 | + | + | + | + | a | . | + | 1 |
| Verbascum chaixii ssp. austriacum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Inula oculus-christi | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . |
| Ballota nigra | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . |
| Syringa vulgaris | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + |
| Ranunculus polyanthemos | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . |
| Cornus mas | . | . | . | a | b | a | b | a | b | a | . | . | b | b | b | + | b | . | . | . | 1 | b | 1 | . | . | + | . | 1 | 1 | . | a | a | b | . | 1 | a |
| Veronica austriaca | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Acer pseudoplatanus | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | r | . | . | r | . | . | . | . | . | . | r | r |
| Tilia platyphyllos | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | r | . | . | . | . | . | . | . | r | . | . | . | . |
| Laburnum anagyroides | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | a | 1 |
| Prunus fruticosa | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . |
| Thalictrum minus s.lat. | . | . | + | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | r | + | . | . | . | . | . | . | . | . | . | . |
| Euonymus verrucosus | . | . | 1 | a | a | 1 | 3 | b | . | 1 | b | 1 | 1 | 1 | 1 | r | 1 | 1 | 1 | 1 | a | r | 3 | + | b | . | a | a | . | 1 | . | + | a | . | a | . |
| Hieracium bauhinii | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | + | . | r |
| Sedum sexangulare | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Orlaya grandiflora | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Poa angustifolia | . | + | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . |
| Sorbus domestica | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | b | . | . | + | . | . | . | . | . | . | . | . | . | . | . | + | . |
| Galium verum agg. | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Fagus sylvatica | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | a | . | . | r | . |
| Stipa pennata sensu orig. | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Scabiosa canescens | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | r | . | . | . | . | . | . | . | . | r | . | . | + | . | . |
| Stellaria holostea | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Pinus nigra | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | r | . | . | . | . | . | . |
| Chaerophyllum temulum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . |
| Galium sylvaticum | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Fragaria sp. | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Trifolium alpestre | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | + | . | 1 | . | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . |
| Carex flacca | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . |
| Linaria genistifolia | . | . | . | . | . | r | . | . | r | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . |
| Mercurialis perennis | . | . | . | . | . | 1 | . | . | . | . | . | . | + | . | . | . | + | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | + | . |
| Reseda lutea | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | r | . | + | . | . | . | . | . |
| Polygonum aviculare | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Lathyrus latifolius | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . |
| Seseli libanotis | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | + | . | . | . | . | . | . | . | . | . | . |
| Gymnadenia conopsea | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . |

| Relevé number | 45 | 47 | 39 | 69 | 71 | 79 | 81 | 43 | 41 | 49 | 53 | 55 | 27 | 29 | 65 | 67 | 19 | 23 | 31 | 33 | 51 | 57 | 59 | 61 | 63 | 77 | 9 | 15 | 11 | 17 | 5 | 7 | 13 | 25 | 73 | 75 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dorycnium germanicum | . | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | + | . | . | r | . | r | . | . | . | . | + | . | . | . | . | . | + | + | . | . |
| Geranium rotundifolium | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Rosa sp. | . | + | r | r | + | . | r | 1 | + | + | . | + | . | + | . | + | + | . | r | . | r | + | r | 1 | . | + | 1 | 1 | + | 1 | + | r | + | r | + | + |
| Hieracium murorum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | + | . | . | . | . | . |
| Lotus corniculatus | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | + | r | . | . |
| Centaurea triumfettii | . | . | . | . | . | . | . | . | r | + | . | . | r | r | . | . | + | + | . | . | . | . | . | . | . | r | r | . | + | . | 1 | . | . | . | . | . |
| Campanula rotundifolia | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | . | + | . | . | . | r | . | . | + | . | . | . | . | . | r | . | . | . |
| Ulmus glabra | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | r | . |
| Calamagrostis epigejos | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . |

**Table A12**: Header data of mainplots gathered in 2012.

| Relevé number | Field number | Date | Altitude (m) | Aspect (degrees) | Slope (degrees) | Cover total % | Cover tree layer % | Cover shrub layer % | Cover herb layer % | Cover moss layer % | Height trees (m) | Longitude | Latitude | Locality | Remarks | Landform | Subplot | Subplot Forest cover | Number of species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 3 | 25.05.2012 | 430 | 225 | 37 | 75 | 60 | 10 | 60 | 0 | 5 | 16°20'37,0" | 48°16'40,0" | Leopoldsberg | SO-Hang unter Kirche unweit P. nigra Forst | steiler Hang | 18 | 35 | 43 |
| 7 | 4 | 30.05.2012 | 395 | 225 | 37 | 75 | 70 | 30 | 60 | 0 | 6 | 16°20'33,0" | 48°16'40,0" | Leopoldsberg | Waldbachsteig 15m NW von stark erodiertem Steig | Mittelhang | 14 | 90 | 37 |
| 9 | 5 | 31.05.2012 | 340 | 270 | 25 | 75 | 60 | 60 | 40 | 3 | 8 | 16°21'38,0" | 48°18'55,0" | Bisamberg | Aufstieg Berggasse links - entlang Grat | Oberhang/Mulde | 14 | 90 | 49 |
| 11 | 6 | 31.05.2012 | 370 | 270 | 25 | 75 | 70 | 45 | 30 | 0 | 6 | 16°21'41,0" | 48°18'58,0" | Bisamberg | Mittlerer Riegel, kurz unterhalb Spielplatz | Oberhang | 14 | 80 | 41 |
| 13 | 7 | 06.06.2012 | 275 | 135 | 25 | 90 | 55 | 70 | 75 | 5 | 5 | 16°21'11,0" | 48°16'34,0" | Leopoldsberg | Nase unter K4, oberhalb P. nigra | Mittelhang | 22 | 75 | 38 |
| 15 | 8 | 07.06.2012 | 338 | 315 | 40 | 90 | 85 | 75 | 20 | 0 | 8 | 16°21'33,0" | 48°19'05,0" | Bisamberg | 3. Riegel Westabhang -> NW Seite, ober Blechdach | Mittelhang | 22 | 70 | 31 |
| 17 | 9 | 07.06.2012 | 359 | 270 | 26 | 85 | 60 | 50 | 80 | 0 | 7 | 16°21'42,0" | 48°19'01,0" | Bisamberg | 2. Rücken Westabhang Mittelhang | Hang | 14 | 90 | 50 |
| 19 | 10 | 08.06.2012 | 352 | 180 | 30 | 70 | 60 | 45 | 60 | 3 | 4 | 16°15'45,7" | 48°02'29,6" | Thermenlinie | Gumpoldskirchen FEBW Oberhang | Oberhang | 14 | 85 | 67 |
| 23 | 12 | 11.06.2012 | 340 | 172 | 9 | 95 | 80 | 30 | 80 | 0 | 7 | 16°15'24,8" | 48°02'10,7" | Thermenlinie | Glaslauterriegel große Weide mit einzelnen FE-Gruppen | geneigte Ebene | 14 | 90 | 62 |
| 25 | 13 | 14.06.2012 | 240 | 230 | 30 | 90 | 40 | 20 | 90 | 0 | 5 | 16°21'08,6" | 48°16'34,4" | Leopoldsberg | Leopoldsberg Nasenweg oberhalb K3 | Hang | 22 | 80 | 41 |
| 27 | 14 | 18.06.2012 | 189 | 270 | 26 | 85 | 65 | 55 | 35 | 3 | 7 | 16°45'16,8" | 47°58'11,9" | Winden am See | Oberhalb Ludlloch/Bärenhöhle | Hang | 14 | 75 | 55 |
| 29 | 15 | 18.06.2012 | 194 | 270 | 26 | 85 | 65 | 55 | 35 | 3 | 7 | 16°45'16,8" | 47°58'12,9" | Winden am See | Ludlloch/Bärenhöhle links oberhalb | Hang | 14 | 90 | 42 |
| 31 | 16 | 20.06.2012 | 314 | 180 | 20 | 80 | 70 | 25 | 70 | 0 | 5 | 16°15'29,5" | 48°02'10,0" | Thermenlinie | Glaslauterriegel | Mittelhang | 14 | 90 | 52 |
| 33 | 17 | 20.06.2012 | 329 | 176 | 25 | 75 | 45 | 20 | 60 | 0 | 4 | 16°15'30,7" | 48°02'10,6" | Thermenlinie | Glaslauterriegel Nord alter Steinbruch | Oberhang | 22 | 90 | 77 |
| 39 | 20 | 21.06.2012 | 353 | 253 | 43 | 70 | 30 | 35 | 45 | 0 | 5 | 16°56'05,0" | 48°08'15,1" | Hainburg | N-Hang, Westlich von Felsrippe | Hang | 14 | 80 | 52 |
| 41 | 21 | 29.06.2012 | 522 | 110 | 27 | 85 | 45 | 30 | 65 | 4 | 4 | 16°13'33,9" | 48°06'12,1" | Nackter Sattel | obere Baumgruppe | Hang | 14 | 75 | 56 |
| 43 | 22 | 30.06.2012 | 365 | 160 | 30 | 80 | 70 | 60 | 10 | 0 | 5 | 16°56'15,7" | 48°07'22,3" | Hainburg | S-Hang d. Hundsheimerberges oberhalb Rotes Kreu | Mulde | 22 | 85 | 14 |
| 45 | 23 | 03.07.2012 | 144 | 149 | 30 | 60 | 40 | 30 | 25 | 1 | 5 | 16°46'25,2" | 47°57'06,3" | Hackelsberg | Unterhang, oberhalb 2. eingezäunten Obstgart | Unterhang | 14 | 85 | 16 |
| 47 | 24 | 03.07.2012 | 183 | 160 | 26 | 75 | 70 | 8 | 35 | 2 | 4 | 16°46'23,9" | 47°57'07,9" | Hackelsberg | Oberhang am südl. Ende +- oberhalb Nr.23 | Oberhang | 14 | 85 | 25 |
| 49 | 25 | 04.07.2012 | 502 | 175 | 40 | 80 | 75 | 35 | 65 | 4 | 5 | 16°13'34,7" | 48°06'10,9" | Nackter Sattel | Unterhang, oberhalb Felsabbruch | Unterhang | 14 | 90 | 51 |
| 51 | 26 | 23.07.2012 | 307 | 245 | 23 | 80 | 75 | 55 | 50 | 2 | 7 | 16°16'47,4" | 48°03'04,6" | Thermenlinie | Gumpoldskirchen, W d. Str. zum Mödlinger Eichkogel | Oberhang | 14 | 85 | 51 |
| 53 | 27 | 24.07.2012 | 245 | 215 | 30 | 60 | 45 | 25 | 35 | 4 | 7 | 16°37'23,8" | 48°05'13,5" | Koenigsberg | Königsberg bei Enzersdorf/Fischa nahe Gipfel | Oberhang | 14 | 80 | 37 |
| 55 | 28 | 24.07.2012 | 239 | 172 | 20 | 65 | 60 | 5 | 45 | 4 | 7 | 16°37'24,4" | 48°05'11,9" | Koenigsberg | Königsberg bei Enzersdorf/Fischa, Unterhang Ri Karlsdorf | Unterhang | 22 | 90 | 32 |
| 57 | 29 | 26.07.2012 | 389 | 143 | 28 | 90 | 80 | 40 | 50 | 1 | 6 | 16°11'51,6" | 47°58'44,7" | Thermenlinie | Waldandacht Sooß/Bad Vöslau, Aufstieg Richtung NW | Oberhang | 14 | 80 | 51 |
| 59 | 30 | 30.07.2012 | 301 | 120 | 37 | 80 | 75 | 60 | 25 | 1 | 6 | 16°16'48,6" | 48°03'04,9" | Thermenlinie | Gumpoldskirchen Bestand N. Sauberer, Ri SO blickend | Oberhang | 14 | 85 | 43 |
| 61 | 31 | 31.07.2012 | 338 | 150 | 18 | 80 | 75 | 30 | 40 | 0 | 7 | 16°15'28,9" | 48°02'10,7" | Thermenlinie | Glaslauterriegel unterhalb verbrachender Weide | Oberhang | 14 | 85 | 61 |
| 63 | 32 | 31.07.2012 | 311 | 45 | 24 | 80 | 65 | 50 | 35 | 0 | 7 | 16°15'22,8" | 48°01'56,8" | Thermenlinie | Heferlberg / Pfaffstätten NO-Hang kurz vor Abstieg | Oberhang | 14 | 85 | 42 |
| 65 | 33 | 01.08.2012 | 200 | 276 | 17 | 75 | 55 | 45 | 40 | 0 | 8 | 16°45'19,6" | 47°58'08,7" | Winden am See | oberhalb "Festplatz" Richtung Ludlloch | Oberhang | 14 | 65 | 50 |
| 67 | 34 | 01.08.2012 | 191 | 263 | 18 | 85 | 40 | 60 | 40 | 0 | 5 | 16°45'22,3" | 47°58'05,5" | Winden am See | Brucknerstr. zw. Haus/Kellern & "Festplatz | Oberhang | 14 | 75 | 45 |
| 69 | 35 | 03.08.2012 | 365 | 134 | 30 | 85 | 75 | 45 | 35 | 3 | 4 | 16°56'20,7" | 48°07'24,8" | Hainburg | -Hang oberhalb Rotes Kreuz | Rücken | 14 | 85 | 50 |
| 71 | 36 | 03.08.2012 | 337 | 205 | 37 | 85 | 65 | 70 | 30 | 4 | 5 | 16°56'16,6" | 48°07'21,3" | Hainburg | S-Hang unterh. Pkt. 22 | Mittelhang | 14 | 80 | 55 |
| 73 | 37 | 04.08.2012 | 344 | 115 | 29 | 80 | 70 | 45 | 25 | 1 | 5 | 16°21'01,4" | 48°16'38,6" | Leopoldsberg | Nase oberhalb Aussichtsplateau | Mittelhang - Grat | 14 | 90 | 56 |
| 75 | 38 | 07.08.2012 | 357 | 245 | 43 | 60 | 45 | 35 | 10 | 0 | 6 | 16°20'36,3" | 48°16'39,7" | Leopoldsberg | oberhalb Waldbachsteig ca. 40m rechts von W | Mittelhang | 22 | 85 | 38 |
| 77 | 39 | 08.08.2012 | 316 | 290 | 34 | 80 | 65 | 75 | 30 | 1 | 6 | 16°21'40,1" | 48°18'58,9" | Bisamberg | mittlerer Riegel unterh. Nr.6 | Mittelhang | 22 | 85 | 57 |
| 79 | 18 | 21.06.2012 | 313 | 225 | 20 | 75 | 45 | 10 | 60 | 1 | 4 | 16°56'02,0" | 48°08'15,7" | Hainburg | Felsrippe NNW-Hang | Kuppe/Hang | 22 | 80 | 69 |
| 81 | 19 | 21.06.2012 | 399 | 280 | 22 | 90 | 40 | 70 | 40 | 0 | 5 | 16°56'08,9" | 48°08'12,4" | Hainburg | N-Hang nahe Weg & Dracocephalum austriacum | Hang | 14 | 70 | 28 |

**Table A13:** Relevés from literature sources, sorted by TWINSPAN Group (TW), year and Relevé number. Original classification of my relevés (Scharl, A.) is the deductive classification following the key of Starlinger (2007), "(.m.V.)" marks ambiguous classifications. Data from: Hübl 1959; Jelem et al. 1965; Kiridus 1987; Reichenberger 1990; Wallnöfer 1998; Zukrigl 2005; Haudek et al. 2006.

