Biodiv. Res. Conserv. 20: 1-138, 2010

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10.2478/v10119-010-0012-4

Acidophilous oak forests of the Wielkopolska region (West Poland) against the background of Central Europe

Marek Kasprowicz

Department of Plant Ecology and Environmental Protection, Faculty of Biology, Adam Mickiewicz University, Umultowska 89, 61-614 Poznań, Poland, e-mail: mkas@amu.edu.pl

Abstract: This monograph gives the phytosociological characteristics of acidophilous oak forests from the class *Quercetea robori-petraeae* (*Aulacomnio androgyni-Quercetum*, *Molinio caeruleae-Quercetum*, and *Calamagrostio arundinaceae-Quercetum*) and the closely related forest communities from the classes *Querco-Fagetea* (*Potentillo albae-Quercetum* and acidophilous forms of *Galio sylvatici-Carpinetum*) and *Vaccinio-Piceetea* (*Querco roboris-Pinetum* and *Serratulo-Pinetum*) in the Wielkopolska region and adjacent areas. The report is based on 1655 relevés selected from 59 published or unpublished studies. The analysed and revised syntaxa are described in accordance with the International Code of Phytosociological Nomenclature. The distribution of the documented localities of all associations and subassociations in the study area is shown in cartograms on the ATPOL grid (squares of 10 km × 10 km). The classical phytosociological methods are complemented with multivariate ordination methods (detrended correspondence analysis and/or principal component analysis) and analyses taking into account Ellenberg indicator values. The natural geographical and site differentiation of all the plant associations is presented, and stages of degeneration are distinguished in some of them. The separation of degenerated forms and substitute forest communities has allowed a clearer classification of the studied syntaxa. This study shows that the analysed associations can be subdivided into 16 subassociations and 23 variants. For 5 subassociations, nomenclatural types are designated here. The most common association in the study area is *Calamagrostio arundinaceae-Quercetum*, but most of its relevés represent various stages of degeneration. Among communities from the order *Quercetalia roboris*, patches of *Aulacomnio androgyni-Quercetum* and *Molinio caeruleae-Quercetum* are rare. On the basis of this detailed study, a coherent system of classification of acidophilous oak forests from the order *Quercetalia roboris* in Central Europe is proposed. The results are important for biodiversity conservation and sustainable forest management.

Key words: phytosociology, Ellenberg indicator values, ATPOL-grid, forest communities, acidophilous oak forests, *Quercetea robori-petraeae*, *Vaccinio-Piceetea*, *Querco-Fagetea*, Wielkopolska region

Contents

ECOLOGY

1. Introduction

Acidophilous oak forests, in the narrow sense, are deciduous forests with the canopy dominated by native *Quercus* spp. (mostly *Quercus petraea* and *Q. robur*), found on acidic soils. So-defined forest ecosystems constitute a clearly distinguished unit, taken into account in modern sustainable forest management (Barbati *et al.* 2007), in actions aimed at biodiversity conservation (Barbati & Marchetti 2005; Bradshaw & Møller 2005), and in phytosociological classification. In the last mentioned aspect, acidophilous oak forests are assigned by various authors to the classes *Quercetea robori-petraeae* or *Querco-Fagetea*, or even (rarely) to the class *Vaccinio-Piceetea*. Oak forests of this group are distributed in extensive areas of the temperate zone in Europe, from the Atlantic coast in northern Portugal, to western Ukraine near Kiev. They reach their northern limit of distribution in Ireland, southern Scandinavia, Lithuania, and Belarus, while the southern limit, in Ukraine, Romania, Croatia, southern France, northern Spain and northern Portugal. The easternmost, isolated locality is found on the river Volga, near Kazan (Barbati *et al.* 2007). On the map of natural European vegetation, their range of distribution was marked as formation F1, comprising floristically poor, acidophilous (oligo-mesotrophic) oak forests and mixed oak forests (Cross *et al.* 2003). However, W. Matuszkiewicz (2003) when describing formation F1, noted that its centre of distribution is in Atlantic and sub-Atlantic Europe. It must be remembered that initially the distribution range of plant communities of the class *Quercetea robori-petraeae* was supposed to be limited to the western and south-western parts of the continent (Braun-Blanquet 1950).

So-defined acidophilous oak forests did not include Central European meso-eutrophic oak-hornbeam forests from the class *Querco-Fagetea* (order *Fagetalia sylvaticae*, alliance *Carpinion betuli*), south-eastern European oak forests from the order *Quercetalia pubescenti-petraeae* (alliance *Potentillo albae-Quercion petraea*), and mixed coniferous forests from the class *Vaccinio-Piceetea*, where *Quercus* spp., more or less abundant, accompanied the dominant coniferous trees (in central Europe, mostly *Pinus sylvestris*). However, a complete characterization of acidophilous oak forests and a clear separation of this controversial group of forests would not be possible without taking into account some of the above-mentioned communities, namely pine-oak forests, thermophilous oak forests, and poorer forms of oak-hornbeam forests. All these communities are distinguished by penetration of some characteristic species of the classes *Vaccinio-Piceetea*, *Querco-Fagetea*, and *Quercetea robori-petraeae* (Fig. 1). This results from both natural conditions and human impact. Tüxen (1975) indicated also that some associations from the

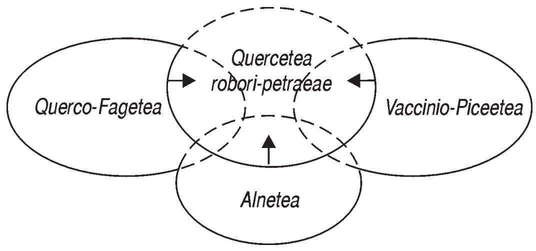

Fig. 1. Floristic connections between acidophilous oak forests from the class *Quercetea robori-petraeae* and related communities (after Tüxen 1975, simplified)

class *Quercetea robori-petraeae* (*Violo-Quercetum* and *Betulo-Quercetum*) are characterized by a small contribution of species of the class *Alnetea glutinosae*. This class is represented by an undoubtedly specific oak forest type described as the association *Carici elongatae-Quercetum* Sokołowski 1972 from the Białowieża Forest (Sokołowski 1972). The association was reported for the first time from Wielkopolska by Brzeg *et al.* (1989). It was later characterized by Brzeg (1995), Wojterska (2003), and Klimko *et al.* (2004). This syntaxon is clearly distinct from the other oak forests types, mentioned above, so such forests have not been taken into account in this study.

The Wielkopolska region (also known as Greater Poland or Great Poland), and the adjacent areas, constitute an important part of the distribution range of Central European acidophilous oak forests (see also Matuszkiewicz J. M. 2001a). In this region, the new association *Aulacomnio androgyni-Quercetum roboris* (new for science) was described a decade ago. It represented the alliance *Dicrano-Quercion* Passarge 1968 (Brzeg *et al.* 2000a), which was earlier unknown in Poland. Moreover, a broader definition of *Calamagrostio arundinaceae-Quercetum petraeae* was proposed (Brzeg *et al.* 1989, 1998, 2001) and the first Polish localities of *Molinio caeruleae-Quercetum roboris* were documented in this region (Brzeg *et al.* 1989).

The analysis of variation and functioning of oak forests in Wielkopolska is important not only for this region but also on a broader scale. Wielkopolska is the first large region relatively well studied by phytosociologists and located east of the natural limit of distribution of *Fagus sylvatica*. Cross *et al.* (2003) emphasized that as a result of competition from that species, acidophilous oak forests, especially in the sub-Atlantic and central parts of Europe, were forced out into sites that are too moist or too dry for natural regeneration of *F. sylvatica* and thus do not allow development of stable beech forests. That is one of the reasons why natural-like oak forest stands in those areas form relatively small and scattered patches. Their larger patches are found also east of the limits of distribution of *Fagus*: in Poland, Belarus, and northern Ukraine (Cross *et al.* 2003). Thus it can be assumed that in Wielkopolska, acidophilous oak forests show a higher habitat variation. Knowledge of this variation should be used as a reference for comparative analyses of acidophilous oak forests in the eastern part of their range. It will also be useful for assessment of the influence of *F. sylvatica* on the development of patches of acidophilous oak forests in central and western parts of their range.

The current state of knowledge about acidophilous oak forests in Poland, particularly about their variation and distribution, is very unsatisfactory. Most of the existent documentation, also from Wielkopolska, was not summarized in the monograph of mixed coniferous forests and acidophilous oak forests of Poland (Matuszkiewicz J. M. 1988), and in later reviews of forest communities in our country (Matuszkiewicz W. & Matuszkiewicz J. M. 1996; Matuszkiewicz J. M. 2001a) or of plant communities in Poland (Matuszkiewicz W. 2001). Phytosociological classification of acidophilous oak forests proposed in the European literature in the last decades was inconsistent (see the works cited above and Oberdorfer 1988, 1992a, 1992b; Härdtle & Wells 1992; Pott 1992, 1995; Pallas 1996, 2000, 2003; Härdtle *et al.* 1997). The knowledge of the ecology of acidophilous oak forests was also highly insufficient, in many aspects.

That is why the major objectives of this study were:

(1) to analyse the variation of acidophilous oak forests (also known as mixed oak forests) in Wielkopolska and in neighbouring areas and precise separation of plant associations and syntaxa of lower rank, i.e. subassociations, variants, and geographic races;
(2) to map the distribution ranges of communities of this group in the study area;
(3) to document and systematize degenerated forms of the studied plant associations and substitute forest communities on their potential sites;
(4) to present floristic and general characteristics of other forest types with a high contribution of *Quercus*, because they are usually partly misidentified or considered as synonymous or combined into one group with acidophilous oak forests. This applies mostly to mixed coniferous forests from the class *Vaccinio-Piceetea* (*Querco roboris-Pinetum*, "*Pino-Quercetum*"), as well as thermophilous oak forest *Potentillo albae-Quercetum* and acidophilous forms of oak-hornbeam forest *Galio sylvatici-Carpinetum* from the class *Querco-Fagetea*.

2. Natural and anthropogenic conditions allowing the development of oak forests

The present distribution and functioning of forest ecosystems including oak forests is obviously related to the earlier events that took place during the Holocene.

The Holocene history of vegetation (also its early stages) is relatively well studied in Poland, primarily thanks to numerous palynological studies. This chapter describes selected ecological processes (partly modified by human activity), which according to researchers have shaped oak forests in Central Europe or still affect their development.

Oak (*Quercus*) immigrated to Poland relatively early, about 9000 BP (Milecka *et al.* 2004). Linden (*Tilia*) appeared slightly later, whereas elm (*Ulmus*) was already present at that time. The gradual increase in frequencies of these trees and hazel (*Corylus*) lead to strong transformations of the earlier forest communities – dominated by birch (*Betula*) and pine (*Pinus*) – in the late Boreal and early Atlantic period. It is assumed that at that time, light-demanding (heliophilous) species started to decline, whereas earlier on they found favourable conditions under the sparse canopy of pine forests (Ralska-Jasiewiczowa 1999). According to Chytrý (1997), the present thermophilous oak forests are relicts of that time. In the early Atlantic period, *Quercus* played an important role in the vegetation of river valleys as well as in forests on poor soils, while *Tilia cordata* dominated on more fertile soils, later accompanied by beech (*Fagus sylvatica*) and hornbeam (*Carpinus betulus*). In areas with low precipitation, pine forests generally prevailed (Kalis *et al.* 2003).

Brzeg *et al.* (2001) regard acidophilous oak forests as an old type of forest ecosystem, formed as early as in the Atlantic period. In many publications, forests of the Atlantic period are described as tall and dense forest stands, which created a specific forest microclimate (Ralska-Jasiewiczowa 1999; Soepboer & Lotter 2009). Until recently, the forests were commonly believed to develop according to the gap-phase model (Watt 1947) or the cyclical model (Leibundgut 1959, 1978). Such a picture of forest ecosystem is described by the high-forest hypothesis (Bradshaw *et al.* 2003). This hypothesis does not explain, however, the relatively high frequency of the light-demanding *Quercus* as well as *Corylus*, observed also in the Atlantic period. Ralska-Jasiewiczowa (1999) reported that both *Q. robur* and *Q. petraea* could survive in unfavourable light conditions, according to its ecological spectrum, and occupied very wet or dry sites on sandy soils. A much more radical view was adopted by Vera (2000), who formulated the wood-pasture hypothesis, assuming that the landscape at that time was more similar to present-day parks or savannas. The landscape, initially shaped (without human interference) by large herbivores, i.e. deer, bison, aurochs, and wild horses, could be a mosaic of cyclically alternating natural pastures, shrub communities, and forests. A key role was attributed to spiny or thorny shrubs, which supposedly protected oak seedlings. Recent research has shown that currently *Quercus robur* populations can be naturally regenerated in north-western Europe in areas exposed to grazing by large herbivores, if protected by thorny thickets of *Prunus spinosa* (Bakker *et al.* 2004). However, results of research conducted in the Białowieża Forest indicate that such protection is not a necessary condition of effective regeneration of this species (Bobiec & Jaszcz 2010).

As noted by Birks (2005), the above-mentioned cycle of forest development roughly corresponds to the classic gap-phase model of Watt (1947). However, the wood-pasture hypothesis is distinguished by a larger scale of the phenomenon and by attribution of a major role to large herbivores rather than to natural processes of tree decline in the above-mentioned system. The wood-pasture hypothesis has aroused much interest also because of its potential importance for both current forest management and nature conservation in Europe (Kirby 2004; Birks 2005; Hodder *et al.* 2005).

Mitchell (2005), on the basis of palynological and other data from north-western Europe and eastern North America, rejected Vera's (2000) hypothesis, mostly because of the overestimated role of large herbivores. He advocated that forests at that time were less dense than believed previously, and animals grazing in them affected their function, but only human interference, rather than wild animals, could effectively change their spatial structure. Already earlier on, Ralska-Jasiewiczowa *et al.* (2003) suggested that the *Corylus-Quercus* vegetation is strongly related to Neolithic human activity. They noted that the *Corylus-Quercus* vegetation is probably the oldest anthropogenic shrub-forest community. Important palaeoecological arguments against the major assumptions of Vera's (2000) hypothesis were presented by Feijen (2003: 29). Many authors suggested that Neolithic human impact on forest structure, by means of livestock grazing, started in north-western Europe at least 6000 BP, while in south-eastern Central Europe, 7500 BP (Bergmeier *et al.* 2010).

Bradshaw *et al.* (2003) showed that both the above hypotheses, i.e. high-forest hypothesis and wood-pasture hypothesis, have many weak points and do not fully explain the function of forest ecosystems. Those authors indicated that fire was another important factor affecting the structure of forests at that time. This seems to be evidenced by the presence of charcoal in sediments even before the invasion of beech (*Fagus*) and spruce (*Picea*). Both the natural forest dynamics and fire, as well as the impact of large herbivores, could – according to those authors – create favourable conditions for regeneration of light-demanding trees and shrubs, such as *Quercus*, *Corylus* as well as *Pinus*. The importance of fire for long-term persistence of oak forests was shown by Abrams (1992) in eastern North America, as well as by Niklasson *et al.* (2002) in southern Sweden. Svenning (2002) assumed that fire and grazing by large herbivores were the major factors allowing the formation of open habitats in north-western Europe. However, according to Kuiters & Slim (2002), it is unlikely that fire was a factor generating the cycle of forest development in climatic conditions of Central Europe. According to those authors, also windthrows did not play any significant role, because of the relatively small spatial scope and low frequency of this phenomenon.

Quercus reached its maximum Holocene range between 4500 and 4000 BP, undoubtedly partly thanks to Neolithic people. Since 3500 BP, its frequency gradually decreased, while frequencies of *Fagus* and *Corylus* clearly increased (Milecka *et al.* 2004). Their spread is clearly related to human activity. Polish palynological data indicate that the expansion of *Fagus* was accelerated by climatic change in the Sub-Atlantic period, about 2500 BP (Ralska-Jasiewiczowa *et al.* 2003). The expansion of *Carpinus* was clearly associated with the decline of Lusatian culture (about 2500 BP). Slightly later or at the same time, in similar anthropogenic conditions in north-western Poland, oak forests were replaced by beech forests (Ralska-Jasiewiczowa 1999; Latałowa *et al.* 2004). Ralska-Jasiewiczowa (1999) reported that the present forests dominated by *Carpinus*, as well as acidophilous beech forests and beech-oak forests in north-western Poland, should be classified as anthropogenic communities in the historical sense.

The mechanism shaping the Holocene range of *Fagus* was a subject of many publications, reviewed recently by Tinner & Lotter (2006). Out of the 5 alternative hypotheses explaining the expansion of *Fagus*, those authors favour the view that at least in southern Central Europe its range of distribution was shaped by climatic conditions. Those authors and Zerbe (2004) considered also contrasting opinions of some researchers, who believed that its expansion was mostly due to human activity. It is believed that *Fagus* is still expansive and continuously extends its range northwards and eastwards (Kielland-Lund 1993; Latałowa *et al.* 2004; Czajkowski *et al.* 2006; Bolte *et al.* 2007; Sułkowska *et al.* 2008). The part of the eastern range limit of *Fagus* that crosses Poland, is probably not conditioned by the climate but by history (Matuszkiewicz J. M. 2001a). Svenning & Skov (2004) report that most of European tree species have not reached the limits of their potential climatic ranges.

The present beech forests in Europe, as well as oak-hornbeam forests and acidophilous oak forests, are commonly regarded as zonal natural communities, conditioned by climate and constituting units of potential natural vegetation (Matuszkiewicz W. *et al.* 1995; Ellenberg 1988; Hannon *et al.* 2000; Matuszkiewicz W. 2001, 2003). A vast majority of forest communities of Poland have the same status, i.e. are regarded as natural communities (Ratyńska *et al.* 2010). However, Bobiec & Jaszcz (2010), who studied natural regeneration of *Quercus robur*, suggested that patches of subcontinental oak-hornbeam forest *Tilio-Carpinetum* in the Białowieża Forest may derive from some relict, culturally conditioned oak forests. Many authors emphasize that as a result of strong human impact in the last 5000 years, no primeval plant communities have been preserved in Europe (Peterken 1996; Vera 2000).

The distribution range of acidophilous oak forests from the order *Quercetalia roboris*, covers the western and central Europe, in a wider classification including also some parts of Belarus, Russia, and Ukraine (Cross *et al.* 2003). It is dominated by the expansive *Fagus* and *Carpinus*, which form shaded forest stands (see Peterken 1996: Fig. 3.1). *Fagus* within its natural range is highly competitive and outcompetes also the coexistent *Carpinus*. However, *Carpinus* is highly competitive on mesotrophic and thermophilous sites located outside the natural range of *Fagus*. Both *Q. robur* and *Q. petraea* in natural conditions, grow slower and thus are subsequently shaded by both *Fagus* and *Carpinus*. Grazing by herbivores is commonly believed to be an important factor eliminating the self-sown seedlings of *Quercus* (Danielewicz & Pawlaczyk 2006), but some studies cited by Bobiec & Jaszcz (2010) indicate that its significance in some cases may be overestimated. Additionally, interactions between roots play a role in the competition between *Fagus* and *Quercus,* so that on poorer sites *Fagus* clearly prevails (Leuschner *et al.* 2001). On fertile sites, fine root weight of *Quercus petraea* tends to be reduced in the presence of roots of both *Fagus* and *Carpinus* (Rewald & Leuschner 2009). Reif & Gärtner (2007) reported that effective natural regeneration of *Quercus robur* and *Q. petraea* is very rare, conditioned by a combination of several factors. It takes place in less dense forest stands with a low ground layer.

Results of many studies suggest that, in recent decades, *Quercus* has been replaced by more shade-tolerant trees: *Acer*, *Fagus*, and *Tilia*. In this process, *Fagus* plays a major role, particularly on poorer sites. This phenomenon is observed not only in Europe but also in North America (Taylor & Lorimer 2003). Usually it is interpreted as a symptom of regeneration of forest ecosystems previously disturbed by human activity (Mountford *et al.* 1999; Timbal & Aussenac 1996; Zerbe 2004; von Oheimb *et al.* 2007; Rüther & Walentowski 2008). The heliophilous nature of *Quercus* was the basic argument used by Timbal & Aussenac (1996), who suggested that oak forests are not climax communities in French lowlands, and the higher percentage contribution of *Quercus* is caused there by both modern forest management and historical forest use. Those authors noted, however, that in some locations, climax oak forests can be found, composed of *Quercus robur* (valley of the river Saône) or *Q. petraea* (central France). Both the species, considering their dynamic trends, are classified as postpioneers, i.e. an intermediate group between pioneers, appearing early, and dryads, appearing in late seral stages (Rameau *et al.* 1989, cited by Falińska 1997: 357).

According to latest research, beech forests prove to have a wider ecological spectrum than assumed until recently, and may constitute units of potential natural vegetation of some site types, earlier classified as potential sites of the fertile and humid sub-Atlantic oak-hornbeam forest *Stellario-Carpinetum*, poor birch-oak forest *Betulo-Quercetum*, or even dry, thermophilous oak forests (Leuschner 1997). Nevertheless, Pott (2000) emphasizes that extremely poor sites in north-western Europe are free from *Fagus*. According to that author, they are covered by birch-oak forests from the class *Quercetea roboris*, which are probably an endemic European vegetation type. A similar view was expressed earlier by van der Werf (1991), who suggested also that other forests, dominated by *Quercus*, occupy the sites of beech forests. This results from coppicing, which was very common in the past and favoured oak trees. According to that author, e.g. on more fertile sites, the sub-Atlantic oak-hornbeam forest *Stellario-Carpinetum* substitutes for the fertile lowland beech forest *Melico-Fagetum*, while the poorer sites of acidophilous beech forest *Luzulo-Fagetum* are occupied by the submontane acidophilous oak forest *Luzulo-Quercetum* or, if the sites are more degraded, by the sessile oak-birch forest *Querco petraeae-Betuletum*. Härdtle *et al.* (2005) claim that *Quercus* dominates in patches of *Betulo-Quercetum* mostly because it is favoured by forest management. Some authors suggest that raking of leaf litter, as well as livestock grazing in forests on poor soils, at least locally, has lead to irreversible soil disturbance, through leaching of nutrients, podzolization, and as well as increase in aluminium content. In such conditions, beech forests were replaced by the sub-climax communities of sub-Atlantic pine forest *Leucobryo-Pinetum* on very poor and periodically dry soils or by pine-oak forests of the alliance *Quercion robori-petraeae* on somewhat more fertile soils (Walentowski & Scheuerer 2004).

The increased percentage contribution of *Fagus* in the regenerating forests results in shading of the forest floor. This leads to elimination of the relatively heliophilous species, typical for acidophilous oak forests, and the whole community is transformed into acidophilous beech forests. Such spontaneous changes in vegetation are observed also in patches of sub-Atlantic acidophilous oak forest *Fago-Quercetum.* According to Jahn (1984), this indicates that this community is not natural and occupies potential sites of poor beech forest *Deschampsio-Fagetum* (=*Luzulo pilosae-Fagetum*). Recently, a decline of patches of the association *Fago-Quercetum* was observed also in north-western Poland, where it was replaced in many areas by *Luzulo pilosae-Fagetum* (Matuszkiewicz J. M. 2007a).

A widely held view is that *Quercus* was favoured by humans for centuries. This was largely due to a specific type of forest use, known as coppice-with-standards, initiated in the Middle Ages (Ellenberg 1988: 27). Such forests were composed of scattered tall trees (standards), and of much lower, regularly coppiced trees and shrubs. They were sources of brushwood (used as fuel), timber, and acorns for pigs, which were commonly reared at that time (Machar 2009). As emphasized by Ellenberg (1988), mostly *Quercus* was allowed to grow on (as the standards), since it performed best the last 2 of the above-mentioned functions of the forests, whereas *Fagus* was discriminated, as it was less useful. In the past, the common use of coppicing favoured *Carpinus*, *Tilia*, *Acer*, *Fraxinus*, and *Corylus*. It was less favourable for *Quercus*, and completely unfavourable for *Fagus*, and caused a large decrease in abundance of this tree species (Ellenberg 1988).

The value of oak forest stands was estimated on the basis of the number of pigs that could be supported by them (Broda 2006; Danielewicz & Pawlaczyk 2006; Modrzyński *et al.* 2006, and literature cited therein). There is much less information on a similar use of beech forests (Björkman 1997). Earlier on, acorns were also consumed by people. Kooistra (2008) considered it as proven that in the Bronze and Iron Ages, acorns were collected, stored, and used as human food. The high value of *Quercus* for people in the past is best evidenced by the fact that this tree was protected in Poland as early as in 1347, by the Wiślica Statutes, which was one of the first collections of laws issued in Poland (Broda 2006).

The observed decrease in the percentage contribution of *Quercus* in European forests is related to the phenomenon of oak decline, initiated nearly 300 years ago. In the last few decades, the phenomenon was confirmed in nearly the whole distribution range of *Q. petraea* and *Q. robur*, and is described in many publications (Thomas *et al.* 2002). In Poland, as reported by Ceitel (2007), on the basis of published literature, large-scale oak-decline was recorded as late as in the 1930s and 1940s, initially in the so-called Krotoszyn Plateau. The current knowledge on oak decline was recently reviewed by Modrzyński *et al.* (2006), who favoured the view of many authors, indicating that there are many causes of this phenomenon. Thomas *et al.* (2002), in a model representing acidic sites (pH in H_20 ≤ 4.2) in Central Europe, showed that oak decline results from an interaction of biotic and abiotic factors.

It is usually preceded by severe defoliation of the trees in 2 successive years, caused by insect foraging combined with extreme weather conditions, e.g. summer drought and/or severe frost in winter or spring. Additional factors deteriorating the condition of *Quercus robur*, in particular, include water deficit as well as an increased deposition of nitrogen compounds. Those authors noted also that on less acidic soils, oak decline may be caused by pathogenic fungi of the genus *Phytophthora*.

The above data indicate that acidophilous oak forests decline within the range of *Fagus*. One of the major reasons of this phenomenon is the expansion of *Fagus*, which at least partly reflects the regeneration of natural vegetation, disturbed earlier by human activity. It is also noteworthy that the largest patches of oak forests are distributed in Europe outside the natural range of *Fagus*, i.e. in north-western Spain and Portugal, south-western France, Ireland, Great Britain, Poland, Belarus, as well as in northern Ukraine (Barbati *et al.* 2007: 50).

Oak forests located east of the limits of distribution of *Fagus*, particularly in northern Ukraine and adjacent parts of Belarus, as well as Russia, are particularly important for assessing the range of site variation and dynamics of acidophilous oak forests from the order *Quercetalia roboris* throughout their distribution range. As late as in the last few years, researchers documented there some plant communities including *Quercus* and representing mixed coniferous forests from the class *Vaccinio-Piceetea* or acidophilous oak forests from the order *Quercetalia roboris*. According to various authors, some of the plant communities found there can be identified as syntaxa known from Central Europe, while others are novel associations (Goncharenko 2001; Didukh *et al.* 2003; Onyshchenko *et al.* 2003; Vorobyov 2003; Yuglichek & Onyshchenko 2003; Onyshchenko 2006; Shelyag-Sosonko *et al.* 2008; Solomakha 2008; Semenishchenkov 2009). This issue will be discussed in detail on pp. 24-25). This means that those countries broaden the distribution range of acidophilous oak forests, within the borders defined already earlier by Cross *et al.* (2003, see also Barbati *et al.* 2007). According to Tüxen (cited by Géhu 1975: 86), their range included only Central and West Europe, and extended from north-western Spain, Ireland, southern Scandinavia, southern Finland, Poland, and northern Balkans. Outside the range of *Fagus*, the major competitor of *Quercus* is *Carpinus*. Its invasion is most probably a direct cause of oak decline in the Białowieża Forest (Faliński 1986; Kwiatkowska 1986, 1996; Kwiatkowska & Wyszomirski 1988, 1990). A similar situation was observed in patches of thermophilous oak forest located in other parts of Poland (Jakubowska-Gabara 1993). In the Białowieża Forest, the success of *Carpinus* probably results from a change in the impact of large herbivores (Kwiatkowska 1996). Little is known about the possibility of expansion of *Carpinus* to patches of acidophilous oak forests. However, as evidenced by patches of acidophilous hornbeam-oak forest *Aulacomnio androgyni*-*Quercetum roboris*, and the relatively high frequency of *Carpinus* in some forms of Central European acidophilous oak forest *Calamagrostio arundinaceae-Quercetum* (Brzeg *et al.* 2001), acidic sites are no barrier for the expansion of this species. The much lower threat posed by this species, as compared with *Fagus*, may result from the influence of forest management. In modern forestry, *Carpinus* is tolerated at best. In many situations, if it only potentially threatens the regeneration of favoured trees (i.e. usually *Quercus*), it is regarded as a weed and felled.

When predicting the future contribution of *Quercus* to European forests, 2 particularly important factors need to be taken into account: climate change and the possibility of *Quercus* regeneration under the canopy of planted pine forests.

The observed climate change, generally leading to its continentalization in West and Central Europe, are not favourable for *Fagus*. That is why some authors assume that in West Europe its competitiveness will decrease (Rennenberg *et al.* 2004). That hypothesis was questioned, partly because of factual errors (Ammer *et al.* 2005), but the transformations of forest vegetation caused by climate change are investigated also by other researchers. Franke & Köstner (2007) suggest that the noticeable decrease in precipitation during the growing season in the last 50 years, and the probable persistence of this trend, must be taken into account when constructing maps of potential natural vegetation. Those authors assume that the contribution of oak forest will increase at the expense of beech forest. This contradicts the above-mentioned views of Leuschner (1997). If temperature increases and precipitation declines in the northern part of West Europe, *Carpinus* may start to be more competitive in relation to *Fagus* (Lawesson *et al.* 2004).

For several decades, spontaneous regeneration has been observed in pine stands (Sokołowski & Paluch 2003, cited by Modrzyński *et al.* 2006). This process – conditioned mostly by birds, which disperse acorns – may lead to formation of high-quality mixed forest stands (Modrzyński *et al.* 2006). Considering the large total area of potential sites of acidophilous oak forests occupied currently by pine monocultures, this phenomenon may play a major role in regeneration of these ecosystems.

When considering the potential for *Quercus* regeneration, a recent study by Bobiec and Jaszcz (2010) is particularly noteworthy. In senile spruce stands in the Białowieża Forest, those authors found that very numerous oak seedlings develop from acorns dispersed mostly by jays on various sites, ranging from the fertile potential sites of deciduous forest to the relatively poor potential sites of mixed coniferous forest. However, the developing oak trees can dominate the tree layer only at the poorer sites. This result confirms the much earlier observations made by Paczoski (1930: 415), who noted that oak stands in the Białowieża Forest can be formed more easily on sites similar to those of coniferous forests than on those classified as potential sites of oak-hornbeam forest. In patches of *Tilio-Carpinetum*, oak seedlings quickly die, as they are outcompeted by the numerous self-sown seedlings of the shade-tolerant *Tilia* and *Carpinus*. Bobiec & Jaszcz (2010) evidenced that *Quercus* is regenerated most numerously along fallen spruce trees. Those authors suggest that fallen logs do not offer any mechanical protection against grazing by herbivores, as it was assumed earlier. Their neighbourhood seems to be preferred by jays, which tend to store their acorns there. The highest and most numerous oak seedlings were usually accompanied by light-demanding grass species: *Calamagrostis arundinacea* and *Molinia caerulea*. The cited authors emphasize that this seems to contradict the common belief that both the plant species have a negative effect on oak regeneration. Modrzyński *et al.* (2006), referring to a study by Krahl-Urban (1959), mentioned also by Bobiec & Jaszcz (2010), reported that natural *Quercus* regeneration is not possible without special sylvicultural practices if the ground layer is dominated by *Pteridium aquilinum*, *Sarothamnus scoparius*, *Calamagrostis* sp., as well as *Molinia caerulea*.

The research results presented above attest to a high regenerative potential of *Quercus* primarily on poorer sites. An effective use of this potential in forest management or in protected areas is of major importance for preservation and regeneration of the existent oak forests, as well as for reconstruction of those that no longer exist.

3. Study area

The geographic boundaries of the Wielkopolska region are sometimes differently defined by various authors (for a review, see Krygowski 1961; Bartkowski 1970; Kondracki 1978; Jackowiak *et al.* 2007). In the present study, its boundaries (Figs. 2 and 3) follow the description of Wojterski (in Brzeg *et al.* 1989): the Toruń-Eberswalde Glacial Valley (Pradolina Toruńsko-Eberswaldzka, also known as Pradolina Noteci) in the north; the rivers Obra and Obrzyca and the depression

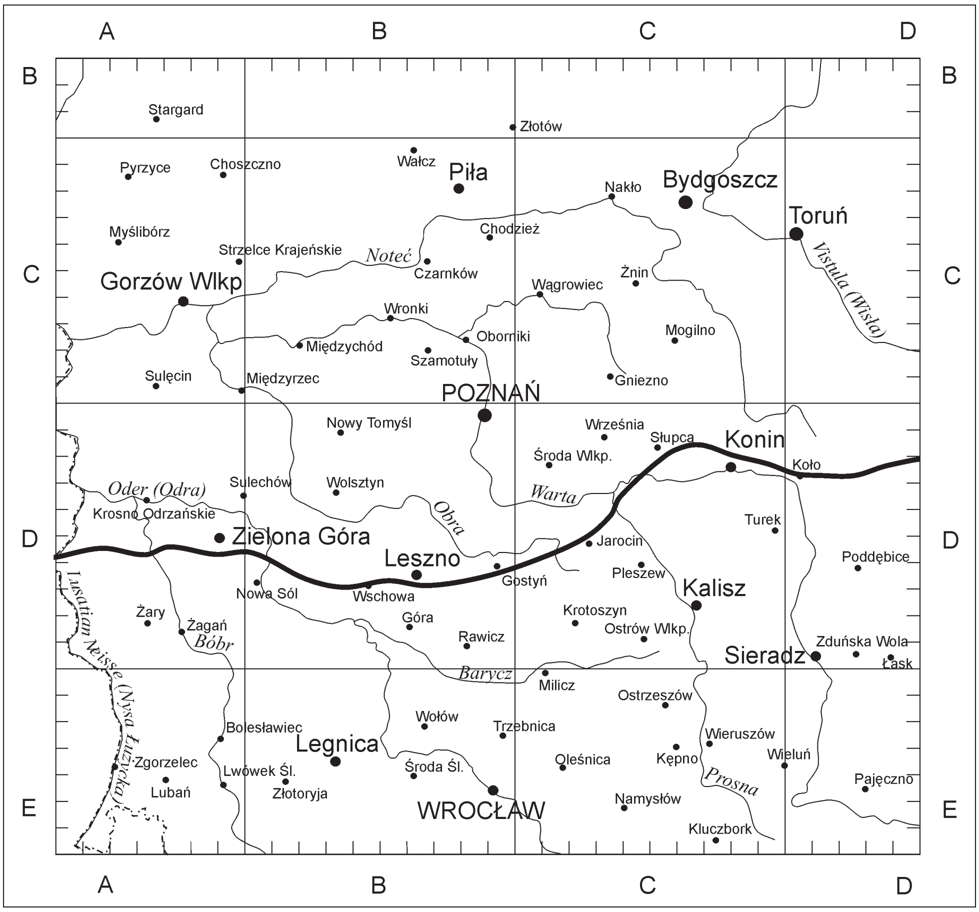

Fig. 2. Map of the study area, against the background of the ATPOL grid (10 km × 10 km). The boundary of Vistulian glaciation after Gilewska (1999)

of Lake Sławskie in the west; edges of the Łódź Hills (Powyże Łódzkie, between the towns of Grabów and Warta) in the southeast; meridional section of the river Warta (to the town of Koło) and the upper section of the river Noteć (to the town of Nakło) in the east (see also Brzeg *et al.* 1989). Such limits have been adopted also in many other research projects. Only slight corrections were made here to include rich materials documenting the studied group of forest communities near the boundaries described above. This applies mostly to relevés from the Trzebnica Ridge (Wał Trzebnicki), delimiting Wielkopolska in the south (Fig. 3, 4d – macroregion 318.4). Taking into account this correction, nearly all localities of the relevés analysed here (Fig. 3) are within the geographic boundaries of Wielkopolska designated by Jackowiak *et al.* (2007), who presented a more detailed environmental description of this region.

With respect to geomorphology, Wielkopolska includes 2 clearly separated parts (Krygowski 1961; Kondracki 1998). The southern part, shaped by the South Polish glaciation (= Saalian), is bordered in the south by hills of the Trzebnica Ridge (Wał Trzebnicki, Fig. 4d – macroregion 318.4; Fig. 4b – Podkraina B4b: Okręgi 10, 13, and 14). These hills reach a relative height of 100-150 m, with culminations exceeding 250 m a.s.l., and are regarded as a limit of the Warta stadial. The southern limit of the northern part, shaped by the Vistulian glaciation (= Weichselian) is less well-defined in the field (Fig. 2).

The climate of Wielkopolska (like the climate of Poland in general) is intermediate between temperate oceanic climate in the west and temperate continental climate in the east. Temperatures are the highest (annual mean > 8.2°C) in the western and south-western parts, while the lowest (annual mean > 7.6°C) in the north-eastern part of the Wielkopolska Lowland (Fig. 5). Precipitation is relatively low in the Wielkopolska region, but the highest (> 600 m) in the southern and south-western parts, while the lowest (< 500 m) in central and eastern parts of the study area (Fig. 6).

The variation in environmental conditions is multifactorial, which is illustrated well by the maps comparing the main Polish systems of regionalization of the study area (Fig. 4). Most of the study area lies within the Wielkopolska-Kujawy Region (Kraina Wielkopolsko-Kujawska, Fig. 4a), the Brandenburg-Wielkopolska Division (Dział Brandenbursko-Wielkopolski, Fig. 4b), the Wielkopolska-Pomeranian Region (Kraina Wielkopolsko-Pomorska, Fig. 4c), and the South Baltic Lakeland Subprovince (Podprowincja Pojezierza Południowobałtyckie, Fig. 4d).

Its above-mentioned location in the intermediate climatic zone is reflected also in features of geographic regions distinguished by J. M. Matuszkiewicz (1993).

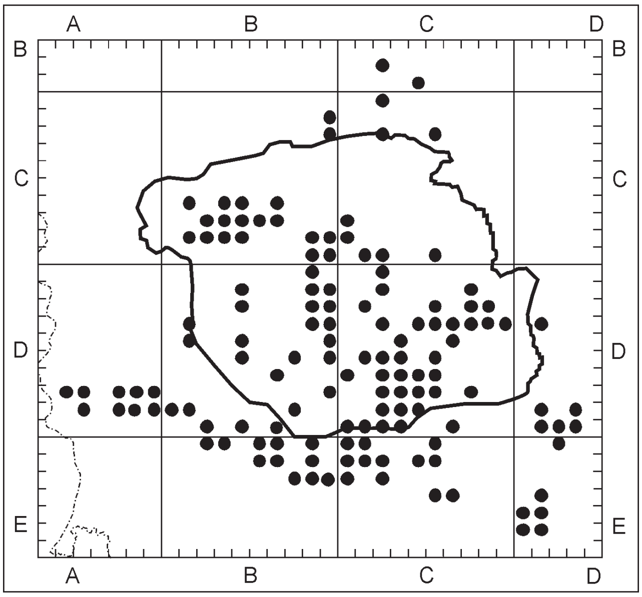

Fig. 3. Location of study sites, comprising the analysed relevés, within the ATPOL grid (10 km × 10 km). The curve indicates the boundary of the Wielkopolska region

On the basis of potential natural vegetation, the cited author showed that the Central Wielkopolska Region and Kujawy Region (B2 and B3, Fig. 4b) have the smallest contributions of the Atlantic element and the largest contributions of the continental element. All the geobotanical units located within the study area have similar contributions of the Central European element, which are larger there than further east.