| Relevé Number | Author | Year | Locality | Original classification | Table | Nr relevé in table | TW |
|---|---|---|---|---|---|---|---|
| 31766 | Hübl, E. | 1959 | Königsberg bei Winden: Gipfel, unterh TR | Euphorbio-Quercetum Subass. von Galanthus nivalis | p138 | 4 | 1 |
| 31767 | Hübl, E. | 1959 | St. Georgen: Tiergarten, am Rand d Schie | Euphorbio-Quercetum Subass. von Galanthus nivalis | p138 | 5 | 1 |
| 31773 | Hübl, E. | 1959 | Zeilerberg bei Jois | Euphorbio-Quercetum Subass. von Oryzopsis virescens | p138 | 12 | 1 |
| 31774 | Hübl, E. | 1959 | Plateau E Zeiler Berg | Euphorbio-Quercetum Subass. von Oryzopsis virescens | p138 | 13 | 1 |
| 30552 | Kiridus, A. | 1987 | Hundsheimer Berg | Corno-Quercetum | kir 1 | 6 | 1 |
| 30553 | Kiridus, A. | 1987 | Hundsheimer Berg | Corno-Quercetum | kir 1 | 9 | 1 |
| 30555 | Kiridus, A. | 1987 | Hundsheimer Berg | Corno-Quercetum | kir 1 | 11 | 1 |
| 30556 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Qu.sass.v.Corylus-BuschWVar.v.Frax exce | kir 1 | 13 | 1 |
| 30558 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Qu.sass.v.Corylus-BuschWVar.v.Cornus mas | kir 1 | 19 | 1 |
| 30559 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Q.sass.v.Sorb aria | kir 1 | 27 | 1 |
| 30561 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Q.sass.v.Sorbaria | kir 1 | 29 | 1 |
| 30562 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Q.sass.v.Sorbaria | kir 1 | 31 | 1 |
| 30563 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Q.sass.v.Sorbaria:Typ.v.A. Typusd. Sass.(A3) | kir 1 | 32 | 1 |
| 30566 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Q.sass.v.Sorbaria:Typ.v.A. Typusd. Sass.(A3) | kir 1 | 38 | 1 |
| 402335 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Ligustro-Prunetum | 2 | 83 | 1 |
| 402337 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Ligustro-Prunetum | 2 | 85 | 1 |
| 32330 | Wallnöfer, S. | 1998 | Steinberg NO Dörfles | Corno-Quercetum pubescentis | | 73 | 1 |
| 32343 | Wallnöfer, S. | 1998 | Leopoldsberg | Corno-Quercetum pubescentis | | 86 | 1 |
| 32344 | Wallnöfer, S. | 1998 | Leopoldsberg | Corno-Quercetum pubescentis | | 87 | 1 |
| 32345 | Wallnöfer, S. | 1998 | Leopoldsberg | Corno-Quercetum pubescentis | | 88 | 1 |
| 32361 | Wallnöfer, S. | 1998 | SO Karlsdorf | Primulo veris-Carpinetum | | 104 | 1 |
| 32362 | Wallnöfer, S. | 1998 | SO Karlsdorf | Primulo veris-Carpinetum | | 105 | 1 |
| 32363 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetum | | 106 | 1 |
| 402202 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum laseretosum (typ. Var.) | 4 | 72 | 1 |
| 402203 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum laseretosum (typ. Var.) | 4 | 12 | 1 |
| 402204 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum laseretosum (typ. Var.) | 4 | 99 | 1 |
| 402207 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum laseretosum (typ. Var.) | 4 | 107 | 1 |
| 402208 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum laseretosum (typ. Var.) | 4 | 108 | 1 |
| 402210 | Zukrigl, K. | 2005 | Leopoldsberg | Lindenhorste am Sonnhang | 4 | 89 | 1 |
| 402211 | Zukrigl, K. | 2005 | Leopoldsberg | Lindenhorste am Sonnhang | 4 | 109 | 1 |
| 402213 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum laseretosum (Sorb.torm.-Var.) | 4 | 46 | 1 |
| 402214 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum laseretosum (Sorb.torm.-Var.) | 4 | 116 | 1 |
| 402215 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum galietosum odorati | 4 | 93 | 1 |
| 402216 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum galietosum odorati | 4 | 71 | 1 |
| 402217 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum galietosum odorati | 4 | 35 | 1 |

| Relevé Number | Author | Year | Locality | Original classification | Table | Nr relevé in table | TW |
|---|---|---|---|---|---|---|---|
| 402218 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum galietosum odorati | 4 | 31 | 1 |
| 402219 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum galietosum odorati | 4 | 92 | 1 |
| 402221 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum galietosum odorati | 4 | 42 | 1 |
| 402222 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum galietosum odorati | 4 | 90 | 1 |
| 402146 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Deutsch Haslau | Euphorbio-Quercetum (frische Ausb.) | 2 | 2 | 1 |
| 402147 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schüttenberg-Rotenbergen | Euphorbio-Quercetum (frische Ausb.) | 2 | 3 | 1 |
| 402148 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schüttenberg-Rotenbergen | Euphorbio-Quercetum (frische Ausb.) | 2 | 4 | 1 |
| 402149 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schüttenberg-Rotenbergen | Euphorbio-Quercetum (frische Ausb.) | 2 | 5 | 1 |
| 402150 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schüttenberg-Rotenbergen | Euphorbio-Quercetum (frische Ausb.) | 2 | 6 | 1 |
| 402151 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schüttenberg-Rotenbergen | Euphorbio-Quercetum (frische Ausb.) | 2 | 7 | 1 |
| 402152 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schüttenberg-Rotenbergen | Euphorbio-Quercetum (frische Ausb.) | 2 | 8 | 1 |
| 402153 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schüttenberg-Rotenbergen | Euphorbio-Quercetum (frische Ausb.) | 2 | 9 | 1 |
| 402154 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schüttenberg-Rotenbergen | Euphorbio-Quercetum (frische Ausb.) | 2 | 10 | 1 |
| 402155 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Höchstenbühel | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 11 | 1 |
| 402156 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Höchstenbühel | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 12 | 1 |
| 402157 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Höchstenbühel | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 13 | 1 |
| 402158 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Höchstenbühel | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 14 | 1 |
| 402159 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Höchstenbühel | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 15 | 1 |
| 402160 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schwadorfer Wald | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 16 | 1 |
| 402161 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schwadorfer Wald | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 17 | 1 |
| 402162 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schwadorfer Wald | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 18 | 1 |
| 402163 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Schwadorfer Wald | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 19 | 1 |
| 402164 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Rauchenwarther Gemeindewald | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 20 | 1 |
| 402165 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Rauchenwarther Gemeindewald | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 21 | 1 |
| 402166 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Rauchenwarther Gemeindewald | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 22 | 1 |
| 402167 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Goldwald bei Ebergassing | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 23 | 1 |
| 402168 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Goldwald bei Ebergassing | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 24 | 1 |
| 402169 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Goldwald bei Ebergassing | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 25 | 1 |
| 402170 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Königsberg | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 26 | 1 |
| 402171 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Königsberg | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 27 | 1 |
| 402172 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Königsberg | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 28 | 1 |
| 402173 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Neuberg | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 29 | 1 |
| 402174 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Neuberg | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 30 | 1 |
| 402175 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Rauchenwarther Gemeindewald | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 31 | 1 |
| 402176 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Arbesthaler Gemeindewald | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 32 | 1 |
| 402177 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Arbesthaler Gemeindewald | Euphorbio-Quercetum (mäßig trockene Ausb.) | 2 | 33 | 1 |
| 402178 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Höchstenbühel | Euphorbio-Quercetum (trockene Ausb.) | 2 | 34 | 1 |
| 402179 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Höchstenbühel | Euphorbio-Quercetum (trockene Ausb.) | 2 | 35 | 1 |

| Relevé Number | Author | Year | Locality | Original classification | Table | Nr relevé in table | TW |
|---|---|---|---|---|---|---|---|
| 45 | Scharl, A. | 2015 | Hackelsberg | Ass. Grp. Buglossoides purpurocaerulea | | 23 | 1 |
| 46 | Scharl, A. | 2015 | Hackelsberg | Ass. Grp. Buglossoides purpurocaerulea | | 123 | 1 |
| 48 | Scharl, A. | 2015 | Hackelsberg | Ass. Grp. Buglossoides purpurocaerulea | | 124 | 1 |
| 81 | Scharl, A. | 2015 | Hundsheimer Berg | Euphorbio angulatae-Quercetum (m. V.) | | 19 | 1 |
| 82 | Scharl, A. | 2015 | Hundsheimer Berg | Euphorbio angulatae-Quercetum (m. V.) | | 119 | 1 |
| 31769 | Hübl, E. | 1959 | Gaisbühel bei Wimpassing | Euphorbio-Quercetum Subass. von Melittis melissophyllum | p138 | 8 | 2 |
| 31770 | Hübl, E. | 1959 | Lebzelterberg bei Wimpassing | Euphorbio-Quercetum Subass. von Melittis melissophyllum (TYPUS) | p138 | 9 | 2 |
| 31772 | Hübl, E. | 1959 | Mannersdorf: N Wüste | Euphorbio-Quercetum Subass. von Oryzopsis virescens | p138 | 11 | 2 |
| 31775 | Hübl, E. | 1959 | Mannersdorf: N Wüste | Euphorbio-Quercetum Subass. von Oryzopsis virescens | p138 | 14 | 2 |
| 31776 | Hübl, E. | 1959 | Schöllingwald nahe Bf Wiesen-Siegleß | Dictamno-Sorbetum | p138 | 15 | 2 |
| 31777 | Hübl, E. | 1959 | Schöllingwald nahe Bf Wiesen-Siegleß | Dictamno-Sorbetum | p138 | 16 | 2 |
| 31778 | Hübl, E. | 1959 | Neue Umriß W Rust | Dictamno-Sorbetum | p138 | 17 | 2 |
| 31779 | Hübl, E. | 1959 | Neue Umriß W Rust | Dictamno-Sorbetum | p138 | 18 | 2 |
| 31780 | Hübl, E. | 1959 | E Oslip | Dictamno-Sorbetum | p138 | 19 | 2 |
| 31781 | Hübl, E. | 1959 | Hackelsberg/Winden | Dictamno-Sorbetum | p138 | 20 | 2 |
| 31848 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Flaumeichen-(Zerreichen-)Wald auf trockenen Rücken und seichtgründigen Kuppen | | 1 | 2 |
| 31849 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Flaumeichen-Wald auf flachen Sonnhängen | | 2 | 2 |
| 31850 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Flaumeichen-Wald auf flachen Sonnhängen | | 3 | 2 |
| 31851 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Flaumeichen-Wald auf flachen Sonnhängen | | 4 | 2 |
| 31852 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Flaumeichen-Wald auf flachen Sonnhängen | | 5 | 2 |
| 31853 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Flaumeichen-Wald auf flachen Sonnhängen | | 6 | 2 |
| 31854 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Flaumeichen-Wald auf flachen Sonnhängen | | 7 | 2 |
| 31855 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Flaumeichen-Wald auf flachen Sonnhängen | | 8 | 2 |
| 31856 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Flaumeichen-Wald auf flachen Sonnhängen | | 9 | 2 |
| 31857 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Wald auf flachen Hängen, Plateaus und Hangverebnungen niederster Lagen mit meist kolluvialem Tschernosem | | 10 | 2 |
| 31858 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Wald auf flachen Hängen, Plateaus und Hangverebnungen niederster Lagen mit meist kolluvialem Tschernosem | | 11 | 2 |
| 31859 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Wald auf flachen Hängen, Plateaus und Hangverebnungen niederster Lagen mit meist kolluvialem Tschernosem | | 12 | 2 |
| 31860 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Wald auf flachen Hängen, Plateaus und Hangverebnungen niederster Lagen mit meist kolluvialem Tschernosem | | 13 | 2 |
| 31861 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Zerreichen-Wald auf flachen Hängen, Plateaus und Hangverebnungen niederster Lagen mit meist kolluvialem Tschernosem | | 14 | 2 |
| 31862 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Traubeneichen-Wald in Schattlagen mit kolluvialer Lößparabraunerde | | 15 | 2 |
| 31863 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Eichen-Hainbuchen-Wald auf schattseitigen Grabeneinhängen und in höheren Lagen (Plateaus) | | 16 | 2 |
| 31864 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Eichen-Hainbuchen-Wald auf schattseitigen Grabeneinhängen und in höheren Lagen (Plateaus) | | 17 | 2 |
| 31865 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Eichen-Hainbuchen-Wald auf schattseitigen Grabeneinhängen und in höheren Lagen (Plateaus) | | 18 | 2 |

| Relevé Number | Author | Year | Locality | Original classification | Table | Nr relevé in table | TW |
|---|---|---|---|---|---|---|---|
| 31866 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Eichen-Hainbuchen-Wald auf schattseitigen Grabeneinhängen und in höheren Lagen (Plateaus) | | 19 | 2 |
| 31867 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Eichen-Hainbuchen-Wald auf schattseitigen Grabeneinhängen und in höheren Lagen (Plateaus) | | 20 | 2 |
| 31868 | Jelem, H., Kilian, W., Neumann, A. | 1965 | Steinbergwald | Stieleichen-Zerreichen-Wald in Talmulden und auf flachen Unterhängen mit Kolluvien aus Tschernosem | | 22 | 2 |
| 30551 | Kiridus, A. | 1987 | Hundsheimer Berg | Corno-Quercetum | kir 1 | 3 | 2 |
| 32296 | Wallnöfer, S. | 1998 | Steinberg O Oslip | Pruno mahaleb-Quercetum pubescentis | | 39 | 2 |
| 32300 | Wallnöfer, S. | 1998 | Im Greut 1 | Pruno mahaleb-Quercetum pubescentis | | 43 | 2 |
| 32302 | Wallnöfer, S. | 1998 | Anzengruberhöhe | Pruno mahaleb-Quercetum pubescentis | | 45 | 2 |
| 32303 | Wallnöfer, S. | 1998 | Königsberg | Pruno mahaleb-Quercetum pubescentis | | 46 | 2 |
| 32305 | Wallnöfer, S. | 1998 | Steinberg NO Dörfles | Pruno mahaleb-Quercetum pubescentis | | 48 | 2 |
| 32311 | Wallnöfer, S. | 1998 | Steinberg O Oslip | Corno-Quercetum pubescentis | | 54 | 2 |
| 32312 | Wallnöfer, S. | 1998 | Bimenuß SW Pottenhofen | Corno-Quercetum pubescentis | | 55 | 2 |
| 32313 | Wallnöfer, S. | 1998 | Bimenuß SW Pottenhofen | Corno-Quercetum pubescentis | | 56 | 2 |
| 32314 | Wallnöfer, S. | 1998 | Bimenuß SW Pottenhofen | Corno-Quercetum pubescentis | | 57 | 2 |
| 32315 | Wallnöfer, S. | 1998 | Bimenuß SW Pottenhofen | Corno-Quercetum pubescentis | | 58 | 2 |
| 32316 | Wallnöfer, S. | 1998 | Bimenuß SW Pottenhofen | Corno-Quercetum pubescentis | | 59 | 2 |
| 32317 | Wallnöfer, S. | 1998 | Steinbergwald | Corno-Quercetum pubescentis | | 60 | 2 |
| 32318 | Wallnöfer, S. | 1998 | Steinbergwald | Corno-Quercetum pubescentis | | 61 | 2 |
| 32319 | Wallnöfer, S. | 1998 | Seeberg O Oslip | Corno-Quercetum pubescentis | | 62 | 2 |
| 32320 | Wallnöfer, S. | 1998 | Im Greut 2 | Corno-Quercetum pubescentis | | 63 | 2 |
| 32321 | Wallnöfer, S. | 1998 | Im Greut 2 | Corno-Quercetum pubescentis | | 64 | 2 |
| 32323 | Wallnöfer, S. | 1998 | Königsberg | Corno-Quercetum pubescentis | | 66 | 2 |
| 32324 | Wallnöfer, S. | 1998 | Im Greut 2 | Corno-Quercetum pubescentis | | 67 | 2 |
| 32325 | Wallnöfer, S. | 1998 | Im Greut 1 | Corno-Quercetum pubescentis | | 68 | 2 |
| 32326 | Wallnöfer, S. | 1998 | Arbesthal. 1.5 km NO | Corno-Quercetum pubescentis | | 69 | 2 |
| 32327 | Wallnöfer, S. | 1998 | Anzengruberhöhe | Corno-Quercetum pubescentis | | 70 | 2 |
| 32328 | Wallnöfer, S. | 1998 | Anzengruberhöhe | Corno-Quercetum pubescentis | | 71 | 2 |
| 32329 | Wallnöfer, S. | 1998 | Anzengruberhöhe | Corno-Quercetum pubescentis | | 72 | 2 |
| 32331 | Wallnöfer, S. | 1998 | Steinberg NO Dörfles | Corno-Quercetum pubescentis | | 74 | 2 |
| 32332 | Wallnöfer, S. | 1998 | Steinbergwald | Corno-Quercetum pubescentis | | 75 | 2 |
| 32333 | Wallnöfer, S. | 1998 | Steinbergwald | Corno-Quercetum pubescentis | | 76 | 2 |
| 32334 | Wallnöfer, S. | 1998 | Steinbergwald | Corno-Quercetum pubescentis | | 77 | 2 |
| 32335 | Wallnöfer, S. | 1998 | Steinbergwald | Corno-Quercetum pubescentis | | 78 | 2 |
| 32336 | Wallnöfer, S. | 1998 | Steinbergwald | Corno-Quercetum pubescentis | | 79 | 2 |
| 32337 | Wallnöfer, S. | 1998 | Im Greut 1 | Corno-Quercetum pubescentis | | 80 | 2 |
| 32338 | Wallnöfer, S. | 1998 | Im Greut 1 | Corno-Quercetum pubescentis | | 81 | 2 |
| 32347 | Wallnöfer, S. | 1998 | Tempelberg | Corno-Quercetum pubescentis | | 90 | 2 |
| 32348 | Wallnöfer, S. | 1998 | Zahlberg O Klement | Corno-Quercetum pubescentis | | 91 | 2 |
| 32349 | Wallnöfer, S. | 1998 | Zahlberg O Klement | Corno-Quercetum pubescentis | | 92 | 2 |