Oak forest stands are not evenly distributed in the study area. They are concentrated in the south, where some districts (Dzielnice) and mesoregions (according to the regionalization of Trampler *et al.* 1990) rank very high on the scale of Poland in respect of areal contribution of oak forests (Fig. 7, Ceitel 2006). These include the Krotoszyn District (Dzielnica Krotoszyńska, III.8), and, outside the study area, 2 mesoregions of the Silesian Region (Kraina Śląska): the Wrocław Plain (Równina Wrocławska, V.2.e) and Sudetes Foothills (Przedgórze Sudeckie, V.3.a) (Fig. 4c). The Krotoszyn District comprises the largest of 6 Polish aggregations of the most valuable oak forest stands on the scale of Central Europe (Sabor 1993). Among them, as much as 3700 hectares are more than 100-year-old (Ceitel 2006). They are located on the so-called Krotoszyn Plateau, between the towns of Krotoszyn, Gostyń, Jarocin, Pleszewo, and Ostrów Wielkopolski (see Fig. 2). Its vegetation has been described in many articles (Szulczewski 1951; Jelinowski 1958; Krotoska & Piotrowska 1962; Brzeg *et al.* 1989, 2000a, 2001; Borysiak *et al.* 1992; Brzeg 1995; Czarna 1999, Pawłowski 2001). The first description of oak forest stands of the Krotoszyn Plateau was presented by Krahl-Urban (1943). Its natural environment is protected as a Landscape Protection Area (see

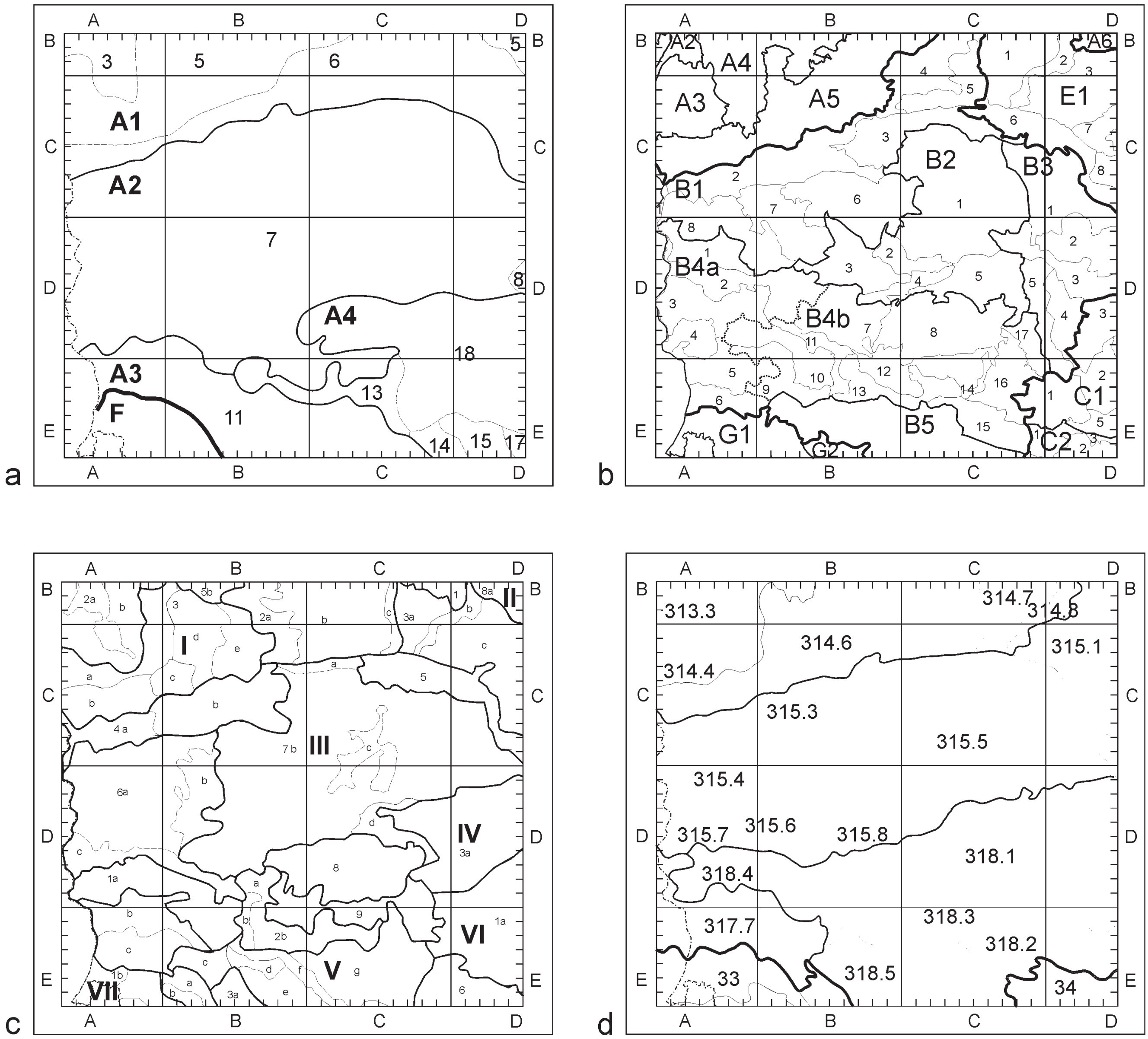

Fig. 4. Various regionalizations of Poland, against the background of the ATPOL grid

a) Geobotanical division (Szafer 1972): A – Dział Bałtycki; A1 – Poddział Pas Równin Przymorskich i Wysoczyzn Pomorskich, with subunits (Krainy), 3 – Nizina Szczecińska, 5 – Pojezierze Pomorskie, 6 – Pomorski Południowy Pas Przejściowy; A2 – Poddział Pas Wielkich Dolin, with subunits (Krainy), 7 – Wielkopolsko-Kujawska, 8 – Mazowiecka; A3 – Poddział Pas Kotlin Podgórskich, with subunit (Kraina), 11 – Kotlina Śląska; A4 – Poddział Pas Wyżyn Środkowych, with subunits (Krainy), 13 – Wzgórza Trzebnicko-Ostrzeszowskie, 14 – Wyżyna Śląska, 15 – Wyżyna Krakowsko-Wieluńska, 17 – Świętokrzyska, 18 – Północne Wysoczyzny Brzeżne; F – Dział Sudety

b) Geobotanical regionalization (J. M. Matuszkiewicz 2008a): A – Dział Pomorski; B – Dział Brandenbursko-Wielkopolski, B.1 – Kraina Notecko-Lubuska, with subunits (Okręgi), 1 – Kotlina Frainwaldzka, 2 – Bory Noteckie, 3 – Chodzieski, 4 – Złotowsko-Chojnicki, 5 – Nakielski, 6 – Poznański, 7 – Międzyrzecko-Nowotomyski, 8 – Pojezierze Łagowskie, B.2 – Kraina Środkowowielkopolska, with subunits (Okręgi), 1 – Pojezierze Gnieźnieńskie, 2 – Kórnicko-Miłosławski, 3 – Kościańsko-Opalenicki, 4 – Wzgórza Żerkowskie, 5 – Jarocińsko-Rychwalski, B.3 – Kraina Kujawska, with subunits (Okręgi), 1 – Czarnych Kujaw, 2 – Kutnowski, 3 – Łęczycki, 4 – Sieradzko-Uniejowski, 5 – Burzeniński, B.4. Kraina Południowowielkopolsko-Łużycka, B.4a – Podkraina Łużycka, with subunits (Okręgi): 1 – Puszcza Rzepińska, 2 – Kotlina Środkowej Odry, 3 – Zielonogórsko-Gubiński, 4 – Wzgórza Żarsko-Trzebielskie, 5 – Bory Dolnośląskie, 6 – Bolesławiecko-Zgorzelecki, B.4b – Podkraina Południowowielkopolska, with subunits (Okręgi), 7 – Wysoczyzna Leszczyńska, 8 – Wysoczyzna Kaliska, 9 – Szprotawsko-Prochowidzki, 10 – Wzgórza Dalkowskie, 11 – Nadodrzańskie Kotliny Ścinawsko-Głogowskie, 12 – Dolina Baryczy, 13 – Wzgórza Trzebnickie, 14 – Wzgórza Ostrzeszowskie, 15 – Byczyńsko-Rychtalski; 16 – Dolina Górnej Prosny, 17 – Błaszkowski, B.5. Kraina Dolnośląska; C – Dział Wyżyn Południowopolskich, C.1 – Kraina Wysoczyzn Łódzko-Wieluńskich, with subunits (Okręgi), 1 – Wieluńsko-Złoczewski, 2 – Szczercowsko-Łaski, 3 – Zduńskowolsko-Strykowski, 5 – Tomaszowsko-Pajęczański, C2 – Kraina Wyżyn Środkowomałopolskich, with subunits (Okręgi), 1 – Praszecko-Działoszyński, 2 – Olesko-Częstochowski, 3 – Niecka Włoszczowska; E – Dział Mazowiecko-Poleski; E.1 – Kraina Chełmińsko-Dobrzyńska, with subunits (Okręgi), 1 – Wysoczyzna Świecka, 2 – Dolina Dolnej Wisły, 3 – Pojezierze Chełmińskie, 6 – Nadwiślański Włocławsko-Bydgoski, 7 – Rypiński, 8 – Dobrzyńsko-Skępski; G – Dział Sudecki

c) Forest regionalization (Trampler *et al*. 1990): I – Kraina Bałtycka; II – Kraina Mazursko-Podlaska; III – Kraina Wielkopolsko-Pomorska, 1 – Dzielnica Borów Tucholskich, 2 – Dzielnica Pojezierza Krajeńskiego, with mesoregions, a – Równina Wałecka, b – Wysoczyzna Krajeńska, c – Dolina Brdy, 3 – Dzielnica Pojezierza Chełmińsko-Dobrzyńskiego, with mesoregions, a – Wysoczyzna Świecka, b – Kotlina

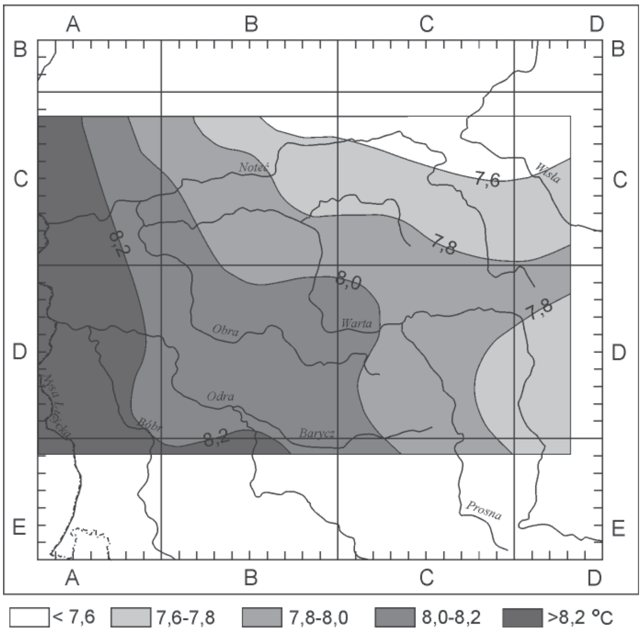

Fig. 5. Mean annual air temperature in Wielkopolska in 1951-1980 (according to Woś 1994)

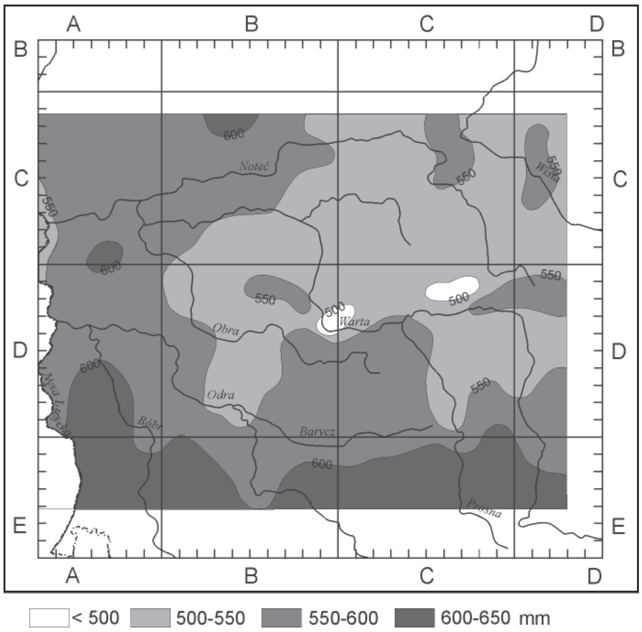

Fig. 6. Mean annual precipitation in Wielkopolska in 1951-1980 (according to Woś 1994)

Borysiak *et al*. 1991), and several years ago it also became a Special Area of Conservation „Dąbrowy Krotoszyńskie" (PLH300002) within the Natura 2000 network (Brzeg *et al*. 2002a, 2002b).

4. Materials and methods

This study is based on 1655 relevés from Wielkopolska and adjacent areas. The methodological justification of the scope of research is presented in the introduction. The analysed database includes all relevés (without any prior selection) diagnosed by their authors as acidophilous oak forests from the class *Quercetea robori-petraeae* or from the order *Quercetalia roboris* (at least at the rank of community, including substitute forest communities); mixed coniferous forests from the class *Vaccinio-Piceetea* (including those classified as *Festuco ovinae-Pinetum*, *Pino-Quercetum* or *Querco roboris-Pinetum*); or thermophilous oak forest (identified as *Potentillo albae-Quercetum* or its synonyms) and substitute forest communities on its potential sites. Similar criteria were applied to oak-hornbeam forests, but they were limited here to those classified in the literature as their acidophilous forms, i.e. the *Galio sylvatici-Carpinetum* (*Querco-Carpinetum*) *holcetosum*, *Gs-C* (*Q-C*) *calamagrostietosum* or *Gs-C* (*Q-C*) *polytrichetosum*. On the basis of results of synoptic tables of Krotoska (1966) as well as W. Matuszkiewicz and

Grudziądzka, c – Wysoczyzna Dobrzyńsko-Chełmińska, d – Równina Urszulewska, 4 – Dzielnica Kotliny Gorzowskiej, with mesoregions, a – Pradolina Warty, b – Puszcza Notecka, 5 – Dzielnica Kotliny Toruńsko-Płockiej, 6 – Dzielnica Pojezierza Lubuskiego, with mesoregions, a – Ziemia Lubuska, b – Równina Nowotomysko-Kargowska, c – Pradoliny Głogowskiej, 7 – Dzielnica Niziny Wielkopolsko-Kujawskiej, with mesoregions, a – Dolina Środkowej Noteci, b – Pojezierze Wielkopolskie, c – Sandry Gnieźnieńskie, d – Dolina Konińska, 8 – Dzielnica Krotoszyńska, 9 – Dzielnica Kotliny Żmigrodzko-Grabowskiej; IV – Kraina Mazowiecko-Podlaska, 3 – Dzielnica Równiny Warszawsko-Kutnowskiej, with mesoregion, a – Wysoczyzna Kłodawsko-Turecka; V – Kraina Śląska, 1 – Dzielnica Równiny Dolnośląskiej, with mesoregions, a – Wzgórza Dalkowskie, b – Bory Dolnośląskie, c – Pogórze Nowogrodzkie, 2 – Dzielnica Wrocławska, with mesoregions, a – Obniżenie Ścinawskie, b – Wzgórza Trzebnicko-Ostrzeszowskie, c – Legnicki, d – Wysoczyzna Średzka, e – Równina Wrocławska, f – Pradolina Wrocławska, g – Równina Oleśnicka, Przedgórze Sudeckie, and Płaskowyż Głubczycki; VI – Kraina Małopolska, 1 – Dzielnica Łódzko-Opoczyńska, 6 – Dzielnica Wyżyny Woźnicko-Wieluńskiej; VII – Kraina Sudecka

d) Physical-geographic division (Kondracki & Rychling 1994), 31 – Prowincja Niż Środkowoeuropejski, 313 – Podprowincja Pobrzeża Południowobałtyckie, with makroregion, 313.3 – Pobrzeże Szczecińskie, 314-315 – Podprowincja Pojezierza Południowobałtyckie, with macroregions, 314.4 – Pojezierze Zachodniopomorskie, 314.6-7 Pojezierze Południowopomorskie, 314.8 – Dolina Dolnej Wisły, 315.1 – Pojezierze Chełmińsko-Dobrzyńskie, 315.3 – Pradolina Toruńsko-Eberswaldzka, 315.4 – Pojezierze Lubuskie, 315.5 – Pojezierze Wielkopolskie, 315.6 – Pradolina Warciańsko-Odrzańska, 315.7 – Wzniesienia Zielonogórskie, 315.8 – Pojezierze Leszczyńskie; 317 – Podprowincja Niziny Sasko-Łużyckie, with macroregions, 317.2. – Obniżenie Dolnołużyckie, 317.4 – Wzniesienia Łużyckie, 317.7 – Nizina Śląsko-Łużycka; 318 – Podprowincja Niziny Środkowopolskie, with macroregions, 318.1-2 – Nizina Południowowielkopolska, 318.3 – Obniżenie Milicko-Głogowskie, 318.4 – Wał Trzebnicki, 318.5 – Nizina Śląska; 33 – Prowincja Masyw Czeski; 34 – Prowincja Wyżyny Polskie

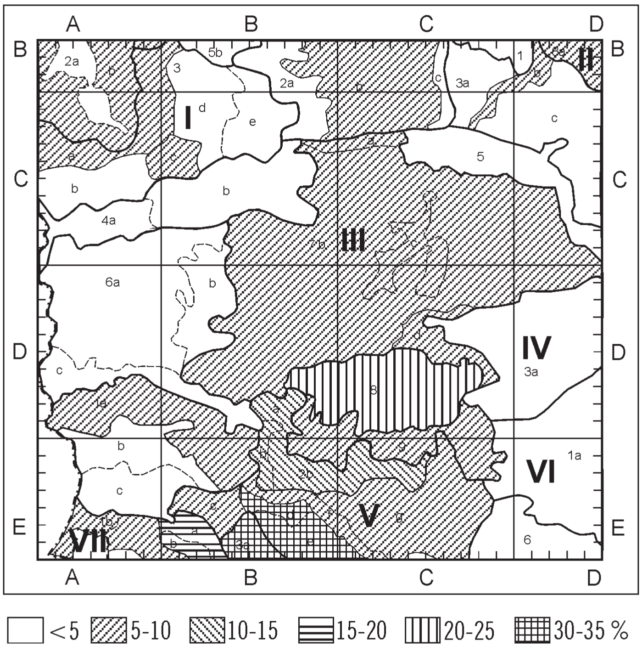

Fig. 7. Area of oak forest stands in mesoregions of the forest regionalization of Trampler *et al.* (1990), modified from Ceitel (2006) Explanations: see Fig. 4c

A. Matuszkiewicz (1985), it is assumed here that other subassociations of oak-hornbeam forests form a floristically well-defined group, clearly distinct from acidophilous oak forests. Acidophilous forms of oak-hornbeam forests were also selected from the tables of the association where no syntaxa of lower rank were identified. Additionally, communities that did not fit within the hierarchic system were taken into account. Their relevés were added to the database if their species composition was similar to the syntaxa listed above. All the relevés included in the database were recorded according to the classic method of Braun-Blanquet (1964), with 7 classes of cover-abundance (5 = cover >75%; 4 = 50-75%; 3 = 25-50%; 2 = 5-25%; 1 = numerous or scattered, but cover <5%; + = few, with small cover; and r = rare, solitary, with small cover). The relevés were extracted from 59 publications (40 of them contributing 69% of all relevés) and from unpublished works listed below. The numbers given in round brackets help to identify the relevés in the analytic tables presented here.

List of sources of the 1655 relevés analysed in this study. Numbers of relevés extracted from individual sources are given in square brackets

(1) Balcerkiewicz *et al.* 1994 [14]; (2) Berdowski & Kwiatkowski 1992 [9]; (3) Błachuta 1995 [4]; (4) Boiński 1973 [56]; (5) Borysiak *et al.* 1998 [5]; (6) Brzeg 1989 [7]; (7) Brzeg 2004 [20]; (8) Brzeg 2006 [3]; (9) Brzeg & Kasprowicz 2001 [3]; (10) Brzeg *et al.* 1989 [33] (11) Brzeg *et al.* 2000a [25]; (12) Brzeg *et al.* 2001 [123]; (13) Brzeg *et al.* 2000b [2]; (14) Fabiszewski & Faliński 1967 [11]; (15) Ferchmin 1966 [22]; (16) Ferchmin 1980 [35]; (17) Gmaj 1997 [40]; (18) Hegenbart-Magdans & Brzeg 1999 [69]; (19) Jakubowska-Gabara 1994 [46]; (20) Jaroszewska 2007 [34]; (21) Jelinowski 1958 [30]; (22) Kaczyńska 1964 [15]; (23) Kamionka 1971 [28] (24) Kasprowicz 2006 [29]; (25) Klimko *et al.* 2003 [1]; (26) Krotoska 1966 [25]; (27) Krotoska 1978 [29]; (28) Krotoska 1983 [4]; (29) Krotoska 1991 [43]; (30) Krotoska & Piotrowska 1962 [39]; (31) Kubiś 1982 [20]; (32) Kulińska 1991 [5]; (33) Kuświk *et al.* 1999 [1]; (34) Lisiewska & Reszel 2000 [5]; (35) Macicka 1984 [67]; (36) Macicka & Wilczyńska 1990 [83]; (37) Macicka & Wilczyńska 1991 [64]; (38) Macicka & Wilczyńska 1992 [20]; (39) Macicka-Pawlik & Wilczyńska 1996 [26]; (40) Maciejewska-Rutkowska *et al.* 2001 [2]; (41) Marcysiak 2001 [13]; (42) Nachotko 1982 [83]; (43) Nowaczyk 1964 [37]; (44) Olaczek 1986 [24]; (45) Paciejewska 1981 [5]; (46) Pawłow & Czech 1959 [22]; (47) Ratyńska 2001 [9]; (48) Robińska 1977 [39]; (49) Ryszewska 1977 [6]; (50) Siwczak 1977 [30]; (51) Sroka 1982 [70]; (52) Szwed 1979 [36]; (53) Wojterska & Wojterski 1953 [11]; (54) Wojterska 1976 [6]; (55) Wojterska 2003 [46]; (56) Wojterska *et al.* 2006 [61]; (57) Wojterska & Wiszniewska 1996 [17]; (58) Wojterska *et al.* 2001 [10]; (59) Zielińska 1994 [33].

A detailed list of all the analysed relevés is presented below. They are grouped into syntaxonomic units and forms of transformation according to the original diagnoses made by authors of the relevés. Most of the communities were initially identified as *Calamagrostio arundinaceae-Quercetum* (31% of all relevés), mixed coniferous forest *Pino-Quercetum* (19%) or thermophilous oak forest *Potentillo albae-Quercetum* (17%). Poor oak-hornbeam forests, identified as the *Galio sylvatici-Carpinetum holcetosum mollis* or *Gs-C calamagrostietosum*, account for 11% of all the analysed relevés. A relatively large group (13%) is composed of relevés assigned only to higher phytosociological units or termed as "community", not included in the phytosociological classification (category: "others"; see the list of analysed relevés below). Relatively small numbers of relevés were available for *Aulacomnio androgyni-Quercetum* (2% of all relevés), *Molinio caeruleae-Quercetum* (2%), *Fago-Quercetum* (2%), *Querco roboris-Pinetum*, and *Festuco ovinae-Pinetum* (jointly 3%), and *Serratulo-Pinetum*, which was documented by only 6 relevés (Fig. 8).

List of relevés analysed in this study

This list includes all the relevés (1655) grouped into syntaxonomic units and forms of transformation according to the original diagnoses made by authors of the relevés. The numbers of relevés included in the analysed database are given in square brackets.

Aulacomnio androgyni-Quercetum roboris (*Aa-Q*) or *Carpino-Quercetum* (*C-Q*) [31]

Błachuta 1995 (*C-Q*, Table 4: relevés 3-4 [2]); Brzeg *et al.* 2001 (*Aa-Q*, Table 1: 1-25 [25]); Kulińska 1991 (*C-Q*, Table 2: 4-5 [2]); Lisiewska & Reszel 2000 (*Aa-Q*, Table 3: 1-2 [2]).

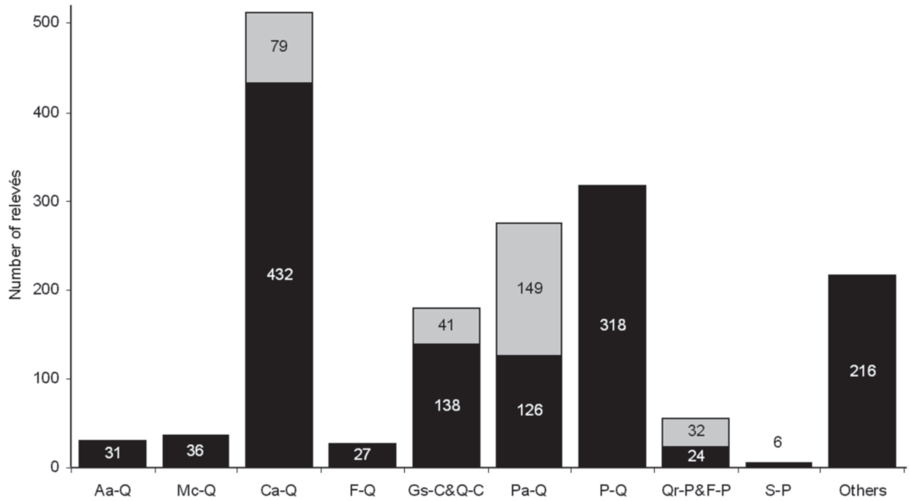

Fig. 8. Numbers of studied relevés of the plant associations, according to the original diagnoses of their authors
Explanations: black – untransformed communities, grey – degenerated or substitute forest communities (further explanations in the text)

Molinio caeruleae-Quercetum roboris (*Mc-Q*) [36]
Brzeg *et al*. 1989 (Table 2: 1-33 [33]); Kulińska 1991 (Table 2: 1 [1]); Lisiewska & Reszel 2000 (Table 3: 4 [1]); Wojterska 2003 (Table 17: 1 [1]).

Calamagrostio arundinaceae-Quercetum petraeae (*Ca-Q*) [511]

A. 432 relevés of untransformed phytocoenoses, including:
167 relevés diagnosed to the association level:
Borysiak *et al*. 1998 (Table 2: 7-11 [5]); Fabiszewski & Faliński 1967 (Table 9: 1-11 [11]); Krotoska 1978 (Table 1: 1-29 [29]), 1991 (Table 10: 1-12 [12]); Macicka & Wilczyńska 1991 (Table 13: 1-5 [5]); Nachotko 1982 (Table 1: 1-14, form with *Calamagrostis arundinacea* [14], Table 2: 1-14, form with z *Festuca ovina* [14]); Olaczek 1986 (Table 4: 1-5 [5]); Ryszewska 1977 (Table 5: 1-6 [6]); Siwczak 1977 (Table 3: 1-30 [30]); Sroka 1982 (Table 1: 1-17, 24-36 [32]); Szwed 1979 (Table 12: 1-4 [4]).
116 relevés diagnosed to the subassociation level:
Ca-Q convallarietosum [27]: Błachuta 1995 (Table 4: 1 [1]); Gmaj 1997 (Table 9: 14-19 [6]); Ratyńska 2001 (Table 176: 1-9 [9]); Zielińska 1994 (Table 6: 1-11 [11]).
Ca-Q molinietosum [8]: Błachuta 1995 (Table 4: 2 [1]); Gmaj 1997 (Table 9: 1-4 [4]); Kuświk *et al*. 1999 (Table 1: 8 [1]); Kulińska 1991 (Table 2: 2 [1]); Wojterska 2003 (Table 16: 17 [1]).
Ca-Q polygonatetosum [51]: Hegenbart-Magdans & Brzeg 1999 (Table 1: 1-36 [36]); Jaroszewska 2007 (Table 1: 1-11 [11]); Wojterska 2003 (Table 16: 1-4 [4]).
Ca-Q typicum [30]: Gmaj 1997 (Table 9: 5-13 [9]); Klimko *et al*. 2003 [1]); Kulińska 1991 (Table 2: 3 [1]); Wojterska 2003 (Table 16: 5-16, 18-24 [19]).
149 relevés diagnosed to the variant level:
Ca-Q molinietosum variant with *Anemone nemorosa* [49]: Brzeg *et al*. 2001 (Table 1: 6-50 [45]); Kasprowicz 2006 [3]; Lisiewska & Reszel 2000 (Table 3: 3 [1]).
Ca-Q molinietosum typical variant [6]: Brzeg *et al*. 2001 (Table 1: 1-5 [5]); Kasprowicz 2006 [1].
Ca-Q polygonatetosum variant with *Anemone nemorosa* [39]: Brzeg *et al*. 2001 (Table 3: 13-41 [29]); Kasprowicz 2006 [10].
Ca-Q polygonatetosum typical variant [17]: Brzeg *et al*. 2001 (Table 3: 1-12 [12]); Kasprowicz 2006 [5].
Ca-Q typicum variant with *Anemone nemorosa* [25]: Brzeg *et al*. 2001, Table 2: 9-32 [24]); Kasprowicz 2006 [1].
Ca-Q typicum typical variant [13]: Brzeg 2006 [1]; Brzeg *et al*. 2001 (Table 2: 1-8 [8]); Kasprowicz 2006 [4].

B. 79 relevés of transformed phytocoenoses: Gmaj 1997 (Table 11: 3,5, Table 12: 1,3 [4]); Hegenbart-Magdans & Brzeg 1999 (Table 2: 1-11 [11], Table 3: 1-10 [10]); Kasprowicz 2006 [2]; Krotoska 1983 (Table 3: 3-4 [2]), 1991 (Table 10: 13-21 [9]); Maciejewska-Rutkowska *et al*. 2001 [1]; Nachotko 1982 (Table 3: 1-12 [12]); Olaczek 1986 (Table 4: 6-13 [8]); Sroka 1982 (Table 1: 20-23 [4]); Zielińska 1994 (Table 5: 1-16 [16]).

Fago-Quercetum (*F-Q*) [27]
F-Q holcetosum mollis: Boiński 1973 (Table 50: 1-27).

Galio sylvatici-Carpinetum & *Querco-Carpinetum* (*Gs-C* & *Q-C*) [179]

A. 138 relevés of untransformed phytocoenoses, including:
7 relevés diagnosed to the association level: Brzeg 1989, *Gs-C*
131 relevés diagnosed to the subassociation level:
Gs-C holcetosum mollis [108]: Gmaj 1997 (Table 4: 7-9 [3]); Kamionka 1971 (Table 10: 15-25 [11]); Krotoska 1966 (Table 10: 1-17, typical variant [17]), Table 11: 1-5, typical variant, form with *Vaccinium myrtillus* [5]); Kubiś 1982 (Table 2: 1-8 [8]); Macicka 1984 (Table 10: 37-48 [12]); Macicka & Wilczyńska 1990 (Table 9: 1-14 [14], 1991, Table 9: 1-14 [14], 1992, Table 4: 18-29 [12]); Kasprowicz 2006 [2]; Maciejewska-Rutkowska *et al*. 2001, (Table 2: 1 [1]); Wojterska 2003 (Table 14: 27-35 [9]).

Gs-C calamagrostietosum [23]: Boiński 1973 (Table 31: 1-23)

B. 41 relevés of transformed phytocoenoses (*Gs-C* & *Q-C*): "Form of deformation of *Galio-Carpinetum* with the share of some acidophilous (pine forest) species" Krotoska 1991, Table 6: 1-8 [8])
Q-C holcetosum mollis aff. (Ferchmin 1980, Table 17: 12-15 [4]).
Q-C calamagrostietosum variant with *Pinus sylvestris* (Ferchmin 1966, Table 8: 2-14, 15-23 [22]).
Q-C calamagrostietosum aff. (Ferchmin 1980, Table 17: 5,6 [2]).
Q-C transitional community (Ferchmin 1980, Table 17:7-11 [5]).

Potentillo albae-Quercetum (*Pa-Q*) or *Querco-Potentilletum albae* [275]

A. 126 relevés of untransformed phytocoenoses, including:
42 relevés diagnosed to the association level:
Pa-Q [13]: Wojterska 2003 (Table 14: 36-38 [3]); Wojterska *et al.* 2001 (Table 1: 4-9, 11-14[10]).
Querco-Potentilletum [31]: Nowaczyk 1964 (Table 9: 1-18 [18]); Wojterska & Wojterski 1953 (Table 1: 1-13 [13]).
84 relevés diagnosed to the subassociation or the variant level:
Pa-Q astrantietosum (cfr.) [1] Wojterska & Wiszniewska 1996 (Table 1: 17).
Pa-Q molinietosum [10]: Brzeg & Kasprowicz 2001 (variant with *Asarum europaeum* [1]); Wojterska *et al.* 2006 (Table 2: 1-9 [9]).
Pa-Q brachypodietosum pinnati [34]: Brzeg 2006 (variant with *Pleurozium schreberi* [1]); Brzeg & Kasprowicz 2001 (typical variant [1]); Jaroszewska 2007 (Table 2: 1-8, variant with *Pleurozium schreberi*, and 9-11, typical variant [11]); Wojterska *et al.* 2006 (Table 1: 7, 10, 11, 13, 15, 19, 20, 22 [8]); Wojterska & Wiszniewska 1996 (Table 1: 1-13 [13]).
Pa-Q lathyrestosum verni [2]: Gmaj 1997 (Table 6: 1-2 [2]); Wojterska & Wiszniewska 1996 (Table 1: 14 [1]).
Pa-Q poëtosum [10]: Jakubowska-Gabara 1994 (Table 1: 1-10).
Pa-Q typicum [26]: Brzeg 2006 (variant with *Pleurozium schreberi* [1]); Brzeg & Kasprowicz 2001 (variant with *Pleurozium schreberi* [1]); Jakubowska-Gabara 1994 (Table 1: 16-23 [8]); Jaroszewska 2007 (Table 3: 1-5 [5]); Marcysiak 2001 (Table 1: 1-9 [9]); Wojterska & Wiszniewska 1996 (Table 1: 15, 16 [2]).

B. 149 relevés of transformed phytocoenoses or substitute forest communities: Boiński 1973 (Table 46: 1-6; [6]); Ferchmin 1980 (Table 19: 1-19 [19]); Gmaj 1997 (Table 6: 3-4 [2]; Table 7: 1-10 [10]); Hegenbart-Magdans & Brzeg 1999 (Table 5: 1-12 [12]); Jakubowska-Gabara 1994 (Table 1: 11-15, 24-30 [12]); Jaroszewska 2007 (Table 4: 1-7 [7]); Krotoska 1983 (Table 3: 1,2 [2]); Krotoska 1991 (Table 11: 1-14 [14]); Marcysiak 2001 (Table 1: 10-13 [4]); Olaczek 1986 (Table 2: 1-3 [3], Table 3: 1-8 [8]); Wojterska *et al.* 2006 (Table 1: 23-31 [9], Table 3: 1-35 [35]); Zielińska 1994 (Table 4: 1, 2, 4-7 [6]).

Pino-Quercetum (*P-Q*) [318]

203 relevés diagnosed to the association level:
Ferchmin 1980 (Table 21: 1-5 [5]); Jelinowski 1958 (Table 1: 1-30 [30]); Kaczyńska 1964 (Table 5: 1-15 [15]); Macicka & Wilczyńska 1991 (Table 14: 1-22 [22]), 1992 (Table 6: 1-8 [8]); Macicka-Pawlik & Wilczyńska 1996 (Table 28: 1-7 [7]); Nowaczyk 1964 (Table 7: 1-19 [19]); Robińska 1977 (Table 3: 1-34 [34], Table 5: 1-5 [5]); Sroka 1982 (Table 2: 1-20 [20]); Szwed 1979 (Table 16: 1-32 [32]); Wojterska 1976 (Table 11: 1-6 [6]).
115 relevés diagnosed to the subassociation level:
P-Q caricetosum brizoides [8]: Krotoska & Piotrowska 1962 (Table 5: 1-8);
P-Q fagetosum [35]: Macicka 1984 (Table 20: 18-30 [18]); Macicka & Wilczyńska 1990 (Table 16: 1-17 [17]).
P-Q typicum [72]: Krotoska & Piotrowska 1962 (Table 5: 10-34, typical variant, and 35-40, variant with *Molinia caerulea* [31]); Macicka 1984 (Table 20: 1-12 [12]); Macicka & Wilczyńska 1990 (Table 17: 1-29 [29]).

Querco roboris-Pinetum (*Qr-P*) & *Festuco ovinae-Pinetum* (*F-P*) [56]

A. 24 relevés of untransformed phytocoenoses including:
F-P molinietosum [2]: Brzeg *et al.* 2000b (Table 2: 41-42 [2]).
Qr-P molinietosum [11]: Brzeg 2004 (Table 1: 1-10 [10]); Jakubowska-Gabara 1994 (Table 2: 15 [1]).
Qr-P typicum [11]: Brzeg 2004 (Table 1: 11-14) [4]); Jakubowska-Gabara 1994 (Table 2: 1-5, 10 [6]); Kasprowicz 2006 [1].

B. 32 relevés of transformed phytocoenoses or substitute forest communities: Berdowski & Kwiatkowski 1992 (Table 7: 1-9 [9]); Jakubowska-Gabara 1994 (Table 2: 6-8, 12-14, 16-18 [9]); Balcerkiewicz *et al.* 1994 (Table 3: 1-14 [14]).

Serratulo-Pinetum (*S-P*) [6]

Brzeg 2004 (Table 1: 15-20).

Others [216]

Mixed coniferous forest (Pawłow & Czech 1959, Table 3: 1-22 [22]).
Acidophilous oak forests from the class *Quercetea robori-petraeae* (Wojterska 2003, Table 17: 3-11 [9].
Oak forest with *Holcus mollis* (Nachotko 1982, Table 5: 1-14 [14].
Oak forest from the class *Querco-Fagetea*, with thermophilous species (Paciejewska 1981, Table 11: 1-4, 6 [5]).
Oak forest from the class *Querco-Fagetea*, with *Pinus sylvestris* (Nachotko 1982, Table 6: 1-7 [7]).
Oak forest with thermophilous species (Nachotko 1982, Table 4: 1-22 [22].
Oak-pine forest with *Molinia caerulea* (Sroka 1982, Table 3: 1-14 [14]).
Substitute forest community (Macicka-Pawlik & Wilczyńska (1996, Table 31: 1-19 [19]).

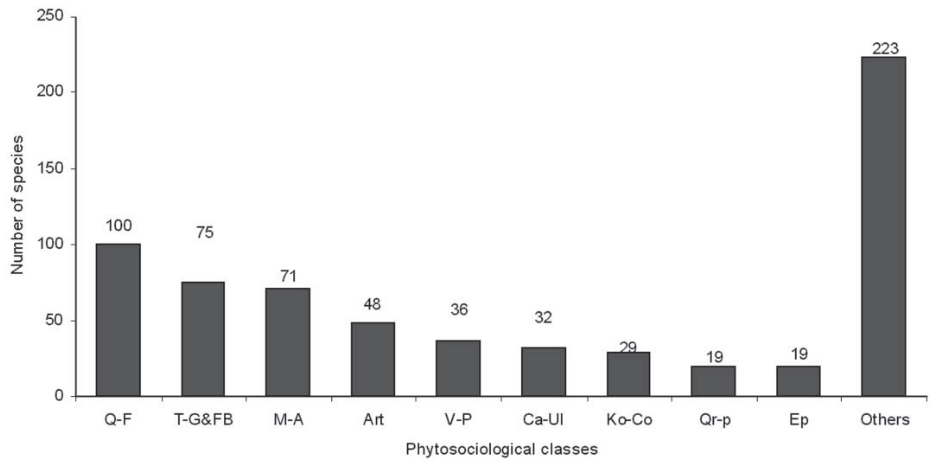

Fig. 9. Numbers of recorded characteristic species of phytosociological classes (total number of species 652, recorded in 1655 relevés)

Plantation of *Pinus sylvestris* on potential sites of deciduous and mixed forests (Macicka 1984, Table 29: 1-18 [18]).
Oak-hornbeam forest with *Vaccinium myrtillus* (Krotoska 1966, Table 21: 1-3 [3].
Community *Carex brizoides-Quercus* (Lisiewska & Reszel 2000, Table 3: 5 [1]).
Community *Polytrichum attenuatum-Carpinus betulus* (Kubiś 1982, Table 4: 1-5, 7-10, 12-15 [12].
Community from the alliance *Quercion robori-petraeae* Br.-Bl. 1932 (Macicka 1984, Table 18: 1-7 [7]; Macicka & Wilczyńska 1990, Table 13: 1-23 [23]; Macicka & Wilczyńska 1991, Table 12: 1-23 [23].
Acidophilous oak forest (Kamionka 1971, Table 12: 1-17 [17]).

In the 1655 relevés analysed in this study, 16 species of lichens and 636 plant taxa were recorded (including 546 vascular plants, 83 bryophytes, and 7 liverworts). The syntaxonomic structure of the analysed set of relevés is presented in Fig. 9.

The relevés were recorded in 1951-2007, mostly (60%) in 1971-1990 (Fig. 10). Plot size varied from 70 to 2000 m^2 (Fig. 11), but only 11 relevés were smaller than 100 m^2 and only 10 relevés exceeded 1000 m^2. They were included in the analysed database mostly to enable comparisons with earlier classifications of other authors. A vast majority (83%) of the relevés covered 100-400 m^2. Patches of this size are also documented most frequently in European phytosociological studies of forest communities (Chytrý 2001, see also Chytrý & Otýpková 2003). The recommended size of relevés of forest communities is usually 100-200 m^2 (Chytrý & Otýpková 2003; Dierschke 1994; Dzwonko 2007), up to 200-500 m^2, for coniferous forests from the class *Vaccinio-Piceetea* (van der Maarel 2005).

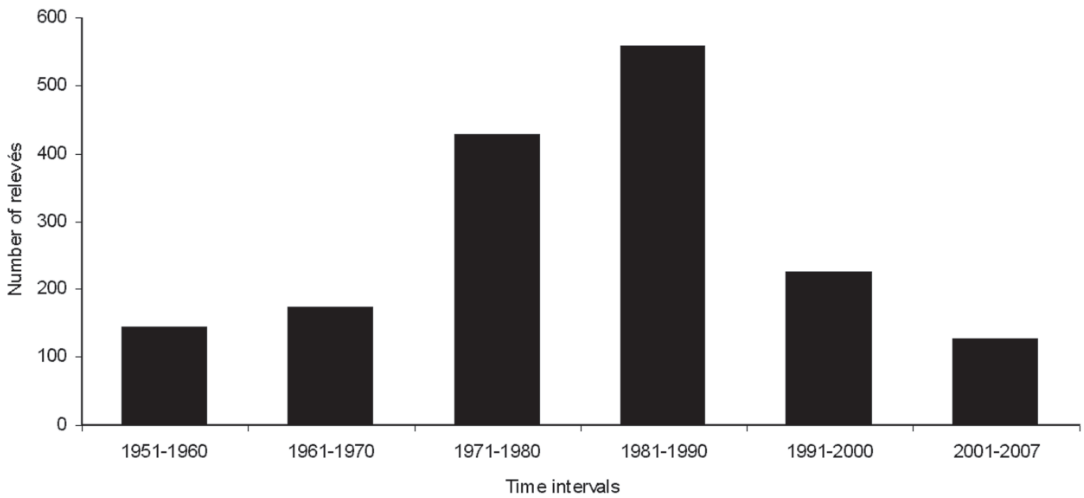

Fig. 10. Numbers of relevés recorded in given time intervals (analysis based on 1655 relevés)

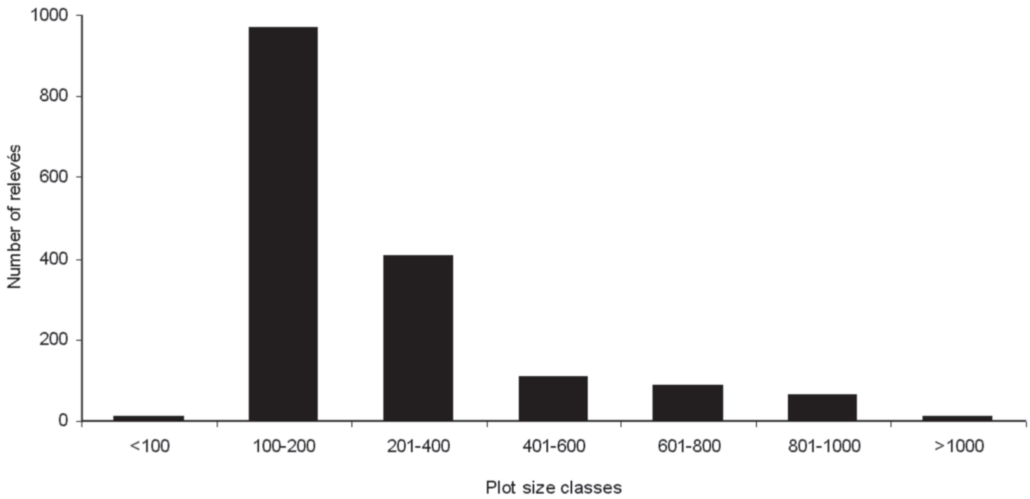

Fig. 11. Numbers of relevés in plot size classes (analysis based on 1650 relevés, as the size of 5 relevés is unknown)

In the analysed set of relevés, no significant correlation was found between the date of the relevé and plot size (see Chytrý 2001). The oldest relevés covered 100-800 m^2 (Wojterska & Wojterski 1953). The largest number of relevés (155) documenting relatively large patches (500-900 m^2) were recorded in 1984-1992, mostly (97%) by Macicka & Wilczyńska (1990, 1991, 1992) or Macicka-Pawlik & Wilczyńska (1996).

The extracted relevés were stored in a database by Profit software (Balcerkiewicz & Sławnikowski 1988). The software was used to generate analytic and synoptic tables. It enabled also calculation of major statistics for groups of relevés and for plant communities (primarily: constancy expressed as percentage, the cover index, number of species in individual tables or in an analysed group of relevés, and mean number of species per relevé).

Localities of 1622 relevés were mapped on a grid of basic ATPOL squares of 10 km × 10 km (Zając 1978). The relevés were recorded in 135 squares (Fig. 3). Localization of the remaining 33 relevés was impossible because of a lack of precise data about geographic location. Cartograms of distribution of the studied plant communities were generated by Gnomon software (2006).

Syntaxonomic research was conducted by the classical phytosociological method of the Braun-Blanquet school (Braun-Blanquet 1964; Pawłowski 1972; Matuszkiewicz W. 2001), i.e. with the use of successive series of comparisons in analytic and synoptic tables (see Brzeg 2005). It must be emphasized that at an early stage of sorting of the materials, individual relevés were analysed in detail, intentionally disregarding their initial diagnosis in the original publications. They were diagnosed on the basis of the presence or relative contributions of individual groups of diagnostic species, with the use of existent standards from the literature and nomenclatural types designated earlier, referred to in later sections of the present monograph. The syntaxonomic and nomenclatural revision of the above syntaxa was made in accordance with the International Code of Phytosociological Nomenclature (Weber *et al.* 2000). Syntaxonomic units of various ranks were identified and diagnosed on the basis of floristic criteria, i.e. the presence or lack of some groups of diagnostic species (characteristic and/or differential).

In many cases, particularly when analysing degenerated forms of various associations, also accidental features were helpful (see Matuszkiewicz W. 2001). Among them, special attention was paid to vertical structure, species composition, and forest dynamics (especially spontaneous regeneration of tree populations) as well as site conditions. Strongly transformed plant communities, which could not be assigned to any known plant associations, were classified as substitute forest communities (see Jakubowska-Gabara 1989).

The basic diagnostic features used to assess the stage of degeneration of forest stands were: contributions of characteristic and differential species for individual associations and units of higher rank, as well as relative contributions of those species and species alien to those ecosystems, and thus attesting to the process of degeneration (see Olaczek 1972, 1974a, 1974b; Krotoska 1991). The application of so-defined diagnostic criteria made it possible to assess the degree of transformation of plant communities in the system of stages of degeneration defined by Faliński (1966). Untransformed patches of an association are characterized by a high constancy of diagnostic species. In stage I of degeneration, the constancy of characteristic species of the association is low. In stage II of degeneration, these species are nearly absent. In stage III of degeneration, also the contribution of characteristic species of the class is reduced.

The sorted phytosociological documentation of the distinguished syntaxa is presented in analytic (A1-A37) and synoptic (3, 5-12) tables. Each relevé in the analytic tables contains descriptive elements (ID-1, ID-2, ID-3), which allow their unambiguous identification. These elements are explained at the end of this section. Lists of sporadic species include the number of the relevé in the table and cover-abundance in brackets. Values of "sociability" were not taken into account. In synoptic tables, species frequency was expressed as a percentage. The cover index was calculated according to Pawlowski (1972). The index is a mean percent cover of the given species in relevés of the table multiplied by 100, with cover-abundance of 5 interpreted as 87.5%, 4 as 62.5%, 3 as 37.5%, 2 as 17.5%, 1 as 5%, + as 0.5%, and r as 0.1. If the index was =0.09, it was denoted as 0.

In the calculations and numerical analyses, the cover-abundance scale of Braun-Blanquet was transformed into a scale of 1-9 (van der Maarel 1979, 2007).

For each relevé, mean Ellenberg indicator values were calculated: light (L), soil moisture (F), soil reaction (R), soil productivity (N), continentality (K) (Ellenberg *et al.* 1992). For indicator L, a weighed mean was calculated, taking into account the cover-abundance of individual species. For the other indicators, arithmetic means were used. Ellenberg indicator values calculated in this way are most similar to results of measurements in field conditions (Dzwonko 2001, 2007; Dzwonko & Loster 2000, see also Diekmann 1995, 2003; Schaffers & Sykora 2000; Seidling & Fischer 2008). In the calculations, all species of vascular plants, bryophytes, and lichens were taken into account (see Ewald 2003), except canopy trees, because the species composition of the canopy often results from human activity and does not reflect fully the natural site conditions (see Diekmann 1995, 2003; McCollin *et al.* 2000; Lawesson & Skov 2002; Hédl 2004). Ertsen *et al.* (1998) excluded trees and shrubs from calculations of mean Ellenberg indicator values, pointing to the fact that they are rooted in deeper soil horizons.

It has been assumed here that the above-mentioned variation in plot size does not affect significantly the calculated Ellenberg indicator values (see Otýpková & Chytrý 2006; Otýpková 2009).

In the interpretation of test results, recent findings were taken into account, showing that values of Ellenberg indicator N are not strongly correlated with the concentration of bioavailable nitrogen in the soil. Values of this indicator are strongly and positively correlated with biomass production (Ertsen *et al.* 1998; Wamelink *et al.* 1998; Schaffers & Sykora 2000; Diekmann 2003) as well as with concentrations of potassium and phosphorus (see Dzwonko 2001; Cornwell & Grubb 2003). The diagnostic importance of Ellenberg indicator N was discussed in detail e.g. by Roo-Zielińska (2004) and Sutton *et al.* (2004). Moreover, Schaffers & Sykora (2000) reported that values of the Ellenberg indicator R reflect well not only the soil reaction but also calcium content.

To characterize the major directions of variation of the studied communities, relevé data were subjected to detrended correspondence analysis (DCA) or principal component analysis (PCA). CANOCO 4.5 software (ter Braak & Šmilauer 2002) was used for the calculations and graphic presentation of the results. The choice of the method (DCA or PCA) was based on the type of analysed data, determined by the lengths of gradient (ter Braak & Prentice 1988; Lepš & Šmilauer 2003). To avoid an excessive effect of rare species, the option "downweighting of rare species" was used in DCA (ter Braak & Šmilauer 2002). In PCA, species found in less than 5% of relevés were not included. In both DCA and PCA, species cover-abundance values were used. Mean Ellenberg indicator values and the other data describing the species composition of patches of individual relevés were included in the analysis as passive variables, i.e. those excluded from axis construction (ter Braak & Šmilauer 2002). The interpretation of DCA ordination results took into account also Spearman's rank correlation coefficient between scores of individual variables and ordination axes. The significance of differences between the analysed plant communities in respect of selected Ellenberg indicator values or floristic features was assessed by the Kruskal-Wallis test or the Mann-Whitney U test. The 0.05 level of probability was accepted as significant troughout the work. The analyses were performed by Statistica software (StatSoft, Inc. 2006).

In the studied flora, the so-called "species of old deciduous forests" were distinguished on the basis of a list proposed by Dzwonko & Loster (2001). This list includes 155 taxa. As emphasized by the cited authors, it should be verified for regional uses. In the study area, e.g. *Dryopteris filix-mas* is found not only in old but also in young forests, planted on former farmland (Janyszek 2004). However, considering the lack of detailed analyses of this group of species in Wielkopolska, the whole list of Dzwonko & Loster (2001) was used here. Pilot tests showed that exclusion of *D. filix-mas* had no significant effect on the results.

The taxonomic nomenclature followed is that of Mirek *et al.* (2002) for vascular plants, Ochyra *et al.* (2003) for mosses, Szweykowski (2006) for liverworts, and Fałtynowicz (2003) for lichens. Diagnostic ranks of plant species in the phytosociological classification of acidophilous oak forests from the class *Quercetea robori-petraeae* follow those proposed by Brzeg *et al.* (2000a, 2001) and Brzeg & Kasprowicz (2001). For other syntaxa of forest and non-forest communities, those proposed by Brzeg & Wojterska (2001) were used. Species abbreviations in the DCA and PCA diagrams are based on the first 3 letters of the generic name and the first 3 letters of the specific name.

Appendix

The analytic tables, because of their large volume, are available as PDF files (Portable Document Format, Adobe Systems) on the website of the journal *Biodiversity: Research and Conservation* (http://www.brc.amu.edu.pl). Ordinal numbers of all the analytic tables (A1-A37) were additionally marked with the letter "A".

Unambiguous identification of the relevés presented in the analytic tables is ensured by the data recorded in table headings: ID-1 = number of the original publication (as in the list of sources of the analysed 1655 relevés above); ID-2 = table number in the original publication; and ID-3 = relevé number in the original table.

5. Acidophilous oak forests and mixed coniferous forests including *Quercus*: a review of the literature

5.1. Evolution of opinions and major syntaxonomic concepts

Pine-oak forests, distinguished initially as the association *Pineto-Quercetum,* were in Poland studied by phytosociologists as early as in the 1920s. The first documentation of this association, from the area of the Małopolska Upland, as well as its first suggested name, were presented by Kozłowska (1926a, 1926b), in 2 independently published, but equivalent articles in French and Polish. It is noteworthy that both the papers were published in 1926, rather than in 1925 (when only their oral presentation took place), as commonly mentioned misleadingly by many authors citing one of the articles (e.g. Matuszkiewicz & Polakowska 1955; Medwecka-Kornaś 1959; Matuszkiewicz J. M. 1988, 2001a; Pallas 1996). Slightly later, several other publications also documented this association (Dziubałtowski 1928; Niedziałkowski 1929; Kobendza 1933). The cited authors, without referring to the articles written by Kozłowska (1926a, 1926b), indicated that human activity substantially affected the species composition of this community. They emphasized, in particular, the increased frequency of *Pinus*, due to its planting. A current analysis of the species composition of those relevés confirms their conclusions. The relevés document transformed plant communities of more fertile deciduous forests. A similar species composition was observed also in the patches described by A. Kozłowska, especially in the last 2 of the 3 relevés of her original table. However, the association *Pino-Quercetum* still raises many doubts. Pallas (1996) designated the first relevé from her table as a lectotype of the association *Pino-Quercetum* Kozłowska 1925, although he did not consider this syntaxon as valid. By contrast, J. M. Matuszkiewicz (1988, 2001a) classified Kozłowska's relevés as the acidophilous oak forest *Luzulo-Quercetum.* In her own interpretation (Kozłowska 1926a, 1926b), the *Pineto-Quercetum* Kozł. 1926 in the process of succession colonizes the sites of xerothermic grassland *Inuletum ensifoliae*, which certainly does not belong to the dynamic circle of communities of acidophilous mixed coniferous forests.

One of the first phytosociological studies of acidophilous oak forests and mixed coniferous forests in the Wielkopolska region was presented by Preising (1943), who reported on acidophilous oak-birch forests *Periclymeno-Quercetum* (Hartm. 1934) Prsg. et Knapp 1942 in western Wielkopolska. On the basis of that study, Piotrowska (1950) regarded mixed coniferous forests of the Wielkopolska National Park as synonymous with the *Periclymeno-Quercetum*, and assigned this association to the class *Betulo-Pinetea*. Soon afterwards, poor oak forests of the Kraków-Częstochowa Upland were distinguished as the *Quercetum medioeuropaeum* Br.-Bl. 1932 from the class *Querceto-Ulicetea* Br.-Bl. 1947 (Medwecka-Kornaś 1952), while mixed coniferous forests in the Białowieża National Park, as the *Querceto-Betuletum* Tx. 1930, identical with the *Quercetum medioeuropaeum* (Matuszkiewicz W. 1952). All the communities were assigned to the alliance *Quercion robori-sessiliflorae* Br.-Bl. 1932. The cited authors noted that this syntaxon in Poland, in contrast to western Europe, is floristically very similar to coniferous forests, and suggested that this alliance should be included in the class *Vaccinio-Piceetea*, within the order *Quercetalia robori-petraeae* (Medwecka-Kornaś 1952), or even (Matuszkiewicz W. 1952) directly in the order *Vaccinio Piceetalia* (after Matuszkiewicz & Polakowska 1955).

In that period, West European researchers usually assigned acidophilous oak forests to the class *Quercetea robori-petraeae*. Only Doing (1962) noticed similarities between this group of plant communities and mixed coniferous forests. On the basis of the floristic variation of acidophilous oak forests and birch forests in the central part of their range, he included them in the new class *Querco-Piceetea*, composed of 2 orders: the *Quercetalia robori-petraeae* and *Betulo-Vaccinietalia uliginosi*.

In the first Polish synoptic study of mixed coniferous forests (Matuszkiewicz & Polakowska 1955), 3 associations were assigned to this group in our country: the *Periclymeno-Quercetum* (within the alliance *Quercion robori-sessiliflorae* (Malc. 1929) Br.-Bl. 1932 and class *Querceto-Ulicetea*); *Pineto-Quercetum* Kozł. 1925; and *Querceto-Piceetum* Mat. 1955 (class *Vaccinio-Piceetea* Br.-Bl. 1932). The first one, the *Periclymeno-Quercetum*, was to be found exclusively in the western part of Polish Pomerania and in the Lubusz Land (Ziemia Lubuska), which marked the eastern limit of the range of sub-Atlantic forests of the alliance *Quercion robori-sessiliflorae*. The second association, *Querceto-Piceetum* (=*Querceto-Betuletum lycopodietosum* Mat. 1952), was distributed only in north-eastern Poland, within the boreal range of *Picea abies*. The most important association of mixed coniferous forests in that classification was the *Pineto-Quercetum,* distributed over most of Poland. It was supposed to include many plant communities reported earlier from Poland: the *Quercetum medioeuropaeum*, most of the forms of *Querceto-Betuletum*, and mixed coniferous forest *Periclymeno-Quercetum* in the Wielkopolska National Park. The association *Pineto-Quercetum* was described in detail in the cited publication. Its high floristic variation allowed its division into 4 provisional subassociations: the *P-Q berberidetosum*, *P-Q luzuletosum*, *P-Q fagetosum,* and *P-Q serratuletosum*.

Another classification of mixed coniferous forests was presented in the first review of plant communities of Poland (Medwecka-Kornaś 1959), included in the monumental work entitled *Szata roślinna Polski*. In that book, describing the vegetation of Poland, this group was represented only by the Pomeranian oak forest *Periclymeno-Quercetum*, Central Polish mixed coniferous forest *Pineto-Quercetum*, and (not without doubts) also the *Querceto-Piceetum.* The cited author included these associations in a new alliance *Pino-Quercion* Medwecka-Kornaś in Medwecka-Kornaś *et al*. 1959 (class *Vaccinio-Piceetea*). She did not exclude that some patches of the *Periclymeno-Quercetum* and *Pineto-Quercetum* were anthropogenic.

Pomeranian birch-oak forest was classified by Piotrowska (1960) as the *Periclymeno-Quercetum pteridetosum*. Several years later, Celiński & Piaczyńska (1966) renamed this association as the *Betulo-Pinetum*. It was assigned to the class *Quercetea robori-petraeae*, and in their opinion it was similar to the *Querco robori-Betuletum molinietosum* both in ecological preferences and in species composition. However, because of the lack of several species with a western distribution, it could not be classified as its synonym.

The first documentation of acidophilous oak forests in southern Wielkopolska was presented by Krotoska and Piotrowska (1962). Initially, they classified these oak forests as the *Pino-Quercetum* Kozł. 1925, but indicated that they were closely related to the association *Querceto roboris-Betuletum* as defined by Tüxen (1937). Later, Krotoska (1966) came to a conclusion that some of them represent the acidophilous oak-hornbeam forest *Galio sylvatici-Carpinetum holcetosum mollis*, while the others should be classified as acidophilous oak forests, related to communities of the alliance *Quercion robori-petraeae*.

A next stage of the revision of the phytosociological classification of mixed coniferous forests and acidophilous oak forests, was the systematic review of plant communities of Poland made by W. Matuszkiewicz (1967). Acidophilous, oligo- and mesotrophic, mixed *Quercus*-dominated forests, were included in the class *Quercetea robori-petraeae* Br.-Bl. et R.Tx. 1943 (with the order *Quercetalia robori-petraeae* R.Tx. 1931, and the single alliance *Quercion robori-petraeae* Br.-Bl. 1932). This group consisted in Poland of 4 provisional associations found here at the eastern limits of their ranges. Two of them, most widely distributed, were earlier classified as subassociations of *Pino-Quercetum*, i.e. (1) the *Quercetum medioeuropaeum* Br.-Bl. 1932 (=*Pino-Quercetum luzuletosum* Mat et Pol. 1955) and (2) *Fago-Quercetum* R.Tx. 1955 (=*Pino-Quercetum fagetosum* Mat. et Pol. 1955 p.p)[1]. The other 2 associations are: (3) the evidently sub-Atlantic, poor birch-oak forest *Querco-Betuletum* R.Tx. 1937 (=*Periclymeno-Quercetum* auct.), distributed along the Baltic coast; and (4) the pine-oak forest *Calamagrostio arundinaceae-Quercetum* (Hartm. 1934) Scam. 1959, known at that time from Brandenburg, the Lubusz Land and Wielkopolska. The acidophilous oak forest *Calamagrostio-Quercetum* was characterized by W. Matuszkiewicz (1967) as the most poorly defined association within this alliance, and most similar to the *Pino-Quercetum.* He emphasized that the 3 associations of the alliance *Quercion robori-petraeae* mentioned above (except the *Querco-Betuletum*) may in fact be various forms of one association. In the same year, Fabiszewski & Faliński (1967) published the first relevés of *Calamagrostio arundinaceae-Quercetum*, in Poland from the vicinity of Wolsztyn. After over a decade, further documentation on this association was given by Krotoska (1978) and Szwed (1979).

In the above-mentioned review (Matuszkiewicz W. 1967), typical mixed coniferous forests dominated by *Pinus* with *Quercus* were represented by the association *Pino-Quercetum* (alliance *Dicrano-Pinion* Libb. 1933, class *Vaccinio-Piceetea*). Also the classification of *Pino-Quercetum* required new, more detailed research.

In the same period, the syntaxonomic classification of communities of poor oak forests from the class *Quercetea robori-petraeae* was revised in the western part of former Czechoslovakia (Neuhäusl & Neuhäuslová-Novotná 1967). A major result of this revision was a proposal to replace the alliance *Quercion robori-petraeae* by 2 vicariant alliances. The older one, *Quercion roboris* (Malcuit 1929) Tx. 1930, was reserved for the Atlantic and sub-Atlantic parts of the range of acidophilous oak forests, while the new one, *Genisto germaniceae-Quercion*, comprised its subcontinental part. The latter

[1] See, however, J. M. Matuszkiewicz (1988), who argued that the *Fago-Quercetum* is not a synonym of *Pino-Quercetum fagetosum*

alliance included a newly described association, *Molinio arundinaceae-Quercetum*, as well as the *Luzulo-Quercetum* Hilitzer 1932 and *Vaccinio vitis-idaeae-Quercetum* Oberd. 1957.

Hartmann and Jahn (1967) came to a conclusion that communities from the class *Quercetea robori-petraeae* have a northern, temperate-Atlantic range of distribution, and its centre is located in northern France and in the area affected by the older glaciation in north-western Germany. The eastern limit of the range of acidophilous oak forests was indicated by those authors in western Brandenburg. Further east, in the coastal belt extending to Poland, only moist birch-oak forests *Betulo-Quercetum molinietosum* were recorded (Hartmann & Jahn 1967: 558).

Medwecka-Kornaś (1972) consistently believed that the acidophilous beech-oak and pine-oak forests found in Poland, lack many "sub-Atlantic" characteristic species and should not be assigned to the class *Quercetea robori-petraeae*. These forests, represented by the associations *Fago-Quercetum petraeae* and *Periclymeno-Quercetum* Hartm. 1934 em. Piotrowska 1960, were supposed to be intermediate between the West European alliance *Quercion robori-petraeae* and the alliance *Pino-Quercion* from the class *Vaccinio-Piceetea*. The latter alliance still included 2 associations of mixed coniferous forests: the *Pino-Quercetum* Kozł. 1925 em. Mat. et Polak. 1955 and *Querco-Piceetum* Mat. (1952) 1955 (Medwecka-Kornaś 1972).

In the first edition of a comprehensive guide to identification of plant communities of Poland (Matuszkiewicz W. 1981), Central European acidophilous, oligo- and mesotrophic, deciduous forests dominated by *Quercus*, were classified as impoverished, extreme forms of associations from the class *Quercetea robori-petraeae*. That author emphasized that Poland is located in the intermediate zone between distribution ranges of communities of the classes *Quercetea robori-petraeae* (widespread in Central Europe) and *Vaccinio-Piceetea* (especially of the alliance *Dicrano-Pinion*, prevailing in the eastern part of the continent). Thus he regarded the *Vaccinio-Piceetea* and *Quercetea robori-petraeae* as vicariant classes. As compared with his earlier work (Matuszkiewicz W. 1967), the 1981 edition does not bring any major changes in the classification of of the group of interest. He listed the same 4 basic syntaxa, but described them more precisely and corrected their names. These included the *Betulo-Quercetum roboris*, *Fago-Quercetum petraeae*, *Luzulo-Quercetum petraeae* (= *Quercetum medioeuropaeum*, *Pino-Quercetum luzuletosum*), and *Calamagrosti-Quercetum petraeae* (= *Pino-Quercetum* (Hartm. 1934) Reinh. (1939) 1944 non Kozł. 1925). Greater changes can be noticed in the group of mixed coniferous forests from the class *Vaccinio-Piceetea*. It was enriched with 2 new, provisional associations: the *Serratulo-Pinetum* J. Mat. (mscr.) (= *Pino-Quercetum serratuletosum*) and *Querco roboris-Pinetum* J. Mat. (mscr.). The latter included partly the former *Pino-Quercetum*.

The first phytosociological revision of mixed coniferous forests and acidophilous oak forests on the scale of Poland was made by J. M. Matuszkiewicz (1988). His analytic and synoptic tables allowed a detailed separation of these 2 groups of forest communities. He was also first to present maps of the distribution of these communities in Poland. Acidophilous oak forests, divided into 5 associations, were included in the class *Quercetea robori-petraeae*, order *Quercetalia robori-petraeae*, and alliance *Quercion robori-petraeae*. Apart from the 4 associations listed in earlier works of W. Matuszkiewicz (1967, 1981), the alliance comprised also the acidophilous submontane oak forest *Molinio arundinaceae-Quercetum*, reported from the former Czechoslovakia (Neuhäusl & Neuhäuslová-Novotná 1967). The group of mixed coniferous forests was composed of 2 newly described associations: the *Serratulo-Pinetum* and *Querco roboris-Pinetum.* They were assigned to the alliance *Dicrano-Pinion*, and class *Vaccinio-Piceetea*. Their detailed descriptions are presented in section 5.2.3.

Our research team (Brzeg *et al.* 1989) proposed a substantial broadening of the list of plant communities in the group of acidophilous oak forests. The range of habitat variation of *Calamagrostio arundinaceae-Quercetum* was also corrected remarkably. It is noteworthy that when submitting that article, we did not know J. M. Matuszkiewicz's (1988) monograph. We reported that in Wielkopolska there are 3 major associations of acidophilous oak forests (within the class *Quercetea robori-petraeae* and alliance *Quercion robori-petraeae*): the *Calamagrostio-Quercetum*; *Molinio caeruleae-Quercetum roboris* (R. Tx. 1937) Scam. et Pass. 1959 em. Brzeg. Kaspr. et Krot. 1989 (not reported earlier from Poland); and the new association *Carpino-Quercetum* (Kubiś 1982) Brzeg, Kaspr. et Krot. 1989. The *Calamagrostio-Quercetum* was subdivided into 3 new subassociations: the *Ca-Q molinietosum*, *Ca-Q typicum*, and *Ca-Q convallarietosum*. The association *Molinio caeruleae-Quercetum roboris* was described in detail in that article, while the other 2 associations, in successive publications (Brzeg *et al.* 2000a, 2001). This group was supplemented with the community *Carex brizoides-Quercus* and the acidophilous beech-oak forest *Fago-Quercetum*, which was not well-developed in Wielkopolska, because of its location at the limit of its distribution range. Besides, in the group of acidophilous oak forests, we included also a poor subassociation of the oak-hornbeam forest *Galio sylvatici-Carpinetum holcetosum mollis* (Prsg. 1943) Krotoska 1966, and wet oak forest *Carici elongatae-*

Quercetum Sokoł. 1972 (class *Alnetea glutinosae*). Results of that study showed that the wet oak forest with *Molinia caerulea* from Wielkopolska can be identified with the association *Molinio* (*caeruleae*)-*Quercetum* Scam. et Pass. 1959, distinguished and described in Brandenburg and with the subassociation *Querco roboris-Betuletum molinietosum*, reported from mid-eastern Germany, mostly from Brandenburg (Passarge 1956, 1957). However it differs from the West European, sub-Atlantic forms of this subassociation. In the proposed classification, the *Molinio caeruleae-Quercetum* was a vicariant (i.e. geographic equivalent) of the *Betulo-Quercetum molinietosum* and *Luzulo-Quercetum molinietosum,* and perhaps also of the possible moist forms of *Fago-Quercetum*. An analysis of 33 relevés documenting the *Molinio caeruleae-Quercetum* in Wielkopolska showed that this association has its centre of distribution in this region, within the so-called Krotoszyn Plateau.

In the history of the phytosociological classification of European deciduous forests, an important role was played by the concepts of Oberdorfer (1987, 1988, 1992a, 1992b). He proposed a very broad definition of the class *Querco-Fagetea*, including mesotrophic and acidophilous deciduous forests and the corresponding shrub communities (occupying similar sites). These communities were divided into 4 orders: the *Prunetalia spinosae*, *Quercetalia robori-petraeae*, *Quercetalia pubescentis*, and *Fagetalia sylvaticae*. The idea to include the order *Quercetalia roboris* (of particular interest for us) in the class *Querco-Fagetea*, was already presented earlier, independently by 2 botanists (Rivas-Martinez 1975; Tombal 1975), during a symposium on acidophilous oak forests. However, that view gained wide acceptance only after the appearance of the above-mentioned publications of E. Oberdorfer (see Mucina 1997). My original table summarizing the major concepts of classification of acidophilous oak forests (Table 1[2]) shows that their concept has been accepted mostly in West Europe, i.e. in Spain (Rivas-Martinez *et al.* 2001), France (Bardat *et al.* 2004), Denmark (Lawesson 2004[3]), the Netherlands (Sykora 2007), United Kingdom (Rodwell *et al.* 2000), Austria (Wallnöfer *et al.* 1993), and Germany (Müller 1991; Härdtle & Welss 1992; Dierschke 1994, 2004; Härdtle *et al.* 1997; Wilmanns 1998). Also Scandinavian acidophilous oak forests and beech forests, at the northern edges of their ranges of distribution, were assigned to the class *Querco-Fagetea* (Dierssen 1996). It must be emphasized that some Dutch (Schaminée & Stortelder 2008) and German phytosociologists (Pott 1992, 1995; Pallas 1996, 2000, 2003) consistently placed the order *Quercetalia roboris* in a separate class, *Quercetea robori-petraeae*, very much like Berg *et al.* (2004), Schubert (2001), and Schubert *et al.* (2001). However, authors of the last 3 cited publications are supporters of a completely different concept of the whole phytosociological classification, distinguished by very narrowly defined units. Deciduous forests with some participation of *Quercus*, are assigned in those publications to several classes, e.g. the *Quercetea robori-petraeae*, *Quercetea pubescenti-petraeae*, and *Carpino-Fagetea*, which correspond to the above-mentioned orders advocated by Oberdorfer (1987, 1992a). Retention of the class *Quercetea robori-petraeae* is also supported by most of Polish researchers, who usually accept the phytosociological system of W. Matuszkiewicz (2001, see Table 1). Only rarely Polish authors accept the concept of Medwecka-Kornaś (1959, 1972), who included mixed coniferous forests and acidophilous oak forests in one, broadly defined association *Pino-Quercetum* from the class *Vaccinio-Piceetea* (Medwecka-Kornaś 1972, 2006). The class *Quercetea robori-petraeae* comprises, according to latest publications, acidophilous oak forests of the Czech Republic (Chytrý & Tichý 2003) and Slovakia (Jarolímek *et al.* 2008). Both the cited publications indicated a high degree of floristic similarity between the classes *Quercetea robori-petraeae* and *Querco-Fagetea*. However, it is noteworthy that in Slovakia the similarity is much smaller. Also in earlier studies, Czech authors usually placed the order *Quercetalia roboris* in the class *Quercetea robori-petraeae* (e.g. Neuhäusl & Neuhäuslová-Novotná 1967; Grulich & Chytrý 1993), and rarely in the class *Querco-Fagetea* (e.g. Chytrý & Vicherek 1995).

Many authors place all associations of acidophilous oak forests in one alliance, *Quercion roboris* Malcuit 1929 (or synonymous syntaxa, see Table 1). At most, they suggest that the regional and ecological variation of acidophilous oak forests may be expressed by indicating groups of associations (Matuszkiewicz J. M. 2001a; Matuszkiewicz W. 2001; Willner *et al.* 2005). Czech and Slovakian authors support, however, the earlier concept of Neuhäusl and Neuhäuslová-Novotná (1967), and regard the alliance of Atlantic and sub-Atlantic acidophilous oak forests as geographically distinct from their subcontinental counterparts (Chytrý & Tichý 2003; Jarolímek *et al.* 2008) (Table 1). A similar view was expressed also, many years ago, by Austrian researchers (Wallnöfer *et al.* 1993), but they have recently published another classification, with the single alliance *Quercion roboris* (Willner *et al.* 2005). The classification of the geographic variation of acidophilous oak forests from the order *Quercetalia robori-petraeae* at the level of alliances was also advocated by Rameau (1985). He reported that in France these communities are grouped in 3 alliances: the *Quercion pyrenaicae*

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[2] For tables see appendix at the end of the monograph.

[3] However, in his publication in 2000, he accepted the class *Quercetea robori-petraeae*.

(best developed in north-western Spain), *Quercion robori-petraeae* (typical for France), and *Genisto germanicae-Quercion petraeae* (continental vicariant). The regional variation of acidophilous oak forests was also taken into account by Oberdorfer (1987, 1992b). However, since it was difficult to indicate their characteristic species, he distinguished 3 suballiances within the *Quercion robori-petraeae*: the *Quercenion robori-petraeae* (Br.-Bl. 32) Riv. Mart. 82; *Genisto germanicae-Quercenion petraeae* (R. et Z. Neuh. 1967) Oberd. 1992; and *Ilici-Fagenion* (Br.-Bl. 1967) Tx. 1979 em. Oberd. 1984). The first 2 of them correspond geographically to the alliances of Neuhäusl & Neuhäuslová-Novotná (1967). A regional division of acidophilous oak forests of that alliance was also proposed by Doing (1975). He distinguished the suballiance *Violo-Quercion*, characterized by species of more fertile and warmer sites, with a centre of distribution in West and South Europe; and the suballiance *Vaccinio-Quercion*, characterized by the presence of species shared with coniferous forests.

A very different classification of acidophilous deciduous forests from the order *Quercetalia roboris* was proposed by Pallas (1996). On the basis of a critical revision of the above syntaxa, according to the principles of the Code of Phytosociological Nomenclature, he assumed that these forests, represented by 23 associations in broadly defined Central Europe, are grouped in 6 alliances (Fig. 12). So narrowly defined units – both associations and alliances – are mostly lacking

Quercetea robori-petraeae

Quercetalia roboris

Vaccinio myrtilli-Quercion petraeae
North Europe (eastern part)

- *Populo tremulae-Quercetum petraeae*
- *Betulo pendulae-Quercetum roboris*
- *Vaccinio vitis idaeae-Quercetum roboris*
- *Tilio cordatae-Betuletum pendulae*
- *Calamagrostio arundinaceae-Ouercetum petraeae*

Ouercion roboris
West Europe

- *Quercetum petraeae*
- *Ilici aquifolii-Quercetum roboris*
- *Betulo pendulae-Ouercetum petraeae*
- *Violo rivinianae-Quercetum roboris*
- *Teucrio scorodoniae-Ouercetum petraeae*

Agrostio capillaris-Quercion petraeae
Central Europe

- *Agrostio capillaris-Quercetum roboris*
- *Pyrolo secundae-Quercetum petraeae*
- *Luzulo luzuloidis-Quercetum roboris*

Hieracio lachenalii-Quercion petraeae
South Europe

- *Hieracio glaucini-Quercetum petraeae*
- *Luzulo luzuloidis-Quercetum petraeae*
- *Genisto pilosae-Quercetum petraeae*

Dicrano scoparii-Quercion roboris
North Europe (western part)

- *Deschampsio flexuosae-Quercetum roboris*
- *Dicrano scoparii-Quercetum roboris*
- *Cladonio portentosae-Quercetum petraeae*

Molinio caeruleae-Quercion roboris
Azonal

- *Molinio caeruleae-Quercetum roboris*
- *Stellario holosteae-Quercetum roboris*
- *Molinio arundinaceae-Quercetum roboris*
- *Calamagrostio villosae-Quercetum roboris*

Fig. 12. Syntaxonomic structure of the class *Quercetea robori-petraeae* according to Pallas (1996, simplified)

characteristic species, and their floristic distinctness is based on groups of differential species. As emphasized by W. Matuszkiewicz (2001), such an approach is not consistent with the Zürich-Montpellier school of phytosociology, and corresponds with the so-called "Eberswalde school". Some syntaxonomic solutions suggested by Pallas (1996) were also criticized by J. M. Matuszkiewicz (2001a) and our research team (Brzeg *et al.* 2001). In the cited publication we emphasized that J. Pallas interpreted too rigorously or even wrongly some principles of the Code of Phytosociological Nomenclature (Barkman *et al.* 1995). The requirement of the presence of both plant species forming the name of the syntaxon, applied also to valid syntaxa, leads to retention or creation of very narrowly defined syntaxa, which are hard to distinguish. However, the system proposed by Pallas (1996, 2000) was taken into account in a review of the broadly defined class *Querco-Fagetea*, where acidophilous beech-oak forests were included in the separate order *Quercetalia roboris* (Dierschke 2004). The syntaxonomic system of Pallas (1996) was accepted by Kwiatkowski (2001) and, after major corrections, by Brzeg *et al.* (2000a, 2001). Consequently, it was also included in the system of plant communities of Wielkopolska (Brzeg & Wojterska 2001), and of Polish lowlands (Ratyńska *et al.* 2010). In such a modified shape, the system has also been accepted in the present study.

An extremely different concept of syntaxonomic classification of forests from the order *Quercetalia roboris* was proposed by Härdtle & Welss (1992). Those authors assumed that Central European acidophilous oak forests are represented by only 3 associations grouped in one alliance (Fig. 13). Admittedly, Pallas (1996) defined Central Europe somewhat more broadly, but most of the plant associations listed by him (except some eu-Atlantic ones of the alliance *Quercion roboris*) are distributed in areas covered by Härdtle & Welss (1992).

In the latest classification (Pallas 2003), covering the whole of Europe, communities from the order *Quercetalia roboris* were assigned to as many as 7 alliances. In comparison to his earlier work (Pallas 1996), he added 3 new alliances: the *Hymenophyllo-Quercion petraeae* (north-western eu-Atlantic part of Europe); *Quercion robori-pyrenaicae* (southern Atlantic part of Europe); and *Castaneo-Quercion* (central part of the sub-Mediterranean province). By contrast, he cancelled 2 other alliances: the *Hieracio lachenalii-Quercion petraeae* and *Dicrano scoparii-Quercion roboris*. It must be emphasized that in his monograph, the eastern limit of the distribution range of acidophilous oak forests has been greatly extended. The easternmost associations are those from the alliances *Vaccinio myrtilli-Quercion petraeae* (Central and Sarmatic parts of Europe) and *Agrostio capillaris-Quercion petraeae* (southern Central and Sarmatic parts of Europe). The first one is composed of 2 associations: the *Calamagrostio arundinaceae-Quercetum petraeae* (including some ill-defined, eastern forms of this association) and the new association *Serratulo tinctoriae-Quercetum roboris* (described by that author). The second alliance, *Agrostio capillaris-Quercion petraeae,* comprises 4 associations: the *Pyrolo-Quercetum*, *Luzulo luzuloidis-Quercetum petraeae*, *Molinio arundinaceae-Quercetum*, and the *Quercus*-dominated form of the Sarmatic race of *Serratulo-Pinetum*.

Complicated phytosociological classifications of communities from the order *Quercetalia roboris* were also proposed by Spanish and Portuguese (Rivas-Martinez *et al.* 2001) and French botanists (Bardat *et al.* 2004). Their complexity is only partly reflected in the data compiled in Table 1 since it does not cover the level of suballiances.

Because of the diversity of the used concepts, the phytosociological classification of poor deciduous forests on a wider geographic scale is unclear and ambiguous at the level of higher syntaxa. This may be easily noticed in Table 1. At the level of associations, the situation is even more complicated. For example, the *Betulo pendulae-Quercetum roboris*, i.e. one of floristically the

Querco-Fagetea

Quercetalia roboris

Luzulo-Fagion

- *Luzulo-Fagetum*

Quercion robori-petraeae

- *Betulo-Quercetum roboris*
- *Luzulo-Quercetum*
- *Vaccinio vitis idaeae-Quercetum*

Fig. 13. Syntaxonomic structure of the order *Quercetalia roboris* according to Härdtle and Welss (1992)

poorest associations (not only in the group of acidophilous oak forests, see Tüxen 1975), has over 30 synonyms, homonyms, and pseudonyms, very much like the *Luzulo-Quercetum petraeae* (see Rennwald 2000).