| Relevé Number | Author | Year | Locality | Original classification | Table | Nr relevé in table | TW |
|---|---|---|---|---|---|---|---|
| 32350 | Wallnöfer, S. | 1998 | Zahlberg O Klement | Corno-Quercetum pubescentis | | 93 | 2 |
| 32351 | Wallnöfer, S. | 1998 | Hackelsberg O Winden | Prun.mah.-Quercetum poetosum | | 94 | 2 |
| 32352 | Wallnöfer, S. | 1998 | Hackelsberg O Winden | Prun.mah.-Quercetum poetosum | | 95 | 2 |
| 32353 | Wallnöfer, S. | 1998 | Hackelsberg O Winden | Prun.mah.-Quercetum poetosum | | 96 | 2 |
| 32354 | Wallnöfer, S. | 1998 | Hackelsberg O Winden | Prun.mah.-Quercetum poetosum | | 97 | 2 |
| 32355 | Wallnöfer, S. | 1998 | Hackelsberg O Winden | Prun.mah.-Quercetum poetosum | | 98 | 2 |
| 32356 | Wallnöfer, S. | 1998 | SO St. Margarethen | Quercetum petraeae-cerris | | 99 | 2 |
| 32357 | Wallnöfer, S. | 1998 | Ober dem See | Quercetum petraeae-cerris | | 100 | 2 |
| 32358 | Wallnöfer, S. | 1998 | NO Klingenbach | Quercetum petraeae-cerris | | 101 | 2 |
| 32359 | Wallnöfer, S. | 1998 | NO Klingenbach | Quercetum petraeae-cerris | | 102 | 2 |
| 32360 | Wallnöfer, S. | 1998 | NO Klingenbach | Quercetum petraeae-cerris | | 103 | 2 |
| 32364 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetum | | 107 | 2 |
| 32365 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetum | | 108 | 2 |
| 32366 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetumn | | 109 | 2 |
| 32367 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetum | | 110 | 2 |
| 32368 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetum | | 111 | 2 |
| 32369 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetum | | 112 | 2 |
| 32370 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetum | | 113 | 2 |
| 32371 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetum | | 114 | 2 |
| 32372 | Wallnöfer, S. | 1998 | WSW Arbesthal | Primulo veris-Carpinetum | | 115 | 2 |
| 32373 | Wallnöfer, S. | 1998 | WSW Arbesthal | Primulo veris-Carpinetum | | 116 | 2 |
| 32374 | Wallnöfer, S. | 1998 | Arbesthal. 1.4 km W | Primulo veris-Carpinetum | | 117 | 2 |
| 32375 | Wallnöfer, S. | 1998 | Arbesthal. 1.4 km W | Primulo veris-Carpinetum | | 118 | 2 |
| 32376 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetum | | 119 | 2 |
| 32377 | Wallnöfer, S. | 1998 | Ellender Wald | Primulo veris-Carpinetum | | 120 | 2 |
| 32378 | Wallnöfer, S. | 1998 | SO Kettlasbrunn | Primulo veris-Carpinetum | | 121 | 2 |
| 32379 | Wallnöfer, S. | 1998 | NNO Luisenmühle | Primulo veris-Carpinetum | | 122 | 2 |
| 32380 | Wallnöfer, S. | 1998 | NNO Luisenmühle | Primulo veris-Carpinetum | | 123 | 2 |
| 402145 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Arbesthaler Gemeindewald | Euphorbio-Quercetum (deg. Ausb.) | 2 | 1 | 2 |
| 402180 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Königsberg | Euphorbio-Quercetum (trockene Ausb.) | 2 | 36 | 2 |
| 402181 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Arbesthaler Gemeindewald | Euphorbio-Quercetum (trockene Ausb.) | 2 | 37 | 2 |
| 402183 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Königsberg | Lithospermo-Quercetum pubescentis | 2 | 39 | 2 |
| 53 | Scharl, A. | 2015 | Königsberg | Geranio sanguinei-Quercetum pubescentis | | 27 | 2 |
| 54 | Scharl, A. | 2015 | Königsberg | weiter verbr. Ges. | | 127 | 2 |
| 31764 | Hübl, E. | 1959 | Königsberg bei Winden: Gipfel | Euphorbio-Quercetum Subass. von Galanthus nivalis | p138 | 2 | 3 |
| 31765 | Hübl, E. | 1959 | Königsberg bei Winden: Gipfel, unterh TR | Euphorbio-Quercetum Subass. von Galanthus nivalis | p138 | 3 | 3 |
| 31768 | Hübl, E. | 1959 | Fuchsberg bei Müllendorf | Euphorbio-Quercetum Subass. von Melittis melissophyllum | p138 | 7 | 3 |
| 30554 | Kiridus, A. | 1987 | Hundsheimer Berg | Corno-Quercetum | kir 1 | 10 | 3 |

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|---|---|---|---|---|---|---|---|
| 30557 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Qu.sass.v.Corylus-BuschWVar.v.Frax exce | kir 1 | 16 | 3 |
| 30560 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Q.sass.v.Sorbaria | kir 1 | 28 | 3 |
| 30564 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Q.sass.v.Sorbaria:Typ.v.A. Typusd. Sass.(A3) | kir 1 | 34 | 3 |
| 30565 | Kiridus, A. | 1987 | Hundsheimer Berg | Mahaleb-Q.sass.v.Sorbaria:Typ.v.A. Typusd. Sass.(A3) | kir 1 | 36 | 3 |
| 402338 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Ligustro-Prunetum | 2 | 86 | 3 |
| 32278 | Wallnöfer, S. | 1998 | SW Gumpoldskirchen | Geranio sanguinei-Quercetum pubescentis | | 21 | 3 |
| 32297 | Wallnöfer, S. | 1998 | Steinberg NO Dörfles | Pruno mahaleb-Quercetum pubescentis | | 40 | 3 |
| 32298 | Wallnöfer, S. | 1998 | Steinberg NO Dörfles | Pruno mahaleb-Quercetum pubescentis | | 41 | 3 |
| 32301 | Wallnöfer, S. | 1998 | Im Greut 1 | Pruno mahaleb-Quercetum pubescentis | | 44 | 3 |
| 32307 | Wallnöfer, S. | 1998 | Bimenuß SW Pottenhofen | Pruno mahaleb-Quercetum pubescentis | | 50 | 3 |
| 32341 | Wallnöfer, S. | 1998 | Kahlenberg | Corno-Quercetum pubescentis | | 84 | 3 |
| 32342 | Wallnöfer, S. | 1998 | Kahlenberg | Corno-Quercetum pubescentis | | 85 | 3 |
| 32383 | Wallnöfer, S. | 1998 | Spitz. 0.8 km N | Sorbo torminalis-Quercetum | | 126 | 3 |
| 402187 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (Sesl.-Var.) | 4 | 9 | 3 |
| 402188 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (Sesl.-Var.) | 4 | 94 | 3 |
| 402189 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (Sesl.-Var.) | 4 | 23 | 3 |
| 402190 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (Sesl.-Var.) | 4 | 95 | 3 |
| 402191 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (Sesl.-Var.) | 4 | 96 | 3 |
| 402192 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (Sesl.-Var.) | 4 | 97 | 3 |
| 402193 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (typ. Var.) | 4 | 2 | 3 |
| 402194 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (typ. Var.) | 4 | 20 | 3 |
| 402195 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (typ. Var.) | 4 | 11 | 3 |
| 402196 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (typ. Var.) | 4 | 8 | 3 |
| 402197 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum caricetosum humilis (typ. Var.) | 4 | 110 | 3 |
| 402198 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum erysimetosum odoratae | 4 | 75 | 3 |
| 402199 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum erysimetosum odoratae | 4 | 13 | 3 |
| 402200 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum erysimetosum odoratae | 4 | 14 | 3 |
| 402201 | Zukrigl, K. | 2005 | Leopoldsberg | Inulo ensifoliae-Quercetum erysimetosum odoratae | 4 | 36 | 3 |
| 402205 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum laseretosum (typ. Var.) | 4 | 74 | 3 |
| 402206 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum laseretosum (typ. Var.) | 4 | 4 | 3 |
| 402209 | Zukrigl, K. | 2005 | Leopoldsberg | Lindenhorste am Sonnhang | 4 | 77 | 3 |
| 402212 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum laseretosum (Sorb.torm.-Var.) | 4 | 22 | 3 |
| 402220 | Zukrigl, K. | 2005 | Leopoldsberg | Euphorbio-Quercetum galietosum odorati | 4 | 27 | 3 |
| 402182 | Haudek, V., Willner, W. & Grünweis, F. M. | 2006 | Königsberg | Euphorbio-Quercetum (trockene Ausb.) | 2 | 38 | 3 |
| 5 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis | | 3 | 3 |
| 6 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis | | 103 | 3 |
| 7 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis | | 4 | 3 |
| 8 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis | | 104 | 3 |

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|---|---|---|---|---|---|---|---|
| 9 | Scharl, A. | 2015 | Bisamberg | weiter verbr. Ges. | | 5 | 3 |
| 10 | Scharl, A. | 2015 | Bisamberg | Ges. des pannonischen Gebiets | | 105 | 3 |
| 11 | Scharl, A. | 2015 | Bisamberg | Lithospermo-Quercetum pubescentis | | 6 | 3 |
| 12 | Scharl, A. | 2015 | Bisamberg | Inulo ensifoliae-Quercetum pubescentis (m. V.) | | 106 | 3 |
| 13 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis | | 7 | 3 |
| 14 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis | | 107 | 3 |
| 15 | Scharl, A. | 2015 | Bisamberg | weiter verbr. Ges. | | 8 | 3 |
| 16 | Scharl, A. | 2015 | Bisamberg | Euphorbio angulatae-Quercetum | | 108 | 3 |
| 17 | Scharl, A. | 2015 | Bisamberg | Geranio sanguinei-Quercetum pubescentis | | 9 | 3 |
| 18 | Scharl, A. | 2015 | Bisamberg | Inulo ensifoliae-Quercetum pubescentis | | 109 | 3 |
| 19 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 10 | 3 |
| 20 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 110 | 3 |
| 24 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis (m. V.) | | 112 | 3 |
| 25 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis | | 13 | 3 |
| 26 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis | | 113 | 3 |
| 28 | Scharl, A. | 2015 | Winden | weiter verbr. Ges. | | 114 | 3 |
| 30 | Scharl, A. | 2015 | Winden | Geranio sanguinei-Quercetum pubescentis | | 115 | 3 |
| 39 | Scharl, A. | 2015 | Hundsheimer Berg | Geranio sanguinei-Quercetum pubescentis | | 20 | 3 |
| 40 | Scharl, A. | 2015 | Hundsheimer Berg | Lithospermo-Quercetum pubescentis | | 120 | 3 |
| 41 | Scharl, A. | 2015 | Nackter Sattel | Geranio sanguinei-Quercetum pubescentis | | 21 | 3 |
| 42 | Scharl, A. | 2015 | Nackter Sattel | Geranio sanguinei-Quercetum pubescentis | | 121 | 3 |
| 43 | Scharl, A. | 2015 | Hundsheimer Berg | Euphorbio angulatae-Quercetum | | 22 | 3 |
| 44 | Scharl, A. | 2015 | Hundsheimer Berg | Ges. des pannonischen Gebiets | | 122 | 3 |
| 47 | Scharl, A. | 2015 | Hackelsberg | Lithospermo-Quercetum pubescentis | | 24 | 3 |
| 49 | Scharl, A. | 2015 | Nackter Sattel | Geranio sanguinei-Quercetum pubescentis | | 25 | 3 |
| 50 | Scharl, A. | 2015 | Nackter Sattel | Geranio sanguinei-Quercetum pubescentis | | 125 | 3 |
| 51 | Scharl, A. | 2015 | Thermenlinie | Inulo ensifoliae-Quercetum pubescentis | | 26 | 3 |
| 52 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 126 | 3 |
| 55 | Scharl, A. | 2015 | Königsberg | Geranio sanguinei-Quercetum pubescentis | | 28 | 3 |
| 56 | Scharl, A. | 2015 | Königsberg | Ges. des pannonischen Gebiets | | 128 | 3 |
| 57 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 29 | 3 |
| 58 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis (m. V.) | | 129 | 3 |
| 59 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 30 | 3 |
| 60 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 130 | 3 |
| 64 | Scharl, A. | 2015 | Thermenlinie | Euphorbio angulatae-Quercetum | | 132 | 3 |
| 66 | Scharl, A. | 2015 | Winden | Geranio sanguinei-Quercetum pubescentis (m. V.) | | 133 | 3 |
| 68 | Scharl, A. | 2015 | Winden | Corno-Quercetum | | 134 | 3 |
| 69 | Scharl, A. | 2015 | Hundsheimer Berg | Geranio sanguinei-Quercetum pubescentis | | 35 | 3 |

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|---|---|---|---|---|---|---|---|
| 70 | Scharl, A. | 2015 | Hundsheimer Berg | Geranio sanguinei-Quercetum pubescentis (m. V.) | | 135 | 3 |
| 71 | Scharl, A. | 2015 | Hundsheimer Berg | Geranio sanguinei-Quercetum pubescentis | | 36 | 3 |
| 72 | Scharl, A. | 2015 | Hundsheimer Berg | Euphorbio angulatae-Quercetum | | 136 | 3 |
| 73 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis | | 37 | 3 |
| 74 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis (m. V.) | | 137 | 3 |
| 75 | Scharl, A. | 2015 | Leopoldsberg | Euphorbio angulatae-Quercetum | | 38 | 3 |
| 76 | Scharl, A. | 2015 | Leopoldsberg | Inulo ensifoliae-Quercetum pubescentis (m. V.) | | 138 | 3 |
| 78 | Scharl, A. | 2015 | Bisamberg | weiter verbr. Ges. (m. V.) | | 139 | 3 |
| 79 | Scharl, A. | 2015 | Hundsheimer Berg | Geranio sanguinei-Quercetum pubescentis | | 18 | 3 |
| 80 | Scharl, A. | 2015 | Hundsheimer Berg | Geranio sanguinei-Quercetum pubescentis | | 118 | 3 |
| 31771 | Hübl, E. | 1959 | Weißes Kreuz bei Groß Höflein | Euphorbio-Quercetum Subass. von Melittis melissophyllum | p138 | 10 | 4 |
| 402301 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Prunetum fruticosae | 2 | 49 | 4 |
| 402302 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Prunetum fruticosae | 2 | 50 | 4 |
| 402303 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Prunetum fruticosae | 2 | 51 | 4 |
| 402304 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Quercetum pubescentis | 2 | 52 | 4 |
| 402305 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Quercetum pubescentis | 2 | 53 | 4 |
| 402306 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Quercetum pubescentis | 2 | 54 | 4 |
| 402307 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Quercetum pubescentis | 2 | 55 | 4 |
| 402308 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 56 | 4 |
| 402309 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 57 | 4 |
| 402310 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 58 | 4 |
| 402311 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 59 | 4 |
| 402312 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 60 | 4 |
| 402313 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 61 | 4 |
| 402314 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 62 | 4 |
| 402315 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 63 | 4 |
| 402316 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 64 | 4 |
| 402317 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 65 | 4 |
| 402318 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Corno-Quercetum pubescentis | 2 | 66 | 4 |
| 402336 | Reichenberger, G. | 1990 | NSG Glaslauterriegel - Heferlberg | Ligustro-Prunetum | 2 | 84 | 4 |
| 32258 | Wallnöfer, S. | 1998 | N Richardshof | Euphorbio angulatae-Quercetum pubescentis | | 1 | 4 |
| 32259 | Wallnöfer, S. | 1998 | Weichselt. WSW Baden | Euphorbio angulatae-Quercetum pubescentis | | 2 | 4 |
| 32260 | Wallnöfer, S. | 1998 | Heferlberg | Euphorbio angulatae-Quercetum pubescentis | | 3 | 4 |
| 32261 | Wallnöfer, S. | 1998 | Heferlberg | Euphorbio angulatae-Quercetum pubescentis | | 4 | 4 |
| 32262 | Wallnöfer, S. | 1998 | Heferlberg | Euphorbio angulatae-Quercetum pubescentis | | 5 | 4 |
| 32263 | Wallnöfer, S. | 1998 | Heferlberg | Euphorbio angulatae-Quercetum pubescentis | | 6 | 4 |
| 32264 | Wallnöfer, S. | 1998 | Heferlberg | Euphorbio angulatae-Quercetum pubescentis | | 7 | 4 |
| 32265 | Wallnöfer, S. | 1998 | Heferlberg | Euphorbio angulatae-Quercetum pubescentis | | 8 | 4 |