Apart from acidophilous oak forests proper (dominated by *Quercus*, sometimes with a substantial contribution of *Betula*, *Fagus*, or *Pinus*), the order *Quercetalia roboris* in some systems includes the alliances *Luzulo-Fagion* and *Ilici-Fagion*, which group nearly pure acidophilous beech forests (e.g. Doing 1975; Korotkov *et al*. 1991; Müller 1991; Wallnöfer *et al*. 1993; Dierschke 1994; Härdtle & Welss 1992; Härdtle *et al*. 1997; Rennwald 2000; Rivas-Martinez *et al*. 2001). This solution is quite common in phytosociological classifications placing the order *Quercetalia roboris* in the class *Querco-Fagetea* (see Table 1), but is exceptionally used if the class *Quercetea robori-petraeae* is recognized as separate unit. However, Härdtle *et al*. (1997) consider 2 solutions – and in one of them the possibility to include in this class also acidophilous beech forests as the order *Luzulo-Fagetalia* Scam. et Pass. 1959 with the alliance *Luzulo-Fagion*. Dierssen (1996), as well as Schaminée and Stortelder (2008), assigned acidophilous beech forests, represented by the association *Deschampsio-Fagetum*, directly to the alliance *Quercion robori-petraeae*. According to Schaminée & Stortelder (2008), the association *Luzulo luzuloidis-Fagetum* belongs to the alliance *Luzulo-Fagion*, included in the order *Quercetalia roboris* and class *Quercetea robori-petraeae*.

Already previously, Medwecka-Kornaś (1972) proposed to accord poor beech forests a special status, and placed them in the group of associations intermediate between the alliances *Fagion* and *Pino-Quercion*, whereas in her very early report (Medwecka-Kornaś 1959), she did not exclude placing of this group of communities in the alliance *Pino-Quercion*.

In the eastern part of the range of forests from the order *Quercetalia roboris*, the importance of *Pinus* is relatively high, while the contribution of *Quercus* and of species with a more western distribution is lower. In that region, also mixed coniferous forests of the alliance *Pino-Quercion* are assigned to this syntaxon by Ukrainian researchers (Onyshchenko *et al*. 2003; Yuglichek & Onyshchenko 2003; Onyshchenko 2006; Solomakha 2008). Slovakian authors suggest that the alliance *Pino-Quercion* should be included in the order *Pino-Quercetalia* within the class *Quercetea robori-petraeae* (Mikuška 2005; Jarolímek *et al*. 2008). However, in Slovakia, the class is floristically more similar to the class *Pulsatillo-Pinetea* than to *Querco-Fagetea,* and the alliance *Genisto germanicae-Quercion* is very similar floristically to thermophilous oak forests of the alliance *Quercion petraeae* from the class *Querco-Fagetea* (Jarolímek *et al*. 2008). This confirms an earlier opinion that in the southern part of their range, acidophilous oak forests are gradually replaced eastwards by thermophilous oak forests (Härdtle 2004). Even further east, open forests from the class *Pulsatillo-Pinetea* substitute for them (Goncharenko & Didukh 2003).

It is very difficult to identify the diversity of acidophilous oak forests from the order *Quercetalia robori-petraeae* in the marginal part of their range, and especially to designate their eastern limit of distribution. This results from both natural conditions and human impact (e.g. Tüxen 1975; Härdtle *et al*. 1997; Matuszkiewicz J. M. 2001a; Matuszkiewicz W. 2001, 2003; Pallas 2003; Härdtle 2004). Another problem is that this group includes floristically poor communities, so even at the centre of its distribution range it is poor in characteristic species (Matuszkiewicz W. 2001). Moreover, Tüxen (1975) noted that locally, in north-western Germany, the alliance *Quercion robori-petraeae* is well-defined floristically, but none of its diagnostic species is useful in the whole distribution range of acidophilous oak forests. It is difficult to build a coherent phytosociological classification covering the whole distribution range of this group of communities also because the group has been relatively poorly studied, particularly in the areas located east of Poland.

Some authors emphasized the western type of the ranges of many plant species typical for acidophilous oak forests. They conclude that the plant associations of this group that are known in West Europe have their limit of distribution in Poland. In Ukraine and in Russia, their geographic equivalents are found, so it can be expected that new syntaxa (alliances and associations) will be described there (Goncharenko & Didukh 2003). A similar view was expressed by Pallas (2003), who noted that the *Calamagrostio-Quercetum* has its limit in Central Europe. As emphasized by W. Matuszkiewicz (2001), it is to a large extent a matter of convention where the eastern limit of the class *Quercetea robori-petraeae* is designated, because there is a wide transitional zone where acidophilous oak forests are gradually replaced by mixed coniferous forests from the class *Vaccinio-Piceetea*, in the eastern direction. However, J. M. Matuszkiewicz (2007c) claims that the class *Quercetea robori-petraeae*, including sub-Atlantic submontane communities in Poland, reaches in our country the eastern limit of its distribution range. The gradual disappearance of diagnostic species of acidophilous oak forests, as the observer moves from the west to the eastern part of Europe, was documented by Ellenberg (1988: 183). As reported by Rameau (1985), this reduction can be noticed as far west as in France. It is reflected, for example, in the geographic variation of the association *Fago-Quercetum*, represented by 4 geographic races: hyper-Atlantic (with *Taxus*, *Ruscus*, *Blechnum*, etc.), Atlantic (with *Ilex aquifolium*), sub-Atlantic, and Central European.

The history of research on acidophilous oak forests, using a syntaxonomic approach similar to the West European one, is relatively short in Eastern Europe. In a phytosociological review of the former Soviet Union (Korotkov *et al.* 1991), acidophilous deciduous forests were included in the class *Querco-Fagetea*, order *Quercetalia robori-petraeae*, and alliance *Quercion robori-petraeae*. The only association within this alliance was the *Calamagrostio-Quercetum petraeae*, reported exclusively from Lithuania. As reported by Patalauskaite (2007), those oak forests were initially identified as the *Pino-Quercetum* Kozł. 1925, and next as the *Calamagrostio-Quercetum* from the class *Querco-Fagetea* (Balevičiene 1984, 1991, cited by Patalauskaite 2007). Recently, considering chorological and floristic aspects, these forests were classified as the *Tilio-Carpinetum* Traczyk 1962 *calamagrostietosum* (Patalauskaite 2007). This diagnosis was justified by, for example, a much smaller contribution of species of the order *Quercetalia roboris*, and a markedly increased contribution of species of the class *Querco-Fagetea* in the species composition of Lithuanian oak forests, as compared with the *Calamagrostio-Quercetum* in Poland. Localities of the *Calamagrostio-Quercetum* reported from Estonia are even more distant (in the north-eastern direction) from its main distribution range (Paal 1998). Recently, the acidophilous oak forest *Vaccinio myrtilli-Quercetum roboris* Bulokhov et Solomeshch 2003 has been documented in western Russia, near Bryansk. This association was included in the alliance *Vaccinio myrtilli-Quercion roboris* Bulokhov et Solomeshch 2003, order *Quercetalia roboris*, and class *Querco-Fagetea* (Semenishchenkov 2009). Its species composition, presented in that publication, shows that it is similar to the above-mentioned *Serratulo tinctoriae-Quercetum roboris*. It is also noteworthy that the alliance *Vaccinio myrtilli-Quercion roboris* is sometimes included in the more broadly defined alliance *Pino-Quercion* Medwecka-Kornaś in Medwecka-Kornaś *et al.* 1959, within the class *Quercetea robori-petraeae* (Onyshchenko 2006).

In the last 2 decades, a very fast progress was achieved in phytosociological research in Ukraine. In that period, basic phytosociological documentation was obtained for at least several classes, not reported earlier from Ukraine (Shelyag-Sosonko *et al.* 2008). That group comprises also the class *Quercetea robori-petraeae*. Ukrainian authors, who study mixed coniferous forests and poor pine-oak forests, apply various concepts. Some of them include mixed coniferous forests in the class *Vaccinio-Piceetea* within the alliance *Dicrano-Pinion* Libb. 1933 (Fitsailo 2003) or *Pino-Quercion* Medw.-Korn. 1959 (Vorobyov 2003). Others place the same alliance *Pino-Quercion* in the order *Quercetalia robori-petraeae* and class *Quercetea robori-petraeae* (Onyshchenko 2006; Onyshchenko *et al.* 2003; Yuglichek & Onyshchenko 2003). The same solution was used in the latest synthesis of Ukrainian vegetation (Solomakha 2008). Mixed coniferous forests of Ukraine represent several associations, but patches of *Querco-Pinetum* J.Mat. 1988 are most widely distributed and can be subdivided into several subassociations, depending on environmental conditions.

The proposal to include mixed coniferous forests as the alliance *Pino-Quercion*, or as the separate order *Pino-Quercetalia* (Jarolímek *et al.* 2008) in the class *Quercetea robori-petraeae*, is very controversial. W. Matuszkiewicz (2004) emphasizes that mixed coniferous forests dominated by pine with oak undoubtedly belong to the alliance *Dicrano-Pinion*, where they may form, at most, a separate suballiance.

Acidophilous oak and pine-oak forests from the order *Quercetalia robori-petraeae* in Ukraine are found mostly in the north-western part of the country and are best studied in Polesie. Like in West and Central Europe, also in Ukraine this order is sometimes placed in the class *Querco-Fagetea* (Vorobyov 2003) or more often in the class *Quercetea robori-petraeae* (Goncharenko 2001; Didukh *et al.* 2003; Onyshchenko 2006; Solomakha 2008). In the review of plant communities of Ukraine, these forests are represented by 3 associations of the alliance *Quercion robori-petraeae:* the *Calamagrostio arundinaceae-Quercetum petraeae* (Hart. 1934) Scam. 1959; *Holco lanati-Quercetum roboris* ass. prov. Vorobyov, Balashov, Solomakha 1997; and *Carici brizoidi-Quercetum* Orlov, Yakushenko, Vorobyov 1999 (Solomakha 2008). The association *Calamagrostio arundinaceae-Quercetum* is also sometimes included in the alliance *Genisto germanicae-Quercion* R. et Z. Neuh. 1967 (Vorobyov 2003). The diversity of Ukrainian acidophilous oak forests was interpreted differently by Goncharenko (2001), who near Suma (central part of northern Ukraine) recorded the presence of 2 associations: the *Querceto roboris-Betuletum* R.Tx. 1930 (alliance *Molinio-Quercion* Scam. et Pass. 1959) and *Violo-Quercetum* (alliance *Agrostio-Quercion* Scam. et Pass. 1959). Supposedly the above-mentioned association *Querceto-Betuletum* corresponds to the *Molinio caeruleae-Quercetum* (R. Tx. 1937) Scam. et Pass. 1959, which was reported, beside the *Calamagrostio-Quercetum petraeae*, from Polesie (Yakushenko 2005). Other researchers considered it necessary to include within the order *Quercetalia robori-petraeae* the alliance *Convallario majali-Quercion roboris* Shevchyk *et al.* 1996, reported from Ukraine (Didukh *et al.* 2003; Onyshchenko 2006). One of the associations included in this alliance is the *Calamagrostio arundinaceae-Pinetum sylvestris* Shevchyk et V.Sl. 1996. It is noteworthy that the same name was used to describe mixed coniferous forest in north-eastern Poland (Sokołowski 1980).

According to J. M. Matuszkiewicz (1988), the latter syntaxon is identical with the *Serratulo-Pinetum pulmonarietosum*. This association was already reported from Ukraine (Onyshchenko *et al.* 2003; Vorobyov 2003).

The above-mentioned monograph of J. M. Matuszkiewicz (1988) was used as a basis for 2 later works (Matuszkiewicz W. & Matuszkiewicz J. M. 1996; Matuszkiewicz J. M. 2001a). The classification of mixed coniferous forests proper and acidophilous oak forests presented there was accepted by W. Matuszkiewicz (2001). Both W. Matuszkiewicz and J. M. Matuszkiewicz (1996) and J. M. Matuszkiewicz (2001a) discussed 2 latest syntaxonomic concepts: first of all, the results of Pallas' (1996) revision of acidophilous oak forests of West and Central Europe (Fig. 12), but also our above-mentioned proposal (Brzeg *et al.* 1989). J. M. Both and W. Matuszkiewicz did not accept the Pallas' system, but added the association *Molinio caeruleae-Quercetum roboris* to the list of forest communities of Poland. They did not accept the broader definition of *Calamagrostio arundinaceae-Quercetum*, either, and did not legitimize the new association *Aulacomnio androgyni-Quercetum roboris* (= *Carpino-Quercetum*). Detailed descriptions of both the associations were presented in 3 successive publications (Brzeg *et al.* 2000a, 2001; Brzeg & Kasprowicz 2001), where subdivision of the class *Quercetea robori-petraeae* followed the solutions of Pallas (1996), but with considerable modifications.

5.2. Major characteristics of associations of acidophilous deciduous forests from the classes *Quercetea robori-petraeae* and *Querco-Fagetea*, and of mixed coniferous forests from the class *Vaccinio-Piceetea*

Associations of acidophilous oak forests of the class *Quercetea robori-petraeae*, the closely related acidophilous deciduous forests of the class *Querco-Fagetea*, and mixed coniferous forests of the class *Vaccinio-Piceetea* are described below on the basis of research results presented in the publications cited above (especially the latest ones).

5.2.1. Acidophilus oak forests from the class *Quercetea robori-petraeae* Br.-Bl. *et* R. Tx. 1943 *nom. mut.*

Betulo pendulae-Quercetum roboris R. Tx. 1930 *nom. invers.*

Syn.: *Querceto roboris-Betuletum molinietosum* Tx. 1937, *Querceto sessiliflorae-Betuletum* R. Tx. 1937 sub-Atlantic race *p.p.*; *Betulo pendulae-Quercetum roboris* R. Tx. 1937 *nom. invers. sensu auct. p.p.*; *Betulo pendulae-Quercetum roboris* R. Tx. (1936) 1937 *sensu auct.*; *Molinio caeruleae-Quercetum* (R. Tx. 1937) Scam. *et* Pass. 1959 *p.p.*; *Fago-Quercetum* R. Tx. 1955 *sensu auct. polon. p.p.*, *Pino-Quercetum* Kozłowska 1925 *sensu auct. polon. p.p.*, *Periclymeno-Quercetum* (Hartm. 1934) Prsg. *et* Knapp 1942 *nom. inval. sensu auct. p.p.*, *Periclymeno-Quercetum pteridetosum* Piotrowska 1960, *Betulo-Pinetum* Celiński *et* Piaczyńska 1966.

This community is known as Pomeranian acidophilous birch-oak forest. In the accepted classification, it is limited in Poland to the narrow coastal zone extending from the Szczecin Lowland to the Hel Peninsula (Matuszkiewicz J. M. 2001a), or even to the Vistula Spit (Piotrowska 2003). On the map of potential natural vegetation, this association reaches, however, only the town of Ustka (Matuszkiewicz J. M. 2008b). They are absent also on an earlier map, covering the areas located west of that town (Wojterski *et al.* 1994). Patches of *Betulo-Quercetum* are developed in Poland mostly at moist sites, as the subassociation *B-Q molinietosum* Tx. 1937 (Matuszkiewicz J. M. 1988). The original diagnosis of this association in Poland was based on 74 relevés (Matuszkiewicz J. M. 1988, 2001a; Matuszkiewicz W. & Matuszkiewicz J. M. 1996).

The Pomeranian birch-oak forest *B-Q molinietosum* occurs on marine, dune, and sandur sands, either loose or clayey, on which podzolic-gley soils develop. The soils are characterized by high acidity of the surface layer and seasonal variation in groundwater level: 0.5-1.5 m under the surface (Piotrowska 2003). Patches of this association are found also on brown-rusty soil (Trzciński 1989). They colonize many types of forest sites: moist mixed coniferous forest (labelled by Polish foresters as BMw), moist mixed deciduous forest (LMw), fresh mixed coniferous forest (BMśw) in the most humid variants, and the drier variants of wet mixed coniferous forest (BMb) (Brzeg *et al.* 2005; Schechtel 1984, 2005).

Piotrowska (1997, 2003) suggested another classification of this association. She divided it into 6 subassociations: the *B-Q prunetosum*, *B-Q typicum*, *B-Q loniceretosum xylostei*, *B-Q convallarietosum*, *B-Q molinietosum caeruleae*, and *B-Q deschampsietosum flexuosae*. Some of them are not limited to oligo-mesotrophic sites, which are typical for the *Betulo-Quercetum* according to most of phytosociologists (Hartmann & Jahn 1967; Tüxen 1975; Pallas 1996; Matuszkiewicz W. 2001; Feijen 2003; Brzeg *et al.* 2005) and the European Commission (Interpretation Manual 2007), but are found also at more fertile sites, related to oak-hornbeam forests. Pomeranian acidophilous birch-oak forest in this form is considered to be the only representative of habitat 9190, in the Natura 2000 network in Poland (Danielewicz & Pawlaczyk 2004a). The cited authors emphasize that it can be confused with alluvial forests, because of their floristic similarity. Thus the spectrum of sites colonized by such a broadly-defined association markedly exceeds the formal description of habitat 9190, quoted by them. According to W. Matuszkiewicz

(2001), one of the distinguishing features of this association is a nearly complete lack of *Querco-Fagetea* species, and its species composition in Poland is completely consistent with the characteristic species combination typical for West European *Betulo-Quercetum*. A similar view was expressed earlier by J. M. Matuszkiewicz (1988).

Pallas (1996) initially assigned the *Betulo-Quercetum roboris* to the alliance *Vaccinio myrtilli-Quercion petraeae*. In his later publication, he included the association in the alliance *Molinio caeruleae-Quercion roboris* (Pallas 2003). Considering the regional variation, this association is part of formation F8 (Pallas 2003). This formation extends from central England, through Belgium, the Netherlands, Denmark, north-western Germany, the south-western Sweden, and southern Norway. Its easternmost localities are on the Darss Peninsula and the island of Bornholm. Only some of the Polish localities of this association – those found at the north-western edges of our country – were in this classification probably assigned to the *Molinio caeruleae-Quercetum roboris*, and presented in the map of distribution of formation F9 (Bohn *et al.* 2003). The distribution range of *Betulo-Quercetum roboris*, presented earlier by Härdtle & Welss (1992), corresponds in Poland to its distribution accepted by Polish authors (see Matuszkiewicz J. M. 2001a).

Tüxen (1975), bearing in mind the low level of floristic distinctness of *Betulo-Quercetum*, considered the possibility of joining this association with the *Fago-Quercetum*. Results of later research indicate that the *Betulo-Quercetum* is not a stable community and can be replaced by the poor beech forest *Deschampsio-Fagetum* (Elgersma 1998; Härdtle *et al.* 2005). It is outcompeted by *Fagus* on the soils where increasing amounts of humus are accumulated as a result of plant succession. However, *Fagus* avoids poor sites with a high groundwater level (Härdtle *et al.* 2003; 2005; see Rode 1999a, 1999b). This feature of *Fagus* is probably responsible for the limited habitat differentiation of *Betulo-Quercetum*, which is usually found at moist sites.

Fago-Quercetum petraeae R. Tx. 1955 *nom. inval. et nom. ambig.*

In this study, acidophilous beech-oak forest was not distinguished as a valid syntaxon, on the basis of the arguments explained below and syntaxonomic solutions presented by Brzeg *et al.* (2001), Brzeg & Wojterska (2001), as well as Ratyńska *et al.* (2010). According to other authors, the *Fago-Quercetum* is distributed mostly in Pomerania, west of the lower Vistula, and in the Lubusz Land (Matuszkiewicz J. M. 1988, 2001a). Its southern and eastern limit in Poland needs to be determined (Matuszkiewicz W. 2001). The *Fago-Quercetum* is represented by 2 subassociations: the *F-Q typicum* on fresh (i.e. moderately moist) sites and the *F-Q molinietosum* on moist sites. Until recently it was the best-documented association of acidophilous oak forests in Poland. It was described on the basis of 398 relevés (Matuszkiewicz J. M. 1988, 2001a; Matuszkiewicz W. & Matuszkiewicz J. M. 1996).

Beech-oak forest is found chiefly on acid brown, rusty or grey-brown (lessivé) soils. Its sites are moist or fresh, varying in fertility, but mostly classified as sites of fresh mixed coniferous forest (BMśw) or mixed deciduous forest (LMśw) (Matuszkiewicz J. M. 1988, 2001a; Trzciński 1989; Święcicki 2000).

The *Fago-Quercetum petraeae* is highly controversial, as emphasized by many authors. W. Matuszkiewicz (2001), supported the retention of this association, but emphasized that the validity of its name, phytosociological position, and its distinctness are questionable. He did not agree with Pallas (1996), who suggested that woods identified as the *Fago-Quercetum* are in fact acidophilous beech forests in north-western Germany, while in the east (including Polish Pomerania) they are a form of *Calamagrostio arundinaceae-Quercetum*. That proposal of J. Pallas was also completely rejected by J. M. Matuszkiewicz (2001a). By contrast, like in the present study, the proposal was accepted by Brzeg *et al.* (2001) and Brzeg & Kasprowicz (2001), considering the *Fago-Quercetum* as the West Pomeranian race of *Calamagrostio arundinaceae-Quercetum*.

It must be emphasized that in later publications, the association *Fago-Quercetum* is usually not distinguished as a separate syntaxon. This question was not resolved by authors of the map of European vegetation (Bohn *et al.* 2003). Bohn (2003) placed the *Fago-Quercetum* in the class *Querco-Fagetea*, as the only component of the alliance *Quercion roboris*. All the other associations of this alliance were placed in the class *Quercetea robori-petraeae* in another section of explanations to this map (Pallas 2003). Additionally, the explanation to formation F8 on that map, informs that the formation includes the *Fago-Quercetum* Tüxen 1955 p.p. (*Quercus*-dominated part). In contrast, Pallas (2003), who described this formation and within it also the subdivision of the class *Quercetea robori-petraeae*, did not even mention the name *Fago-Quercetum*.

One of the first critics of the definition of *Fago-Quercetum* was Doing (1975). He emphasized that according to that definition, its ecological range was too broad, including very heterogeneous sites. He did not find any place for it in the proposed system of plant communities. He described also the association *Solidagini-Quercetum*, including the western part of the distribution range of the former *Fago-Quercetum* in the forms lacking *Fagus*. Its forms with *Fagus* are sometimes classified as the association *Periclymeno-Fagetum* Pass. 1957 (Pott 1995; Pallas 1996, 2002), which corresponds with an earlier suggestion of Passarge (1957), or as the *Luzulo-Fagetum* Meusel 1937 (Rennwald 2000). Bohn *et al.* (2003) consider *F-Q typicum* as synonymous with the *Deschampsio-Fagetum* Pass. 1956. Similarly, Brzeg *et al.* (2000a, 2001) as well as Brzeg & Wojterska (2001), agreed with the suggestion of Pallas (1996), and regarded its *Fagus*-dominated forms as the acidophilous beech forest *Luzulo pilosae-Fagetum*, while the *Quercus*-dominated forms were included in the association *Calamagrostio arundinaceae-Quercetum petraeae*. In other classifications, the *Quercus*-dominated form of *Fago-Quercetum* (Härdtle 1997), and probably the corresponding typical subassociation *F-Q typicum* (Böhnert *et al.* 2001) or an undefined part of this association, *Fago-Quercetum* p.p. (Rennwald 2000) were included in the *Betulo-Quercetum roboris*. A similar solution was also accepted by Ratyńska *et al.* (2010). They listed 3 separate forms of the broadly defined *Fago-Quercetum* as synonyms of the associations *Betulo-Quercetum roboris, Calamagrostio-Quercetum petraeae*, and *Deschampsio flexuosae-Fagetum*. Yet another concept, accepted also by Schubert *et al.* (2001), was proposed by Oberdorfer (1992b), who included the *F-Q typicum* in the *Holco mollis-Quercetum* Lemeé 1937, according to his broader definition of the association.

The *Fago-Quercetum petraeae* Tx. 1955 was indicated on the map of European vegetation as a component of 4 formations within the group of lowland oligo- and mesotrophic beech forests or mixed deciduous forests with *Fagus* (Bohn *et al.* 2003). Western Poland and eastern Germany are within the range of formation F80, which includes the *Fago-Quercetum* and poor beech forests, e.g. the *Luzulo pilosae-Fagetum* (=*Deschampsio flexuosae-Fagetum*). Both the associations, described as poor beech forests, were assigned to the order *Quercetalia robori-petraeae* and class *Querco-Fagetea* (the former as a component of *Quercion roboris*, while the latter was placed in the *Deschampsio flexuosae-Fagion*) (Bohn 2003).

J. M. Matuszkiewicz (2007a) reported a decline of patches of the association *Fago-Quercetum* in Kashubia. In that region, in a relatively short period of 40 years, they were transformed in extensive areas into the poor beech forest *Luzulo pilosae-Fagetum*. This process probably reflects a regeneration of poor beech forest deformed earlier by forest management, which favoured *Pinus* and/or *Quercus*. Floristic relationships of beech-oak forests were probably modified by extensive sheep grazing. Thus the *Fago-Quercetum* may be a community conditioned by zoo-anthropogenic impact, i.e. livestock grazing, very much like thermophilous oak forests (Matuszkiewicz 2007a). According to the cited author, the expansion of beech forest (at the expense of beech-oak forest) is unlikely to be due to climate change. The decline of *Fago-Quercetum* also seems to be confirmed by results of a biodiversity survey on permanent plots of forest monitoring (Czerepko *et al.* 2008). The monitoring showed that the frequency of patches corresponding to this association is about 5-fold lower than expected according to the estimations of J. M. Matuszkiewicz (2001a).

Luzulo luzuloidis-Quercetum petraeae Hilitzer 1932

Syn.: *Genisto germanicae-Quercetum* Aichinger 1933, *Genisto tinctoriae-Quercetum* Klika 1932, *Querceto sessiliflorae-Betuletum* R. Tx. 1937 *p.p.*; *Luzulo luzuloidis-Quercetum* Hartm. 1953; *Luzulo* (*nemorosae*)-*Quercetum petraeae* Pass. 1953 *em.* R. *et* Z. Neuh. 1967

The submontane acidophilous oak forest is found in Poland in lower parts of the Sudetes, in the submontane zone and foothills of the Sudetes and Western Carpathians, and locally in the southern part of the Kraków-Częstochowa Upland. Because of its geographic variation, it is subdivided into the Sudetian (typical) race and the Małopolska race. The latter is regarded as its marginal form because of the presence of species typical of coniferous forests (Matuszkiewicz J. M. 2001a). Ecological variation was initially observed exclusively in the western, Sudetian part of its range (Matuszkiewicz J. M. 1988). The association is clearly differentiated into 2 subassociations: the *L-Q typicum* and *L-Q genistetosum tinctoriae*. The latter syntaxon, highly xerothermophilous, is a submontane equivalent of thermophilous oak forest (Matuszkiewicz W. 2001). The basic description of this association in Poland was based on 72 relevés (Matuszkiewicz J. M. 1988, 2001a; Matuszkiewicz W. & Matuszkiewicz J. M. 1996).

The well-drained, rocky sites of submontane oak forest are characterized by the presence of loess or loamy deposits, on which podzolic or grey-brown (lessivé) soils develop (after J. M. Matuszkiewicz 2001a). The cited author reported that this association is found on potential sites of fresh mixed coniferous forest (BMśw). Patches of *Luzulo-Quercetum* studied by Kwiatkowski (2001) in the western foothills of the Sudetes developed on soils classified as rankers (*L-Q typicum*) or erosive lithosols (*L-Q genistetosum*).

The distribution of the association in Poland, described above, is consistent with the map of European vegetation. The centre of its distribution is in the western and south-western Czech Republic (Bohn *et al.* 2003).

One of the northernmost localities was reported from Dalków Hills in the Głogów Forest District (Lisiewska & Sekuła-Woźniak 1998; Lisiewska 2006). The relevés published in the first of the cited articles do not allow this diagnosis. The documented plant communities undoubtedly represent the association *Calamagrostio arundinaceae-Quercetum*. The habitats of *Luzulo-Quercetum* were also wrongly identified on the map of potential natural vegetation of the catchment area of the river Barycz, where its biotopes were marked between Twardogóra and Milicz and near Sułów, Żmigród, Milicz, and Oborniki Śląskie (Wojterski *et al.* 1981). All the sites on a later map of potential natural vegetation of Poland were classified as sites of *Calamagrostio arundinaceae-Quercetum* (Matuszkiewicz W. *et al.* 1995; Matuszkiewicz J. M. 2008b).

Recently, a comparison of changes in species composition over 30 years has indicated that patches of *Luzulo-Quercetum* tend to disappear on its sites in the Ojców National Park. They are gradually transformed into *Fagus*-dominated forests, which will probably develop into poor beech forests *Luzulo pilosae-Fagetum* (Matuszkiewicz 2007c). The cited author regards air pollution, the ban on grazing, and changes in forest management as the major reasons of the decline of *Luzulo-Quercetum*. Those conclusions are based on results of research documented in several articles of Medwecka-Kornaś and Gawroński, recently summarized by Medwecka-Kornaś (2006). Those authors provide evidence that the major cause of the observed changes in species composition of those forests is air pollution. In all those articles, the forests are diagnosed currently as the *Pino-Quercetum*. Earlier on (Medwecka-Kornaś 1952), this association was reported under the name *Quercetum medioeuropaeum* Br.-Bl. 1932, which according to Medwecka-Kornaś (2006) can be regarded as a synonym of *Pino-Quercetum*. Yet another diagnosis was made by Pallas (1996). He noted that the nearly complete lack of *Pinus* in the relevés of *Quercetum medioeuropaeum* from the Kraków-Częstochowa Upland (Medwecka-Kornaś 1952), does not make it possible – for formal reasons – to regard this community as a synonym of *Pino-Quercetum*. At least some of the relevés, in his opinion, represent the *Calamagrostio-Quercetum luzuletosum luzuloidis*.

Calamagrostio arundinaceae-Quercetum petraeae (Hartm. 1934) Scam. *et* Pass. 1959 *em.* Brzeg, Kaspr. *et* Krot.1989

Syn.: *Pino-Quercetum* Kozł. 1925 *sensu aut. p.p.*, *Quercetum medioeuropaeum* Br.-Bl. 1932 *ex* Libbert 1933, *Querceto-Betuletum calamagrostidetosum vel Quercetum medioeuropaeum calamagrostidetosum* Hartm. 1934, *Periclymeno-Quercetum marchicum* Preising 1943, *Fago-Quercetum petraeae* Tx. 1955 *p.p.* (*excl. Deschampsio flexuosae-Fagetum* Schröder 1938), *Pyrolo secundae-Quercetum petraeae* Pass. 1957, *Stellario holosteae-Quercetum roboris* Scam. *et* Pass. 1959 *p.p.*, *Agrostio capillaris-Quercetum* Pass. 1968 *sensu aut. p.p.*, *Querco roboris-Pinetum* J. M. Matuszkiewicz 1988 *sensu aut. p.p.*[4]

Until recently, this association, known as Central European acidophilous oak forest with *Calamagrostis*, has been very poorly studied and aroused controversy (Matuszkiewicz W. 1967, 1981). J. M. Matuszkiewicz (1988) characterized it on the basis of 43 relevés, but 17 of them represented only "a community similar to the *Calamagrostio-Quercetum*". This association had been documented from the Lubusz Land, Wielkopolska, and Upper Silesia, but its hypothetical range was supposed to include also the Upper Silesia and the Częstochowa-Wieluń Upland. The ecological variation of the association was not known at that time. It was assumed that this oak forest type occupies sites similar to those of *Querco-Pinetum* in central Poland. Its patches known at that time developed on fresh soils, but their presence on moist sites was not excluded (J. M. Matuszkiewicz 1988). Later research showed that this association (narrowly defined in that study), is limited to fresh sites and shows a low ecological variation. Although quite many local forms of *Calamagrostio arundinaceae-Quercetum* were reported in the literature, also the interpretation of its regional variation was not clearly determined (Matuszkiewicz J. M. 2001a). W. Matuszkiewicz (2001) accepted the view of German authors and described the *Calamagrostio arundinaceae-Quercetum* as a marginal form of acidophilous oak forests from the class *Quercetea robori-petraeae*. According to his definition, the association should be dominated by *Quercus petraea* and nearly completely lack *Fagus* in the canopy. In its species composition, all-forest acidophilous mesotrophic species should prevail, and the contribution of characteristic species of the class *Quercetea robori-petraeae* should be high. Characteristic species of the class *Vaccinio-Piceetea* (e.g. sometimes abundant *Vaccinium myrtillus*) and of the class *Querco-Fagetea* (represented by several more eurytopic species) should not play any important role there.

The association *Calamagrostio arundinaceae-Quercetum* is more broadly defined by Brzeg *et al.* (1989, 2001) as well as Brzeg & Kasprowicz (2001). Already in the first cited article, devoted chiefly to the *Molinio caeruleae-Quercetum roboris* (another association from the group of acidophilous oak forests), 3 subassociations of *Calamagrostio arundinaceae-Quercetum* were distinguished: the *Ca-Q molinietosum*, *Ca-Q typicum*, and *Ca-Q convallarietosum*. They are conditioned mostly by differences in soil moisture content (Brzeg *et al.* 1989). This association includes acidophilous oak forests developed chiefly on sites of

4 After Brzeg *et al.* (2001), modified

fresh mixed coniferous forest (BMśw), but also of fresh mixed deciduous forest (LMśw). According to that definition, the *Calamagrostio arundinaceae-Quercetum* is ecologically and floristically related to moist forest communities dominated by *Molinia caerulea* (the *Molinio caeruleae-Quercetum*, *Querco-Pinetum molinietosum*, and *Molinio-Pinetum*), but also to thermophilous oak forest from the order *Quercetalia pubescentis*. The distribution range of *Calamagrostio arundinaceae-Quercetum* was reported to include the central and western part of the Polish Lowlands. According to that classification, the association was distinct both from the *Fago-Quercetum*, found in Poland in Pomerania, and from the *Luzulo-Quercetum*, distributed in uplands and in the submontane zone.

A detailed description of the association *Calamagrostio-Quercetum* from Wielkopolska, based on 123 relevés, was presented by our research team (Brzeg *et al*. 2001), after the revision of the syntaxonomy and nomenclature of acidophilous oak forests made by Pallas (1996). As a result of a critical analysis and discussion of his classification, we assigned this association to the alliance *Agrostio capillaris-Quercion* Scam. et Pass. 1959 em. Brzeg, Kasprowicz et Krotoska 2001. We also documented the reported earlier (Brzeg *et al.* 1989) differentiation of the association into 3 subassociations: the *Ca-Q molinietosum* Brzeg, Kasprowicz, Krotoska 1989 ex Lisiewska et Reszel 2000; *Ca-Q typicum* Grosser 1964; and *Ca-Q polygonatetosum odorati* Pass. in Pallas 1996 (=*Ca-Q convallarietosum* (Fab. et Fal. 1964) Brzeg, Kasprowicz, Krotoska 1989 nom. inval.). The differentiation is mostly due to variation in soil moisture content. This is confirmed by the ecological scale of their differential species, i.e. for the moist subassociation *Ca-Q molinietosum*: *Agrostis canina*, *Carex leporina*, *C. nigra*, *C. pallescens*, *Deschampsia caespitosa*, *Frangula alnus* (opt.), *Hypericum maculatum*, *Juncus effusus*, *Lysimachia vulgaris*, *Molinia caerulea*, *Potentilla erecta*, and *Trientalis europaea*; while for the driest and warmest subassociation *Ca-Q polygonatetosum odorati: Campanula persicifolia*, *Convallaria majalis* (opt.), *Corylus avellana*, *Festuca heterophylla*, *Fragaria vesca*, *Galium album* fo. *dumetorum*, *Hieracium murorum*, *H. pilosella*, *Hypericum perforatum*, *Moehringia trinervia* (opt.), *Mycelis muralis*, *Poa angustifolia*, *Polygonatum odoratum*, *Veronica officinalis*, and *Viola riviniana*. Patches of the typical subassociation are associated with fresh (i.e. moderately moist) sites. The *Ca-Q typicum* has no differential species. The varied fertility of its sites is less important for floristic variation of this association. It is reflected in the separation of typical variants (poorer) from variants with *Anemone nemorosa* (more fertile) within each subassociation. The more fertile variants are distinguished also by other species of the class *Querco-Fagetea*, e.g. *Atrichum undulatum*, *Melica nutans*, *Poa nemoralis*, *Stellaria holostea*, *and Viola reichenbachiana*.

Mazur (1994), on the basis of his research on the *Calamagrostio-Quercetum petraeae* in the Niemodlin Forest in Silesia, distinguished its 4 trophic variants: variant with *Carex montana* (on dry sites, with species of the order *Quercetalia pubescentis*), variant with *Rubus saxatilis* (on more fertile sites, with the canopy dominated by planted *Pinus*), typical variant, and variant with *Circaea alpina* (on relatively poor and wet sites).

Recently, Kurowski (2009) reported from central Poland (Łagiewniki Forest at the northern limits of the city of Łódź) a new subassociation, the *Ca-Q festucetosum*. Earlier on (Kurowski & Andrzejewski 2000), this syntaxon was classified as a form *Calamagrostio-Quercetum* with *Festuca ovina*. It was described (Kurowski *et al*. 2001) as dry and much poorer floristically than the subassociation *Ca-Q polygonatetosum* documented by us (Brzeg *et al.* 2001).

The habitat variation of *Calamagrostio-Quercetum* was also discussed by Grosser (1964), who described the *Ca-Q typicum* and *Ca-Q scorzoneretosum humilis*, and by Pallas (1996), who assumed that this association may form 4 subassociations, i.e. the 2 mentioned above and additionally also the *Ca-Q luzuletosum luzuloidis* and *Ca-Q polygonatetosum odorati*. The subassociation *Ca-Q luzuletosum luzuloidis* was described on the basis of relevés diagnosed earlier as the *Quercetum medioeuropaeum* (Medwecka-Kornaś 1952) and *Pino-Quercetum* (Celiński 1965). Data shown by Pallas (1996, Table 5), contrary to his interpretation, indicate that in fact this subassociation is not conditioned by local ecological variation but by geographic variation. It corresponds primarily to the *Luzulo luzuloidis-Quercetum*, and probably partly also to the South Polish race of *Calamagrostio arundinaceae-Quercetum,* described below.

Pallas (1996) indicated that in Poland there is yet another association from the group of acidophilous oak forests, namely the *Pyrolo secundae-Quercetum petraeae* Pass. 1957. He assigned to this association also some relevés originally identified as the association *Calamagrostio arundinaceae-Quercetum* by Celiński & Wika (1974-1975), Fabiszewski & Faliński (1967 – by Pallas wrongly recorded as 1964), and Krotoska (1978). Disregarding the question of the definition of the association *Pyrolo-Quercetum* (see Brzeg *et al*. 2001), it is important here to go back to the phytosociological table of Krotoska (1978, Table 1). The *Calamagrostio-Quercetum* in the Włoszakowice Forest is relatively homogeneous, floristically poor, differentiated into several facies. As emphasized by T. Krotoska, the facies correspond to its forms distinguished by Scamoni (1961). By contrast, Pallas (1996) identified one of the facies as the *Pyrolo-Quercetum*, while the facies with *Vaccinium myrtillus* (partly also the facies with *Calamagrostis arundinacea*), as the *Ca-Q scorzoneretosum humilis* Grosser 1964[5]. Moreover, he assigned these 2 associations to different alliances: the *Pyrolo-Quercetum* to the *Agrostio capillaris-Quercion petraeae* Scam. et Pass. 1959 em. Pallas 1996, while the *Calamagrostio-Quercetum* to the *Vaccinio myrtilli-Quercion petraeae* Pallas 1996. In his original synoptic table (Pallas 1996, Table 5), showing various subassociations of *Calamagrostio-Quercetum* and *Pyrolo-Quercetum*, neither characteristic nor differential species were given. The lack of significant floristic differences indicates that the table presents in fact the species composition of one association, the *Calamagrostio arundinaceae-Quercetum* (except the 2 columns corresponding to the *Luzulo-Quercetum*).

Patches of *Calamagrostio arundinaceae-Quercetum* are found on sandy and loamy sites, either fresh or moderately moist, on rusty, gley-podzolic, leached brown, podzolic brown, and grey-brown (lessivé) soils. As emphasized by authors of a detailed study of the soils under the patches of *Calamagrostio-Quercetum*, their common feature is a high acidity and leached surface layer (Lasota *et al*. 2005). These sites are classified by foresters as fresh mixed deciduous forest (LMśw), fresh mixed coniferous forest (BMśw), less frequently also as moist mixed deciduous forest (LMw) and moist mixed coniferous forest (BMw), as well as poorer variants of fresh deciduous forest (Lśw) (Szwed 1979; Matuszkiewicz J. M. 1988, 2001a; Zaręba 1988a; Trzciński 1989; Kosakowski 1995, 1999; Sokołowski *et al.* 1997; Święcicki Z. 2000; Brzeg *et al.* 2001; Brzeg & Kasprowicz 2001; Lasota *et al.* 2005).

According to J. M. Matuszkiewicz (2001a), the general range of *Calamagrostio-Quercetum* covers about 1/3 of the area of Poland, mostly in 4 geobotanical regions: South Wielkopolska with Lusatia, Central Wielkopolska, Lower Silesia, and Upper Silesia, and partly also Central Małopolska Uplands, Kraków-Częstochowa Upland, Łódź-Wieluń Hills, Noteć-Lubusz Land, and perhaps also the Świętokrzyskie Mts. However it is estimated that forest site types suitable for the *Calamagrostio-Quercetum* account for about only 3.7% of Polish forests (Matuszkiewicz J. M. 2001a). According to BioSoil data, the areal contribution of *Calamagrostio-Quercetum* may be even lower (Czerepko *et al.* 2008). In contrast, we reported (Brzeg *et al.* 2001; Brzeg & Kasprowicz 2001) that the *Calamagrostio-Quercetum* is widespread in the lowlands and uplands of western Poland, but 3 geographic races can be distinguished: the West Pomeranian, Wielkopolska, and South Polish. Floristic characteristics of those units, accepted also in the present study, are shown above (Table 2). Recently, in the Silesian-Kraków Upland, Greń and Wika (2009) found patches of *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati*, representing the South Polish race of the association.

On the European scale, the *Calamagrostio-Quercetum* is a major plant community of Central Europe and is a component of 3 formations: F11, F12, and F19 (Pallas 2003). The last one covers the uplands and the submontane zone in the north-western part of the Czech Republic and the adjacent part of Germany. Formation F11, including the *Calamagrostio-Quercetum* and *Pyrolo-Quercetum*, covers mostly Silesia and the south-eastern part of the German Lowland (Bohn *et al.* 2003). It is noteworthy that the description of vegetation, e.g. of formation F12, by Pallas (2003) is not consistent with the map of its range of distribution (Bohn *et al.* 2003). According to his description, formation F12 comprises exclusively the eastern form of *Calamagrostio arundinaceae-Quercetum*, and this association reaches in Poland the eastern limit of its range. On the map, the same formation is marked as a sum of the ranges of *Calamagrostio-Quercetum* and *Querco roboris-Pinetum*, reaching further east, to the junction of the borders of Belarus, Russia, and Ukraine. However, as emphasized by Pallas (2003), most of the patches of *Querco-Pinetum* are dominated by *Pinus*, and thus cannot be included in formation F, comprising deciduous forests.

Molinio caeruleae-Quercetum roboris (R. Tx. 1937) Scam *et* Pass. 1959 *em*. Brzeg, Kasprowicz *et* Krotoska 1989

Central European wet oak forest with *Molinia caerulea* was identified in Poland about 20 years ago (Brzeg *et al.* 1989). According to the initial definition, this association may be treated as a vicariant of the coastal *Betulo-Quercetum molinietosum* – the most moist form of acidophilous birch-oak forest (Brzeg *et al.* 1989; Brzeg & Kasprowicz 2001; Matuszkiewicz W. 2001). We included in the *Molinio caeruleae-Quercetum roboris* the following syntaxa: *Molinio-Quercetum* (R. Tx. 1937) Scam. et Pass. 1959 p.p. (except the forms corresponding to the *Betulo-Quercetum molinietosum*), *Querco roboris-Betuletum molinietosum* R. Tx. 1937 (only the forms from Brandenburg, described by Passarge 1956, 1957); *Tilio-Betuletum molinietosum* Pass. 1957 p.p.; *Stellario-Quercetum* Scam. 1959 p.p.; *Pino-Quercetum typicum* var. with *Molinia caerulea* (documented by Krotoska and Piotrowska 1962); and pine-oak forest with *Molinia caerulea* (Sroka 1982). In Poland, the *Molinio caeruleae-Quercetum* was assigned to the alliance *Quercion robori-petraeae* (Brzeg *et al.*

[5] As indicated on p. 59, these relevés show *Ca-Q typicum*, in a floristically impoverished form

1989; Brzeg & Wojterska 1996; Matuszkiewicz J. M. 2001a; Matuszkiewicz W. 2001) or recently to the alliance *Agrostio capillaris-Quercion* (Brzeg *et al.* 2001; Brzeg & Kasprowicz 2001; Brzeg & Wojterska 2001; Greń 2007; Greń & Wika 2010; Ratyńska *et al.* 2010). The distribution of *Molinio-Quercetum* is not well studied. Most often, this association was documented from southern and central Wielkopolska, especially from the so-called Krotoszyn Plateau (Brzeg *et al.* 1989; Brzeg & Kasprowicz 2001). The area is located at the border between 3 geobotanical regions: South Wielkopolska with Lusatia, Central Wielkopolska, and Noteć-Lubusz Land (Matuszkiewicz J. M. 2001a). Recently, the *Molinio caeruleae-Quercetum* has been documented also from Silesia (Greń 2007; Kącki & Stefańska-Krzaczek 2009; Stefańska-Krzaczek & Kącki 2009; Greń & Wika 2010). Authors of the latest Polish handbook on ecological principles of forest management (Kliczkowska *et al.* 2003) report that the association is found in the Silesian and Wielkopolska-Pomeranian Regions, distinguished in the forest regionalization system. In the latter region, it is limited to 3 districts: the Wielkopolska-Kujawy Lowland, Krotoszyn District, and Żmigród-Grabów Basin. On BioSoil plots, only potential sites of this association were found. One of them is located in the Silesian and another in the Małopolska forest region (Czerepko *et al.* 2008). According to the cited author, the lack of real patches of *Molinio caeruleae-Quercetum* suggests that J. M. Matuszkiewicz (2001a) overestimated its contribution, or many of its patches have been transformed. It is noteworthy that in an earlier study (Brzeg *et al.* (1989), we indicated that sites of this association are widespread in Wielkopolska. However, many of them have been transformed by planting of *Pinus* and they are now covered by substitute forest communities, similar to moist mixed coniferous forests, or even moist coniferous forests *Molinio-Pinetum*.

Within the range of *Betulo-Quercetum* there is no floristic justification for distinguishing the *Molinio caeruleae-Quercetum* as defined by Scamoni & Passarge (1959). Thus Rennwald (2000) are right to include this association in the *Betulo-Quercetum*. In the areas located outside the range of the latter association, but within the limits of distribution of communities from the order *Quercetalia roboris*, sites similar in respect of fertility and soil moisture content, at least in western Poland, are occupied by the *Molinio caeruleae-Quercetum* as defined by Brzeg *et al.* (1989). Some of the sites may also be suitable for patches of *Calamagrostio arundinaceae-Quercetum molinietosum*. Anyway, its seems wrong to extend the range of *Betulo-Quercetum* to areas with continental climate, as suggested by Goncharenko (2001), who reported from Ukraine the association *Querceto roboris-Betuletum* R.Tx. 1930. That community, assigned by him to the alliance *Molinio-Quercion* Scam. et Pass. 1959, is distinguished with a canopy dominated by *Betula pubescens*, with addition of *B. pendula* and *Pinus sylvestris*. According to that author, its regionally diagnostic species is *Potentilla erecta*, while the major herbaceous species of its ground layer of vegetation are *Molinia caerulea*, *Deschampsia caespitosa*, *Vaccinium myrtillus*, and *Pyrola rotundifolia*. More data are needed to verify its distinctness from the *Vaccinio uliginosi-Betuletum pubescentis* and *Molinio caeruleae-Quercetum roboris*. The latter syntaxon, without phytosociological documentation, was included in the list of plant communities of northern Ukraine (Polissya) (Yakushenko 2005).

The distribution range of *Molinio caeruleae-Quercetum* on the map of European vegetation corresponds to the range of *Betulo-Quercetum roboris molinietosum*, considered as its synonym according to the syntaxonomic system accepted there (Bohn *et al.* 2003). The *Molinio-Quercetum* defined in that way is the only component of formation F9. This formation has its centre of distribution in northern Germany, but it reaches south to Saxony (Böhnert *et al.* 2001). In Poland it reaches its eastern limit, and occupies only a small part of the country in the north-west, near Szczecin (Bohn *et al.* 2003). Thus it does not comprise most of the Polish distribution range of *Betulo-Quercetum* (see J. M. Matuszkiewicz 1988, 2001a; W. Matuszkiewicz 2001) and of *Molinio-Quercetum*.

Within its known range of distribution, the *Molinio caeruleae-Quercetum* has 3 geographic races. Two of them were described by our research team (Brzeg *et al.* 1989; see also Matuszkiewicz J. M. 2001a): from Brandenburg (western) and Wielkopolska (eastern). The last, South Polish race has been distinguished recently by Greń and Wika (2010). Differential species for the western race include: *Lonicera periclymenum*, *Deschampsia flexuosa*, *Hypnum cupressiforme*, and *Fagus sylvatica*; for the eastern race: *Calamagrostis arundinacea*, *Solidago virgaurea*, *Sphagnum girgensohnii*, and *Trientalis europaea*; and for the South Polish race: *Calamagrostis villosa*, *Rubus hirtus*, *Senecio ovatus*, *Carex brizoides*, and (like for the western race) *Deschampsia flexuosa*.

The *Molinio caeruleae-Quercetum* does not show any significant ecological variation. Two variants can be distinguished depending on soil moisture content. The typical variant is found on less moist sites, while the variant with *Calamagrostis arundinacea*, distinguished also by the presence of *Betula pubescens*, occupies more moist and wet sites. The latter variant can be subdivided into a typical subvariant and a subvariant with *Carex canescens* and *Sphagnum girgensohnii* (Brzeg *et al.* 1989; Brzeg & Kasprowicz 2001; Matuszkiewicz J. M. 2001a).

Gley soils (both groundwater gley soils or surface-water gley soils) are typical for patches of *Molinio* *caeruleae-Quercetum*. Surface-water gley soils are particularly frequent in the Krotoszyn Plateau. Those sites are classified by foresters as moist mixed coniferous forest (BMw) or moist mixed deciduous forest (LMw) (see Matuszkiewicz J. M. 1988, 2001a; Brzeg *et al.* 1989; Kliczkowska *et al.* 2003).

Molinio arundinaceae-Quercetum Samek 1962

Syn.: *Molinio arundinaceae-Quercetum* R. *et* Z. Neuh. 1967

The upland-submontane moist acidophilous oak forest is poorly studied in Poland. Until recently, its patches were reported in our country only from lower altitudes in the Sudetes and their foothills. The *Molinio arundinaceae-Quercetum* does not show any regional variation. In Poland mostly its moist forms have been documented, but it cannot be excluded that a drier variant exists here as well (Matuszkiewicz J. M. 1988, 2001a). W. Matuszkiewicz (2001) regards this association as a submontane equivalent of *Molinio caeruleae-Quercetum*.

Poor sites of *Molinio arundinaceae-Quercetum* are formed in often extensive local depressions, on sandy or loamy soils. A characteristic feature of the sites is a high seasonal variation in groundwater level (Matuszkiewicz J. M. 2001a; Matuszkiewicz W. 2001). Greń (2007) found its patch on a surface-water gley soil.

The description of *Molinio arundinaceae-Quercetum* in Poland was based on only 15 relevés of Kuczyńska (1973) and Celiński & Wika (1974-75), and it was insufficient to determine the range of its distribution in our country (Matuszkiewicz J. M. 1988, 2001a; Matuszkiewicz W. & Matuszkiewicz J. M. 1996). The estimated area of its well-developed patches is only several square kilometres (Matuszkiewicz J. M. 2001a).

The *Molinio arundinaceae-Quercetum* was recently recorded in the Silesian Upland and in the Oświęcim Basin (Babczyńska-Sendek *et al.* 2007; Greń 2007). These new localities, documented jointly by 37 relevés, represent mostly the moist variant, and are its easternmost records in Poland and probably also in Central Europe. Those results suggest that this association may be more widespread in the northern part of the upland zone. Brzeg and Wojterska (1996, 2001) included it in the list of plant communities of Wielkopolska on the basis of fragmentary materials and observations made near Rychtal and Kępno, and moved its hypothetical border northwards. Patches of the association *Molinio arundinaceae-Quercetum* in this part of Wielkopolska have been found recently by Rutkowski (2007), but he did not publish its phytosociological documentation.

Pallas (1996) initially assigned the *Molinio arundinaceae-Quercetum* to the alliance *Molinio caeruleae-Quercion roboris*, which groups azonal, moist acidophilous oak forests. Later on, he assigned it to the alliance *Agrostio capillaris-Quercion petraeae*, which includes acidophilous oak forests of the southern part of Central and Sarmatic Europe (Pallas 2000, 2003). Brzeg & Wojterska (2001), followed by Ratyńska *et al.* (2010), placed this association in the alliance *Agrostio capillaris-Quercion petraeae* amended by Brzeg *et al.* (2001). It was defined more broadly in respect of ecological variation, and with a different geographic distribution.

On the map of European vegetation, the *Molinio arundinaceae-Quercetum* and *Carici brizoidis-Quercetum roboris* jointly constitute formation F22 (Bohn *et al.* 2003). This formation has an eastern distribution and covers more extensive areas in western Ukraine and the adjacent parts of Romania, Hungary, and Slovakia. It must be emphasized that it covers a very small area in the Czech Republic, where it has been reported only from north-eastern part of the country and near Ostrava. Neuhäuslová (2001) indicates, however, that the *Molinio arundinaceae-Quercetum* is found also in the central and eastern part of the country. It is unclear why the map does not show any localities of submontane moist acidophilous oak forest in Poland. This association was identified very early in our country, only a few years after the publication of its formal description by Neuhäusl and Neuhäuslová-Novotná (1967), which until recently was regarded as its first description. Potential biotopes of *Molino arundinaceae-Quercetum*, although indicated jointly with the *Luzulo luzuloidis-Quercetum* as one category, were shown also on the map of potential vegetation of Poland (Matuszkiewicz W. *et al.* 1995, Matuszkiewicz J. M. 2008b).

Aulacomnio androgyni-Quercetum roboris Brzeg *et* Kasprowicz in Brzeg *et al.* 2000

Syn.: Community *Polytrichum attenuatum-Carpinus betulus* Kubiś 1982, *Carpino-Quercetum* (Kubiś 1982 mscr.) Brzeg, Kasprowicz, Krotoska 1989 nom. illeg. et nom. inval. [6]

The relatively recently described association of acidophilous hornbeam-oak forest was earlier reported in several publications (Brzeg *et al.* 1989, 1998; Borysiak *et al.* 1992; Brzeg 1995; Brzeg & Wojterska 1996) under the invalid name *Carpino-Quercetum* (Theurillat and Moravec 1993). J. M. Matuszkiewicz (2001a), on the basis of works by Brzeg *et al.* (1989) as well as Brzeg & Wojterska (1996), which lack phytosociological documentation, came to a conclusion that this community cannot be regarded as a plant association, partly because of the lack of its sufficient and convincing description.

The original diagnosis of this syntaxon, renamed as the *Aulacomnio androgyni-Quercetum roboris*, was presented by our research team (Brzeg *et al.* 2000a). In a

[6] After Brzeg *et al.* (2000a)

synoptic table, composed of 25 relevés, its 2 subassociations were documented: the *Aa-Q anemonetosum nemorosae* on more fertile sites and the *Aa-Q typicum* on poorer sites. Within both subassociations, 2 variants were distinguished: typical and with *Pleurozium schreberi*.

The *Aulacomnio androgyni-Quercetum roboris* is floristically well-defined. The relatively long list of its characteristic and differential species consists mostly of bryophytes, which justifies its assignment to the alliance *Dicrano-Quercion* Pallas 1996.

The association it known only from southern Wielkopolska, where its patches are particularly frequent in the Krotoszyn Plateau. They have been reported also from the Rychwał Plain (Równina Rychwalska), Valley of the Barycz (Dolina Baryczy), Leszno Plateau (Wysoczyzna Leszczyńska), and Trzebnica-Ostrzeszów Hills (Wzgórza Trzebnicko-Ostrzeszowskie) (Brzeg & Kasprowicz 2001).

Patches of *Aulacomnio-Quercetum* develop exclusively on surface-water gley soils, formed mostly from clayey sands overlying more compact deposits.. The soils are very acidic in the upper part of the soil profile, which contrasts with the neutral or even slightly alkaline pH of the bedrock containing calcium carbonate (Kosakowski 1995). These sites cannot be identified with any specific forest site type. Kosakowski (1995) diagnosed them as locally the most moist form of fresh deciduous forest (Lśw2A). However, the soil acidity and humus type (moder, partly decomposed) do not match the characteristics of this forest site type (see Brzeg *et al.* 2000a).

The scanty published phytosociological documentation of *Aulacomnio-Quercetum* is supplemented by 2 relevés included in an article about macrofungi in its patches (Lisiewska & Reszel 2000). Detailed data are also available for extensive patches of this association, found in the reserve "Dąbrowa koło Biadek Krotoszyńskich". This study concerned the flora of vascular plants (Klimko *et al.* 2004) and liverworts (Górski 2006).

Cladonio portentosae-Quercetum petraeae Pallas 1996

Acidophilous lichen oak forest is very poorly studied. In Poland it has no published phytosociological documentation. Nevertheless, the *Cladonio-Quercetum* was included in the list of plant communities of Wielkopolska (Brzeg & Wojterska 2001) and of Poland (Ratyńska *et al.* 2010). It was also mentioned by Brzeg & Kasprowicz (2001).

Patches of this association occupy poor sites, drier than those of all the other acidophilous oak forests. They cover small areas, interspersed with the thermophilous oak forest *Potentillo albae-Quercetum*, and dry forms of *Calamagrostio arundinaceae-Quercetum*. It cannot be excluded that, at least in Poland, this community results from human transformation of patches of the above-mentioned associations.

The distribution of *Cladonio-Quercetum*, both in Poland and in Europe, is very poorly studied. Initially, this association was assigned to the alliance *Dicrano scoparii-Quercion roboris,* which groups communities that are distributed mostly in north-western Europe (Pallas 1996). More recently, the same author placed the *Cladonio-Quercetum* in the alliance *Quercion roboris*, whose range includes the southern part of Atlantic and sub-Atlantic Europe. It is one of 2 components of formation F18 (Pallas 2003), but on the map of European vegetation (Bohn *et al.* 2003), this formation – covering only a very small part of mid-western Germany – does not include the *Cladonio-Quercetum.*

5.2.2. Oak forests from the class *Querco-Fagetea* Br.-Bl. *et* Vlieger 1937

Galio sylvatici-Carpinetum (R.Tx. 1937) Oberd. 1957
Syn.*: Querco-Carpinetum medioeuropaeum* 1937 *nom. illeg. p.max.p.*

The association of Central European oak-hornbeam forest shows a clear ecological and regional variation. A vast majority of the studied patches represent the Wielkopolska race in its lowland form (Matuszkiewicz J. M. 2001a). Only several relevés from southern Wielkopolska are distinguished by the presence of species with more southern distribution. The question of separateness of this type of oak-hornbeam forest will be discussed in detail in section 6.3.4. Oak-hornbeam forests in Wielkopolska have been thoroughly investigated by Krotoska (1966, 1972). She documented 5 subassociations of *Galio sylvatici-Carpinetum*, subdivided into units of lower rank: variants and forms. Those subassociations were assigned to 3 larger ecological groups: (1) moist oak-hornbeam forests: the *Gs-C corydalidetosum* (*corydaletosum*), *Gs-C stachyetosum silvaticae*, and *Gs-C caricetosum brizoidis*); (2) moderately dry oak-hornbeam forests: the *Gs-C lathyretosum*; and (3) slightly acidophilous oak-hornbeam forests: the *Gs-C holcetosum mollis*. The third group is supplemented by the *Gs-C calamagrostietosum*. As emphasized by Krotoska (1966, pp. 20 and 98), this subassociation, not detected by later studies in Wielkopolska, corresponds to the *Querco-Carpinetum wartovistulense calamagrostietosum*, described by Preising (1943).

Traczyk (1962b) analysed 11 subassociations of oak-hornbeam forest described from Poland, and simplified their ecological differentiation into 4 subassociations. Within the *Galio* (*sylvatici*)-*Carpinetum*, these included the *Gs-C corydaletosum*, *Gs-C stachyetosum*, *Gs-C typicum* (broadly defined subassociation, comprising, e.g. also subassociations with *Lathyrus vernus* and with

Polytrichum attenuatum, syn. *Polytrichastrum formosum*), and the *Gs-C calamagrostietosum* (with *Calamagrostis arundinacea*). The first 2 subassociations were assigned to the group of moist oak-hornbeam forests, while the other 2 to moderately dry oak-hornbeam forests.

Matuszkiewicz W. & Matuszkiewicz A. (1985) distinguished within the range of *Galio sylvatici-Carpinetum* in Poland, 5 subassociations depending on site conditions: the *Gs-C polytrichetosum* (poor oak-hornbeam forests), *Gs-C lathyretosum* (moderately dry oak-hornbeam forests), *Gs-C luzuletosum* (submontane oak-hornbeam forests), *Gs-C typicum*, and *Gs-C corydalidetosum* (fertile oak-hornbeam forests, less moist). Their classification has been accepted in the latest geobotanical reviews (Matuszkiewicz W. & Matuszkiewicz J. M. 1996; Matuszkiewicz J. M. 2001a; Wysocki & Sikorski 2002; Danielewicz & Pawlaczyk 2004b).

Considering the main subject of this study, the major differences between the above concepts can be summarized as follows.

- The synoptic table of *Gs-C holcetosum mollis* presented by Krotoska (1966), and that of *Gs-C polytrichetosum* presented by Matuszkiewicz W. & Matuszkiewicz A. (1985), document similar units. Considering the priority principle (Weber *et al.* 2000, Art. 22), the first name is considered valid. It must be emphasized that in Wielkopolska and in adjacent areas, acidophilous oak-hornbeam forests identified as the *Galio sylvatici-Carpinetum holcetosum mollis*, were described not only by Krotoska (1966), but also by other researchers (e.g. Kamionka 1971; Macicka 1984; Macicka & Wilczyńska 1990, 1991, 1992; Wojterska 2003). There is no published information from this region about the *Gs-C polytrichetosum.*
- The *Gs-C lathyretosum*, as defined by Matuszkiewicz W. & Matuszkiewicz A. (1985), comprises in my opinion also at least some slightly acidophilous oak-hornbeam forests with a greater contribution of *Calamagrostis arundinacea*. This grass species, in the table of the cited authors, reaches the third degree of constancy in the Wielkopolska race of this subassociation. By contrast, in tables of Krotoska (1966), it is recorded with the lowest degree of constancy (r-I).
- The subassociations with *Calamagrostis arundinacea* defined by Krotoska (1966) and Traczyk (1962b) are synonymous. They were described on the basis of the same pool of 11 relevés of Preising (1943), documenting the subassociation *Querco-Carpinetum warto-vistulense calamagrostidetosum*.

This study takes into account only the poorest forms of Central European oak-hornbeam forest, closely related to acidophilous oak forests. Undoubtedly these include the *Gs-C holcetosum mollis* (= *Gs-C polytrichetosum*) (see Krotoska 1966; Matuszkiewicz J. M. 2001a), and at least some forms of moderately dry oak-hornbeam forests with *Calamagrostis arundinacea*, classified by Krotoska (1966) and Boiński (1973) as the *Gs-C calamagrostietosum*, or identified with the *Querco-Carpinetum calamagrostietosum* (Ferchmin 1966). The *Gs-C lathyretosum* was taken into account only in comparisons. In patches of this subassociation some acidophilous species (*Polytrichastrum formosum* and *Vaccinium myrtillus*) may be abundant, but the constant presence of the group of species of more fertile sites (*Aegopodium podagraria*, *Lathyrus vernus*, *Galium odoratum*, *Pulmonaria obscura*, etc.) makes it clearly distinct from acidophilous oak forests (see Krotoska 1966; Matuszkiewicz W. & Matuszkiewicz A. 1985).

A leading subassociation of acidophilous oak-hornbeam forests in Wielkopolska is the *Galio sylvatici-Carpinetum holcetosum mollis*. It was described in detail by Krotoska (1966), who indicated the features that distinguish this form of oak-hornbeam forest from the similar subassociation *Gs-C calamagrostietosum*, and from acidophilous oak forests and mixed coniferous forests. It is noteworthy that the connections between acidophilous oak-hornbeam forests and communities from the order *Quercetalia robori-petraeae* were noted much earlier by Preising (1943, after Krotoska 1966). On the basis of synoptic tables, Krotoska (1966: 102) indicated species regionally differentiating the *Gs-C holcetosum* from the other subassociations of oak-hornbeam forests in Wielkopolska: *Polytrichastrum formosum* (=*Polytrichum attenuatum*), *Carex pilulifera*, *Holcus mollis*, *Hieracium lachenalli*, and *Vaccinium myrtillus*, and to a smaller extent also *Solidago virgaurea*, *Melampyrum pratense*, *Dryopteris carthusiana* (=*D. spinulosa*), and *Veronica officinalis*.

The site variation of both acidophilous subassociations of oak-hornbeam forest (*Gs-C holcetosum mollis* and *Gs-C calamagrostietosum*) is poorly studied. They grow on acid brown (typical and podzolic), lessivé (Krotoska 1966; Trzciński 1989), rusty soils (Boiński 1973), and para-rendzinas (Święcicki 2000). Krotoska (1966), when describing the ecological specificity of *Gs-C holcetosum*, emphasized that these oak-hornbeam forests grow on a shallow layer of sands, overlying clay deposits. The soils are characterized by a low groundwater level and surface-water gleying. Patches of *Gs-C holcetosum* can be identified with sites of moist mixed deciduous forest (LMw), while the *Gs-C calamagrostietosum*, those of fresh mixed deciduous forest (LMśw).

Potentillo albae-Quercetum Libbert 1993 *nom invers.*

Syn.: *Carici montanae-Quercetum* (Kuhn 1937) Förster 1968 *sensu* Fijałkowski 1991

The association of thermophilous oak forest, described from the area of Poland (Libbert 1933), presumably has its centre of distribution in our country and in Germany, but is found also in northern Austria, southern Germany, the Czech Republic, and Slovakia (Chytrý & Horák 1996; Chytrý 1997). According to Roleček (2005), the status of its patches documented from Austria and Hungary is unclear and needs to be verified. According to other data, this association is distributed mostly in Poland and the Czech Republic, while its marginal localities are in Germany and Slovakia (Doniţă 2003). The distribution range of *Potentillo albae-Quercetum* includes also northern Ukraine and an adjacent part of Russia (Brzeg *et al.* 2009a, 2009b). The image of its distribution presented on the map of European vegetation (formation G1 Bohn *et al.* 2003) is very incomplete. For example, it does not take into account the numerous localities reported from the Czech Republic (Chytrý 1997; Neuhäuslová 2001; Roleček 2005).

Poland is crossed by the northern limit of its distribution, which at the same time is the limit of the whole group of thermophilous oak forests from the order *Quercetalia pubescenti-petraeae* (Matuszkiewicz J. M. & Kozłowska 1991; Jakubowska-Gabara 1993; Matuszkiewicz W. 2001). Patches of thermophilous oak forest are found in extensive areas within 3 geobotanical units of a high rank: Mazovia-Polesie, South Wielkopolska Uplands, and Brandenburg-Wielkopolska (Matuszkiewicz J. M. 1993).

The *Potentillo albae-Quercetum* shows regional variation, diagnosed initially by Głazek (1973), Matuszkiewicz J. M. & Kozłowska (1991), as well as Wojterska and Wiszniewska (1996). Jakubowska-Gabara (2004) lists 3 geographic races of this association: the Wielkopolska, North Podlasie, and Mazovia-Małopolska races. Our recent studies (Wojterska *et al.* 2007; Brzeg *et al.* 2009a, 2009b), taking into account the previous concept of Wojterska & Wiszniewska (1996), show that 4 geographic races of this association can be distinguished in Poland. The Wielkopolska race is distinguished by e.g. *Deschampsia flexuosa*, *Rubus sprengelii*, and *Galium sylvaticum*; Mazovian by *Chamaecytisus ratisbonensis*; Podlasie by *Aquilegia vulgaris*, *Geranium sylvaticum*, *Centaurea phrygia*, and *Dracocephalum ruyschiana*; while Małopolska-Lublin by *Berberis vulgaris* (opt.), *Cerasus fruticosa*, *Euphorbia angulata, Lembotropis nigricans, Pulmonaria mollis*, *Rosa gallica, Viola collina*, and *Tanacetum corymbosum*.

The local ecological variation of *Potentillo albae-Quercetum* has been documented in many publications, also in the area of Poland (Matuszkiewicz A. 1955; Matuszkiewicz W. & Matuszkiewicz A. 1956; Kaźmierczakowa 1971; Sokołowski 1979, 1980; Matuszkiewicz J. M. & Kozłowska 1991; Jakubowska-Gabara 1993; Wojterska & Wiszniewska 1996). In Wielkopolska, this association develops at least 3 subassociations, depending on soil moisture content: the *Pa-Q molinietosum*, *Pa-Q typicum*, and *Pa-Q brachypodietosum*. Each of them can be subdivided into variants (with *Asarum europaeum*, typical, and with *Pleurozium schreberi*) depending on site fertility (Brzeg & Kasprowicz 2001). A similar scheme of ecological variation of this association applies also to the whole documented distribution range of *Potentillo albae-Quercetum*. An analysis of 1445 relevés of *Potentillo albae-Quercetum* from 6 countries (Germany, the Czech Republic, Slovakia, Poland, Ukraine, and Russia) shows that ecological forms of this association, in that region, can be divided into 3 groups of subassociations: xerothermophilous, mesophilous, and hygrophilous (Brzeg *et al.* 2009b). Subassociations within these groups can be subdivided into trophic variants, similar to those mentioned above.

An important feature of the sites of this association is a sandy or gravely soil with layers of clay (Matuszkiewicz J. M. & Kozłowska 1991). The soils are well-drained, but gleying may be observed in some periods at the borders between the layers (Wojterska & Wiszniewska 1996). Both groundwater and surface-water gleying are regarded as a factor eliminating thermophilous oak forests (Matuszkiewicz J. M. & Kozłowska 1991). In soil profiles, disproportions can be often noticed in calcium carbonate content. In the upper, leached horizons, it is present in trace amounts or even absent, while soil pH is slightly acidic, or sometimes moderately acidic. By contrast, the bedrock may be rich in carbonates and its pH may be strongly alkaline (Matuszkiewicz J. M. & Kozłowska 1991; Wojterska & Wiszniewska 1996; Matuszkiewicz J. M. 2001a). Most often, thermophilous oak forests are found on brown soils (Matuszkiewicz J. M. & Kozłowska 1991). They grow also on rusty soils (Trzciński 1989; Wojterska *et al.* 2006), lessivé soils, and rendzinas in the south of Poland (Święcicki 2000; Jakubowska-Gabara 2004). They are mainly identified with sites of fresh mixed deciduous forest (LMśw), whereas poorer forms with sites of fresh mixed coniferous forest (BMśw) and the most fertile ones, as fresh deciduous forest (Lśw).

The *Potentillo albae-Quercetum* is one of several associations whose patches have declined in Poland over the last few decades. They are gradually transformed, mostly into oak-hornbeam forests, while in the western part of the country, also into acidophilous oak forests *Calamagrostio-Quercetum*, or even into acid beech forests. This process has been reported many times in our country (Jakubowska-Gabara 1991, 1993, 1996; Kwiatkowska 1986, 1994; Kwiatkowska *et al.* 1997; Kwiatkowska & Wyszomirski 1988, 1990; Matejczuk 2007; Matuszkiewicz A. 1977; Matuszkiewicz J. M. 2007b, 2007c, Orzechowski 2007). In Wielkopolska, like in other parts of Poland (Jakubowska-Gabara 1993, 1996) patches of *Potentillo albae-Quercetum* completely disappeared from many of its earlier localities (Wojterska & Wiszniewska 1996). These transformations, according to the cited authors as well as to many others (e.g. Faliński 1986, Müller 1992; Chytrý 1997; Ellenberg 1988; Vera 2000; Matuszkiewicz W. 2001), indicate that at least some of its patches (and other thermophilous oak forests, see Hédl *et al*. 2010) are conditioned by zoo-anthropogenic impact, which consists in long-term livestock grazing and removal of the leaf litter. According to Jakubowska-Gabara (1993), this applies to more fertile forms of this association, occupying potential sites of oak-hornbeam forest and beech forest, whereas the forms developed on relatively dry, mesotrophic sites, are autogenic. This concept was accepted by Chytrý (1997). He regards thermophilous oak forests as relict communities, which were more widespread before the Atlantic period of the Holocene. Similarly, Vera (2000) indicates that thermophilous oak forest may be a relict of the Boreal and Atlantic periods. In the present landscape, its patches have been preserved only at the sites where the microclimatic and soil conditions limit the expansion of mesophilous species of broadleaved trees. Recently, however, J. M. Matuszkiewicz (2007b) assigned the *Potentillo albae-Quercetum* to the group of semi-natural plant communities.

5.2.3. Mixed coniferous forests from the class *Vaccinio-Piceetea* Br.-Bl. *in* Br.-Bl. *et al*. 1939

Querco roboris-Pinetum Kozłowska 1926 *em.* J. M. Mat. 1998 nom. invers. nom. conserv.

Syn.: *Pino-Quercetum* Kozłowska 1925 p.min.p.; *Pino-Quercetum* Kozł. 1925 em. W. Mat. et Polak. 1955 p.p.; *Pinetum fruticoso-herbosum* Juraszek 1928 nom. illeg. p.p.; *Populo tremulae-Quercetum roboris* Sokołowski 1980; *Querco roboris-Pinetum* J. M. Mat. 1988 nom. illeg. et nom. inval.; *Querco roboris-Pinetum* Kozłowska 1925 em. J. M. Mat. 1998[7]

In an early diagnosis of J. M. Matuszkiewicz (1988), this association was named the Central European pine-oak mixed coniferous forest. It was considered to be common in central and eastern Poland, but its range of distribution covered most of our country, except its small north-eastern part as well as central and western Pomerania, Lower Silesia, and the submontane zone. Both earlier (Matuszkiewicz W. 1981), and later (Matuszkiewicz W. & Matuszkiewicz J. M. 1996; Matuszkiewicz J. M. 2001a; Matuszkiewicz W. 2001), the *Querco-Pinetum* was described as continental mixed coniferous forest. Its range of distribution covers over 90% of Poland, but it is most common in central and eastern parts of the country (Matuszkiewicz J. M. 2001a). W. Matuszkiewicz (2001) noted that the *Querco-Pinetum* is found in the subcontinental part of Polish lowlands, where *Picea* and *Fagus* are rare. It is particularly difficult to determine the distribution range of this association, because of both natural and anthropogenic factors (Matuszkiewicz J. M. 2001a). The *Querco-Pinetum* shows a low geographic variation, but 3 major geographic races can be distinguished: sub-boreal, Małopolska, and Mazovian (Matuszkiewicz J. M. 1988, 2001a). By contrast, its ecological variation is very clear. Three subassociations can be distinguished: the *Qr-P coryletosum* on relatively dry and most fertile sites, the *Qr-P molinietosum* on moist sites, and the *Qr-P typicum* (Matuszkiewicz J. M. 1988).

Soils of mixed coniferous forest are formed from clayey sands and loose sands on outwash plains, riverine accumulation terraces, eskers, and terminal moraines. Typical forms of *Querco-Pinetum* (*Qr-P typicum*) and more fertile forms (*Qr-P coryletosum*) develop on podzolic or rusty soils, while patches of the poorer and more moist subassociation with *Molinia caerulea* (*Qr-P molinietosum*), on the less fertile, groundwater gley (Matuszkiewicz J. M. 2001a) and gley-podzolic soils (Trzciński 1989; Święcicki 2000). They are identified with sites of fresh mixed coniferous forest (BMśw) or moist mixed coniferous forest (BMw).

The association has a relatively rich documentation. Its original diagnosis is based on 530 relevés (Matuszkiewicz J. M. 1988, 2001a; Matuszkiewicz W. & Matuszkiewicz J. M. 1996). The nomenclatural type of the association, with the old name *Pino-Quercetum*, was designated by Pallas (1996), who indicated that its lectotype is the first relevé in Table 3 of Kozłowska (1926a). Recently, the name *Festuco ovinae-Pinetum* (Juraszek 1928) Kobendza 1930 *nom. invers*., proposed slightly earlier for this syntaxon (Brzeg & Wojterska 2001) was abandoned by Brzeg (2004). He indicated that the name *Festuco-Pinetum* is ambiguous, and supported the retention of the old name *Querco roboris-Pinetum nom. invers*. proposed by Kozłowska (1926a, 1926b) – but as defined by J. M. Matuszkiewicz (1988) – as *nomen conservandum*. Brzeg (2004) argued that the name introduced by J. M. Matuszkiewicz (1988) was illegitimate (nom. illeg., Art. 31), and invalid (nom. inval., Art. 5) in light of the Code of Phytosociological Nomenclature (Weber *et al*. 2000).

The species composition of *Pineto-Festucetum*, shown in the table of Kobendza (1930), roughly corresponds to the description of sub-boreal mixed coniferous forest *Serratulo-Pinetum*, presented by J. M. Matuszkiewicz (2001a). Relatively small floristic differences between those units may be due to the very poorly

[7] After Brzeg (2004), modified

developed canopy or even a lack of the tree layer in some patches documented by R. Kobendza. Thus it is not possible to accept the suggestion of W. Matuszkiewicz (2001, 2004), who wanted to reactivate the name *Festuco ovinae-Pinetum*, to replace the nomenclaturally incorrect name *Querco roboris-Pinetum*, on condition that the syntaxa are identical (Matuszkiewicz W. 2004).

Recently, a nomenclatural type (lectotype) of the association *Festuco-Pinetum* Kobendza 1930 nom. invers. was designated from the original table of R. Kobendza (Dengler *et al.* 2004). The cited authors report that it is distinguished by the presence of continental species: *Chamaecytisus ratisbonensis, Cytisus nigricans*, and *Viola rupestris*.

Festuca ovina and *Pinus sylvestris* gave their names to 2 very different associations from the class *Vaccinio-Piceetea*: (1) *Festuco ovinae-Pinetum sylvestris* Ermakov 1991, found in western Siberia (Hoffmann & Ermakov 2008), and (2) *Pino-Festucetum ovinae* Eggler 1954, reported from eastern Austria (Eggler 1954). Also the name *Pino-Quercetum* is ambiguous. For example, Eggler (1959) in one article described 2 new associations from the class *Quercetea robori-petraeae*, namely the *Pineto-Quercetum roboris* Eggler 1948 and *Querceto-Pinetum sylvestris* Eggler 1959. In both communities, the canopy was dominated by *Pinus sylvestris* and *Quercus robur*.

Serratulo-Pinetum J. M. Mat. 1988 *ex* Brzeg *in* Brzeg *et* M. Wojterska 2004

Syn.: *Pino-Quercetum* Kozł. 1925 *em.* W. Mat. *et* Polak. 1955 *p.p.*; *Pinetum fruticoso-herbosum* Juraszek 1928 *nom. illeg. p.p.*; *Festuco ovinae-Pinetum* (Juraszek 1928) Kobendza 1930 *nom. invers. p.p.*; *Calamagrostio arundinaceae-Pinetum* Sokołowski 1980.[8]

Sub-boreal mixed coniferous forest has a continental type of distribution and is found mostly in north-eastern Poland. It is rarer in the mid-eastern part of the country. The association has a clear regional variation and can develop in the sub-boreal race (within the sub-boreal range of *Picea*) or the Sarmatic race. Its ecological variation is poor, observed chiefly in north-eastern Poland, where the *Serratulo-Pinetum* is represented by 2 subassociations: the *S-P typicum* and *S-P pulmonarietosum*. The latter syntaxon is related to thermophilous oak forest (Matuszkiewicz J. M. 1988, 2001a). According to W. Matuszkiewicz (2001) it is probably a vicariant of *Potentillo albae-Quercetum*.

As emphasized by J. M. Matuszkiewicz (2001a), the *Serratulo-Pinetum* is linked with local elevations, especially near its western range limit. Its patches occupy mostly warm sites on hill tops or south-facing slopes. Rusty or podzolic soils are regarded as typical for this association. They are identified as sites of fresh mixed coniferous forest (BMśw) (Matuszkiewicz J. M. 1988, 2001a; Święcicki 2000).

The association was described in Poland on the basis of 257 relevés (Matuszkiewicz J. M. 1988, 2001a; Matuszkiewicz W. & Matuszkiewicz J. M. 1996). Its westernmost localities were reported from eastern Wielkopolska (Brzeg 2004). The cited author designated as the nomenclatural type (holotype) of *Serratulo-Pinetum* one of the relevés of the Sarmatic race of this association in an article of J. M. Matuszkiewicz (1988).

Recently, Pallas (2003) described a new association, the *Serratulo tinctoriae-Quercetum roboris* J. M. Matuszkiewicz 1988 ex Pallas 2003, by separating the *Quercus*-dominated form from the sub-boreal race of *Serratulo-Pinetum*. He suggested that the *Quercus*-dominated form of its Sarmatic race should be classified in the same way. The resultant 2 new associations of acidophilous oak forests, in his classification, would belong to 2 different alliances: the *Vaccinio myrtilli-Quercion petraeae* and *Agrostio capillaris-Quercion petraeae*, respectively.