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|---|---|---|---|---|---|---|---|
| 32266 | Wallnöfer, S. | 1998 | Glaslauterriegel | Geranio sanguinei-Quercetum pubescentis | | 9 | 4 |
| 32267 | Wallnöfer, S. | 1998 | Glaslauterriegel | Geranio sanguinei-Quercetum pubescentis | | 10 | 4 |
| 32268 | Wallnöfer, S. | 1998 | Glaslauterriegel | Geranio sanguinei-Quercetum pubescentis | | 11 | 4 |
| 32269 | Wallnöfer, S. | 1998 | Glaslauterriegel | Geranio sanguinei-Quercetum pubescentis | | 12 | 4 |
| 32270 | Wallnöfer, S. | 1998 | Glaslauterriegel | Geranio sanguinei-Quercetum pubescentis | | 13 | 4 |
| 32271 | Wallnöfer, S. | 1998 | Glaslauterriegel | Geranio sanguinei-Quercetum pubescentis | | 14 | 4 |
| 32272 | Wallnöfer, S. | 1998 | NW Gumpoldskirchen | Geranio sanguinei-Quercetum pubescentis | | 15 | 4 |
| 32273 | Wallnöfer, S. | 1998 | NW Gumpoldskirchen | Geranio sanguinei-Quercetum pubescentis | | 16 | 4 |
| 32274 | Wallnöfer, S. | 1998 | NW Gumpoldskirchen | Geranio sanguinei-Quercetum pubescentis | | 17 | 4 |
| 32275 | Wallnöfer, S. | 1998 | NW Gumpoldskirchen | Geranio sanguinei-Quercetum pubescentis | | 18 | 4 |
| 32276 | Wallnöfer, S. | 1998 | NW Gumpoldskirchen | Geranio sanguinei-Quercetum pubescentis | | 19 | 4 |
| 32277 | Wallnöfer, S. | 1998 | NW Gumpoldskirchen | Geranio sanguinei-Quercetum pubescentis | | 20 | 4 |
| 32279 | Wallnöfer, S. | 1998 | Eichkogel | Geranio sanguinei-Quercetum pubescentis | | 22 | 4 |
| 32280 | Wallnöfer, S. | 1998 | Eichkogel | Geranio sanguinei-Quercetum pubescentis | | 23 | 4 |
| 32281 | Wallnöfer, S. | 1998 | Eichkogel | Geranio sanguinei-Quercetum pubescentis | | 24 | 4 |
| 32282 | Wallnöfer, S. | 1998 | Eichkogel | Geranio sanguinei-Quercetum pubescentis | | 25 | 4 |
| 32283 | Wallnöfer, S. | 1998 | Bisamberg | Geranio sanguinei-Quercetum pubescentis | | 26 | 4 |
| 32284 | Wallnöfer, S. | 1998 | Bisamberg | Geranio sanguinei-Quercetum pubescentis | | 27 | 4 |
| 32285 | Wallnöfer, S. | 1998 | Bisamberg | Geranio sanguinei-Quercetum pubescentis | | 28 | 4 |
| 32286 | Wallnöfer, S. | 1998 | Bisamberg | Geranio sanguinei-Quercetum pubescentis | | 29 | 4 |
| 32287 | Wallnöfer, S. | 1998 | Bisamberg | Geranio sanguinei-Quercetum pubescentis | | 30 | 4 |
| 32288 | Wallnöfer, S. | 1998 | Bisamberg | Geranio sanguinei-Quercetum pubescentis | | 31 | 4 |
| 32289 | Wallnöfer, S. | 1998 | Steinbergwald | Pruno mahaleb-Quercetum pubescentis | | 32 | 4 |
| 32290 | Wallnöfer, S. | 1998 | Steinbergwald | Pruno mahaleb-Quercetum pubescentis | | 33 | 4 |
| 32291 | Wallnöfer, S. | 1998 | Steinbergwald | Pruno mahaleb-Quercetum pubescentis | | 34 | 4 |
| 32292 | Wallnöfer, S. | 1998 | Steinbergwald | Pruno mahaleb-Quercetum pubescentis | | 35 | 4 |
| 32293 | Wallnöfer, S. | 1998 | Steinbergwald | Pruno mahaleb-Quercetum pubescentis | | 36 | 4 |
| 32294 | Wallnöfer, S. | 1998 | Steinbergwald | Pruno mahaleb-Quercetum pubescentis | | 37 | 4 |
| 32295 | Wallnöfer, S. | 1998 | Steinbergwald | Pruno mahaleb-Quercetum pubescentis | | 38 | 4 |
| 32299 | Wallnöfer, S. | 1998 | Im Greut 1 | Pruno mahaleb-Quercetum pubescentis | | 42 | 4 |
| 32304 | Wallnöfer, S. | 1998 | Königsberg | Pruno mahaleb-Quercetum pubescentis | | 47 | 4 |
| 32306 | Wallnöfer, S. | 1998 | Anzengruberhöhe | Pruno mahaleb-Quercetum pubescentis | | 49 | 4 |
| 32308 | Wallnöfer, S. | 1998 | O Burg Greifenstein | Pruno mahaleb-Quercetum pubescentis | | 51 | 4 |
| 32309 | Wallnöfer, S. | 1998 | O Burg Greifenstein | Pruno mahaleb-Quercetum pubescentis | | 52 | 4 |
| 32310 | Wallnöfer, S. | 1998 | O Burg Greifenstein | Pruno mahaleb-Quercetum pubescentis | | 53 | 4 |
| 32322 | Wallnöfer, S. | 1998 | Im Greut 2 | Corno-Quercetum pubescentis | | 65 | 4 |
| 32339 | Wallnöfer, S. | 1998 | Bürgerspitalwald | Corno-Quercetum pubescentis | | 82 | 4 |
| 32340 | Wallnöfer, S. | 1998 | Bürgerspitalwald | Corno-Quercetum pubescentis | | 83 | 4 |

| Relevé Number | Author | Year | Locality | Original classification | Table | Nr relevé in table | TW |
|---|---|---|---|---|---|---|---|
| 32346 | Wallnöfer, S. | 1998 | Tempelberg | Corno-Quercetum pubescentis | | 89 | 4 |
| 32381 | Wallnöfer, S. | 1998 | Im Schild | Sorbo torminalis-Quercetum | | 124 | 4 |
| 32382 | Wallnöfer, S. | 1998 | Im Schild | Sorbo torminalis-Quercetum | | 125 | 4 |
| 32384 | Wallnöfer, S. | 1998 | Spitz. 0.9 km N | Sorbo torminalis-Quercetum | | 127 | 4 |
| 23 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 12 | 4 |
| 27 | Scharl, A. | 2015 | Winden | Lithospermo-Quercetum pubescentis | | 14 | 4 |
| 29 | Scharl, A. | 2015 | Winden | Geranio sanguinei-Quercetum pubescentis | | 15 | 4 |
| 31 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 16 | 4 |
| 32 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 116 | 4 |
| 33 | Scharl, A. | 2015 | Thermenlinie | Lithospermo-Quercetum pubescentis | | 17 | 4 |
| 34 | Scharl, A. | 2015 | Thermenlinie | Lithospermo-Quercetum pubescentis | | 117 | 4 |
| 61 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 31 | 4 |
| 62 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 131 | 4 |
| 63 | Scharl, A. | 2015 | Thermenlinie | Geranio sanguinei-Quercetum pubescentis | | 32 | 4 |
| 65 | Scharl, A. | 2015 | Winden | Lithospermo-Quercetum pubescentis | | 33 | 4 |
| 67 | Scharl, A. | 2015 | Winden | Lithospermo-Quercetum pubescentis | | 34 | 4 |
| 77 | Scharl, A. | 2015 | Bisamberg | Inulo ensifoliae-Quercetum pubescentis | | 39 | 4 |

**Table A14:** Synoptic table of my relevés and literature data. First four columns show species constancy in percent, second four columns fidelity (phi-value x 100). Shaded areas mark diagnostic species.