The sub-boreal race of *Serratulo-Pinetum* is very similar to the *Melico nutantis-Piceetum* of the alliance *Piceion abietis* Pawł. et all. 1928. The latter is common in southern Finland and Sweden (Matuszkiewicz W. 2001, 2004). Their canopy is devoid of *Quercus*, which results from natural conditions (Matuszkiewicz W. 2004; see also Kasprowicz & Wojterska 2004). Thus the sub-boreal race of *Serratulo-Pinetum* may in fact include 2 associations: the *Serratulo-Quercetum* and *Melico nutantis-Piceetum*.

Recent studies (Szczygielski 2007; Solon 2007) suggest that the association *Serratulo-Pinetum* is conditioned by zoo-anthropogenic impact. Its patches are declining and gradually transformed into the mixed coniferous forest *Querco-Pinetum* or oak-hornbeam forest (Matuszkiewicz J. M. 2007c).

6. Phytocoenotic and ecological characteristics of acidophilous forests with a high contribution of *Quercus*

6.1. A systematic review

Cl. *Quercetea robori-petraeae* Br.-Bl. *et* R. Tx. 1943 *nom. mut.*

Syn.: *Quercetea robori-sessiliflorae* Br.-Bl. *et* R. Tx. 1943, *Querco-Ulicetea* Br.-Bl. 1947 *p.p.*, *Vaccinio-Piceetea* Br.-Bl. *in* Br. Bl. *et al.* 1939 *em. auct. p.min. p.*, *Querco-Fagetea* Br.-Bl. *et* Vlieger 1937 *em. auct. p.min.p.*

O. *Quercetalia roboris* R. Tx. 1931

Syn.: *Quercetalia robori-sessiliflorae* Br.-Bl. et R. Tx. 1943 *nom. superfl.*, *Quercetalia robori-petraeae* Br.-Bl.

[8] After Brzeg (2004), modified

et R. Tx. 1943 *nom. mut. auct. nom. superfl.*, *Pteridio-Quercetalia* Scamoni et Passarge 1959 *nom. superfl.*

All. *Agrostio capillaris-Quercion* Scamoni *et* Pass. 1959 *em.* Brzeg, Kasprowicz *et* Krotoska 2001

Syn.: *Quercion robori-petraeae* Br.-Bl. 1932 *nom. superfl. ex auct. p.p.*, *Agrostio-Quercion* Scamoni *et* Passarge 1959 *p.p.*, *Molinio caeruleae-Quercion roboris* Scamoni *et* Passarge 1959, *Pino-Quercion* Medwecka-Kornaś *et al.* 1959 *p.p.*, *Dicrano-Pinion* (Libbert 1933) W. Matuszkiewicz 1962 *ex auct. p.min.p.*, *Vaccinio myrtilli-Quercion petraeae* Pallas 1996

Non: *Quercion roboris* Malcuit 1929 *em.* Pallas 1996, *Agrostio capillaris-Quercion petraeae* Scamoni *et* Passarge 1959 *em.* Pallas 1996, *Genisto germanicae-Quercion* R. *et* Z. Neuhäusl 1967 = *Hieracio lachenalii-Quercion petraeae* Pallas 1996 *nom. superfl.*, *Dicrano scoparii-Quercion roboris* Passarge 1968

Ass. *Molinio caeruleae-Quercetum roboris* (R. Tx. 1937) Scam *et* Pass. 1959 *em.* Brzeg, Kasprowicz *et* Krotoska 1989

Ass. *Calamagrostio arundinaceae-Quercetum petraeae* (Hartm. 1934) Scam. *et* Pass. 1959 *em.* Brzeg, Kasprowicz et Krotoska 1989

Ca-Q molinietosum Brzeg *et al.* 1989 *ex* Lisiewska *et* Reszel 2000

Ca-Q typicum Großer 1964

Ca-Q polygonatetosum Passarge *in* Pallas 1996

All. *Dicrano scoparii-Quercion roboris* Pass. 1968

Ass. *Aulacomnio androgyni-Quercetum roboris* Brzeg *et* Kasprowicz *in* Brzeg *et al.* 2000

Aa-Q typicum Brzeg *et* Kasprowicz *in* Brzeg *et al.* 2000

Aa-Q anemonetosum nemorosae Brzeg *et* Kasprowicz *in* Brzeg *et al.* 2000

Cl. *Querco-Fagetea* Br.-Bl. *et* Vlieger 1937

O. *Fagetalia sylvaticae* Pawłowski *in* Pawłowski *et al.* 1928

Syn.: *Carpino-Fagetalia* Scamoni *et* Pass. 1959

All. *Carpinion betuli* Issler 1931 *em.* Oberd. 1957

Ass. *Galio sylvatici-Carpinetum* (R. Tx. 1937) Oberd. 1957

Gs-C holcetosum mollis Preising 1943 *ex* Krotoska 1966

O. *Quercetalia pubescenti-petraeae* Klika 1933 *nom. mut.*

All. *Potentillo albae-Quercion petraeae* (Zólyomi *et* Jakucs 1957) Jakucs 1967

Ass. *Potentillo albae-Quercetum* Libbert 1933 *nom. invers.*

Pa-Q astrantietosum Jakubowska-Gabara 1993

Pa-Q molinietosum Brzeg *et* Kasprowicz 2001 *ex* Kasprowicz 2010 *subass. nova*

Pa-Q typicum Preising 1943 *ex* W. *et* A. Mat. 1956

Pa-Q brachypodietosum pinnati M. Wojterska *et* Wiszniewska 1996 *ex* Kasprowicz 2010 *subass. nova*

Cl. *Vaccinio-Piceetea* Br.-Bl. *in* Br.-Bl. *et al.* 1939

O. *Piceetalia excelsae* Pawłowski *in* Pawłowski *et al.* 1928 em. Br.-Bl. *in* Br.-Bl. *et al.* 1939

Syn.: *Vaccinio-Piceetalia* Br.-Bl. *in* Br.-Bl. *et al.* 1939; *Pulsatillo-Pinetalia* Oberd. *in* Th. Müller 1966; *Cladonio-Vaccinietalia* Kiell.-Lund 1967 *sensu* W. Mat. 2001

All. *Dicrano-Pinion* (Libbert 1933) W. Mat. 1962

Ass. *Querco roboris-Pinetum* Kozł. 1926 *em.* J. M. Mat. 1988 *nom. invers. nom. conserv.*

Qr-P molinietosum J. M. Mat. 1988 *nom. inval.*

Qr-P typicum J. M. Mat.1988 *nom. inval.*

Qr-P coryletosum J. M. Mat. 1988 *nom. inval.*

Ass. *Serratulo-Pinetum* J. M. Mat. 1988 *ex* Brzeg *in* Brzeg *et* M. Wojterska 2004

6.2. General differentiation at the level of associations

Basic documentation

The plant communities diagnosed below are described in detail in the next section of this monograph. The diagnoses presented here concern their easily recognizable, typologically well-defined forms. They do not take into account the forms that markedly deviate from the type, e.g. those impoverished floristically or transformed by human activity. An exception is the documentation of *Serratulo-Pinetum*. All its relevés presented here were recorded in its degenerated forms. The species composition of the plant communities defined so, is shown in a synoptic table based on 787 relevés (Table 3). It presents 3 associations from the class *Quercetea robori-petraeae* (*Aulacomnio androgyni-Quercetum roboris*, col. 1; *Molinio caeruleae-Quercetum roboris*, col. 2; and *Calamagrostio arundinaceae-Quercetum petraeae*, col. 3); as well as 2 associations from the class *Querco-Fagetea* (*Galio sylvatici-Carpinetum* – acidophilous forms, col. 4, and *Potentillo albae-Quercetum*, col. 5); and 2 associations from the class *Vaccinio-Piceetea* (*Querco roboris-Pinetum*, col. 6; and *Serratulo-Pinetum*, col. 7). Footnotes to the table, list the sources of the relevés as well as the species that were omitted in the table (for each species, constancy and cover index are given).

Major floristic and phytosociological characteristics of the studied plant associations

• The association *Aulacomnio androgyni-Quercetum* is poorly documented. In the present study, 37 relevés have been assigned to this syntaxon. These include the 25 relevés that constituted the basic documentation of this syntaxon (Brzeg *et al.* 2000a). This association is the only member of the alliance *Dicrano scoparii-Quercion roboris*. The high frequency of characteristic species of the association (*Aulacomnium androgynum, Dicranella hetheromalla, Herzogiella seligerii*, *Mnium hornum, Plagiothecium denticulatum, P. laetum*), and the alliance (*Dicranum scoparium, Lophocolea heterophylla*, *Plagiothecium curvifolium, Pohlia nutans*) indicates that *Aulacomnio-Quercetum* is clearly distinct from other, comparable communities.

An important species, distinguishing the association from other communities of the class *Quercetea robori-petraeae*, is *Carpinus betulus*. Its constant presence in the tree layer makes this association similar to the oak-hornbeam forest *Galio sylvatici-Carpinetum* (Table 3, col. 4). Significant floristic differences, which can be noticed in that table, resolve any possible doubts about their separateness. The common feature of *Aulacomnio-Quercetum* and other acidophilous oak forests is the presence of characteristic and differential species of the class *Quercetea robori-petraeae* (*Carex pilulifera*, *Holcus mollis*, *Melampyrum pratense*, and *Polytrichastrum formosum*).

The alliance *Agrostio capillaris-Quercion* is represented by 2 associations: the *Molinio caeruleae-Quercetum* (Table 3, col. 2) and *Calamagrostio arundinaceae-Quercetum* (Table 3, col. 3).

• *Molinio caeruleae-Quercetum roboris* – in this study, 56 relevés (Table 3, col. 2) have been classified as wet oak forest with *Molinia caerulea*. These include 33 relevés from the analytic table of Brzeg *et al.* (1989), and another 18 relevés from the synoptic table of Brzeg and Kasprowicz (2001). This association has no characteristic species, but is usually distinguished by the presence of *Betula pubescens*, *Molinia caerulea*, *Polytrichum commune*, *Rubus nessensis*, and *Sphagnum girgensohnii*. It is noteworthy that *B. pubescens* and *Sph. girgensohnii* are limited only to some forms of this association, while *M. caerulea*, which reaches in *Molinio caeruleae-Quercetum* the highest constancy and a high cover index, is also a constant component of moist subassociations of 3 other associations: the *Calamagrostio arundinaceae-Quercetum*, *Potentillo albae-Quercetum*, and *Querco roboris-Pinetum*. Additionally, *Trientalis europaea* and partly *Picea abies* in lower layers of the vegetation have a similar diagnostic value. The *Molinio-Quercetum* is distinguished from the *Calamagrostio-Quercetum* (particularly from its moist subassociation *Ca-Q molinietosum*) by the negligible contribution of characteristic and differential species of *Calamagrostio-Quercetum* (except for *Calamagrostis arundinacea*). Separation of these 2 units was questioned by J.M. Matuszkiewicz (2001a). He supposed that a regionally characteristic species of the association *Molinio caeruleae-Quercetum* could be *Holcus mollis*. Similarly, W. Matuszkiewicz (2001) considered this species as differential for the association. An analysis of Table 3 shows that those suggestions were wrong. *H. mollis* is a constant component of *Calamagrostio-Quercetum* – not only of *Ca-Q molinietosum*, but also of the other 2 subassociations: the *Ca-Q typicum* and *Ca-Q polygonatetosum* (Table 7). It is also not justifiable to include in the list of regionally differential species of the association *Molinio-Quercetum*, plants like *Carex canescens*, *Lysimachia vulgaris, Rubus gracilis* (= *R. villicaulis*) (Brzeg *et al.* 1989), *Oxalis acetosella* (Brzeg & Wojterska 2001), or *Rubus plicatus*, *Agrostis canina, Carex nigra*, and *Juncus effusus* (Ratyńska *et al.* 2010). The last 3 species are equally common in the *Aulacomnio-Quercetum* (Table 3) and in the *Ca-Q molinietosum* (Table 7), being an important differential species for this subassociation (Brzeg *et al.* 2001). Constant characteristic or differential species for the class *Quercetea robori-petraeae* in patches of *Molinio caeruleae-Quercetum* are: *Carex pilulifera*, *Holcus mollis*, *Melampyrum pratense*, *Polytrichastrum formosum*, and *Pteridium aquilinum*.

• *Calamagrostio arundinaceae-Quercetum* – in this study, 304 relevés (Table 3, col. 3) have been classified as untransformed patches of the association. It is noteworthy that an earlier description of the association was based on a much lower number of relevés: either 47 (Matuszkiewicz J. M. 1988, 2001a) or 123 (Brzeg *et al.* 2001; Brzeg & Kasprowicz 2001). From the latter group, 80 relevés were selected in the present study, because nearly all the other relevés (42) represent degenerated forms of the association (Table 7). The *Calamagrostio arundinaceae-Quercetum* is well-defined floristically. Its characteristic species (*Hieracium lachenalii*, *H. laevigatum*, and *H. sabaudum*), at least on the regional scale, have their phytosociological optimum in patches of this association. The same applies to *Lathyrus montanus*, which plays an more important role in the other 2 regional races of the association (Brzeg & Kasprowicz 2001). The presented data do not confirm the diagnostic value of *Calamagrostis arundinacea*, which was indicated as one of the characteristic species of the association (see Brzeg *et al.* 2001). Considering the high constancy and cover index, this species as well as *Festuca ovina* and *Quercus petraea*, were indicated as regionally differential for the *Calamagrostio arundinaceae-Quercetum* within the class *Quercetea robori-petraeae*. In contrast to an earlier report (Brzeg *et al.* 2001), *Festuca heterophylla* does not have such a diagnostic value. This grass species is more strongly associated with poor oak-hornbeam forest and thermophilous oak forest (Table 3). The characteristic species combination of the association includes also diagnostic species of the class *Quercetea robori-petraeae* (*Carex pilulifera*, *Holcus mollis*, *Melampyrum pratense*, *Polytrichastrum formosum* i *Pteridium aquilinum*), and differential species of the alliance *Agrostio capillaris-Quercion* (*Convallaria majalis*, *Luzula pilosa*, *Maianthemum bifolium*, *Moehringia trinervia*, *Poa angustifolia* and *Vaccinium myrtillus*).

The association *Calamagrostio-Quercetum* in the study area develops exclusively as its Wielkopolska race (see p. 31). It must be emphasized that although many relevés were located near the southern limits of Wielkopolska (Fig. 30-32), the contribution of differential species for the South Polish race was negligible.

• The oak-hornbeam forest *Galio sylvatici-Carpinetum* is represented in this study by 114 relevés (Table 3, col. 4) of its acidophilous forms: the *Gs-C holcetosum* and *Gs-C calamagrostietosum arundinaceae*. Most of them (105) have been classified here as the former syntaxon. The present study does not take into account the subassociation *Gs-C lathyretosum*, as this unit is clearly distinct from acidophilous oak forests. Only its relevés reported by Boiński (1973) are considered in later chapters of the present monograph, because he classified them as the *Gs-C calamagrostietosum arundinaceae*.

Characteristic species of the association (*Galium sylvaticum i Ranunculus auricomus*) are infrequent in the analysed forms of *Galio-Carpinetum*. This is not a specific feature of the data presented here but is noticeable also in tables of other authors (Krotoska 1966; Matuszkiewicz W. & Matuszkiewicz A 1985; Matuszkiewicz J. M. 2001a). By contrast, its different species, *Carpinus betulus* and *Stellaria holostea* (Table 3, col. 4), have a high diagnostic value. Among other species of the class *Querco-Fagetea*, the most frequent are: *Anemone nemorosa*, *Atrichum undulatum*, *Poa nemoralis*, and *Viola reichenbachiana*. Another significant feature is the constant participation of diagnostic species of the class *Quercetea robori-petraeae* (*Holcus mollis* and *Polytrichastrum formosum*), and of the *Vaccinio-Piceetea* (*Vaccinium myrtillus*). The species composition of this forest type is very similar to that of *Gs-C polytrichetosum* presented by W. Matuszkiewicz and A. Matuszkiewicz (1985).

• *Potentillo albae-Quercetum* – an average species composition of the association is presented in the synoptic Table 3, (col. 5), on the basis of 98 relevés. In comparison with the other analysed communities, the *Potentillo-Quercetum* is distinguished by a particularly numerous group of diagnostic species. The most frequent among them are characteristic species of the association (*Carex montana*, *Potentilla alba*, and *Ranunculus polyanthemos*), and of the order *Quercetalia pubescentis* (*Campanula persicifolia*). Differential species include xerothermophilous plants, especially those of the class *Trifolio-Geranietea* (e.g. *Fragaria vesca*, *Poa angustifolia*, *Polygonatum odoratum*, and *Trifolium alpestre*) and of the class *Festuco-Brometea* (e.g. *Euphorbia cyparissias* and *Pimpinella saxifraga*); plants of periodically humid meadows of the class *Molinio-Arrhenatheretea* (e.g. *Betonica officinalis* and *Galium boreale*); and plants of mesophilous deciduous forests from the class *Querco-Fagetea* (*Melica nutans* and *Ajuga reptans*). Specific site conditions in patches of *Potentillo albae-Quercetum* are distinguished also by a constant participation of acidophilous species of the classes *Quercetea robori-petraeae*, *Vaccinio-Piceetea*, and *Calluno-Ulicetea*. However, 3 other species of the class *Quercetea robori-petraeae* are infrequent (*Carex pilulifera, Holcus mollis*, and *Polytrichastrum formosum*).

Mixed coniferous forests from the class *Vaccinio-Piceetea* (the *Querco roboris-Pinetum* and *Serratulo-Pinetum*) are a well-defined group, clearly distinct from the other communities presented in Table 3. Their differential species include: *Dicranum polysetum*, *Pleurozium schreberi*, *Pinus sylvestris*, and *Vaccinium vitis-idaea*.

• The *Querco roboris-Pinetum* is described here on the basis of 165 relevés (Table 3, col. 6). Among them, as many as 93% were initially identified by their authors as mixed coniferous forest and assigned to the *Pino-Quercetum* (120 relevés), *Querco-Pinetum* (30 relevés), or *Festuco ovinae-Pinetum* (3 relevés). Another 121 relevés, diagnosed initially as the *Pino-Quercetum*, in the present study, have been classified as other communities, mostly substitute forest communities (47%) or unidentified communities from the class *Quercetea robori-petraeae* (28%), which cannot be assigned to any association. The rich documentation of *Querco-Pinetum* presented by J.M. Matuszkiewicz (1988, 2001a) originates primarily from central and eastern Poland. It comprises 530 relevés, including 55 located in Wielkopolska. Identification of 32 of them as the *Querco-Pinetum* has been confirmed. The other 23 relevés were classified mostly as substitute forest communities.

In the present study, the *Querco roboris-Pinetum* is defined as by J. M. Matuszkiewicz (1988). This syntaxon has no characteristic species. It is unambiguously distinguished from other mixed coniferous forests and acidophilous deciduous forests by the combination of differential species (Matuszkiewicz J. M. 2001a). The association is represented here by relevés that meet the criteria formulated in the publications cited above. A high diagnostic value is assigned to characteristic species of the alliance *Dicrano-Pinion* (*Pinus sylvestris* and *Dicranum polysetum*), and of the class *Vaccinio-Piceetea*, which are less frequent in acidophilous oak forests (*Hylocomium splendens*, *Pleurozium schreberi*, *Pseudoscleropodium purum*, and *Vaccinium vitis-idaea*). Whenever those species were absent or scanty, but the other floristic criteria were met, the relevés were diagnosed as substitute forest communities from the class *Vaccinio-Piceetea* (Table A35).

The species composition of phytocoenoses identified as the association *Querco-Pinetum* (Table 3, col. 6) is distinguished by the presence of the above-mentioned characteristic species of the alliance *Dicrano-Pinion* and of the class *Vaccinio-Piceetea*. This contrasts with all the other analysed associations from the classes *Querco-Fagetea* and *Quercetea robori-petraeae*. Species of the class *Quercetea robori-petraeae* (*Carex pilulifera*, *Hieracium lachenalii*, *H. laevigatum*, *H. sabaudum*, and *Holcus mollis*) were infrequent in mixed coniferous forests. Also the *Querco roboris-Pinetum* (Table 3, col. 6) is clearly distinct from the *Serratulo-Pinetum* (col. 7). Numerous species typical for the latter association are the most useful for differentiating between them.

The above synthetic picture of the species composition of *Querco-Pinetum* is similar to that presented by J. M. Matuszkiewicz (1988, his Table 4). However, his table is distinguished by e.g. a higher frequency of several species of the class *Querco-Fagetea* (*Anemone nemorosa*, *Atrichum undulatum*, *Carex digitata*, *Corylus avellana*, and *Poa nemoralis*), which are components of the above-mentioned combination of differential species (Matuszkiewicz J. M. 2001a). The differences result partly from the prevalence of relevés of *Querco-Pinetum coryletosum* (62%) in the compilation of J. M. Matuszkiewicz (1988), whereas in the present study, 28% of relevés represent this most fertile form of mixed coniferous forest, and partly from the generally lower contribution of these species in mixed coniferous forests in the study area. This question is described in greater detail on p. 82.

- The mixed coniferous forest *Serratulo-Pinetum* is represented by 13 relevés (col. 7). In Poland, this association finds optimum conditions in the north-west (Matuszkiewicz J. M. 1988, 2001a), while the phytocoenoses described here develop at the western edge of its distribution range. Thus it can be assumed that they are impoverished, incompletely developed forms of *Serratulo-Pinetum*. Its definition used here is consistent with the concept of J.M. Matuszkiewicz (1988). The studied phytocoenoses represent the Sarmatic race, distinguished by the presence of *Galium verum*, *Genista tinctoria*, and *Pimpinella saxifraga*. In the analysed table, an important role is played by species of all the syntaxonomic groups regarded by J.M. Matuszkiewicz (2001a) as diagnostic. Species of the alliance *Dicrano-Pinion* (*Dicranum polysetum*, *Pinus sylvestris*) and of the class *Vaccinio-Piceetea* (*Hylocomium splendens*, *Orthilia secunda*, *Pleurozium schreberi*, *Vaccinium myrtillus*, *V. vitis-idaea*) are frequent, and only *Trientalis europaea* is less common. Plants associated with thermophilous oak forest and other xerothermophilous species of the class *Trifolio-Geranietea* appear in large numbers. Species of the class *Querco-Fagetea* are represented mainly by *Anemone nemorosa* and *Viola riviniana*. In comparison with the other associations, it is confirmed that regionally characteristic species for the *Serratulo-Pinetum* include *Orthilia secunda* (as indicated earlier by J. M. Matuszkiewicz 1988, 2001a) as well as *Chamaecytisus ratisbonensis*, *Koeleria grandis*, and *Pulsatilla vernalis* (as indicated also by Ratyńska *et al.* 2010).

Interpretation of the floristic variation of the studied plant associations

The presented differentiation of the studied communities at the level of associations (Table 3) is confirmed by results of detrended correspondence analysis DCA (Fig. 14). Interpretation of this diagram, taking into account diagnoses of individual relevés by the classical phytosociological analysis, allowed separation of quite homogeneous and compact clusters of the relevés documenting the studied plant associations. The most homogeneous are clusters of relevés of 3 associations. The designated cluster of *Potentillo albae-Quercetum* comprises 103 relevés, including 89 of this association, which constitutes 91% of all its analysed relevés. The cluster of *Galio sylvatici-Carpinetum* is composed of 114 relevés, including 101 (89%) of this association, while the cluster of *Calamagrostio arundinaceae-Quercetum* encompasses 308 relevés, including 270 (89%) of this association.

DCA does not allow to distinguish between mixed coniferous forests *Querco roboris-Pinetum* and *Serratulo-Pinetum*, and between moist forms of acidophilous oak forests, i.e. the *Molinio caeruleae-Quercetum*, and *Aulacomnio androgyni-Quercetum*. However, both the pairs of associations form clear, isolated clusters. The former cluster comprises 170 relevés, including 90% of all relevés of *Querco-Pinetum,* and 92% of *Serratulo-Pinetum.* The second cluster consists of 91 relevés, which account for 96% of analysed relevés of *Molinio caeruleae-Quercetum*, and for 89%of *Aulacomnio androgyni-Quercetum.*

Distribution of the points (relevés) in the DCA ordination space is justified by differences in floristic

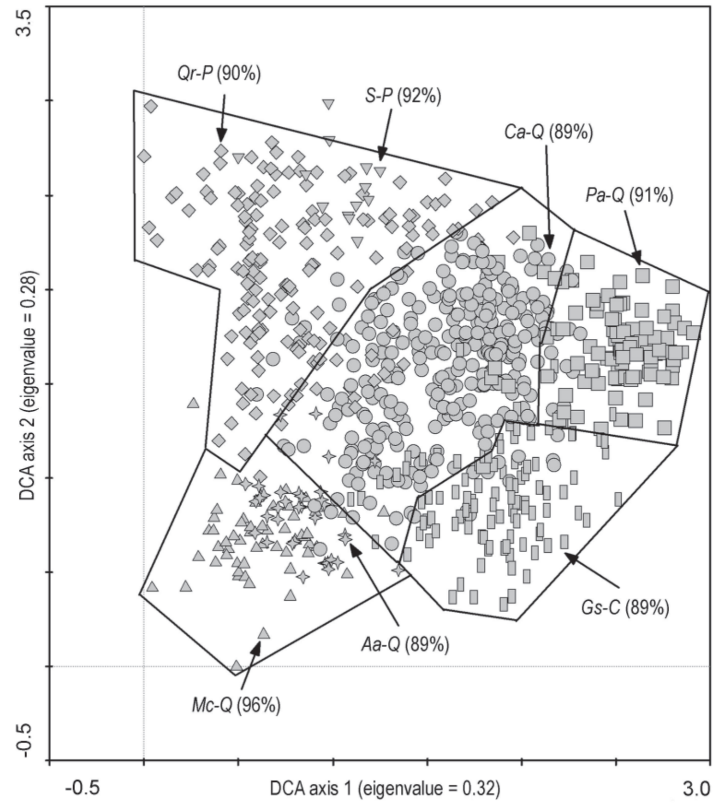


Fig. 14. DCA ordination of 787 relevés classified according to the classical phytosociological method
Explanations: Calculations for quantitative data with down-weighting of rare species. Tree species were not taken into account. The percentage of relevés of the given association located within a delimited area is enclosed in brackets

structure, reflected in numbers of species from various syntaxonomic groups (Fig. 15, Table 4). The cluster of relevés of *Potentillo albae-Quercetum* is the richest in herbaceous species, correlated with a high contribution of xerothermophilous species of the order *Quercetalia pubescentis*, as well as of the classes *Festuco-Brometea* and *Trifolio-Geranietea*. The cluster of relevés of mixed coniferous forest is clearly separated from that of thermophilous oak forest. The *Querco-Pinetum* is characterized by a high contribution of species of the moss

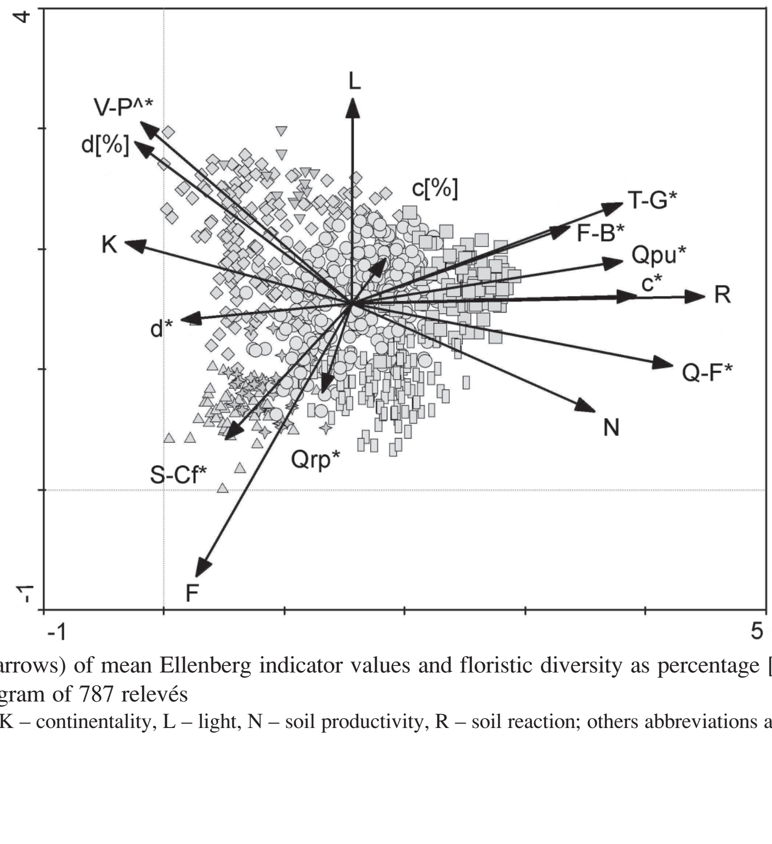


Fig. 15. Passive projection (arrows) of mean Ellenberg indicator values and floristic diversity as percentage [%] or number of species (*), onto the DCA ordination diagram of 787 relevés
Explanations: F – soil moisture, K – continentality, L – light, N – soil productivity, R – soil reaction; others abbreviations as in Table 4

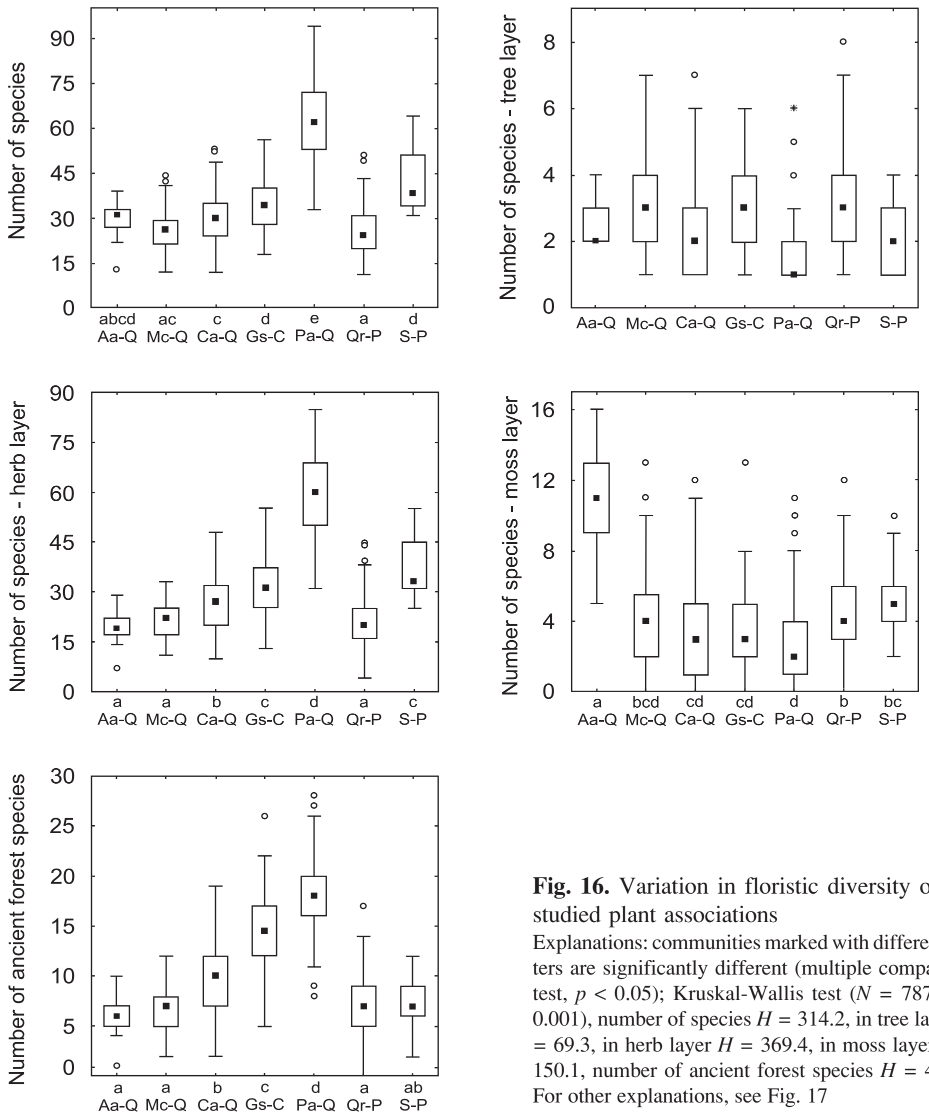


Fig. 16. Variation in floristic diversity of the studied plant associations

Explanations: communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$); Kruskal-Wallis test ($N = 787$, $p < 0.001$), number of species $H = 314.2$, in tree layer $H = 69.3$, in herb layer $H = 369.4$, in moss layer $H = 150.1$, number of ancient forest species $H = 407.9$. For other explanations, see Fig. 17

layer (reaching high coverage), as well as species of the class *Vaccinio-Piceetea*. The high soil moisture content of the sites of *Aulacomnio-Quercetum* and *Molinio-Quercetum* is reflected in a significantly higher contribution of species of the class *Scheuchzerio-Caricetea fuscae*.

The general variation of the major floristic features of the analysed communities is illustrated in Fig. 16. Their tree layer was composed of a relatively low number of species. This applies particularly to patches of *Potentillo albae-Quercetum* (composed mostly of *Quercus petraea*), *Aulacomnio-Quercetum* (*Q. robur* and *Carpinus betulus*), *Calamagrostio-Quercetum* (*Q. petraea* and *Q. robur*), and *Serratulo-Pinetum* (dominated by *Pinus sylvestris*, with an admixture of *Betula pendula* and both numbers of species). The other 3 communities had a slightly more diverse canopy: the *Molinio-Quercetum* (dominated by *Q. robur* with an admixture of *B. pendula*, *P. sylvestris*, *Picea abies*, *Carpinus betulus,* etc.), *Galio-Carpinetum* (oak-hornbeam forest stands with an admixture of *B. pendula*, etc.), and *Querco-Pinetum* (mostly *P. sylvestris*, with the participation of *Q. robur*, *Q. petraea*, *B. pendula*, etc.).

The phytocoenoses of *Potentillo-Quercetum* were most diverse floristically and significantly different from the other syntaxa (Fig. 16). The *Serratulo-Pinetum* is also very rich in herbaceous species. The lowest diversity of herbaceous plants was recorded in patches of *Querco-Pinetum*, *Molinio-Quercetum*, and *Aulacomnio-Quercetum.* The last mentioned association was distinguished by the highest number of species in the moss layer.

Ancient forest plant species (AFS) were most numerous in relevés of *Potentillo aalbae-Quercetum* and *Galio sylvatici-Carpinetum*. Those patches comprised additionally the largest number of species of the class *Querco-Fagetea*, which includes many species of the ecological group considered here. The contribution of AFS was relatively high also in the *Calamagrostio-Quercetum*, while the lowest in both mixed coniferous forest associations from the class *Vaccinio-Piceetea*

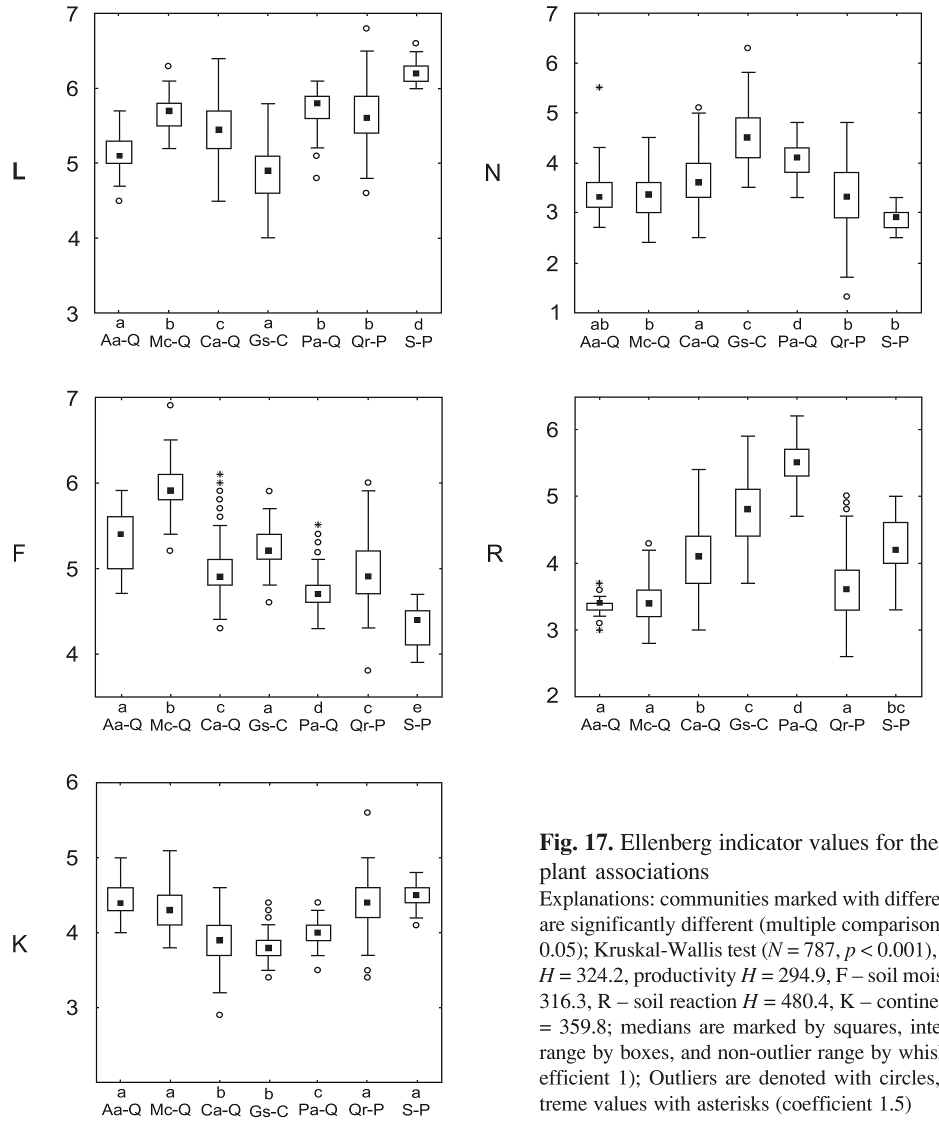


Fig. 17. Ellenberg indicator values for the studied plant associations
Explanations: communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$); Kruskal-Wallis test ($N = 787$, $p < 0.001$), L – light $H = 324.2$, productivity $H = 294.9$, F – soil moisture $H = 316.3$, R – soil reaction $H = 480.4$, K – continentality $H = 359.8$; medians are marked by squares, interquartile range by boxes, and non-outlier range by whiskers (coefficient 1); Outliers are denoted with circles, and extreme values with asterisks (coefficient 1.5)

(*Serratulo-Pinetum* and *Querco-Pinetum*) and the other acidophilous oak forests, i.e. the *Aulacomnio-Quercetum* and *Molinio-Quercetum*. The small number of species of the order *Quercetalia robori-petraeae* (5%) in the European list of AFS, including 132 species, was emphasized earlier by Hermy *et al.* (1999). Thus it can be assumed that the small contribution of AFS in the 4 communities mentioned above may be natural, rather than associated with human impact.

Analysis of selected site indicators

The DCA diagram of variation of the analysed relevés, taking into account mean Ellenberg indicator values, indicates that relevés distributed along the first ordination axis differ in soil reaction and calcium content (R), productivity (N), and continentality (K). The second axis shows differences between the communities in their plant preferences with respect to light (L) and moisture (F) (Fig. 15). These differences, statistically significant (Table 4), are confirmed by results of analysis of variance (Kruskal-Wallis test, Fig. 17).

Summarizing the above analyses (Fig. 15-17, Table 4), the following conclusions can be drawn.

a) The value of L did not vary widely. Mean L values of individual relevés indicate that most species were typical of half shade (L-5). The most shaded conditions were under the canopy of *Carpinus*-dominated forest stands of *Aulacomnio-Quercetum* and *Galio-Carpinetum*. Access to light was the highest in the mixed coniferous forest *Serratulo-Pinetum*, whose canopy was less dense, dominated by *Pinus*. More light-demanding plants (L=7) found favourable conditions in several relevés of *Querco-Pinetum*.
b) The phytocoenoses of *Molinio caeruleae-Quercetum* were composed mostly of plants preferring relatively moist sites (F=6). The contribution of plant indicators of intermediate soil moisture (F=5) was significantly higher in patches of *Aulacomnio androgyni-Quercetum* and *Galio sylvatici-Carpinetum*. Slightly lower but significantly different F values were recorded in relevés of *Calamagrostio-Quercetum* and *Querco-Pinetum*. Patches of *Potentillo-Quercetum*

and *Serratulo-Pinetum* consisted primarily of plant indicators of soils intermediate between fresh and dry (F=4).

c) Mixed coniferous forests (*Querco-Pinetum* and *Serratulo-Pinetum*) and 2 associations of acidophilous oak forests (*Aulacomnio-Quercetum* and *Molinio-Quercetum*) were composed mostly of plant indicators of nutrient-poor sites (N=3). Oak forests from the class *Querco-Fagetea* (*Galio-Carpinetum* and *Potentillo-Quercetum*) were dominated by plant indicators of medium fertility (N = 5).
d) Soil reaction indicator values in all the studied relevés varied from R=3 (acidic soils) to R=5 (moderately acidic soils). R values were significantly lowest in the mixed coniferous forest *Querco-Pinetum* and 2 associations of acidophilous oak forests *Aulacomnio-Quercetum* and *Molinio-Quercetum*, while the highest in the thermophilous oak forest *Potentillo-Quercetum*.
e) The studied associations only slightly varied in continentality, but formed 2 significantly different groups. One group composed of *Calamagrostio-Quercetum* and *Galio-Carpinetum* is dominated by plant species whose centre of distribution is in Central Europe (K=4). This group is composed of *Calamagrostio-Quercetum* and *Galio-Carpinetum.* The second group includes mixed coniferous forests (*Querco-Pinetum* and *Serratulo-Pinetum*) and the remaining 2 associations of acidophilous oak forests (*Aulacomnio-Quercetum* and *Molinio-Quercetum*). They are distinguished by a significantly higher contribution of species intermediate between weakly oceanic and weakly subcontinental ones (K=5). The thermophilous oak forest *Potentillo albae-Quercetum* in this analysis is intermediate between the 2 groups mentioned above.

6.3. Detailed descriptions of plant communities

6.3.1. *Aulacomnio androgyni-Quercetum roboris* Brzeg *et* Kasprowicz in Brzeg *et al.* 2000

Basic documentation

The 37 relevés representing this association here (Tables 5 and A1) include all (25) relevés from the table of Brzeg *et al.* (2000a).

Distribution

Phytocoenoses of *Aulacomnio-Quercetum* were documented in the study area in 10 basic ATPOL squares (10 km × 10 km each, Fig. 18), which are regarded as localities here. Most of them (8), according to the geobotanical regionalization of J. M. Matuszkiewicz (1993, 2008a, Fig. 4b here) are located in the Kalisz Plateau (Wysoczyzna Kaliska) within the South Wielkopolska Subregion (Podkraina Południowowielkopolska), and is associated mostly with the part

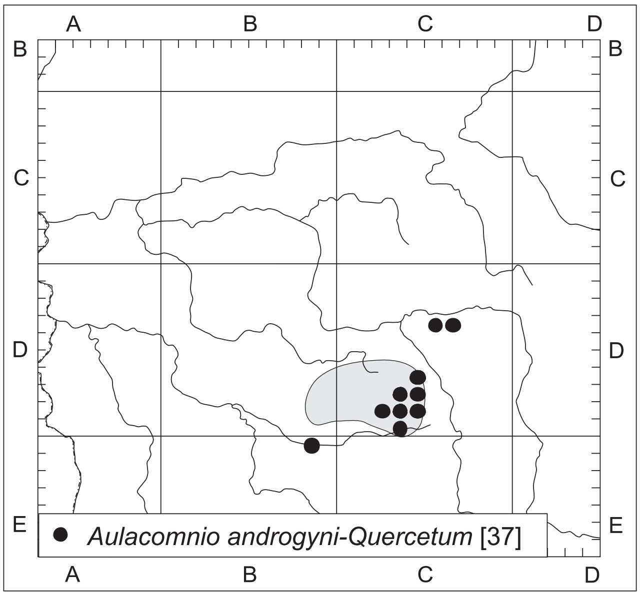


Fig. 18. Distribution of localities of *Aulacomnio androgyni-Quercetum* (number of relevés given in brackets). The Krotoszyn Plateau (Płyta Krotoszyńska) is shaded

known as the Krotoszyn Plateau. According to the forest regionalization (Trampler *et al.* 1990), the *Aulacomnio-Quercetum* is distributed mostly in the Krotoszyn District (Dzielnica Krotoszyńska) within the Wielkopolska-Pomeranian Region (Kraina Wielkopolsko-Pomorska).

Vertical structure and species composition

In respect of vertical structure, phytocoenoses of the association did not vary at the level of subassociations (Fig. 19). Generally, the studied patches had well-defined upper and lower tree layers. In the upper layer (a1), coverage reached 25-70%, compared to 20-90% in the lower layer (a2). In individual relevés, usually 2-3 tree species were found in the canopy. These included mostly *Quercus robur* in a1 and *Carpinus betulus* in a2. The most frequent admixture was *Betula pendula*. Both *Picea abies* and *Pinus sylvestris* were very rare.

The shrub layer (b) was absent in several of the studied phytocoenoses. Usually, however, its coverage was negligible, and it was composed mostly of *Frangula alnus* and *Carpinus betulus*. The coverage of the herb

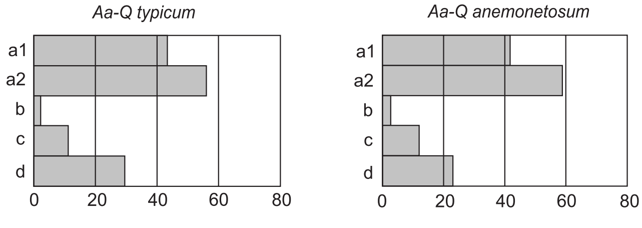


Fig. 19. Scheme of the vertical structure of subassociations of *Aulacomnio androgyni-Quercetum*.
Explanations: bars denote the percent cover of vegetation layers

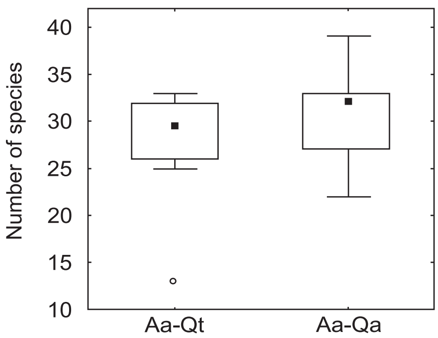


Fig. 20. Variation in number of species in relevés of subassociations of *Aulacomnio androgyni-Quercetum*

Explanations: Aa-Qt – *Aulacomnio androgyni-Quercetum* typicum, Aa-Qa – *Aulacomnio androgyni-Quercetum* with *anemonetosum*

layer (c) typically varied from negligible to 40% (Table A1), but in one relevé (23) it reached 80%, thanks to *Vaccinium myrtillus*. That relevé documented a forest stand with only one tree layer, so it was not taken into account when constructing the synthetic picture of the vertical structure of the association (Fig. 19). The highest constancy (4 or 5) in the table was reached by several species. Among them, *Carex pilulifera*, *Luzula pilosa*, *Maianthemum bifolium*, and *Vaccinium myrtillus* were most abundant (usually 1-2, exceptionally 5). Minor components of that layer were *Carpinus betulus*, *Deschampsia caespitosa*, *Frangula alnus*, *Holcus mollis*, *Melampyrum pratense*, and *Sorbus aucuparia*. Bryophytes were recorded in all relevés, and their coverage reached 5- 60% (mean 26%). Most constant components of that layer were *Aulacomnium androgynum*, *Dicranella heteromalla*, *Dicranum scoparium*, *Hypnum cupressiforme*, *Mnium hornum*, *Plagiothecium curvifolium*, *P. laetum* and *Pohlia nutans*.

In Table A1 (see also Table 3), 113 plant species were recorded. These include a particularly large group of 32 species of bryophytes and lichens. In individual relevés, their number varied from 5 to 16. The number of vascular plant species ranged from 7 to 29 (Fig. 20).

Subdivision based on habitat variation

In the present study (in accordance with Brzeg *et al.* 2000a; see also Brzeg & Kasprowicz 2001), 2 subassociations are distinguished:

- *Aulacomnio androgyni-Quercetum roboris typicum* Brzeg *et* Kasprowicz *in* Brzeg *et al.* 2000 (Table 5, col. 1 i 2),
- *Aulacomnio androgyni-Quercetum roboris anemonetosum nemorosae* Brzeg *et* Kasprowicz *in* Brzeg *et al.* 2000 (Table 5, col. 3 i 4).

Each of them is subdivided into 2 variants. Their species composition is presented in the synoptic Table 5 and the analytic Table A1.

The number of species recorded in individual relevés of these subassociations varied from 13 to 33 in the *Aa-Q typicum*, and from 22 to 39 in the *Aa-Q anemonetosum*. The differences are not statistically significant (Fig. 20).

The *Aa-Q typicum* is characterized by a very small contribution of mesophilous species of deciduous forests from the class *Querco-Fagetea* (except *Carpinus*

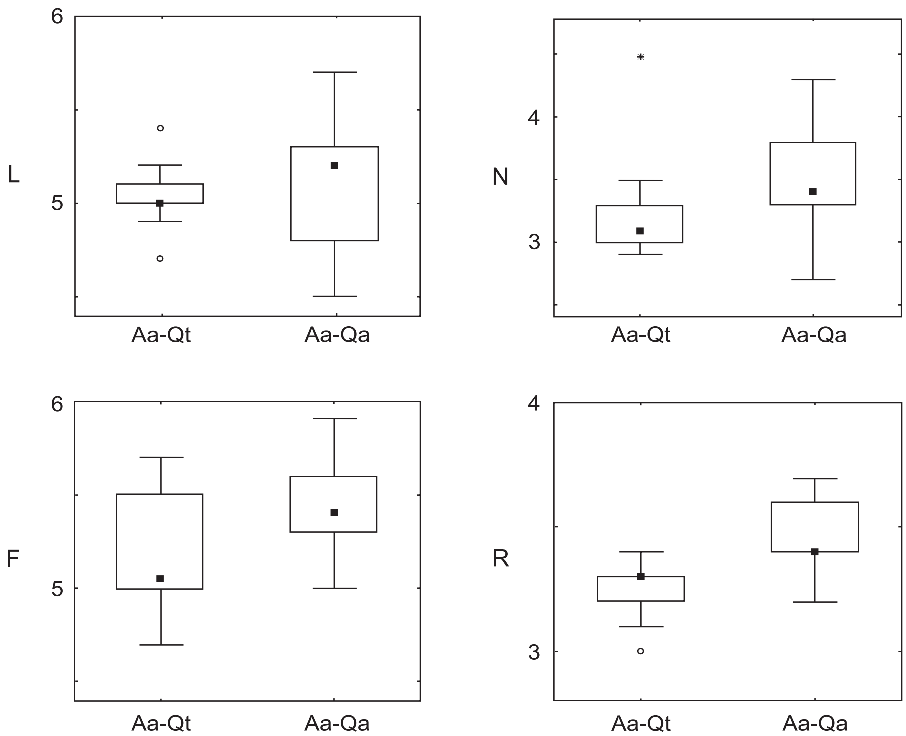


Fig. 21. Ellenberg indicator values for subassociations of *Aulacomnio androgyni-Quercetum*

Explanations: Mann-Whitney U test, L – light $U = 117.5$, $Z = -1.378$, $p = 0.175$, F – soil moisture $U = 89$, $Z = -2.288$, $p = 0.024$, N – soil productivity $U = 75.5$, $Z = -2.69$, $p = 0.0062$, R – soil reaction $U = 42$, $Z = -3.805$, $p < 0.001$. For other explanations, see Fig. 17

betulus and *Fagus sylvatica*). Also the role of species of coniferous forests from the class *Vaccinio-Piceetea* in the typical variant of the subassociation is relatively low, while in the variant with *Pleurozium schreberi* they are classified as differential species: *Hylocomium splendens*, *Picea abies*, *Pleurozium schreberi*, *Trientalis europaea*, and *Vaccinium myrtillus* (Table 5).

The subassociation *Aa-Q anemonetosum* is well distinguished by a group of differential species. Among them, the highest constancy in the table was reached by *Anemone nemorosa*, *Agrostis canina*, *Juncus effusus*, and *Oxalis acetosella* (see Brzeg *et al.* 2000a; Brzeg & Kasprowicz 2001). Differentiation of this subassociation into variants is equally conspicuous and based on the same species (except *Vaccinium myrtillus*) as within the typical subassociation (Table 5). In the typical variant of *Aa-Q anemonetosum*, a greater role is played by *Milium effusum* and *Stellaria holostea*.

Analysis of selected site indicators

Authors of the formal description of the association *Aulacomnio androgyni-Quercetum* reported that its variation, presented above, results from differences in site conditions, mostly in fertility (Brzeg *et al.* 2000a). This opinion is confirmed here by the analysis of Ellenberg indicator values (Fig. 21, N and R). Additionally the subassociations differ in the contribution of species varying in moisture requirements (Fig. 21 F).

Patches of the association were dominated by plants preferring fresh soils (F=5), poor in nutrients (N=3), and highly acidic (R=3). However, values of these indicators were slightly but significantly higher in the *Aa-Q anemonetosum*. The forest floor was most favourable for half shade plants (L=5) in both subassociations.

6.3.2. *Molinio caeruleae-Quercetum roboris* (R. Tx. 1937) Scam *et* Pass. 1959 *em.* Brzeg, Kasprowicz *et* Krotoska 1989

Basic documentation

This association is poorly documented. Most (51) of the 56 relevés shown in Table 6 and A2 were previously presented in a synoptic table by Brzeg & Kasprowicz (2001), including 7 relevés of Krotoska and Piotrowska (1962), who classified them as the *Pino-Quercetum*.

Distribution

Phytocoenoses of this association were found in 12 ATPOL squares. Their distribution pattern (Fig. 22) resembles the above-mentioned distribution of localities of *Aulacomnio-Quercetum* (Fig. 18). As many as 10 of them, according to the geobotanical regionalization of J. M. Matuszkiewicz (1993), are located in the Kalisz Plateau within the South Wielkopolska Subregion. According to the forest regionalization (Trampler *et al.* 1990), it lies in the Krotoszyn District within the Wielkopolska-Pomeranian Region (see also Fig. 4c here). The centre of distribution of *Molinio caeruleae-Quercetum* is the Krotoszyn Plateau (Brzeg *et al.* 1989, Brzeg & Kasprowicz 2001).

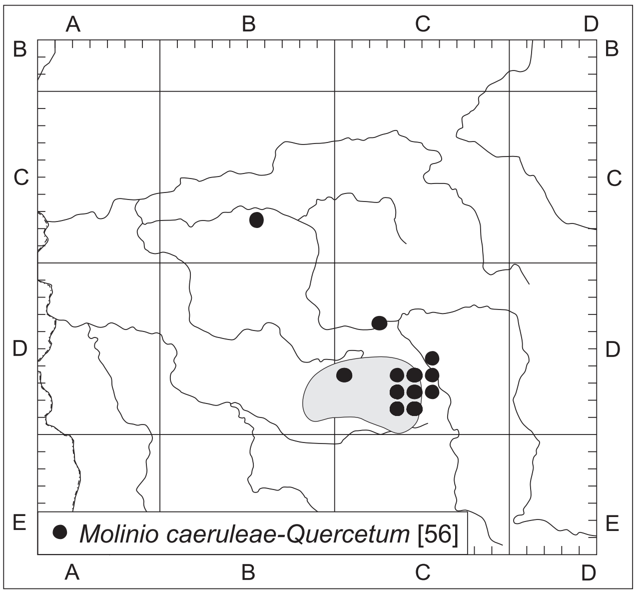


Fig. 22. Distribution of localities of *Molinio caeruleae-Quercetum* (number of relevés given in brackets). The Krotoszyn Plateau (Płyta Krotoszyńska) is shaded

Vertical structure and species composition

In the studied patches of *Molinio-Quercetum*, the canopy was composed of 1-2 layers (Fig. 23). One-layered canopy was formed by 1-4 species, while 2-layered by 2-5 (exceptionally 6-7) species. In both groups, *Quercus robur* was the dominant. However, if the canopy was 2-layered, *Q. robur* was found mostly in

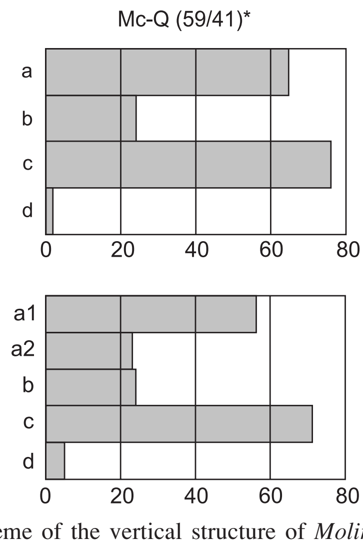


Fig. 23. Scheme of the vertical structure of *Molinio caeruleae-Quercetum roboris*

Explanations. One and two-layered tree-stands are shown on separate diagrams; bars denote the percent cover of vegetation layers; * – percent contributions of relevés with one/two-layered canopy the upper layer (a1), accompanied by *Betula pendula* and *Pinus sylvestris*. Major components of the lower tree layer (a2) were: *Picea abies*, *B. pubescens, Betula pendula*, *Sorbus aucuparia*, and *Carpinus betulus*. The last mentioned species was quite abundant in several relevés. The coverage of a1 as well as a2 varied between relevés from 30% to 80%. If the canopy was one-layered, its coverage ranged from 40% to 90%.

The shrub layer was absent in only 2 relevés. In the others, irrespective of tree layer structure, its coverage varied from negligible to 70% (mean 24%). Its major component was *Frangula alnus*. *Picea abies* reached also a high constancy in the table. Its presence is probably natural, as evidenced by its abundant natural regeneration and location of the studied relevés near the northern limit of *Picea abies* distribution range in Wielkopolska (see also Boratyńska 1998).

The herb layer (c) was always well-developed, and its cover varied between relevés from 50% to 95%. In most of the relevés (53) it was dominated by *Molinia caerulea*, whose Braun-Blanquet cover-abundance reached 3-5. In single relevés, also *Calamagrostis arundinacea*, *Deschampsia caespitosa*, *Pteridium aquilinum*, *Trientalis europaea*, and *Vaccinium myrtillus* were more abundant. The moss layer was nearly always present but poorly developed (its coverage ranging from negligible to 30%), and its most frequent species was *Polytrichastrum formosum*.

In the 56 analysed relevés of the association, 135 plant species were recorded. Individual relevés included

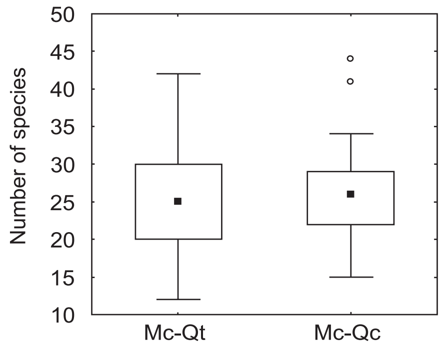


Fig. 24. Variation in number of species in relevés of variants of *Molinio caeruleae-Quercetum*

Explanations: Mc-Qt – *Molinio caeruleae-Quercetum* typical variant, Mc-Qc – *Molinio caeruleae-Quercetum* variant with *Calamagrostis arundinacea*

12-44 species (mean 26). There were no significant differences in species richness between the variants of *Molinio-Quercetum* described below (Fig. 24).

Subdivision based on habitat variation

Patches of the association *Molinio-Quercetum* are relatively homogenous in respect of species composition. In the basic table of the community, a form with *Calamagrostis arundinacea* was distinguished, and it was subdivided into 2 variants: with *Carex canescens* and with *Sphagnum girgensohnii* (Brzeg *et al.* 1989). Later on, that subdivision was improved by the separation of 2 variants: typical and with *Calamagrostis arundinacea*, and within the latter, 2 subvariants: typical and with *Sphagnum girgensohnii* (Brzeg & Kasprowicz

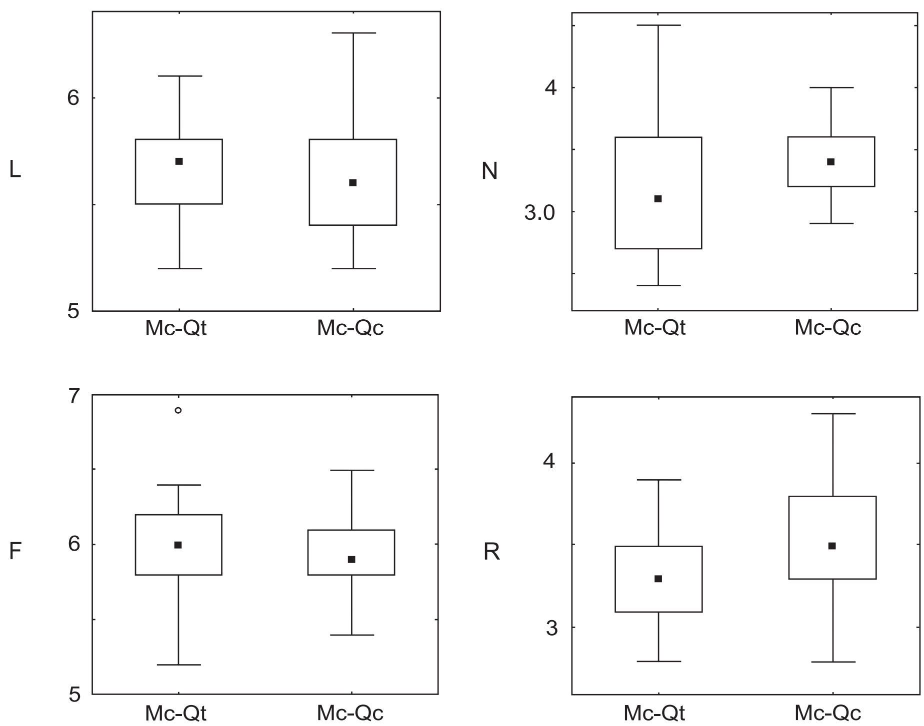


Fig. 25. Ellenberg indicator values for variants of *Molinio caeruleae-Quercetum*

Explanations: Mann-Whitney U test, L – light $U = 313.5$, $Z = 1.293$, $p = 0.1196$, F – soil moisture $U = 339.0$, $Z = 0.898$, $p = 0.385$, N – soil productivity $U = 282$, $Z = -1.802$, $p = 0.072$, R – soil reaction $U = 241.5$, $Z = -2.477$, $p = 0.013$. For other explanations, see Fig. 17

2001). The species composition of the association, as defined above, is shown in the analytic Table A2 and in the synoptic Table 6.

The typical variant, represented by 27 relevés, has no differential species. However, it is distinguished by a higher constancy of *Pinus sylvestris* and a very low frequency of *Carpinus betulus* in the tree layer (Table 6). In the analytic Table A2, probably because of differences in forest management, 2 forms of the community were distinguished. The first one (relevés 1-18) has a canopy dominated by *Quercus robur* and a well-developed shrub layer. In many relevés, this layer is composed mostly of *Frangula alnus*. The second form (relevés 19-27) is distinguished by *Quercus petraea* as a major component of the tree layer.

The variant with *Calamagrostis arundinacea*, documented by 29 relevés (28-56), is also characterized by the presence of *Betula pubescens*. In some of its patches, the contribution of *Carpinus betulus* to the tree layer was higher. This community is divided into 2 subvariants: typical (relevés 37-56), and with *Sphagnum girgensohnii* (relevés 28-36), distinguished also by the presence of *Carex canescens* (Table A2).

Analysis of selected site indicators

Ellenberg indicator values of plant species recorded in the studied variants of *Molinio-caeruleae-Quercetum* show that these syntaxa differ significantly only in soil reaction (Fig. 25). Patches of both variants were characterized by the presence of plant indicators of moderately moist soils (F=6, intermediate between fresh and moist), poor in nutrients (N3) and highly acidic (R=3). The forest floor was most favourable for half shade plants (L=5), or slightly more light-demanding species (L=6).

6.3.3. *Calamagrostio arundinaceae-Quercetum petraeae* (Hartmann 1934) Scamoni *et* Pass. 1959 *em.* Brzeg, Kasprowicz *et* Krotoska 1989

Basic documentation

As a result of a classical phytosociological analysis, 792 relevés have been assigned to the *Calamagrostio arundinaceae-Quercetum* in the present study. These include most of the 588 relevés representing this syntaxon according to the author's diagnosis, and relevés initially identified as other associations, mostly the *Pino-Quercetum* (125), *Fago-Quercetum* (18), and *Galio* (*Querco*)-*Carpinetum* (16). All th relevés were collected in 17 analytic tables (A3-A19), which show the species composition of subassociations and variants of *Calamagrostio arundinaceae-Quercetum*, taking into account the symptoms of its degeneration. The high habitat variation, observed in both well-preserved and degenerated phytocoenoses, is shown in the synoptic Tables 7-9. They include 780 relevés. Twelve relevés were excluded, as they represented mixed patches with indicator species of both *Ca-Q molinietosum* and *Ca-Q polygonatetosum*. Those relevés are compiled in the analytic Table A19.

Distribution

The *Calamagrostio arundinaceae-Quercetum* represents the Central European lowlands type of distribution (Matuszkiewicz J. M. 2001b). The first map of its distribution in Poland was presented by J. M. Matuszkiewicz (1988). As mentioned above, it is based on only 47 relevés (Fig. 26a). Later research did not change its distribution pattern dramatically. The distribution pattern of the continuous part of the potential biochore of *Calamagrostio-Quercetum* on the map of potential natural vegetation of Poland (W. Matuszkiewicz *et al.* 1995; Fig. 26b) is similar to its distribution pattern suggested on the latest map of European vegetation (Bohn *et al.* 2003; see Fig. 26e).

Localities or potential sites of this oak forest type are very unevenly distributed. They are concentrated in the western and southern parts of its distribution range (Fig. 26a-c). This is noticeable also on the original map of J. M. Matuszkiewicz (2001a), whose simplified version is presented in Fig. 26d. The cited author indicated the *Calamagrostio-Quercetum* as an association characteristic for the Brandenburg-Wielkopolska Division (Dział Brandenbursko-Wielkopolski) according to the geobotanical regionalization of J. M. Matuszkiewicz (1993). The importance of *Calamagrostio arundinaceae-Quercetum* differs between geobotanical regions of the Division. In the Lower Silesia Region (Kraina Dolnośląska) and the South Wielkopolska–Lusatia Region (Kraina Południowowielkopolsko-Łużycka), the *Calamagrostio-Quercetum* is common and prevails over the *Querco-Pinetum* on sites of mixed coniferous forest (BM). In the Noteć-Lubusz Region (Kraina Notecko-Lubuska) and Central Wielkopolska Region (Kraina Środkowowielkopolska), the *Calamagrostio-Quercetum* is less common, and the *Querco-Pinetum* prevails on sites of mixed coniferous forest. The latter association nearly completely dominates on sites of mixed coniferous forest in the Kujawy Region (Kraina Kujawska), where the *Calamagrostio-Quercetum* is rare (Matuszkiewicz J. M. 1993, 2001b).

In the present study, the cartogram of distribution of *Calamagrostio-Quercetum* in Wielkopolska and in neighbouring areas is based on 595 relevés of the association (including 291 documenting stage I of degeneration) found in 91 basic ATPOL squares (Fig. 26f, see also Figs. 30-31). However, 185 relevés were excluded, as they represented its more degenerated forms (stages II and III of degeneration, see also Table 7, col. 7-12). The distribution of localities of the more degenerated forms of *Calamagrostio-Quercetum* is presented in separate cartograms (Figs. 32-33).

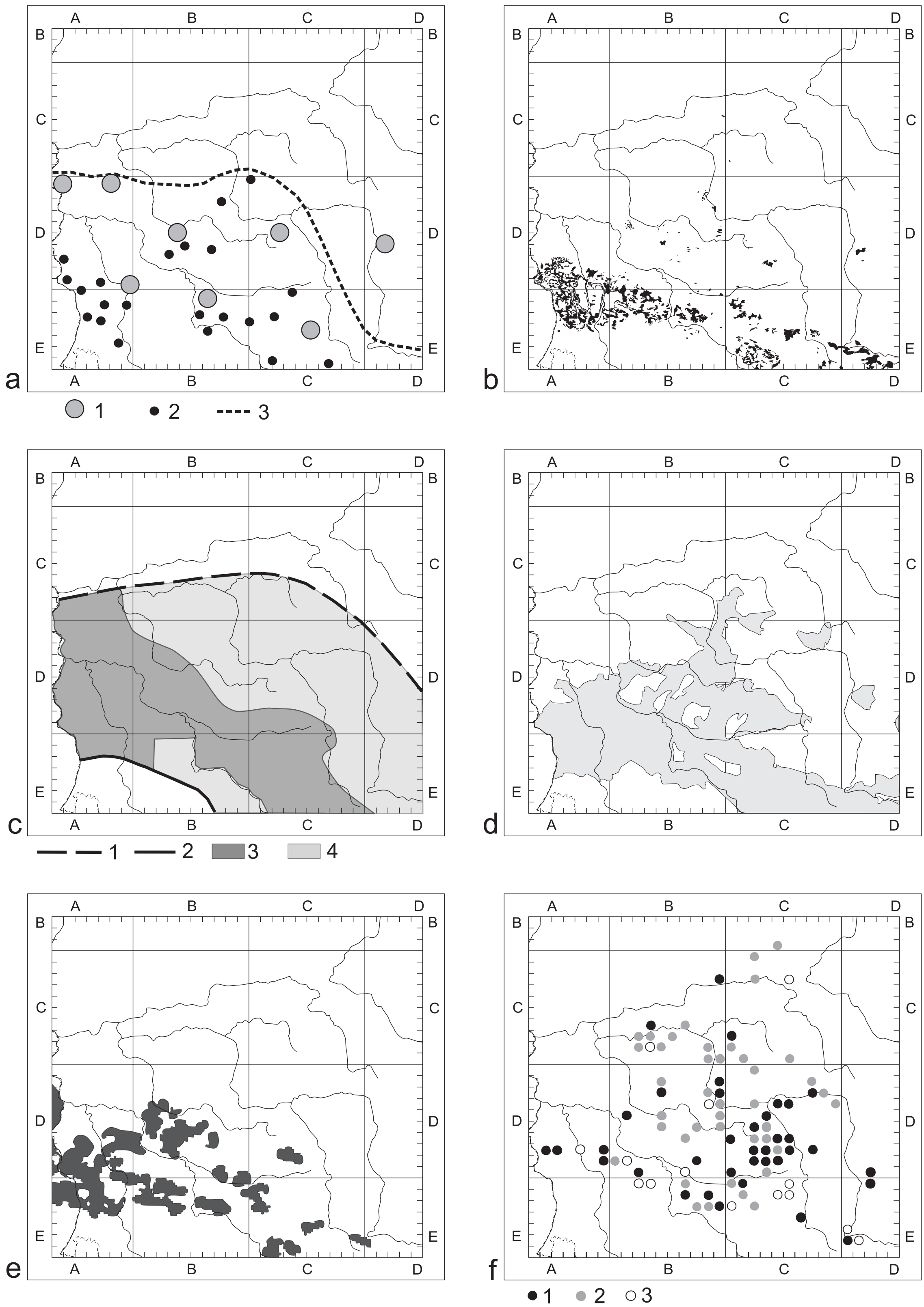


Fig. 26. Actual and potential distribution of *Calamagrostio arundinaceae-Quercetum petraeae*

a) Matuszkiewicz J. M. (1988), simplified, 1 – distribution of relevés, 2 – localities without phytosociological documentation, 3 – presumed eastern limit of distribution
b) Matuszkiewicz W. *et al*. (1995), potential distribution of the association's biochore
c) Matuszkiewicz W. & Matuszkiewicz J. M. (1996), Matuszkiewicz W. (2001), simplified, 1 – location of the association's range limit uncertain or conventional, 2 – location of the range limit certain, 3 – moderate role of the association in the landscape: the association or its potential habitat are constant elements of the landscape, 4 – unimportant role of the association in the landscape: the association or its potential habitat are rare and cover small surfaces
d) Matuszkiewicz J. M. (2001a), simplified, geographic range of the association
e) Bohn *et al*. (2003), potential range of the association
f) Kasprowicz (original), distribution of relevés on the ATPOL grid, 1 – untransformed patches, 2 – untransformed or in stage I of degeneration, 3 – in stage I of degeneration

It is interesting to interpret the distribution of localities of *Calamagrostio-Quercetum* in comparison with the above-mentioned geobotanical regionalization (J.M. Matuszkiewicz 1993; Fig. 4b). Disregarding Silesia, which is located outside the study area, nearly half of localities (ATPOL squares) of untransformed patches of the association (46%) are located in the South Wielkopolska-Lusatia Region. The Noteć-Lubusz Region and the Central Wielkopolska Region include 25% and 23%, respectively, while the Kujawy Region includes 6% of all its localities in the Brandenburg-Wielkopolska Division. Degenerated forms of *Calamagrostio-Quercetum* have a similar distribution pattern. Thus the structure of its range corresponds to an earlier assessment of its distribution, presented by J.M. Matuszkiewicz (1993, 2001a) on the basis of preliminary data. When commenting on its distribution in Poland, he noted also that its range and proportions of its localities in individual regions are uncertain, mostly because of difficulties in separating oak forests of this type from mixed coniferous forests, particularly in managed forests, and the available data are far from complete (Matuszkiewicz J. M. 2001b: 267). The diagram (Fig. 26f) presenting a part of the range of *Calamagrostio-Quercetum* is devoid of many of those drawbacks. However, it still may reflect, to some extent, the availability of data on these forests. A clear relationship between the areal contribution of oak forests (Fig. 7) and distribution of localities of the association, seems to contradict this argument.

The resultant picture of distribution of *Calamagrostio-Quercetum* in the study area is most similar to that presented by J.M. Matuszkiewicz (2001a), but it moves its limit northwards (Fig. 26). The relevés located near this limit represent mostly the Wielkopolska race rather than the West Pomeranian race (see also Table 2). According to J.M. Matuszkiewicz (1988, 2001a) and W. Matuszkiewicz (2001), its West Pomeranian race should be classified as the *Fago-Quercetum*.

In light of results of this study, the distribution of potential sites of *Calamagrostio-Quercetum* needs to be corrected to a large extent, especially in the central and northern parts of its range. It is noteworthy that the map of potential natural vegetation of Poland (Matuszkiewicz W. *et al.* 1995; Matuszkiewicz J. M. 2008b) includes data from earlier published maps of potential vegetation of Lubusz Lakeland (Pojezierze Lubuskie), recorded in 1969-1971 (Wojterski 1972; Wojterski *et al.* 1974), central Wielkopolska (Wojterski *et al.* 1978; field research in 1972-1977, see also Wojterski *et al.* 1981), and the catchment area of the river Barycz (Wojterski *et al.* 1981). The first 2 publications, covering the areas that are most controversial in this respect, appeared at the time when the *Calamagrostio-Quercetum* was first reported from Wielkopolska and known from practically only one locality in Poland (Fabiszewski & Faliński 1967). Moreover, at that time, both the phenomenon of degeneration of plant communities (Faliński 1966; Olaczek 1972, 1974a, 1974b; see also Łaska 2001) and the process of synanthropization of vegetation (Faliński 1972; Kostrowicki 1972) only started to be investigated. That is why patches of degenerated acidophilous oak forests, especially those with *Pinus* in the canopy, were in most cases diagnosed as the *Pino-Quercetum*, as a unit of both actual and potential vegetation. Identification of potential sites of acidophilous oak forests in deforested areas was at that time very difficult or even impossible (Wojterski *et al.* 1981).

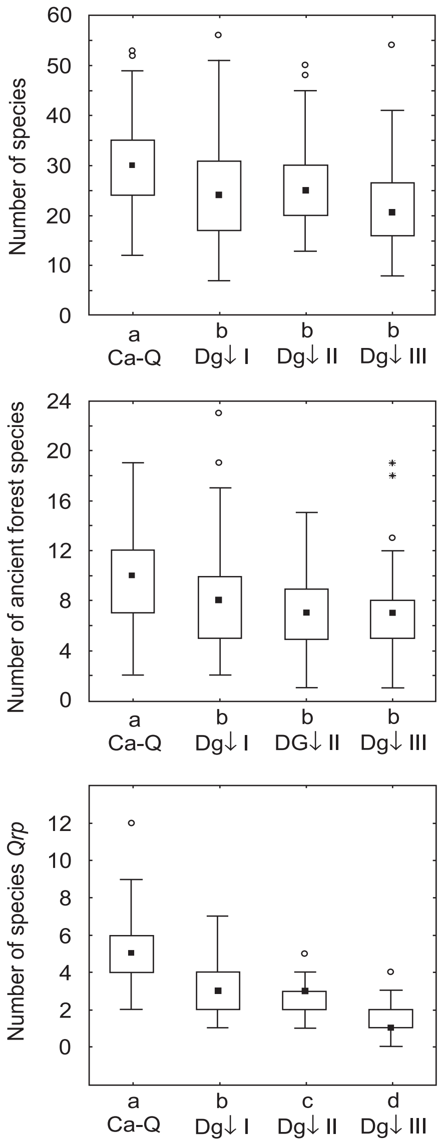
Subdivision based on habitat variation and anthropogenic dynamics

The association *Calamagrostio arundinaceae-Quercetum* is defined here in accordance with Brzeg *et al.* (2001). The relevés representing them, document the whole range of its habitat variation proposed in that study, i.e. 3 subassociations conditioned by soil moisture content, each of them subdivided into trophic variants. A synthetic picture of variation of *Calamagrostio arundinaceae-Quercetum* at the level of subassociations, taking into account also its more or less degenerated forms, is presented in Table 7. The following subassociations are distinguished:

- *Calamagrostio arundinaceae-Quercetum petraeae molinietosum* Brzeg *et al.* 1989 *ex* Lisiewska *et* Reszel 2000 (col. 1, 4, 7, 10),
- *Calamagrostio arundinaceae-Quercetum petraeae typicum* Großer 1964 (col. 2, 5, 8, 11),
- *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* Passarge *in* Pallas 1996 (col. 3, 6, 9, 12).

The basic diagnostic feature used to determine the stage of degeneration of phytocoenoses was mainly the contribution of characteristic and differential species of the association *Calamagrostio arundinaceae-Quercetum* and the class *Quercetea robori-petraeae*.

Untransformed patches of the association are characterized by a high constancy of diagnostic species (Table 7, col. 1-3). In stage I of degeneration, relevés are distinguished by a markedly smaller constancy of characteristic species of the association (col. 4-6). In stage II of degeneration, these species and *Calamagrostis arundinacea*, i.e. one of its differential species, are nearly absent (col. 7-9). In stage III of degeneration, a decrease is observed also in the contribution of characteristic species of the class *Quercetea robori-petraeae* (col. 10-12). Moreover, in stages II and III of degeneration, the contribution of species characteristic of forest clearings, of the class *Epilobietea angustifolii* is higher (e.g. *Calamagrostis epigejos* and *Rubus idaeus*).



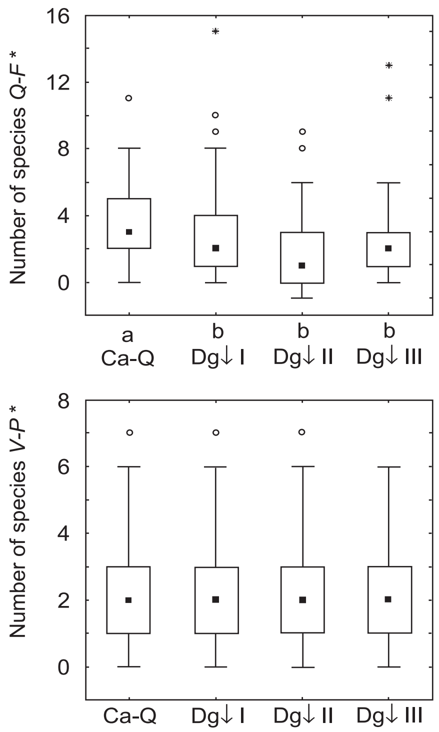


Fig. 27. Synoptic floristic and syntaxonomic characterization of *Calamagrostio arundinaceae-Quercetum* (Ca-Q) and of its degeneration stages (Dg)
Explanations: Communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$). Kruskal-Wallis test ($N = 780$, $p < 0.001$), number of all species $H = 74.52$; of *Quercetea robori-petraeae* $H = 358.46$; of *Querco-Fagetea** $H = 46.26$; of *Vaccinio-Piceetea** $H = 5.65$ ($p = 0.13$ n.s.). * tree species not taken into account. For other explanations, see Fig. 17

The significant decrease in the contribution of diagnostic species of the class *Quercetea robori-petraeae* in successive stages of degeneration is not clearly related to other floristic features (Fig. 27). Untransformed patches of *Calamagrostio-Quercetum* are characterized by a significantly higher number of species, including those of the class *Querco-Fagetea*, which partly overlap with ancient forest plant species (AFS). However, values of those parameters did not differ between successive stages of degeneration. The number of species of the class *Vaccinio-Piceetea* is stable.

Untransformed, well-defined patches of *Calamagrostio-Quercetum* are represented in this study by 304 relevés. Its degenerated forms are also well documented (476 relevés: 291 in stage I, 110 in stage II, and 75 in stage III of degeneration). Before the present study, little attention was paid to its degenerated forms. This issue has been discussed so far only on the basis of 79 relevés.