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Number of relevés | 78 | 100 | 90 | 83 | 78 | 100 | 90 | 83 |
| Polygonatum latifolium | 45 | 13 | 1 | 2 | 47 | --- | --- | --- |
| Lonicera xylosteum | 44 | 20 | 9 | 1 | 38 | --- | --- | --- |
| Sambucus nigra | 36 | 4 | . | . | 50 | --- | --- | --- |
| Acer campestre | 86 | 47 | 49 | 58 | 31 | --- | --- | --- |
| Viola alba | 24 | 2 | 1 | 1 | 39 | --- | --- | --- |
| Chaerophyllum temulum | 24 | 1 | 1 | . | 41 | --- | --- | --- |
| Lamium maculatum | 29 | 1 | . | . | 48 | --- | --- | --- |
| Bryonia dioica | 28 | 3 | . | . | 44 | --- | --- | --- |
| Impatiens parviflora | 19 | 2 | 1 | 1 | 33 | --- | --- | --- |
| Corydalis cava | 21 | . | 3 | . | 36 | --- | --- | --- |
| Viola suavis | 42 | 9 | 21 | 2 | 35 | --- | --- | --- |
| Fallopia dumetorum | 42 | 2 | 16 | . | 44 | --- | --- | --- |
| Elymus caninus | 22 | 3 | 6 | . | 31 | --- | --- | --- |
| Galium aparine | 54 | 21 | 3 | 2 | 49 | --- | --- | --- |
| Astragalus glycyphyllos | 6 | 40 | 2 | . | --- | 49 | --- | --- |
| Clinopodium vulgare | 13 | 63 | 9 | 12 | --- | 52 | --- | --- |
| Fragaria moschata | 8 | 38 | 3 | 2 | --- | 43 | --- | --- |
| Carex michelii | 5 | 61 | 23 | 28 | --- | 40 | --- | --- |
| Hieracium sabaudum | 1 | 34 | 13 | 6 | --- | 34 | --- | --- |
| Rosa gallica | . | 16 | . | . | --- | 35 | --- | --- |
| Veronica chamaedrys agg. | 4 | 31 | 4 | 6 | --- | 36 | --- | --- |
| Galium pycnotrichum | 3 | 51 | 9 | 14 | --- | 47 | --- | --- |
| Vicia pisiformis | . | 16 | . | . | --- | 35 | --- | --- |
| Prunus spinosa | 28 | 65 | 23 | 34 | --- | 33 | --- | --- |
| Potentilla alba | . | 18 | . | 2 | --- | 34 | --- | --- |
| Heracleum sphondylium | 5 | 22 | . | 1 | --- | 34 | --- | --- |
| Quercus petraea s.lat. | 14 | 60 | 4 | 28 | --- | 44 | --- | --- |
| Convolvulus arvensis | 1 | 25 | 1 | . | --- | 42 | --- | --- |
| Rubus fruticosus agg. | 3 | 28 | 1 | 5 | --- | 38 | --- | --- |
| Pulmonaria officinalis | 4 | 19 | 1 | . | --- | 32 | --- | --- |
| Inula salicina | 1 | 22 | . | 8 | --- | 30 | --- | --- |
| Valeriana wallrothii | . | 20 | 2 | 2 | --- | 33 | --- | --- |
| Lathyrus niger | 9 | 53 | . | 5 | --- | 56 | --- | --- |
| Elymus hispidus | 1 | . | 24 | 6 | --- | --- | 35 | --- |
| Coronilla coronata | . | . | 26 | 1 | --- | --- | 44 | --- |
| Melica ciliata | . | . | 17 | 4 | --- | --- | 31 | --- |
| Laser trilobum | 24 | . | 41 | 13 | --- | --- | 31 | --- |
| Erysimum odoratum | 4 | . | 19 | 1 | --- | --- | 31 | --- |
| Cornus mas | 64 | 23 | 79 | 30 | 17 | --- | 35 | --- |
| Anthericum ramosum | 1 | 21 | 53 | 87 | --- | --- | 15 | 54 |
| Cervaria rivini | 3 | 23 | 28 | 90 | --- | --- | --- | 66 |
| Amelanchier ovalis | . | . | 9 | 49 | --- | --- | --- | 57 |
| Sesleria albicans | . | . | 9 | 41 | --- | --- | --- | 50 |
| Rhamnus saxatilis | . | . | 4 | 46 | --- | --- | --- | 58 |
| Geranium sanguineum | . | 16 | 16 | 67 | --- | --- | --- | 57 |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Centaurea scabiosa | . | 1 | 10 | 35 | --- | --- | --- | 43 |
| Melittis melissophyllum | . | 9 | 11 | 48 | --- | --- | --- | 48 |
| Staphylea pinnata | 6 | 4 | 12 | 37 | --- | --- | --- | 36 |
| Clematis recta | . | 15 | 16 | 43 | --- | --- | --- | 37 |
| Mercurialis ovata | . | 8 | 9 | 34 | --- | --- | --- | 37 |
| Asperula tinctoria | . | . | 4 | 18 | --- | --- | --- | 31 |
| Melampyrum cristatum | 1 | 9 | 8 | 37 | --- | --- | --- | 39 |
| Melampyrum nemorosum | 3 | 5 | 9 | 29 | --- | --- | --- | 32 |
| Dianthus carthusianorum agg. | . | 3 | 6 | 23 | --- | --- | --- | 32 |
| Cyclamen purpurascens | . | . | . | 19 | --- | --- | --- | 39 |
| Carex halleriana | . | . | 2 | 16 | --- | --- | --- | 31 |
| Seseli libanotis | . | 5 | . | 30 | --- | --- | --- | 44 |
| Polygala chamaebuxus | . | . | 1 | 16 | --- | --- | --- | 33 |
| Inula hirta | 3 | 6 | 4 | 25 | --- | --- | --- | 31 |
| Hierochloe australis | . | 4 | . | 17 | --- | --- | --- | 30 |
| Carex muricata agg. | 42 | 37 | 8 | . | 29 | 21 | --- | --- |
| Buglossoides purpurocaerulea | 55 | 64 | 24 | 20 | 17 | 27 | --- | --- |
| Brachypodium sylvaticum | 55 | 61 | 14 | 29 | 18 | 25 | --- | --- |
| Festuca heterophylla | 23 | 32 | 3 | . | 14 | 28 | --- | --- |
| Viola mirabilis | 33 | 43 | 4 | 12 | 14 | 27 | --- | --- |
| Ulmus minor | 29 | 38 | 9 | 2 | 14 | 27 | --- | --- |
| Polygonatum multiflorum | 27 | 19 | 2 | . | 26 | 12 | --- | --- |
| Dactylis polygama | 50 | 45 | 9 | 27 | 21 | 15 | --- | --- |
| Prunus avium | 37 | 43 | 6 | 20 | 14 | 22 | --- | --- |
| Inula ensifolia | 12 | 6 | 52 | 51 | --- | --- | 28 | 26 |
| Hippocrepis emerus | 3 | 2 | 36 | 40 | --- | --- | 23 | 29 |
| Cytisus nigricans | 1 | 3 | 20 | 29 | --- | --- | 11 | 27 |
| Galium lucidum | . | . | 11 | 23 | --- | --- | --- | 30 |
| Aster amellus | 4 | 8 | 22 | 34 | --- | --- | --- | 26 |
| Polygonatum odoratum | 18 | 39 | 56 | 78 | --- | --- | --- | 35 |
| Teucrium chamaedrys | 22 | 44 | 60 | 82 | --- | --- | --- | 35 |
| Berberis vulgaris | 18 | 14 | 32 | 58 | --- | --- | --- | 34 |
| Helianthemum nummularium | . | . | 12 | . | --- | --- | 31 | --- |
| Bupleurum falcatum | 13 | 30 | 56 | 80 | --- | --- | 13 | 41 |
| Hypericum perforatum | 1 | 17 | 7 | 2 | --- | 23 | --- | --- |
| Geum urbanum | 86 | 72 | 12 | 14 | 46 | 30 | --- | --- |
| Galium odoratum | 38 | 22 | 3 | 1 | 35 | 9 | --- | --- |
| Fraxinus excelsior | 83 | 22 | 79 | 57 | 27 | --- | 22 | --- |
| Mercurialis perennis | 23 | 5 | 12 | 4 | 22 | --- | --- | --- |
| Melica uniflora | 27 | 10 | 10 | 8 | 22 | --- | --- | --- |
| Glechoma hirsuta | 18 | 4 | 4 | 1 | 25 | --- | --- | --- |
| Poa nemoralis | 47 | 59 | 6 | 6 | 23 | 37 | --- | --- |
| Euonymus europaeus | 56 | 70 | 20 | 17 | 18 | 34 | --- | --- |
| Quercus cerris | 47 | 77 | 7 | 33 | --- | 42 | --- | --- |
| Quercus robur | 24 | 44 | 1 | 1 | --- | 40 | --- | --- |
| Viola hirta | 13 | 67 | 24 | 52 | --- | 33 | --- | 15 |
| Betonica officinalis | 1 | 39 | 1 | 30 | --- | 32 | --- | 18 |
| Rubus corylifolius agg. | . | 12 | . | . | --- | 31 | --- | --- |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Malus sylvestris | 6 | 25 | 3 | 8 | --- | 26 | --- | --- |
| Fragaria viridis | 9 | 26 | 4 | 10 | --- | 24 | --- | --- |
| Ligustrum vulgare | 54 | 93 | 68 | 67 | --- | 29 | --- | --- |
| Origanum vulgare | . | 3 | 19 | 6 | --- | --- | 27 | --- |
| Sorbus aria | 12 | 6 | 60 | 63 | --- | --- | 30 | 33 |
| Carex humilis | 6 | 11 | 49 | 64 | --- | --- | 20 | 39 |
| Galium glaucum | 6 | 9 | 36 | 51 | --- | --- | 14 | 33 |
| Stachys recta | 1 | 11 | 30 | 43 | --- | --- | 12 | 31 |
| Euphorbia cyparissias | 17 | 40 | 57 | 75 | --- | --- | 11 | 32 |
| Festuca rupicola | 6 | 13 | 11 | 28 | --- | --- | --- | 22 |
| Adonis vernalis | 8 | 9 | 6 | 28 | --- | --- | --- | 27 |
| Trifolium alpestre | 1 | 29 | . | 37 | --- | 19 | --- | 32 |
| Quercus pubescens s.lat. | 71 | 71 | 100 | 98 | --- | --- | 25 | 21 |
| Allium flavum | . | . | 14 | 12 | --- | --- | 18 | 13 |
| Buphthalmum salicifolium | 3 | . | 20 | 11 | --- | --- | 24 | --- |
| Centaurea triumfettii | 1 | 3 | 19 | 17 | --- | --- | 17 | 13 |
| Salvia pratensis | 4 | 17 | 22 | 40 | --- | --- | --- | 27 |
| Fagus sylvatica | 1 | . | 9 | 16 | --- | --- | --- | 22 |
| Dictamnus albus | 19 | 50 | 66 | 54 | --- | --- | 21 | --- |
| Bromus erectus | . | 2 | 11 | 16 | --- | --- | --- | 19 |
| Dorycnium germanicum | . | . | 13 | 6 | --- | --- | 23 | --- |
| Brachypodium pinnatum | 12 | 44 | 41 | 64 | --- | --- | --- | 28 |
| Cotoneaster integerrimus | 1 | . | 12 | 10 | --- | --- | 16 | --- |
| Asperula cynanchica | . | 1 | 11 | 11 | --- | --- | 13 | 13 |
| Carex digitata | . | . | 9 | 10 | --- | --- | 12 | 14 |
| Medicago falcata | 3 | 3 | 12 | 17 | --- | --- | --- | 17 |
| Helianthemum ovatum | . | . | 7 | 10 | --- | --- | --- | 16 |
| Pseudoturritis turrita | . | . | 11 | 5 | --- | --- | 21 | --- |
| Pinus nigra | 1 | . | 9 | 10 | --- | --- | 11 | 13 |
| Scorzonera austriaca | . | . | 2 | 12 | --- | --- | --- | 26 |
| Arabis hirsuta agg. | 4 | 3 | 11 | 17 | --- | --- | --- | 17 |
| Vincetoxicum hirundinaria | 38 | 64 | 64 | 77 | --- | --- | --- | 19 |
| Genista pilosa | . | . | 1 | 12 | --- | --- | --- | 28 |
| Hieracium bauhinii | . | . | 6 | 7 | --- | --- | --- | 13 |
| Thesium linophyllon | . | . | 7 | 6 | --- | --- | 12 | --- |
| Acer platanoides | 10 | 3 | 17 | 19 | --- | --- | --- | 12 |
| Phyteuma orbiculare | . | 1 | 1 | 14 | --- | --- | --- | 30 |
| Laserpitium siler | . | . | 2 | 10 | --- | --- | --- | 23 |
| Prunus mahaleb | 13 | 2 | 18 | 18 | --- | --- | --- | --- |
| Centaurea stoebe s.lat. | . | . | 8 | 2 | --- | --- | 19 | --- |
| Cuscuta epithymum | . | . | 4 | 6 | --- | --- | --- | 12 |
| Chamaecytisus ratisbonensis | . | . | 1 | 10 | --- | --- | --- | 25 |
| Reseda lutea | . | . | 10 | . | --- | --- | 28 | --- |
| Laburnum anagyroides | . | . | 10 | . | --- | --- | 28 | --- |
| Tilia cordata | 6 | 3 | 11 | 17 | --- | --- | --- | 15 |
| Agropyron desertorum | . | 2 | 2 | 13 | --- | --- | --- | 25 |
| Sorbus domestica | . | 2 | 4 | 11 | --- | --- | --- | 19 |
| Thalictrum minus s.lat. | . | 2 | 6 | 10 | --- | --- | --- | 15 |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Acer pseudoplatanus | 6 | 1 | 11 | 12 | --- | --- | --- | --- |
| Rosa pimpinellifolia | 1 | 9 | 9 | 22 | --- | --- | --- | 22 |
| Campanula rotundifolia | . | . | 7 | 2 | --- | --- | 17 | --- |
| Scabiosa canescens | . | 1 | 11 | . | --- | --- | 27 | --- |
| Potentilla incana | . | . | 8 | . | --- | --- | 24 | --- |
| Aster linosyris | . | . | . | 8 | --- | --- | --- | 25 |
| Tanacetum corymbosum | 14 | 63 | 44 | 67 | --- | 18 | --- | 23 |
| Allium lusitanicum | . | 1 | 7 | 4 | --- | --- | 13 | --- |
| Linaria genistifolia | 1 | 1 | 8 | 5 | --- | --- | 12 | --- |
| Veronica austriaca | . | 2 | 2 | 11 | --- | --- | --- | 22 |
| Campanula glomerata | . | 2 | . | 13 | --- | --- | --- | 29 |
| Laserpitium latifolium | 6 | . | 6 | 13 | --- | --- | --- | 17 |
| Rosa sp. | 12 | 25 | 39 | 22 | --- | --- | 20 | --- |
| Asplenium trichomanes | . | . | 6 | 1 | --- | --- | 17 | --- |
| Scorzonera hispanica | . | . | . | 7 | --- | --- | --- | 24 |
| Arabis turrita | 21 | 1 | 11 | 27 | 9 | --- | --- | 19 |
| Carex flacca | . | 1 | 3 | 6 | --- | --- | --- | 13 |
| Galium verum agg. | 1 | 4 | 4 | 13 | --- | --- | --- | 19 |
| Sedum album | . | . | 6 | . | --- | --- | 21 | --- |
| Calamagrostis varia | . | . | . | 6 | --- | --- | --- | 21 |
| Muscari tenuiflorum | . | . | 3 | 2 | --- | --- | --- | --- |
| Sanguisorba minor | . | 2 | 3 | 7 | --- | --- | --- | 14 |
| Allium sp. | 1 | . | 2 | 6 | --- | --- | --- | 14 |
| Veronica teucrium | 1 | 3 | 2 | 12 | --- | --- | --- | 20 |
| Tilia platyphyllos | 15 | 9 | 14 | 25 | --- | --- | --- | 15 |
| Lathyrus latifolius | . | 2 | 3 | 6 | --- | --- | --- | --- |
| Thymus sp. | . | 2 | 9 | . | --- | --- | 22 | --- |
| Lotus corniculatus | . | 2 | 6 | 4 | --- | --- | --- | --- |
| Achillea millefolium agg. | 6 | 16 | 19 | 19 | --- | --- | --- | --- |
| Allium ursinum | 3 | . | . | . | 14 | --- | --- | --- |
| Ornithogalum kochii | 1 | . | . | . | --- | --- | --- | --- |
| Calamagrostis epigejos | . | 2 | 2 | 1 | --- | --- | --- | --- |
| Betula pendula | 1 | . | . | . | --- | --- | --- | --- |
| Silene latifolia ssp. alba | . | 3 | 1 | 2 | --- | --- | --- | --- |
| Arrhenatherum elatius | 3 | 10 | 4 | 6 | --- | 11 | --- | --- |
| Lilium martagon | 1 | . | . | . | --- | --- | --- | --- |
| Carex pilosa | . | 3 | . | . | --- | 15 | --- | --- |
| Viola collina | 3 | 12 | . | 12 | --- | 12 | --- | 13 |
| Lithospermum officinale | . | 3 | . | . | --- | 15 | --- | --- |
| Hesperis sylvestris | 1 | . | . | . | --- | --- | --- | --- |
| Populus tremula | . | 3 | . | . | --- | 15 | --- | --- |
| Reseda luteola | 1 | . | . | . | --- | --- | --- | --- |
| Prunus sp. | 1 | 1 | . | . | --- | --- | --- | --- |
| Viola reichenbachiana | 10 | 7 | 6 | 2 | --- | --- | --- | --- |
| Lactuca serriola | 1 | . | . | . | --- | --- | --- | --- |
| Artemisia vulgaris | 1 | . | . | . | --- | --- | --- | --- |
| Geranium rotundifolium | 1 | . | . | . | --- | --- | --- | --- |
| Cardamine impatiens | . | 1 | . | 1 | --- | --- | --- | --- |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Hypericum maculatum s.str. | . | 1 | 1 | . | --- | --- | --- | --- |
| Avenella flexuosa | . | 3 | 1 | 4 | --- | --- | --- | --- |
| Corydalis pumila | 8 | . | 3 | . | 17 | --- | --- | --- |
| Verbascum chaixii ssp. austriacum | 8 | 8 | 6 | 1 | --- | --- | --- | --- |
| Anthriscus sylvestris | 1 | 1 | . | . | --- | --- | --- | --- |
| Cirsium vulgare | . | 1 | 1 | . | --- | --- | --- | --- |
| Fragaria sp. | 1 | . | . | . | --- | --- | --- | --- |
| Solidago gigantea | 1 | . | . | . | --- | --- | --- | --- |
| Iris graminea | 3 | . | . | . | 14 | --- | --- | --- |
| Dactylis glomerata | 9 | 13 | 7 | 5 | --- | --- | --- | --- |
| Euphorbia polychroma | 1 | 21 | 4 | 16 | --- | 20 | --- | --- |
| Anthriscus caucalis | 3 | . | . | . | 14 | --- | --- | --- |
| Polytrichum formosum | . | 1 | . | 1 | --- | --- | --- | --- |
| Solanum dulcamara | 4 | . | . | . | 17 | --- | --- | --- |
| Anemone nemorosa | 1 | . | . | . | --- | --- | --- | --- |
| Cirsium arvense | 1 | . | . | . | --- | --- | --- | --- |
| Rubus caesius | 4 | . | . | . | 17 | --- | --- | --- |
| Impatiens noli-tangere | 1 | . | . | . | --- | --- | --- | --- |
| Gagea pratensis | 3 | 1 | . | . | --- | --- | --- | --- |
| Hedera helix | 29 | 8 | 14 | 23 | 16 | --- | --- | --- |
| Arum alpinum | 3 | . | . | . | 14 | --- | --- | --- |
| Aquilegia vulgaris | 5 | . | . | . | 20 | --- | --- | --- |
| Allium scorodoprasum | 1 | . | . | . | --- | --- | --- | --- |
| Chelidonium majus | 3 | 1 | . | . | --- | --- | --- | --- |
| Anthriscus cerefolium | 8 | . | 1 | . | 22 | --- | --- | --- |
| Neottia nidus-avis | . | 1 | . | 1 | --- | --- | --- | --- |
| Plagiomnium rostratum | 1 | . | . | . | --- | --- | --- | --- |
| Lamiastrum montanum | 1 | . | . | . | --- | --- | --- | --- |
| Sanicula europaea | 1 | . | . | . | --- | --- | --- | --- |
| Rubus bertramii | 4 | 1 | . | . | 14 | --- | --- | --- |
| Knautia sp. | . | 2 | . | . | --- | --- | --- | --- |
| Lathyrus linifolius | . | 1 | . | 1 | --- | --- | --- | --- |
| Melampyrum barbatum | 1 | . | . | . | --- | --- | --- | --- |
| Medicago lupulina | 1 | . | . | . | --- | --- | --- | --- |
| Ailanthus altissima | 4 | . | . | . | 17 | --- | --- | --- |
| Solanum nigrum | . | 2 | . | . | --- | --- | --- | --- |
| Viola riviniana | . | 4 | . | . | --- | 17 | --- | --- |
| Rosa agrestis | . | 1 | 1 | . | --- | --- | --- | --- |
| Ulmus glabra | 9 | 1 | 2 | 2 | 16 | --- | --- | --- |
| Verbascum phoeniceum | . | 2 | . | . | --- | --- | --- | --- |
| Lonicera caprifolium | . | 2 | . | . | --- | --- | --- | --- |
| Cephalanthera rubra | 1 | . | . | . | --- | --- | --- | --- |
| Elymus repens | 1 | . | . | . | --- | --- | --- | --- |
| Gagea villosa | 1 | . | . | . | --- | --- | --- | --- |
| Porella platyphylla | 1 | . | . | . | --- | --- | --- | --- |
| Homomallium incurvatum | 1 | . | . | . | --- | --- | --- | --- |
| Daucus carota | 1 | . | . | . | --- | --- | --- | --- |
| Mahonia aquifolium | 4 | . | . | . | 17 | --- | --- | --- |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Pulmonaria angustifolia | . | 2 | . | . | --- | --- | --- | --- |
| Ajuga reptans | 1 | 5 | 1 | . | --- | 14 | --- | --- |
| Anthoxanthum odoratum | . | 3 | . | . | --- | 15 | --- | --- |
| Potentilla argentea | . | 2 | . | . | --- | --- | --- | --- |
| Bromus sterilis | . | 4 | . | . | --- | 17 | --- | --- |
| Cruciata glabra | . | 3 | . | . | --- | 15 | --- | --- |
| Luzula multiflora s.lat. | . | 1 | . | . | --- | --- | --- | --- |
| Artemisia absinthium | . | 2 | . | . | --- | --- | --- | --- |
| Arabis sagittata | . | 1 | . | . | --- | --- | --- | --- |
| Galium boreale | . | 4 | . | . | --- | 17 | --- | --- |
| Carex praecox | 1 | 4 | 1 | . | --- | --- | --- | --- |
| Sorbus aucuparia | . | 1 | . | . | --- | --- | --- | --- |
| Lavatera thuringiaca | . | 2 | . | . | --- | --- | --- | --- |
| Saxifraga bulbifera | . | 1 | . | . | --- | --- | --- | --- |
| Bromus sp. | . | 1 | . | . | --- | --- | --- | --- |
| Erysimum sp. | . | 2 | 2 | . | --- | --- | --- | --- |
| Lactuca viminea | . | 1 | . | . | --- | --- | --- | --- |
| Phlomis tuberosa | . | 1 | . | . | --- | --- | --- | --- |
| Euphorbia sp. | . | 2 | . | . | --- | --- | --- | --- |
| Glechoma hederacea | . | 2 | 2 | . | --- | --- | --- | --- |
| Pseudolysimachion orchideum | . | 3 | . | . | --- | 15 | --- | --- |
| Atrichum undulatum | . | 2 | . | . | --- | --- | --- | --- |
| Asparagus officinalis | . | 2 | . | . | --- | --- | --- | --- |
| Hesperis tristis | . | 1 | . | . | --- | --- | --- | --- |
| Prunus cerasus agg. | . | 2 | . | . | --- | --- | --- | --- |
| Colchicum autumnale | . | 2 | . | . | --- | --- | --- | --- |
| Hieracium racemosum | . | 1 | . | 1 | --- | --- | --- | --- |
| Eryngium campestre | 1 | 5 | 2 | . | --- | 12 | --- | --- |
| Poa compressa | . | . | 2 | . | --- | --- | --- | --- |
| Gymnadenia conopsea | . | . | 3 | . | --- | --- | 16 | --- |
| Galeopsis sp. | 1 | 2 | . | . | --- | --- | --- | --- |
| Veronica hederifolia agg. | 3 | 2 | . | . | --- | --- | --- | --- |
| Peucedanum alsaticum | 6 | 18 | 3 | 20 | --- | 11 | --- | 15 |
| Platanthera bifolia | 3 | 4 | . | 2 | --- | --- | --- | --- |
| Sedum sexangulare | . | . | 2 | . | --- | --- | --- | --- |
| Biscutella laevigata ssp. kerneri | . | . | 1 | . | --- | --- | --- | --- |
| Inula oculus-christi | . | . | 2 | . | --- | --- | --- | --- |
| Prunella vulgaris | . | 1 | . | . | --- | --- | --- | --- |
| Veratrum nigrum | . | 6 | . | 4 | --- | 14 | --- | --- |
| Helianthemum canum | . | . | 2 | . | --- | --- | --- | --- |
| Astragalus onobrychis | . | . | 2 | . | --- | --- | --- | --- |
| Solidago virgaurea | 4 | 16 | 11 | 19 | --- | --- | --- | 12 |
| Melampyrum arvense | 1 | 3 | 1 | 1 | --- | --- | --- | --- |
| Fraxinus ornus | . | 1 | . | . | --- | --- | --- | --- |
| Knautia drymeia | 4 | 4 | 6 | 10 | --- | --- | --- | --- |
| Muscari neglectum | 15 | 1 | 8 | 1 | 21 | --- | --- | --- |
| Trifolium medium | 3 | . | . | 1 | --- | --- | --- | --- |
| Lathyrus vernus | 1 | 4 | 1 | . | --- | --- | --- | --- |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Luzula campestris agg. | . | 6 | . | 4 | --- | 14 | --- | --- |
| Trifolium rubens | . | 2 | . | 1 | --- | --- | --- | --- |
| Sonchus oleraceus | . | 1 | . | . | --- | --- | --- | --- |
| Crataegus laevigata x monogyna | 13 | . | 4 | . | 24 | --- | --- | --- |
| Corylus avellana | 21 | 15 | 20 | 18 | --- | --- | --- | --- |
| Sedum maximum | 12 | 26 | 21 | 13 | --- | 12 | --- | --- |
| Asplenium ruta-muraria | . | . | 2 | . | --- | --- | --- | --- |
| Leontodon hispidus | . | . | 3 | . | --- | --- | 16 | --- |
| Echium vulgare | . | . | 3 | . | --- | --- | 16 | --- |
| Festuca pallens s.lat. | . | . | 3 | . | --- | --- | 16 | --- |
| Arabis sp. | . | 1 | . | . | --- | --- | --- | --- |
| Potentilla heptaphylla | . | 2 | . | 1 | --- | --- | --- | --- |
| Hieracium lachenalii | 3 | 20 | 7 | 10 | --- | 20 | --- | --- |
| Thlaspi perfoliatum | . | . | 3 | 1 | --- | --- | --- | --- |
| Sesleria sadleriana | . | . | 3 | . | --- | --- | 16 | --- |
| Linum flavum | . | . | 3 | . | --- | --- | 16 | --- |
| Prunus eminens | . | . | 1 | . | --- | --- | --- | --- |
| Teucrium montanum | . | . | 4 | . | --- | --- | 18 | --- |
| Linum tenuifolium | . | . | 4 | . | --- | --- | 18 | --- |
| Petrorhagia saxifraga | . | . | 3 | . | --- | --- | 16 | --- |
| Viburnum opulus | . | 3 | . | 1 | --- | --- | --- | --- |
| Orobanche sp. | 1 | 3 | . | . | --- | --- | --- | --- |
| Linaria vulgaris | 1 | 4 | 1 | . | --- | --- | --- | --- |
| Iris variegata | . | 9 | . | 4 | --- | 19 | --- | --- |
| Thesium bavarum | . | . | 2 | . | --- | --- | --- | --- |
| Taxus baccata | . | . | 2 | . | --- | --- | --- | --- |
| Colutea arborescens | . | . | 1 | . | --- | --- | --- | --- |
| Silene nutans s.lat. | 9 | 38 | 8 | 31 | --- | 23 | --- | 14 |
| Anthyllis vulneraria | . | . | 1 | . | --- | --- | --- | --- |
| Campanula bononiensis | . | 12 | 1 | 12 | --- | 14 | --- | 14 |
| Ilex aquifolium | . | 1 | . | . | --- | --- | --- | --- |
| Stachys sylvatica | . | 4 | . | . | --- | 17 | --- | --- |
| Hypericum montanum | 1 | 6 | . | 6 | --- | --- | --- | --- |
| Potentilla sp. | . | 2 | . | 1 | --- | --- | --- | --- |
| Campanula persicifolia | 13 | 39 | 10 | 39 | --- | 19 | --- | 18 |
| Crepis praemorsa | . | 1 | . | . | --- | --- | --- | --- |
| Prunus fruticosa | 4 | 8 | 3 | 5 | --- | --- | --- | --- |
| Euphorbia angulata | 1 | 9 | 3 | 16 | --- | --- | --- | 19 |
| Quercus sp. | 5 | . | 1 | . | 17 | --- | --- | --- |
| Carex caryophyllea | . | 2 | 1 | . | --- | --- | --- | --- |
| Hieracium laevigatum | . | 2 | . | . | --- | --- | --- | --- |
| Filipendula ulmaria | . | 1 | . | . | --- | --- | --- | --- |
| Senecio germanicus | 1 | . | . | . | --- | --- | --- | --- |
| Carex pallescens | . | 2 | . | . | --- | --- | --- | --- |
| Rhytidiadelphus triquetrus | . | 1 | . | . | --- | --- | --- | --- |
| Crataegus sp. | . | 1 | . | . | --- | --- | --- | --- |
| Leucanthemum vulgare | . | 1 | . | . | --- | --- | --- | --- |
| Calamagrostis arundinacea | 1 | 2 | 1 | 6 | --- | --- | --- | 12 |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Ranunculus polyanthemos | . | 15 | 1 | 11 | --- | 19 | --- | --- |
| Viola sp. | 1 | 10 | 1 | 6 | --- | 15 | --- | --- |
| Lychnis viscaria | . | 6 | . | 2 | --- | 16 | --- | --- |
| Arabidopsis thaliana | 6 | . | 3 | . | 15 | --- | --- | --- |
| Hieracium umbellatum | . | 8 | . | 19 | --- | --- | --- | 29 |
| Peucedanum oreoselinum | . | 4 | 4 | 4 | --- | --- | --- | --- |
| Vicia cracca | . | 3 | 1 | 1 | --- | --- | --- | --- |
| Pimpinella saxifraga agg. | . | 11 | 9 | 6 | --- | 11 | --- | --- |
| Allium sphaerocephalon | . | 1 | 1 | . | --- | --- | --- | --- |
| Thymus praecox agg. | . | 3 | . | 1 | --- | --- | --- | --- |
| Genista tinctoria | . | 12 | . | 6 | --- | 21 | --- | --- |
| Frangula alnus | 1 | 7 | 1 | 2 | --- | 14 | --- | --- |
| Moehringia trinervia | . | 3 | . | 1 | --- | --- | --- | --- |
| Koeleria macrantha | . | 2 | . | 2 | --- | --- | --- | --- |
| Ranunculus nemorosus | . | 1 | . | . | --- | --- | --- | --- |
| Melampyrum pratense | . | 2 | . | . | --- | --- | --- | --- |
| Muscari comosum | 10 | 1 | 1 | 4 | 19 | --- | --- | --- |
| Hieracium cymosum | . | 1 | . | 1 | --- | --- | --- | --- |
| Carpinus betulus | 23 | 28 | 16 | 36 | --- | --- | --- | 14 |
| Verbascum sp. | . | 5 | 2 | 2 | --- | --- | --- | --- |
| Campanula rapunculoides | 31 | 20 | 33 | 17 | --- | --- | 11 | --- |
| Populus alba | . | 1 | . | . | --- | --- | --- | --- |
| Molinia arundinacea | . | 1 | . | . | --- | --- | --- | --- |
| Arabis glabra | 1 | 2 | 1 | 1 | --- | --- | --- | --- |
| Actaea spicata | . | 2 | . | . | --- | --- | --- | --- |
| Lamium purpureum | 5 | . | 2 | . | 14 | --- | --- | --- |
| Lysimachia vulgaris | . | 1 | . | . | --- | --- | --- | --- |
| Allium carinatum | . | 3 | . | . | --- | 15 | --- | --- |
| Aesculus hippocastanum | 1 | . | . | . | --- | --- | --- | --- |
| Galanthus nivalis | 13 | . | 8 | . | 20 | --- | --- | --- |
| Scrophularia nodosa | . | 4 | . | . | --- | 17 | --- | --- |
| Carex curvata | . | 4 | . | . | --- | 17 | --- | --- |
| Allium rotundum | . | 3 | . | . | --- | 15 | --- | --- |
| Hylocomium splendens | . | 1 | . | . | --- | --- | --- | --- |
| Ballota nigra | 3 | . | 1 | . | --- | --- | --- | --- |
| Digitalis grandiflora | . | 1 | . | . | --- | --- | --- | --- |
| Rumex acetosa | . | 1 | . | . | --- | --- | --- | --- |
| Salvia glutinosa | 4 | . | 2 | . | --- | --- | --- | --- |
| Isopyrum thalictroides | . | 4 | . | . | --- | 17 | --- | --- |
| Carlina biebersteinii | . | . | . | . | | | | |
| Prunus padus | 5 | 1 | 1 | . | 14 | --- | --- | --- |
| Sisymbrium strictissimum | 6 | . | . | . | 22 | --- | --- | --- |
| Ranunculus auricomus s.lat. | . | 5 | . | . | --- | 20 | --- | --- |
| Rosa arvensis | 15 | 9 | 9 | . | 15 | --- | --- | --- |
| Agrimonia eupatoria | . | 12 | 1 | 2 | --- | 24 | --- | --- |
| Carex tomentosa | . | 5 | . | . | --- | 20 | --- | --- |
| Primula veris | 27 | 34 | 12 | 31 | --- | 10 | --- | --- |
| Ajuga genevensis | 5 | 8 | 4 | . | --- | --- | --- | --- |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Viola odorata | 36 | 9 | 19 | 5 | 29 | --- | --- | --- |
| Inula conyza | 19 | 26 | 18 | 11 | --- | 11 | --- | --- |
| Vicia sepium | . | 6 | . | . | --- | 21 | --- | --- |
| Asarum europaeum | 8 | 1 | . | . | 22 | --- | --- | --- |
| Ornithogalum umbellatum agg. | 3 | 5 | . | . | --- | 13 | --- | --- |
| Stellaria media | 8 | 1 | . | . | 22 | --- | --- | --- |
| Galium sylvaticum | 5 | 12 | 1 | 4 | --- | 17 | --- | --- |
| Stellaria holostea | 9 | 5 | 2 | . | 14 | --- | --- | --- |
| Veronica sublobata | 9 | . | . | . | 26 | --- | --- | --- |
| Physalis alkekengi | 9 | . | . | . | 26 | --- | --- | --- |
| Melica nutans | 31 | 33 | 16 | 25 | --- | 9 | --- | --- |
| Melica transsilvanica | . | 6 | . | . | --- | 21 | --- | --- |
| Symphytum tuberosum | 4 | 3 | . | . | --- | --- | --- | --- |
| Campanula trachelium | 27 | 8 | 8 | 7 | 25 | --- | --- | --- |
| Falcaria vulgaris | 1 | 8 | . | 1 | --- | 19 | --- | --- |
| Poa angustifolia | 9 | 23 | 7 | 13 | --- | 17 | --- | --- |
| Encalypta streptocarpa | . | . | 1 | . | --- | --- | --- | --- |
| Stipa joannis | . | . | 1 | . | --- | --- | --- | --- |
| Senecio sp. | . | . | 1 | . | --- | --- | --- | --- |
| Syringa vulgaris | . | 1 | 3 | . | --- | --- | --- | --- |
| Stipa pennata sensu orig. | . | . | 1 | . | --- | --- | --- | --- |
| Polygonum aviculare | . | . | 1 | . | --- | --- | --- | --- |
| Clinopodium acinos | . | . | 1 | . | --- | --- | --- | --- |
| Scabiosa columbaria agg. | . | 1 | . | 5 | --- | --- | --- | 16 |
| Phleum phleoides | . | 2 | 6 | 2 | --- | --- | --- | --- |
| Festuca sp. | . | 1 | . | 4 | --- | --- | --- | 13 |
| Tussilago farfara | . | . | 1 | . | --- | --- | --- | --- |
| Bromus inermis | . | 2 | 3 | 2 | --- | --- | --- | --- |
| Seseli annuum | . | 1 | . | 5 | --- | --- | --- | 16 |
| Campanula sibirica | . | . | 1 | . | --- | --- | --- | --- |
| Orlaya grandiflora | . | . | 1 | . | --- | --- | --- | --- |
| Thymus kosteleckyanus | . | . | 1 | . | --- | --- | --- | --- |
| Echinops sphaerocephalus | . | . | 1 | . | --- | --- | --- | --- |
| Serratula tinctoria | . | 24 | 1 | 14 | --- | 27 | --- | --- |
| Veronica sp. | . | . | 1 | . | --- | --- | --- | --- |
| Hieracium maculatum | . | . | 1 | . | --- | --- | --- | --- |
| Orchis purpurea | 1 | . | 2 | . | --- | --- | --- | --- |
| Potentilla recta | 1 | . | 2 | . | --- | --- | --- | --- |
| Seseli osseum | . | . | 1 | . | --- | --- | --- | --- |
| Hippocrepis comosa | . | . | 1 | . | --- | --- | --- | --- |
| Malus dasyphylla | 1 | . | 2 | . | --- | --- | --- | --- |
| Epipactis helleborine | 5 | 1 | 12 | . | --- | --- | 21 | --- |
| Robinia pseudacacia | 12 | 11 | 3 | . | 12 | 11 | --- | --- |
| Clematis vitalba | 42 | 36 | 29 | 10 | 17 | --- | --- | --- |
| Lactuca quercina | 6 | 10 | . | . | --- | 17 | --- | --- |
| Cruciata laevipes | 8 | 7 | . | . | 12 | 10 | --- | --- |
| Alliaria petiolata | 37 | 28 | 13 | 12 | 20 | --- | --- | --- |
| Rosa canina s.latiss. | 53 | 41 | 16 | 27 | 23 | 9 | --- | --- |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Fragaria vesca | 23 | 38 | 8 | 8 | --- | 27 | --- | --- |
| Torilis japonica | 5 | 15 | . | . | --- | 26 | --- | --- |
| Mycelis muralis | 8 | 13 | . | . | --- | 20 | --- | --- |
| Geranium robertianum | 19 | 12 | 1 | 1 | 23 | --- | --- | --- |
| Convallaria majalis | 27 | 27 | 7 | 11 | 14 | 14 | --- | --- |
| Lapsana communis | 15 | 4 | 3 | . | 24 | --- | --- | --- |
| Bromus benekenii | 13 | 4 | 2 | . | 22 | --- | --- | --- |
| Vicia cassubica | . | 9 | . | . | --- | 26 | --- | --- |
| Allium oleraceum | 4 | 6 | . | . | --- | 13 | --- | --- |
| Vicia tenuifolia | 9 | 8 | 1 | 2 | --- | --- | --- | --- |
| Crataegus monogyna | 82 | 93 | 84 | 69 | --- | 17 | --- | --- |
| Urtica dioica | 8 | 2 | . | . | 20 | --- | --- | --- |
| Festuca rubra | 3 | 6 | . | . | --- | 15 | --- | --- |
| Arctium lappa | 9 | 1 | . | . | 24 | --- | --- | --- |
| Carex montana | 4 | 22 | 2 | 7 | --- | 27 | --- | --- |
| Taraxacum officinale agg. | 13 | 15 | 4 | 4 | --- | 12 | --- | --- |
| Anemone ranunculoides | 4 | 8 | . | . | --- | 17 | --- | --- |
| Filipendula vulgaris | 1 | 15 | 2 | . | --- | 29 | --- | --- |
| Ficaria verna agg. | 9 | 3 | . | . | 20 | --- | --- | --- |
| Chamaecytisus supinus | 1 | 19 | . | 6 | --- | 29 | --- | --- |
| Veronica officinalis | . | 10 | . | . | --- | 28 | --- | --- |
| Rubus sp. | 8 | 4 | . | . | 16 | --- | --- | --- |
| Crataegus laevigata | 33 | 15 | 11 | 10 | 25 | --- | --- | --- |
| Cirsium pannonicum | 1 | . | . | 4 | --- | --- | --- | 13 |
| Hieracium sp. | . | 1 | 1 | 2 | --- | --- | --- | --- |
| Galeobdolon montanum | 1 | . | 1 | 2 | --- | --- | --- | --- |
| Rhamnus cathartica | 40 | 64 | 66 | 57 | --- | --- | 11 | --- |
| Lepidium campestre | 1 | 5 | 4 | 2 | --- | --- | --- | --- |
| Juglans regia | 6 | 8 | 6 | 14 | --- | --- | --- | 12 |
| Hieracium murorum | 8 | 11 | 13 | 10 | --- | --- | --- | --- |
| Viburnum lantana | 60 | 74 | 70 | 70 | --- | --- | --- | --- |
| Loranthus europaeus | 1 | 14 | 7 | 19 | --- | --- | --- | 17 |
| Hypochaeris maculata | . | 4 | . | 7 | --- | --- | --- | 16 |
| Euphorbia esula | . | 1 | 1 | 1 | --- | --- | --- | --- |
| Epipactis sp. | 1 | 2 | . | 4 | --- | --- | --- | --- |
| Carex sp. | 1 | 2 | . | 4 | --- | --- | --- | --- |
| Cornus sanguinea | 51 | 66 | 60 | 61 | --- | --- | --- | --- |
| Galium mollugo agg. | 8 | 15 | 10 | 12 | --- | --- | --- | --- |
| Orobanche lutea | . | . | . | 2 | --- | --- | --- | --- |
| Poa pratensis | 3 | . | 2 | 1 | --- | --- | --- | --- |
| Humulus lupulus | 1 | 1 | 2 | . | --- | --- | --- | --- |
| Leontodon incanus | . | . | . | 4 | --- | --- | --- | 17 |
| Viola ambigua | . | . | . | 4 | --- | --- | --- | 17 |
| Carex alba | 5 | 1 | 3 | 2 | --- | --- | --- | --- |
| Cephalanthera sp. | . | . | . | 1 | --- | --- | --- | --- |
| Pyrus pyraster | 19 | 18 | 30 | 10 | --- | --- | 16 | --- |
| Bromus tectorum | 1 | . | 1 | . | --- | --- | --- | --- |
| Festuca amethystina | . | . | . | 2 | --- | --- | --- | --- |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Epipactis atrorubens | . | . | . | 1 | --- | --- | --- | --- |
| Euonymus verrucosus | 67 | 56 | 73 | 61 | --- | --- | 11 | --- |
| Daphne laureola | 4 | . | 2 | 2 | --- | --- | --- | --- |
| Erysimum diffusum agg. | . | 1 | . | 2 | --- | --- | --- | --- |
| Hepatica nobilis | 14 | 8 | 17 | 8 | --- | --- | --- | --- |
| Verbascum lychnitis | 1 | 4 | 4 | 1 | --- | --- | --- | --- |
| Sorbus torminalis | 31 | 62 | 44 | 58 | --- | 15 | --- | --- |
| Phyteuma spicatum | 1 | . | 1 | 1 | --- | --- | --- | --- |
| Vinca minor | 1 | . | 2 | . | --- | --- | --- | --- |
| Securigera varia | 12 | 10 | 10 | 11 | --- | --- | --- | --- |
| Muscari sp. | 1 | 5 | 1 | 6 | --- | --- | --- | --- |
| Geranium molle | 1 | . | . | . | --- | --- | --- | --- |
| Ribes uva-crispa | 3 | . | . | . | 14 | --- | --- | --- |
| Anthemis tinctoria | 3 | 2 | 1 | . | --- | --- | --- | --- |
| Cirsium sp. | 1 | . | . | 1 | --- | --- | --- | --- |
| Prunus domestica | 1 | . | . | . | --- | --- | --- | --- |
| Plantago major | 1 | . | . | . | --- | --- | --- | --- |
| Ornithogalum sp. | . | . | . | 1 | --- | --- | --- | --- |
| Galium album s.str. | . | 1 | 1 | 1 | --- | --- | --- | --- |
| Cephalanthera damasonium | 1 | . | 2 | 1 | --- | --- | --- | --- |
| Anemone sylvestris | 3 | 2 | . | 7 | --- | --- | --- | 15 |
| Juniperus communis | 4 | 3 | 8 | 5 | --- | --- | --- | --- |
| Euphorbia dulcis | 1 | 1 | 3 | 1 | --- | --- | --- | --- |
| Festuca valesiaca | . | 1 | 3 | . | --- | --- | --- | --- |
| Piptatherum virescens | 3 | 1 | 1 | 4 | --- | --- | --- | --- |
| Cardaminopsis petraea | . | . | . | 1 | --- | --- | --- | --- |
| Dorycnium pentaphyllum agg. | . | . | . | 4 | --- | --- | --- | 17 |
| Thymus pulegioides | . | . | . | 1 | --- | --- | --- | --- |
| Lathyrus pannonicus s.lat. | . | 3 | 7 | 1 | --- | --- | 14 | --- |
| Melampyrum sp. | . | . | 1 | 4 | --- | --- | --- | 13 |
| Hypnum cupressiforme agg. | . | . | . | 2 | --- | --- | --- | --- |
| Pulsatilla sp. | . | . | 2 | 1 | --- | --- | --- | --- |
| Jovibarba hirta sensu LGM | . | . | 2 | 1 | --- | --- | --- | --- |
| Arabis pauciflora | . | . | 1 | 1 | --- | --- | --- | --- |
| Scabiosa ochroleuca | . | 1 | 4 | 2 | --- | --- | --- | --- |
| Galium pumilum | . | . | 1 | 2 | --- | --- | --- | --- |
| Conringia austriaca | . | . | 1 | 2 | --- | --- | --- | --- |
| Sedum acre | . | . | 2 | 1 | --- | --- | --- | --- |
| Trinia glauca | . | . | 1 | 2 | --- | --- | --- | --- |
| Pinus sylvestris | . | . | . | 4 | --- | --- | --- | 17 |
| Jurinea mollis | . | . | . | 1 | --- | --- | --- | --- |
| Seseli hippomarathrum | . | . | . | 1 | --- | --- | --- | --- |
| Crataegus sanguinea | . | . | 1 | 1 | --- | --- | --- | --- |
| Galium sp. | . | . | 1 | . | --- | --- | --- | --- |
| Dracocephalum austriacum | . | . | 1 | . | --- | --- | --- | --- |
| Cotoneaster divaricatus | . | . | 1 | . | --- | --- | --- | --- |
| Lotus borbasii | . | . | 3 | . | --- | --- | 16 | --- |
| Silene vulgaris | 1 | . | . | 6 | --- | --- | --- | 18 |

| Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Luzula luzuloides | 1 | . | . | 2 | --- | --- | --- | --- |
| Ribes sp. | . | . | 1 | . | --- | --- | --- | --- |
| Melilotus officinalis | 1 | . | 2 | . | --- | --- | --- | --- |
| Onosma visianii | . | . | 1 | . | --- | --- | --- | --- |
| Verbascum speciosum | . | . | 1 | . | --- | --- | --- | --- |
| Carlina vulgaris | . | . | 3 | 1 | --- | --- | --- | --- |
| Centaurea jacea | . | 1 | 4 | . | --- | --- | 15 | --- |
| Globularia bisnagarica | . | . | 1 | . | --- | --- | --- | --- |
| Stipa eriocaulis | . | . | 1 | . | --- | --- | --- | --- |
| Dentaria bulbifera | . | . | . | 1 | --- | --- | --- | --- |
| Scabiosa sp. | . | . | . | 1 | --- | --- | --- | --- |
| Rosa elliptica | . | . | . | 1 | --- | --- | --- | --- |
| Campanula sp. | . | . | . | 1 | --- | --- | --- | --- |
| Trifolium montanum | . | . | . | 1 | --- | --- | --- | --- |
| Prunella grandiflora | . | . | . | 1 | --- | --- | --- | --- |
| Salvia nemorosa | . | . | . | 1 | --- | --- | --- | --- |
| Melampyrum subalpinum s.lat. | . | . | . | 1 | --- | --- | --- | --- |
| Clinopodium alpinum | . | . | . | 1 | --- | --- | --- | --- |
| Ononis sp. | . | . | . | 1 | --- | --- | --- | --- |
| Hieracium bifidum | . | . | . | 4 | --- | --- | --- | 17 |
| Galium austriacum | . | . | . | 1 | --- | --- | --- | --- |
| Bromus ramosus | . | . | . | 1 | --- | --- | --- | --- |
| Phyteuma sp. | . | . | . | 4 | --- | --- | --- | 17 |
| Erigeron annuus | . | . | . | 1 | --- | --- | --- | --- |
| Sisymbrium orientale | 1 | . | 1 | . | --- | --- | --- | --- |
| Veronica vindobonensis | 1 | . | 1 | . | --- | --- | --- | --- |
| Carex pilulifera | . | . | . | 1 | --- | --- | --- | --- |
| Rosa rubiginosa | . | . | . | 1 | --- | --- | --- | --- |
| Festuca ovina agg. sensu LGM | . | 1 | 1 | 6 | --- | --- | --- | 16 |
| Iris pumila | . | 5 | 4 | 1 | --- | --- | --- | --- |
| Arabis auriculata | . | . | . | 1 | --- | --- | --- | --- |
| Polygala major | . | . | . | 2 | --- | --- | --- | --- |
| Plantago media | . | . | . | 2 | --- | --- | --- | --- |
| Pulsatilla grandis | . | . | . | 4 | --- | --- | --- | 17 |
| Koeleria sp. | . | . | . | 1 | --- | --- | --- | --- |
| Koeleria pyramidata | . | . | . | 1 | --- | --- | --- | --- |
| Erysimum sylvestre | . | . | . | 2 | --- | --- | --- | --- |

**Table A15:** Crosstable showing mainplots sorted by locality. Columns are TW-Group of mainplots only (withouth literature data, 4.3.1) and relevé number. Rows are relevés sorted by Loc = locality vector (4.3.1). TW = TWINSPAN Group (including literature data), Diagn = Groups as assigned by total cover of diagnostic species.

| Relevé | Loc | TW | Diagn | 1_ 45 | 2_ 47 | 2_ 39 | 2_ 69 | 2_ 71 | 2_ 79 | 2_ 81 | 2_ 41 | 2_ 49 | 2_ 19 | 3_ 43 | 3_ 53 | 3_ 55 | 3_ 27 | 3_ 29 | 3_ 65 | 3_ 67 | 3_ 23 | 3_ 31 | 3_ 33 | 3_ 51 | 3_ 57 | 3_ 59 | 3_ 61 | 3_ 63 | 3_ 77 | 3_ 15 | 3_ 9 | 4_ 11 | 4_ 17 | 4_ 5 | 4_ 7 | 4_ 13 | 4_ 25 | 4_ 73 | 4_ 75 | Locality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45 | 1 | 1 | 1 | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hackelsberg |
| 47 | 1 | 3 | 3 | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hackelsberg |
| 39 | 2 | 3 | 4 | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 69 | 2 | 3 | 1 | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 71 | 2 | 3 | 3 | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 79 | 2 | 3 | 3 | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 81 | 2 | 1 | 1 | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 43 | 2 | 3 | 3 | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 41 | 3 | 3 | 3 | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Nackter Sattel |
| 49 | 3 | 3 | 1 | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | Nackter Sattel |
| 53 | 4 | 2 | 4 | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | Koenigsberg |
| 55 | 4 | 3 | 4 | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | Koenigsberg |
| 27 | 5 | 4 | 3 | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | Winden |
| 29 | 5 | 4 | 3 | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | Winden |
| 65 | 5 | 4 | 3 | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | Winden |
| 67 | 5 | 4 | 4 | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | Winden |
| 19 | 6 | 3 | 4 | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 23 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 31 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | Thermenlinie |
| 33 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | Thermenlinie |
| 51 | 6 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | Thermenlinie |
| 57 | 6 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | Thermenlinie |
| 59 | 6 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | Thermenlinie |
| 61 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | Thermenlinie |
| 63 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | Thermenlinie |
| 77 | 7 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | Bisamberg |
| 15 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | Bisamberg |
| 9 | 7 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | Bisamberg |
| 11 | 7 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | Bisamberg |
| 17 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | Bisamberg |
| 5 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | Leopoldsberg |
| 7 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | Leopoldsberg |
| 13 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | Leopoldsberg |
| 25 | 8 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | Leopoldsberg |
| 73 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | Leopoldsberg |
| 75 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | Leopoldsberg |

**Table A16:** Crosstable showing subplots sorted by locality. Columns are TW-Group of mainplots only (withouth literature data, 4.3.1) and relevé number. Rows are relevés sorted by Loc = locality vector (4.3.1). TW = TWINSPAN Group (including literature data), Diagn = Groups as assigned by total cover of diagnostic species.

| Relevé | Loc | TW | Diagn | 1_ 46 | 1_ 48 | 1_ 82 | 1_ 42 | 2_ 32 | 2_ 52 | 2_ 58 | 2_ 60 | 2_ 62 | 3_ 40 | 3_ 70 | 3_ 72 | 3_ 80 | 3_ 44 | 3_ 50 | 3_ 54 | 3_ 56 | 3_ 28 | 3_ 30 | 3_ 66 | 3_ 68 | 3_ 20 | 3_ 24 | 3_ 64 | 3_ 78 | 3_ 16 | 3_ 74 | 3_ 76 | 4_ 34 | 4_ 10 | 4_ 12 | 4_ 18 | 4_ 6 | 4_ 8 | 4_ 14 | 4_ 26 | Locality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 1 | 1 | 1 | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hackelsberg |
| 48 | 1 | 1 | 1 | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hackelsberg |
| 40 | 2 | 3 | 4 | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 70 | 2 | 3 | 1 | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 72 | 2 | 3 | 1 | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 80 | 2 | 3 | 3 | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 82 | 2 | 1 | 1 | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 44 | 2 | 3 | 3 | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 42 | 3 | 3 | 3 | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Nackter Sattel |
| 50 | 3 | 3 | 1 | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | Nackter Sattel |
| 54 | 4 | 2 | 2 | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | Koenigsberg |
| 56 | 4 | 3 | 4 | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | Koenigsberg |
| 28 | 5 | 3 | 4 | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | Winden |
| 30 | 5 | 3 | 3 | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | Winden |
| 66 | 5 | 3 | 3 | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | Winden |
| 68 | 5 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | Winden |
| 20 | 6 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | Thermenlinie |
| 24 | 6 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | Thermenlinie |
| 32 | 6 | 4 | 4 | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 34 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | Thermenlinie |
| 52 | 6 | 3 | 4 | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 58 | 6 | 3 | 3 | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 60 | 6 | 3 | 4 | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 62 | 6 | 4 | 4 | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 64 | 6 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | Thermenlinie |
| 78 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | Bisamberg |
| 16 | 7 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | Bisamberg |
| 10 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | Bisamberg |
| 12 | 7 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | Bisamberg |
| 18 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | Bisamberg |
| 6 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | Leopoldsberg |
| 8 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | Leopoldsberg |
| 14 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | Leopoldsberg |
| 26 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | Leopoldsberg |
| 74 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | Leopoldsberg |
| 76 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | Leopoldsberg |

**Table A17:** Crosstable showing mainplots sorted by TWINSPAN with literature data. Columns are TW-Group of mainplots in context of literature data (4.3.2) and relevé number. Rows are relevés sorted by Loc = locality vector (4.3.1). TW = TWINSPAN Group (including literature data), Diagn = Groups as assigned by total cover of diagnostic species.

| Relevé | Loc | TW | Diagn | 1_45 | 1_81 | 2_53 | 3_47 | 3_39 | 3_69 | 3_71 | 3_79 | 3_43 | 3_41 | 3_49 | 3_55 | 3_19 | 3_51 | 3_57 | 3_59 | 3_15 | 3_9 | 3_11 | 3_17 | 3_5 | 3_7 | 3_13 | 3_25 | 3_73 | 3_75 | 4_27 | 4_29 | 4_65 | 4_67 | 4_23 | 4_31 | 4_33 | 4_61 | 4_63 | 4_77 | Locality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45 | 1 | 1 | 1 | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hackelsberg |
| 47 | 1 | 3 | 3 | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hackelsberg |
| 39 | 2 | 3 | 4 | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 69 | 2 | 3 | 1 | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 71 | 2 | 3 | 3 | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 79 | 2 | 3 | 3 | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 81 | 2 | 1 | 1 | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 43 | 2 | 3 | 3 | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 41 | 3 | 3 | 3 | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | Nackter Sattel |
| 49 | 3 | 3 | 1 | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | Nackter Sattel |
| 53 | 4 | 2 | 4 | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Koenigsberg |
| 55 | 4 | 3 | 4 | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | Koenigsberg |
| 27 | 5 | 4 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | Winden |
| 29 | 5 | 4 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | Winden |
| 65 | 5 | 4 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | Winden |
| 67 | 5 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | Winden |
| 19 | 6 | 3 | 4 | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 23 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | Thermenlinie |
| 31 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | Thermenlinie |
| 33 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | Thermenlinie |
| 51 | 6 | 3 | 4 | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 57 | 6 | 3 | 3 | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 59 | 6 | 3 | 4 | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 61 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | Thermenlinie |
| 63 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | Thermenlinie |
| 77 | 7 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | Bisamberg |
| 15 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | Bisamberg |
| 9 | 7 | 3 | 3 | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | Bisamberg |
| 11 | 7 | 3 | 3 | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | Bisamberg |
| 17 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | Bisamberg |
| 5 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | Leopoldsberg |
| 7 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | Leopoldsberg |
| 13 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | Leopoldsberg |
| 25 | 8 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | Leopoldsberg |
| 73 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | Leopoldsberg |
| 75 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | Leopoldsberg |

**Table A18:** Crosstable showing subplots sorted by TWINSPAN with literature data. Columns are TW-Group of mainplots in context of literature data (4.3.2) and relevé number. Rows are relevés sorted by Loc = locality vector (4.3.1). TW = TWINSPAN Group (including literature data), Diagn = Groups as assigned by total cover of diagnostic species.

| Relevé | Loc | TW | Diagn | 1_46 | 1_48 | 1_82 | 2_54 | 3_40 | 3_70 | 3_72 | 3_80 | 3_44 | 3_42 | 3_50 | 3_56 | 3_28 | 3_30 | 3_66 | 3_68 | 3_20 | 3_24 | 3_52 | 3_58 | 3_60 | 3_64 | 3_78 | 3_16 | 3_10 | 3_12 | 3_18 | 3_6 | 3_8 | 3_14 | 3_26 | 3_74 | 3_76 | 4_32 | 4_34 | 4_62 | Locality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45 | 1 | 1 | 1 | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hackelsberg |
| 47 | 1 | 3 | 3 | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hackelsberg |
| 39 | 2 | 3 | 4 | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 69 | 2 | 3 | 1 | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 71 | 2 | 3 | 3 | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 79 | 2 | 3 | 3 | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 81 | 2 | 1 | 1 | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 43 | 2 | 3 | 3 | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 41 | 3 | 3 | 3 | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | Nackter Sattel |
| 49 | 3 | 3 | 1 | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | Nackter Sattel |
| 53 | 4 | 2 | 4 | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Koenigsberg |
| 55 | 4 | 3 | 4 | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | Koenigsberg |
| 27 | 5 | 4 | 3 | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | Winden |
| 29 | 5 | 4 | 3 | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | Winden |
| 65 | 5 | 4 | 3 | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | Winden |
| 67 | 5 | 4 | 4 | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | Winden |
| 19 | 6 | 3 | 4 | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 23 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 31 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | Thermenlinie |
| 33 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | Thermenlinie |
| 51 | 6 | 3 | 4 | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | Thermenlinie |
| 57 | 6 | 3 | 3 | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | Thermenlinie |
| 59 | 6 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | Thermenlinie |
| 61 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | Thermenlinie |
| 63 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | Thermenlinie |
| 77 | 7 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | Bisamberg |
| 15 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | Bisamberg |
| 9 | 7 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | Bisamberg |
| 11 | 7 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | Bisamberg |
| 17 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | Bisamberg |
| 5 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | Leopoldsberg |
| 7 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | Leopoldsberg |
| 13 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | Leopoldsberg |
| 25 | 8 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | Leopoldsberg |
| 73 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | Leopoldsberg |
| 75 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | Leopoldsberg |

**Table A19:** Crosstable showing mainplots sorted by total cover value of diagnostic species. Columns are groups as assigned by total cover of diagnostic species (4.3.2) and releve number. Rows are relevés sorted by Loc = locality vector (4.3.1). TW = TWINSPAN Group (including literature data), Diagn = Groups as assigned by total cover of diagnostic species.

| Relevé | Loc | TW | Diagn | 1_45 | 1_69 | 1_81 | 1_49 | 3_47 | 3_71 | 3_79 | 3_43 | 3_41 | 3_27 | 3_29 | 3_65 | 3_57 | 3_9 | 3_11 | 3_5 | 3_7 | 3_13 | 3_73 | 3_75 | 4_39 | 4_53 | 4_55 | 4_67 | 4_19 | 4_23 | 4_31 | 4_33 | 4_51 | 4_59 | 4_61 | 4_63 | 4_77 | 4_15 | 4_17 | 4_25 | Locality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45 | 1 | 1 | 1 | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hackelsberg |
| 47 | 1 | 3 | 3 | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hackelsberg |
| 39 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | Hainburg |
| 69 | 2 | 3 | 1 | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 71 | 2 | 3 | 3 | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 79 | 2 | 3 | 3 | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 81 | 2 | 1 | 1 | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 43 | 2 | 3 | 3 | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hainburg |
| 41 | 3 | 3 | 3 | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | Nackter Sattel |
| 49 | 3 | 3 | 1 | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Nackter Sattel |
| 53 | 4 | 2 | 4 | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | Koenigsberg |
| 55 | 4 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | Koenigsberg |
| 27 | 5 | 4 | 3 | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | Winden |
| 29 | 5 | 4 | 3 | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | Winden |
| 65 | 5 | 4 | 3 | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | Winden |
| 67 | 5 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | Winden |
| 19 | 6 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | Thermenlinie |
| 23 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | Thermenlinie |
| 31 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | Thermenlinie |
| 33 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | Thermenlinie |
| 51 | 6 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | Thermenlinie |
| 57 | 6 | 3 | 3 | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | Thermenlinie |
| 59 | 6 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | Thermenlinie |
| 61 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | Thermenlinie |
| 63 | 6 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | Thermenlinie |
| 77 | 7 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | Bisamberg |
| 15 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | Bisamberg |
| 9 | 7 | 3 | 3 | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | Bisamberg |
| 11 | 7 | 3 | 3 | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | Bisamberg |
| 17 | 7 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | Bisamberg |
| 5 | 8 | 3 | 3 | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | Leopoldsberg |
| 7 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | Leopoldsberg |
| 13 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | Leopoldsberg |
| 25 | 8 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | Leopoldsberg |
| 73 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | Leopoldsberg |
| 75 | 8 | 3 | 3 | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | Leopoldsberg |

**Table A20:** Crosstable showing subplots sorted by total cover value of diagnostic species. Columns are groups as assigned by total cover of diagnostic species (4.3.2) and releve number. Rows are relevés sorted by Loc = locality vector (4.3.1). TW = TWINSPAN Group (including literature data), Diagn = Groups as assigned by total cover of diagnostic species.

| Relevé | Loc | TW | Diagn | 1_46 | 1_48 | 1_70 | 1_72 | 1_82 | 1_50 | 2_54 | 3_80 | 3_44 | 3_42 | 3_30 | 3_66 | 3_20 | 3_58 | 3_64 | 3_16 | 3_12 | 3_6 | 3_8 | 3_14 | 3_26 | 3_74 | 3_76 | 4_40 | 4_56 | 4_28 | 4_68 | 4_24 | 4_32 | 4_34 | 4_52 | 4_60 | 4_62 | 4_78 | 4_10 | 4_18 | Locality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45 | 1 | 1 | 1 | x ||||||||||||||||||||||||||||||||||| Hackelsberg |
| 47 | 1 | 3 | 3 || x |||||||||||||||||||||||||||||||||| Hackelsberg |
| 39 | 2 | 3 | 4 ||||||||||||||||||||||| x |||||||||||| Hainburg |
| 69 | 2 | 3 | 1 ||| x ||||||||||||||||||||||||||||||||| Hainburg |
| 71 | 2 | 3 | 3 |||| x |||||||||||||||||||||||||||||||| Hainburg |
| 79 | 2 | 3 | 3 |||||||| x |||||||||||||||||||||||||||| Hainburg |
| 81 | 2 | 1 | 1 ||||| x ||||||||||||||||||||||||||||||| Hainburg |
| 43 | 2 | 3 | 3 ||||||||| x ||||||||||||||||||||||||||| Hainburg |
| 41 | 3 | 3 | 3 |||||||||| x |||||||||||||||||||||||||| Nackter Sattel |
| 49 | 3 | 3 | 1 |||||| x |||||||||||||||||||||||||||||| Nackter Sattel |
| 53 | 4 | 2 | 4 ||||||| x ||||||||||||||||||||||||||||| Koenigsberg |
| 55 | 4 | 3 | 4 |||||||||||||||||||||||| x ||||||||||| Koenigsberg |
| 27 | 5 | 4 | 3 ||||||||||||||||||||||||| x |||||||||| Winden |
| 29 | 5 | 4 | 3 ||||||||||| x ||||||||||||||||||||||||| Winden |
| 65 | 5 | 4 | 3 |||||||||||| x |||||||||||||||||||||||| Winden |
| 67 | 5 | 4 | 4 |||||||||||||||||||||||||| x ||||||||| Winden |
| 19 | 6 | 3 | 4 ||||||||||||| x ||||||||||||||||||||||| Thermenlinie |
| 23 | 6 | 4 | 4 ||||||||||||||||||||||||||| x |||||||| Thermenlinie |
| 31 | 6 | 4 | 4 |||||||||||||||||||||||||||| x ||||||| Thermenlinie |
| 33 | 6 | 4 | 4 ||||||||||||||||||||||||||||| x |||||| Thermenlinie |
| 51 | 6 | 3 | 4 |||||||||||||||||||||||||||||| x ||||| Thermenlinie |
| 57 | 6 | 3 | 3 |||||||||||||| x |||||||||||||||||||||| Thermenlinie |
| 59 | 6 | 3 | 4 ||||||||||||||||||||||||||||||| x |||| Thermenlinie |
| 61 | 6 | 4 | 4 |||||||||||||||||||||||||||||||| x ||| Thermenlinie |
| 63 | 6 | 4 | 4 ||||||||||||||| x ||||||||||||||||||||| Thermenlinie |
| 77 | 7 | 4 | 4 ||||||||||||||||||||||||||||||||| x || Bisamberg |
| 15 | 7 | 3 | 4 |||||||||||||||| x |||||||||||||||||||| Bisamberg |
| 9 | 7 | 3 | 3 |||||||||||||||||||||||||||||||||| x | Bisamberg |
| 11 | 7 | 3 | 3 ||||||||||||||||| x ||||||||||||||||||| Bisamberg |
| 17 | 7 | 3 | 4 ||||||||||||||||||||||||||||||||||| x | Bisamberg |
| 5 | 8 | 3 | 3 |||||||||||||||||| x |||||||||||||||||| Leopoldsberg |
| 7 | 8 | 3 | 3 ||||||||||||||||||| x ||||||||||||||||| Leopoldsberg |
| 13 | 8 | 3 | 3 |||||||||||||||||||| x |||||||||||||||| Leopoldsberg |
| 25 | 8 | 3 | 4 ||||||||||||||||||||| x ||||||||||||||| Leopoldsberg |
| 73 | 8 | 3 | 3 |||||||||||||||||||||| x |||||||||||||| Leopoldsberg |
| 75 | 8 | 3 | 3 ||||||||||||||||||||||| x ||||||||||||| Leopoldsberg |

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**WORK EXPERIENCE**

**2014, May – June: Forestry department, City of Vienna (MA49)**
Independent contractor: Vegetation science; taking 96 Braun-Blanquet relevés of fallows being turned into lowland meadows in the National Park Lobau/Donau-Auen, contributing to a monitoring program to evaluate the success of eradication measures targeted at neophytes (*Solidago gigantea*).

DI Alexander Mrkvicka
Magistrat der Stadt Wien - MA 49 – Forstamt, www.wald.wien.at
Triester Straße 114, A-1100 Wien

**2012 – present: BPWW**
Independent contractor: Data analysis (GIS, statistics) and report writing for the "Weinbaulandschaften" (viticultural-landscape) project.
Management of volunteer-assisted restoration-ecology projects about xeric grassland.
Data synthesis, evaluation and volunteer scientist at the "Tag der Artenvielfalt", guiding educational tours about ecology, botany and conservation.

MMag. Irene Drozdowski
Biosphärenpark Wienerwald Management GmbH (www.BPWW.at)
Norbertinumstraße 9, A-3013 Tullnerbach

**2011, July: Ural owl project**
Intern: feeding young ural owls and preparing them for release into the wild.

Mag. Dr. Richard Zink, www.habichtskauz.at,
Forschungsinstitut für Wildtierkunde und Ökologie, VetmedUni Wien
Savoyenstraße 1, A-1160 Wien

**2010 – 2014, October: BPWW**
Project participant at the Obstbaumtag Biosphärenpark Wienerwald:
Assembling fruit tree packages for individual orders and handing them out to customers. Offering advice on biological gardening and diversity of cultivated plants.

Mag. Ines Lemberger
Biosphärenpark Wienerwald Management GmbH (www.BPWW.at)
Norbertinumstraße 9, A-3013 Tullnerbach

**2010, February – April: Koh Lanta Diving Center**
Intern: offering biological expertise to recreational divers. Assisting in activities and duties delegated to Divemasters (Dive Briefing, Guiding Divers, etc.).

Oliver Marsel http://www.dive-adventure.com/
Koh Lanta Diving Center, http://www.kolantadivingcenter.com/
Koh Lanta, Saladan, 81150 Krabi, Thailand

**2009, July – September: Red Sea Environmental Centre**
Intern: gathering data for a bachelor thesis, assisting fellow students with research dives, hold biological snorkel-, dive- and beach-tours for tourists.

Dr. Robert Hofrichter
RSEC Field Station in El Quseir, Egypt
RSEC – Red Sea Environmental Centre, http://www.redsea-ec.org/englisch/index-en.php
Schwarzstraße 33, A-5020 Salzburg, Austria

**2005, October – 2006, September: Red Cross Salzburg**
Civil service: ambulance driver and first aid worker.

**EDUCATION AND TRAINING**

**2010 – 2015: University of Vienna (C.V.L.)**
Aspired degree: MSc, Master of Science
**Conservation Biology and Biodiversity Management**
Legal and economical considerations of conservation work
Management of protected areas and rare species
Restoration techniques for degraded habitats

University of Vienna, Department of Botany and Biodiversity Research
Division of Conservation Biology, Vegetation Ecology and Landscape Ecology
Rennweg 14, A-1030 Vienna

**2006 – 2010: University of Salzburg**
Bakk rer. Nat. (equivalent to BSc, Bachelor of Science)
**Environmental and evolutionary biology**
General: Career management, use of digital information sources, ethics in biology
Occupational: Understanding of ecosystems, their workings and inhabitants
Knowledge of local flora and fauna, geographical information systems (GIS), aquatic and terrestrial ecology, geobotany, wildlife management and conservation, marine biology

University of Salzburg, Faculty for Natural Sciences
Hellbrunnerstraße 34, A-5020 Salzburg

**2000 – 2005 HTL Salzburg**
Matura, general qualification for university entrance
General: German, English, Maths, Physics & Chemistry
Occupational: Computer Sciences: Programming, Hardware Development, Industrial Electronics, High Frequency and Telecommunication Technology

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## PERSONAL SKILLS AND COMPETENCES

**Languages**
German (mother tongue), English (C1-C2)

**Social skills and competences**
Practical experience in explaining complex issues to fellow students and co-workers; Adapting to the needs of a team; interest in foreign cultures and traditions.

**Organisational skills and competences**
Delegating tasks to team members and monitoring the progress;
Coordinating group efforts such as field trip reports and presentations.

**Technical skills and competences**
Practical knowledge of GIS (ArcGIS and QGIS) applications and python scripting; Knowledge of statistical analysis using R-project; vegetation science tools such as TurboVeg and JUICE; Good knowledge of MS-Access and database principles.

**Computer skills and competences**
Administrating Windows (desktop) and Linux (desktop and server) computers;
Good grasp of computer network infrastructure and protocols,
digital audio and video, LaTeX typesetting, good knowledge of office applications (LibreOffice & MS Office).

**Artistic skills and competences**
Nature photography.

**Other skills and competences**
Good knowledge of the Austrian flora; Understanding of phytosociology and ecological principles; Quick learner, ability to understand complex matters in a short period; Ability to deduct factual conclusions from self-made observations; First aid and CPR; Good knowledge of the marine fauna of the Red Sea and Indo-Pacific regions; PADI Divemaster with 200 dives

**Driving licence:** Category A and B

**Sports:** Hiking, rock climbing (VI+), via ferrata (D-E), mountain biking, ski touring, swimming, scuba diving, yoga.

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