The habitat variation of *Calamagrostio-Quercetum* is reflected in the PCA ordination diagrams both for its untransformed patches (Fig. 28), and for stages I (Fig. 29), II, and III of degeneration. Results of the last 2 analyses are not shown. The relevés classified as untransformed communities form 2 clusters (Fig. 28a), unambiguously characterized floristically by the distribution of differential species of its subassociations in the ordination space (Fig. 28b). One cluster comprises 96% of relevés of *Ca-Q molinietosum*, while the other one, 91% of patches of *Ca-Q polygonatetosum*. Relevés of the typical subassociation are located mostly in the central part of the diagram, and are found in both the clusters. In the diagram for relevés representing this association in stage I of degeneration, the cluster of *Ca-Q polygonatetosum* is not so well-defined, and includes 79% of its relevés (Fig. 29).

Phytocoenoses of the above-mentioned subassociations of *Calamagrostio-Quercetum* can develop in 2 trophic variants: typical and with *Anemone nemorosa*. A synthetic picture of their species composition is presented for untransformed communities and for stage I of degeneration (Tables 8 and 9). This community in

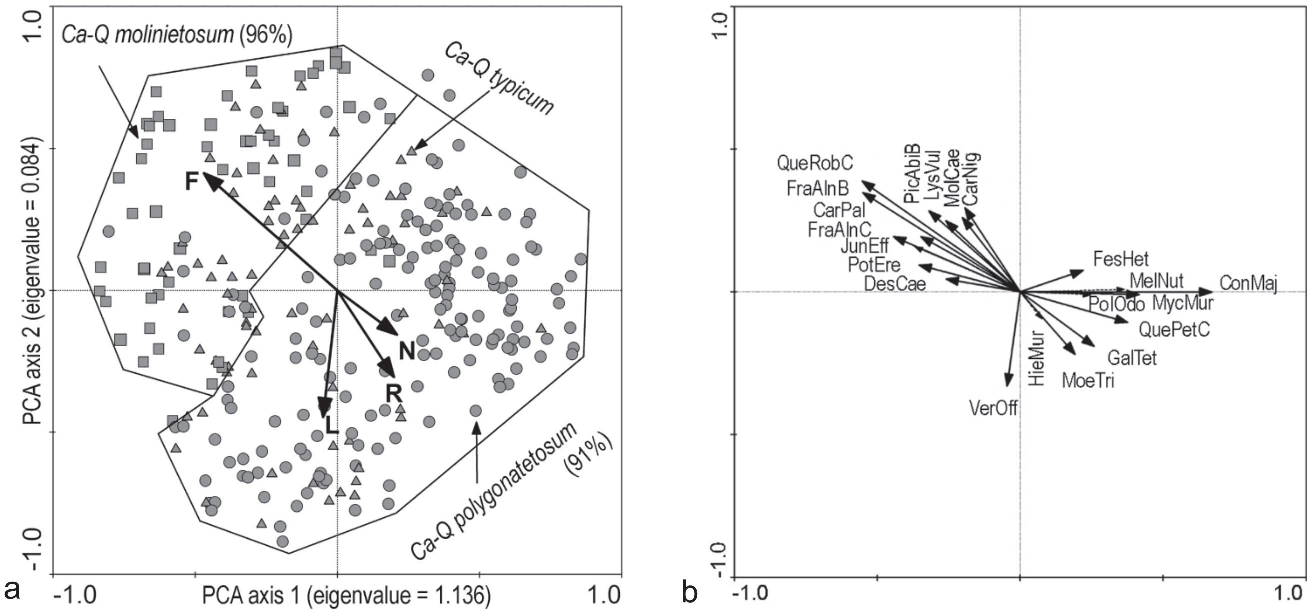


Fig. 28. PCA ordination of untransformed plots of subassociations of *Calamagrostio arundinaceae-Quercetum* (*Ca-Q*)

a) Distribution of 304 relevés classified according to the classical phytosociological method, and passive projection (arrows) of mean Ellenberg indicator values: F – soil moisture, L – light, N – soil productivity, R – soil reaction

b) Distribution of differential species of *Ca-Q molinietosum* and *Ca-Q polygonatetosum* (see Table 8)

stages II and III of degeneration is documented only in the form of the analytic Tables A6, A7, A12, A17, and A18.

Calamagrostio arundinaceae-Quercetum petraeae molinietosum Brzeg *et al.* 1989 *ex* Lisiewska *et* Reszel 2000

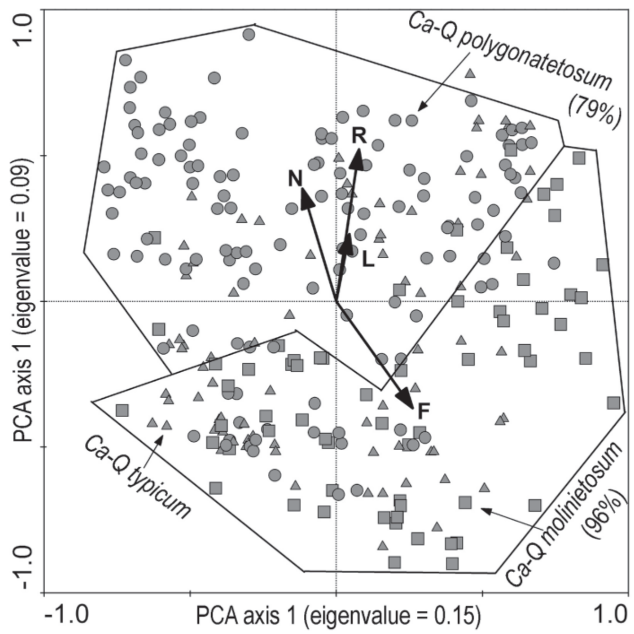


Fig. 29. PCA ordination of plots of *Calamagrostio arundinaceae-Quercetum* in stage I of degeneration

Explanations: Distribution of 291 relevés classified according to the classical phytosociological method, and passive projection (arrows) of mean Ellenberg indicator values: F – soil moisture, L – light, N – soil productivity, R – soil reaction

In this study, 182 relevés have been classified as this subassociation. Most of them (66%) represent untransformed form (56) or stage I of degeneration (64). Out of the 50 relevés documenting the *Ca-Q molinietosum* according to Brzeg *et al.* (2001) and Brzeg & Kasprowicz (2001), in the present study 24 relevés have been classified as untransformed patches of the subassociation. Another 24 relevés of this pool have been assigned to stage I (19 relevés) or stage II of degeneration (5 relevés).

The distribution of 20 localities of untransformed *Ca-Q molinietosum* is presented in Fig. 30. According to the geobotanical regionalization of J.M. Matuszkiewicz (2008a; see also Fig. 4b in the present study), most of them (65%) are located in the South Wielkopolska Subregion, particularly within the Krotoszyn Plateau, which is part of the Kalisz Plateau. Localities of the subassociation in stages I (Fig. 31), II (Fig. 32), and III of degeneration (Fig. 33) have similar distribution patterns.

The canopy of *Ca-Q molinietosum* was composed of 1-2 layers (Figs. 34-35). In individual relevés, 1-7 tree species were found in the canopy (mean 3). Irrespective of the degree of degeneration, the mean coverage of the tree layer slightly exceeded 60% if the canopy was not subdivided. If the canopy was 2-layered, the mean coverage of the upper tree layer (a1) did not exceed 60%, while that of the lower tree layer a2) was usually about 30%. The canopy was dominated by *Quercus robur*, or rarely by *Quercus petraea* or *Pinus sylvestris*. The contribution of *Pinus* was higher in forest stands

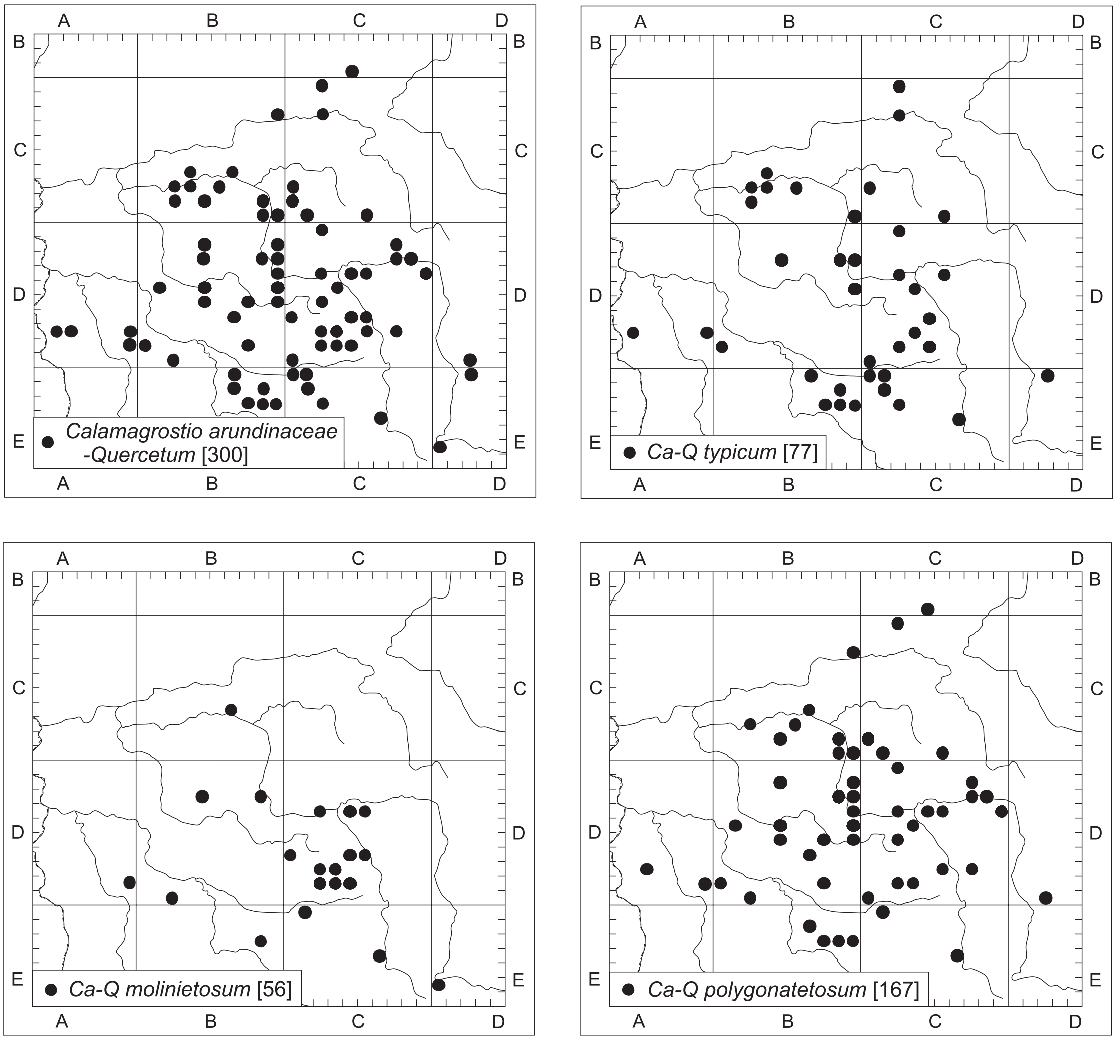


Fig. 30. Distribution of localities of untransformed patches of *Calamagrostio arundinaceae-Quercetum*
Explanations: Number of relevés given in brackets. The localization of 4 relevés was impossible (2 of *Ca-Q typicum* and 2 of *Ca-Q polygonatetosum*)

of the typical variant and in more degenerated forms of the subassociation (Table 7, see also Tables A3-A7). The lower tree layer was composed mostly of *Quercus robur*, *Carpinus betulus*, and *Picea abies*.

The shrub layer (b) was present in most of the relevés, and its mean coverage reached about 20%, mainly thanks to *Frangula alnus*. In patches representing stage III of degeneration, *Carpinus betulus* and *Picea abies* were more frequent.

The herb layer (c) generally had a high coverage (mean 70% under a single tree layer or 60% if the canopy was 2-layered). In individual relevés, herbaceous species covered 10-100% of plot area. The extreme values were recorded chiefly in its degenerated forms. Several species formed facies (most often *Vaccinium myrtillus* or *Holcus mollis,* less often *Calamagrostis arundinacea* or *Pteridium aquilinum*, and rarely *Convallaria majalis*, *Festuca ovina*, *F. rubra*, *Luzula pilosa*, *Maianthemum bifolium* or *Melampyrum pratense*). Only in transformed phytocoenoses, facies were formed by *Calamagrostis epigejos* and *Deschampsia flexuosa* (Tables A5 and A7).

Bryophytes were recorded in most relevés. The mean cover of the moss layer did not exceed 20%. The most frequent species of this layer was *Polytrichastrum formosum*.

In the table of untransformed patches of *Ca-Q molinietosum*, 216 plant species are found (Table A3), and individual relevés contain 20-53 species (mean 35). The relevés classified as stage I of degeneration (Tables A4 and A5) include jointly 225 species (in individual relevés 12-60, mean 30). The *Ca-Q molinietosum* in stages II (Table A6) and III of degeneration (Table A7) are much poorer in species. Their tables comprise 167 species (in individual relevés 14-48, mean 26) and 104 species (11-34, mean 22), respectively. It is noteworthy that the compared units differ also in the number of relevés: 56, 64, 47, and 15, respectively.

The *Ca-Q molinietosum* is well-defined floristically, also among the more degenerated forms (Table 7). A list of differential species of the subassociation, proposed by Brzeg *et al.* (2001), must be supplemented with *Quercus robur* and *Picea abies*. Other diagnostic species

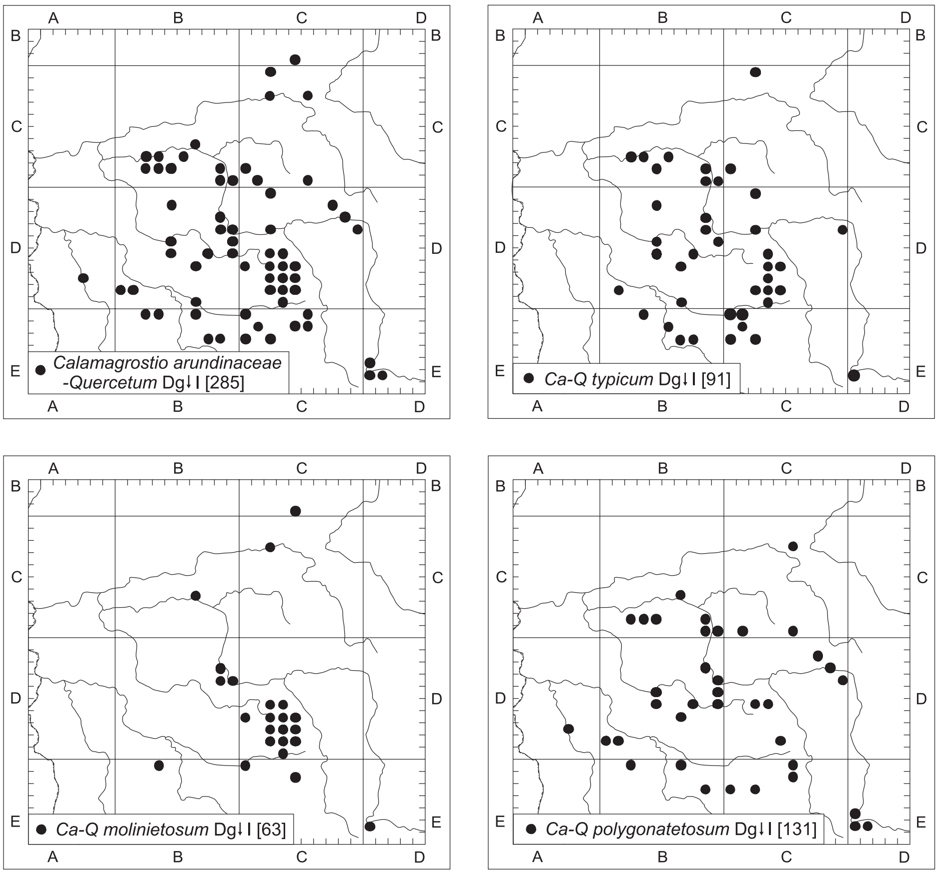


Fig. 31. Distribution of localities of *Calamagrostio arundinaceae-Quercetum* in stage I of degeneration
Explanations: Number of relevés given in brackets. The localization of 6 relevés was impossible (1 of *Ca-Q molinietosum* and 5 of *Ca-Q polygonatetosum*)

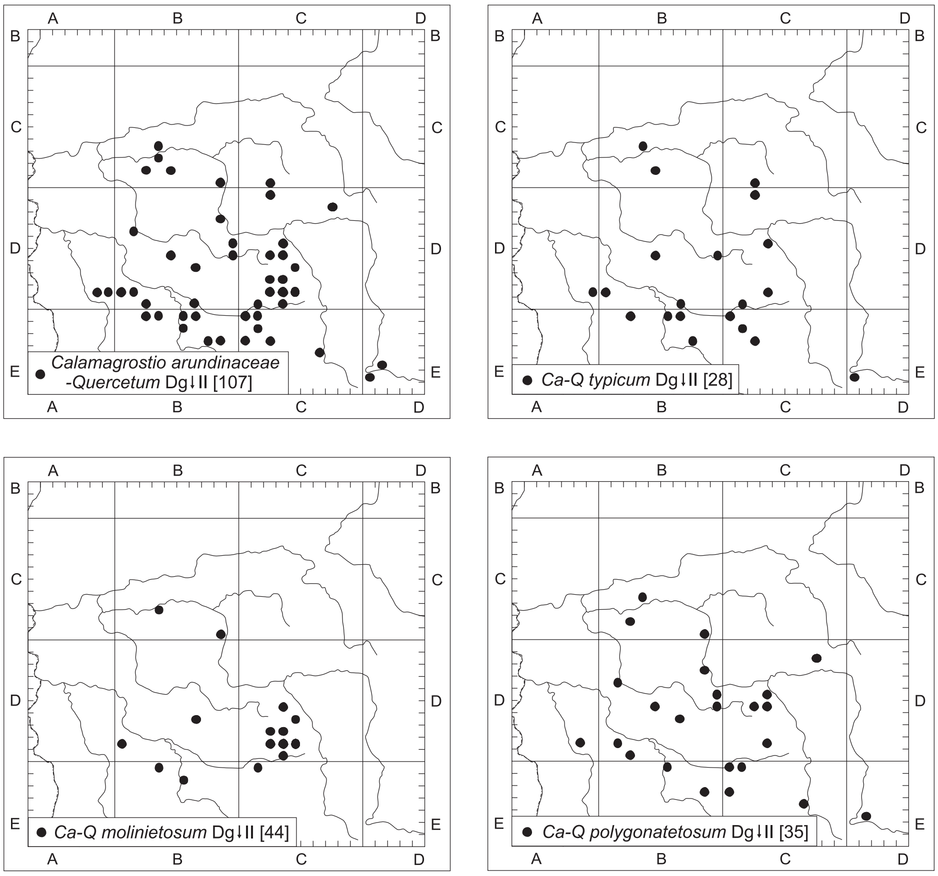


Fig. 32. Distribution of localities of *Calamagrostio arundinaceae-Quercetum* in stage II of degeneration
Explanations: Number of relevés given in brackets. The localization of 3 relevés of *Ca-Q molinietosum* was impossible

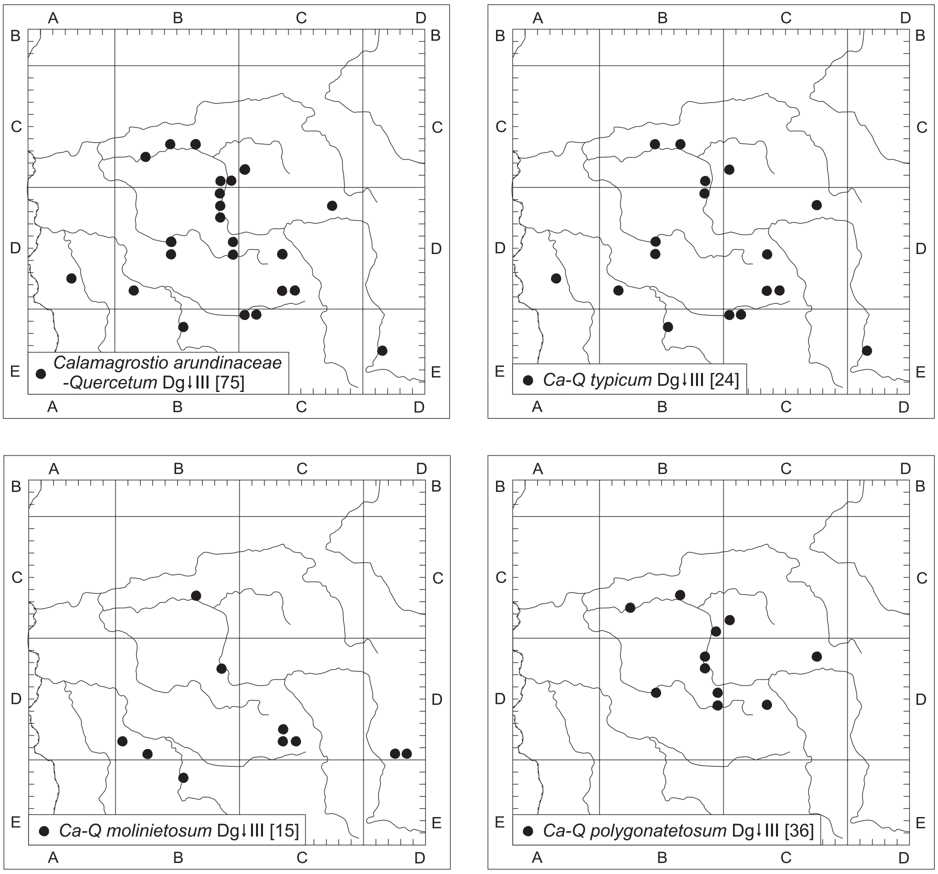


Fig. 33. Distribution of localities of *Calamagrostio arundinaceae-Quercetum* in stage III of degeneration (number of relevés given in brackets)

of the subassociation *Ca-Q molinietosum* are still valuable. These include *Carex nigra*, *C. pallescens*, *Deschampsia caespitosa*, *Frangula alnus*, *Juncus effusus*, *Lysimachia vulgaris*, *Molinia caerulea*, *Potentilla erecta* and *Trientalis aeuropaea*. The above-mentioned tree species, as well as *Frangula alnus* and *Carex nigra*, lose their diagnostic value in more degenerated forms of *Calamagrostio arundinaceae-Quercetum* (Table 7).

This subassociation, as mentioned above, is clearly subdivided into 2 trophic variants: typical and with *Anemone nemorosa* (Tables 8 and 9, as well as Tables A3-A7). Within those units, individual relevés include a similar number of species. However, patches of the typical variant are poorer in species than patches of the variant with *Anemone nemorosa* (Figs. 36-37). The typical variant of *Ca-Q molinietosum* does not have any diagnostic species, while the variant with *Anemone nemorosa* has many differential species (e.g. *Anemone nemorosa*, *Poa nemoralis*, *Viola reichenbachiana*, and *Oxalis acetosella*), with a high contribution of plants of the class *Querco-Fagetea*. In the compilations of Brzeg *et al.* (2001) as well as Brzeg and Kasprowicz (2001), also *Carpinus betulus* had a high diagnostic value. It must be emphasized that in the cited publications the typical variant of *Ca-Q molinietosum* was represented by only 5 relevés, while 45 relevés documented the variant with *Anemone nemorosa*. Their documentation presented here is much richer: 77 and 105 relevés, respectively. These include relatively high numbers of untransformed patches (14 and 42 relevés, Table 8) and those classified as stage I of its degeneration (26 and 38 relevés, Table 9). In the relevés classified as stage III of degeneration, the differentiation at the level of variants is poorly defined (Table A7).

Calamagrostio arundinaceae-Quercetum petraeae typicum Großer 1964

In the present study, 222 relevés have been assigned to this subassociation (Table 7, col. 2, 5, 8, 11). This is several-fold more than the number of its relevés (32) presented earlier by Brzeg *et al.* (2001) or Brzeg and Kasprowicz (2001). A vast majority (77%) of the relevés represent untransformed form (79, including 19 relevés from the table of Brzeg *et al.* 2001) or slightly transformed ones (91, including 10 from the table of Brzeg *et al.* 2001). The distribution pattern of localities of *Ca-Q typicum* (Fig. 30) does not deviate from the above-mentioned distribution range of the association in the study area. Untransformed phytocoenoses were recorded in 37 basic ATPOL squares. A similar number (39) of localities was recorded for the subassociation in stage I of degeneration (Fig. 31).

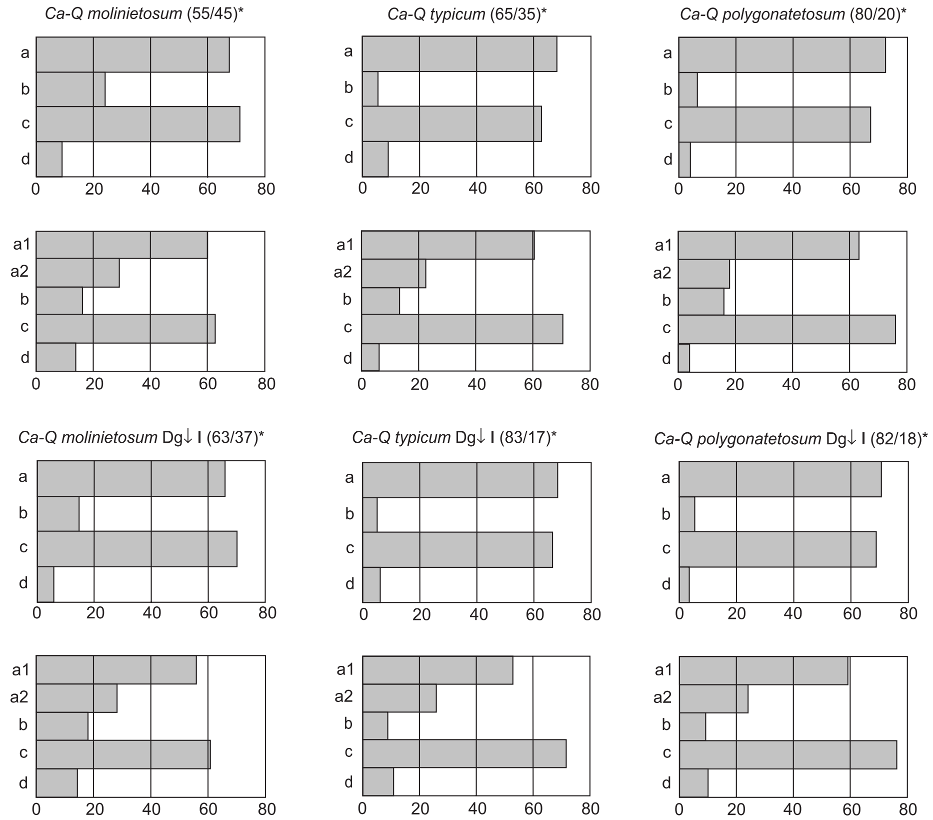


Fig. 34. Scheme of the vertical structure of subassociations of *Calamagrostio arundinaceae-Quercetum* – untransformed and in stage I of degeneration

Explanations: One and two-layered tree-stands are shown on separate diagrams; bars denote the percent cover of vegetation layers; * percent contributions of relevés with one/two-layered canopy

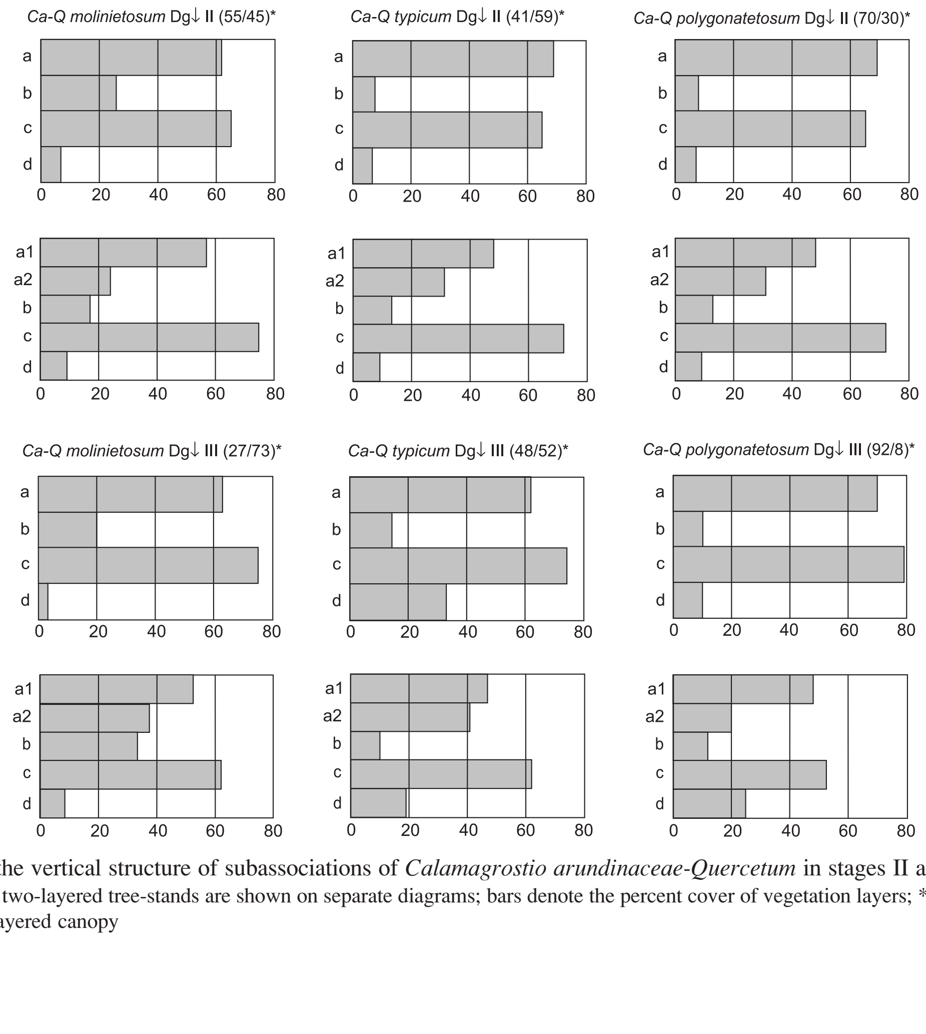


Fig. 35. Scheme of the vertical structure of subassociations of *Calamagrostio arundinaceae-Quercetum* in stages II and III of degeneration

Explanations. One and two-layered tree-stands are shown on separate diagrams; bars denote the percent cover of vegetation layers; * percent contributions of relevés with one/two-layered canopy

Forest stands of untransformed form of *Ca-Q typicum* usually had only one tree layer (65% of relevés). In stage I of degeneration, the contribution of relevés with only one tree layer was even higher (83%), while in stages II and III, the canopy was usually 2-layered (Fig. 35). These forests had a very small number of species in the canopy. In most of the relevés (66% of untransformed form and 80% of those in stage I of degeneration), the canopy was composed of up to 2 tree species. Many forest stands were composed of only one species (38% and 45% of relevés, respectively). They were usually dominated by *Quercus petraea* or *Q. robur*. As a rule, *Pinus sylvestris* was only a minor component of untransformed patches, but it was more frequent in relevés of the typical variant (Tables 8 and 9). In degenerated communities, its contribution markedly increased. In stages II and III of degeneration, this species was one of the major components of both variants (Tables A12 and A7). The lower tree layer was dominated by *Carpinus betulus*. Its contribution was higher in the variant with *Anemone nemorosa* than in the typical variant. Its contribution was also higher in more degenerated phytocoenoses.

The shrub layer in many relevés (52%) was absent or scanty. In other relevés, its coverage varied from 5% to 50% (only exceptionally 65%). *Frangula alnus* was most frequent, but it usually covered less than 5% of plot area. In some relevés, *Carpinus betulus* and *Picea abies* were more abundant in this layer.

The herb layer covered 5-100% of the area of the studied relevés. The higher values were recorded more often under a 2-layered canopy. In many patches, facies were formed by *Vaccinium myrtillus* or *Holcus mollis*, while in some others, by *Pteridium aquilinum*, *Calamagrostis arundinacea*, *Festuca ovina*, etc. The moss layer was generally poorly developed or absent in many relevés.

Like the other 2 subassociations, also the typical subassociation of *Calamagrostio-Quercetum*, analysed with respect to its stages of degeneration, varies widely in floristic richness (Table 9). The untransformed forms and those in stage I of degeneration have similar ranges of species number, but clearly differ in the mean number of species per relevé: 26 (range: 12-42) and 19 (range: 7-37), respectively. In tables of stages II and III of degeneration of the subassociation, species number was much smaller. It should be noted, however, that both the tables comprised a markedly smaller number of relevés (Table 7).

The typical variant and the one with *Anemone nemorosa* are distinguished both in untransformed form and in successive stages of degeneration of the subassociation. Constant differential species of the variant with *A. nemorosa* in untransformed patches of *Ca-Q typicum* or in stage I of degeneration include: *A. nemorosa*, *Carpinus betulus*, *Oxalis acetosella*, *Poa nemoralis*, *Veronica chamaedrys*, and *Atrichum undulatum*. The variant with *A. nemorosa* in stage III of degeneration, as in the case of *Ca-Q molinietosum*, is poorly distinguished (Table A7).

Relevés of *Ca-Q typicum* vary in species richness but generally patches of typical variant have a significantly lower number of species, not only in comparison to the variant with *A. nemorosa* within the *Ca-Q typicum*, but also to the other analysed subassociations (Figs. 36 and 37). Phytocoenoses of the typical variant are the poorest in stage I of degeneration (Fig. 37). This is mostly due to the inclusion of many relevés (22 of the 59 compiled in Table A10) of *Calamagrostio-Quercetum* from the Włoszakowice Forest near Leszno (Krotoska 1978). They contained 7-15 species (mean 11). It is noteworthy that Pallas (1966) classified 15 of the 22 relevés as the *Ca-Q scorzoneretosum humilis* (see p. 31 of the present monograph).

Some patches of *Ca-Q typicum* with the canopy dominated by *Pinus* (Table A10, relevés 53-59, and Table A11, relevés 31-32) did not differ considerably from other patches of this subassociation in stage I of degeneration, while in stage III of degeneration (Table A7, relevés 25-31), this community with share of *Pinus* resembles the mixed coniferous forest *Querco roboris-Pinetum*, e.g. because of the increased contribution of *Pleurozium schreberi*.

Calamagrostio arundinaceae-Quercetum patraeae polygonatetosum odorati Passarge in Pallas 1996

In the study area, 376 relevés have been classified as this subassociation (Table 7), of which 169 represent the within untransformed form (Tables A13 and A14) and 136 are communities in stage I of degeneration (Tables A15 and A16). In the untransformed group, relevés identified by their authors as *Calamagrostio-Quercetum*, account for 77%. These include e.g. 8 of 11 relevés of Fabiszewski and Faliński (1967), 34 of 41 relevés of *Ca-Q polygonatetosum* of Brzeg *et al.* (2001), and 17 of 36 relevés of *Ca-Q polygonatetosum* of Hegenbart-Magdans and Brzeg (1999). In the group of phytocoenoses in stage I of degeneration, 65% of relevés were identified by their authors as the above-mentioned association. These include e.g. most of the remaining relevés contained in the tables cited above. The more degenerated forms are represented by less numerous relevés: stage II of degeneration (Table A17) by 35, whereas stage III, by 36 relevés (Table A18).

Localities of the subassociation are quite evenly distributed in the study area. Untransformed patches of the community are documented in 52 (Fig. 30), while those in stage I of degeneration, in 37 ATPOL squares (Fig. 31).

The canopy of *Ca-Q polygonatetosum*, both untransformed and degenerated ones, were in most

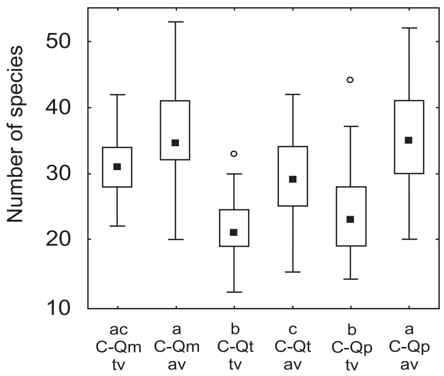


Fig. 36. Variation in number of species in relevés of untransformed patches of variants of subassociations of *Calamagrostio arundinaceae-Quercetum*

Explanations: tv – typical variant, av – variant with *Anemone nemorosa*; communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$); Kruskal-Wallis test ($N = 304$, $p < 0.001$), $H = 139.86$. For other explanations, see Fig. 17

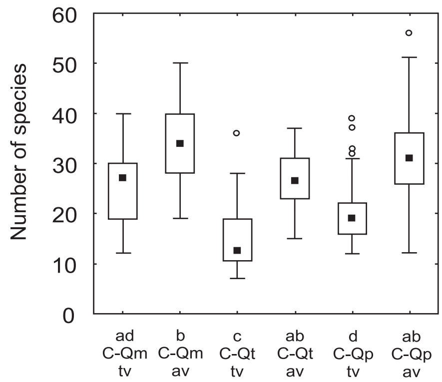


Fig. 37. Variation in number of species in relevés of variants of subassociations of *Calamagrostio arundinaceae-Quercetum* in stage I of degeneration

Explanations: tv – typical variant, av – variant with *Anemone nemorosa*; communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$); Kruskal-Wallis test ($N = 291$, $p < 0.001$), $H = 134.71$. For other explanations, see Fig. 17

relevés (about 80%) one-layered (Figs. 34 and 35). In that group, the canopy was usually composed of up to 2 tree species (81% of untransformed phytocoenoses and 91% of those in stage I of degeneration), and many of only one species (49% and 59%, respectively). The major component of the tree layer was *Quercus petraea*, accompanied by *Q. robur* and *Pinus sylvestris*. In patches of the typical variant, *Pinus sylvestris* was more frequent than *Q. robur*, and its contribution increased with increasing degeneration of the subassociation. In stage III of degeneration, *P. sylvestris* was a dominant species in many relevés (Table A18). The lower tree layer reached a higher coverage (up to 90%) in only few relevés. It was composed mostly of both the native *Quercus* spp., and in some cases also by *Fagus sylvatica*. In Tables A13-A18, the constancy of *Carpinus betulus* was low and this species did not play any major role except for one patch (Table A16, relevé 40).

The shrub layer in many relevés was poorly defined or absent. In other, less numerous patches, its percent cover increased, and one of the major species was *Corylus avellana*. *Frangula alnus* in patches of *Ca-Q polygonatetosum* did not form any facies, in contrast to the *Ca-Q molinietosum*.

The herb layer covered 10-100% (usually 65-75%) of the area of the studied relevés. Like in the typical subassociation (except for the most transformed phytocoenoses) higher values were recorded under a 2-layered canopy (Fig. 34). The *Ca-Q polygonatetosum* was characterized by a relatively high frequency of patches with facies in the herb layer. The facies were most often formed by *Calamagrostis arundinacea*, *Convallaria majalis*, *Vaccinium myrtillus*, *Pteridium aquilinum*, and rarely by *Holcus mollis*, *Festuca ovina*, and *Melampyrum pratense*. Some patches of this subassociation in stage III of degeneration were characterized by a greater contribution of *Calamagrostis epigejos*, *Rubus idaeus*, *Deschampsia flexuosa*, or *Agrostis capillaris* (Table A18).

Bryophytes, although present in most of the studied relevés, rarely formed a well-developed layer. Only in stage III of degeneration, *Pleurozium schreberi* and *Pseudoscleropodium purum* were more abundant (Table A18).

The *Ca-Q polygonatetosum* is rich in species. Tables of untransformed form and of those in stage I of degeneration include similar numbers of species (273 and 271, respectively). The much lower species numbers in tables of the subassociation in stages II and stage III of degeneration (194 and 172, respectively), is mostly due to the much lower numbers of relevés (Table 7). This subassociation is distinguished, from the above subassociations (*Ca-Q molinietosum* and *Ca-Q typicum*), by many species: *Convallaria majalis*, *Hieracium murorum*, *Melica nutans*, *Moehringia trinervia*, *Mycelis muralis*, *Polygonatum odoratum*, and *Veronica officinalis* (see also Brzeg *et al.* 2001; Brzeg & Kasprowicz 2001). Most of them have a high diagnostic value also in degenerated forms of the subassociation (Table 7).

The *Ca-Q polygonatetosum* can be subdivided into 2 variants reported earlier by Brzeg *et al.* (2001, see also Brzeg & Kasprowicz 2001). Their description here is based on much larger numbers of relevés. In the cited articles, the typical variant was represented by 12, while the variant with *Anemone nemorosa*, by 29 relevés, while in Table 8 (untransformed form), these syntaxa comprise 78 and 91, and in Table 9 (community in stage I of degeneration), 73 and 63 relevés, respectively. These variants in their more degenerated forms are documented by smaller numbers of relevés (Tables A17 and A18). Patches of the typical variant were poorer in species than the variant with *Anemone nemorosa*. This was

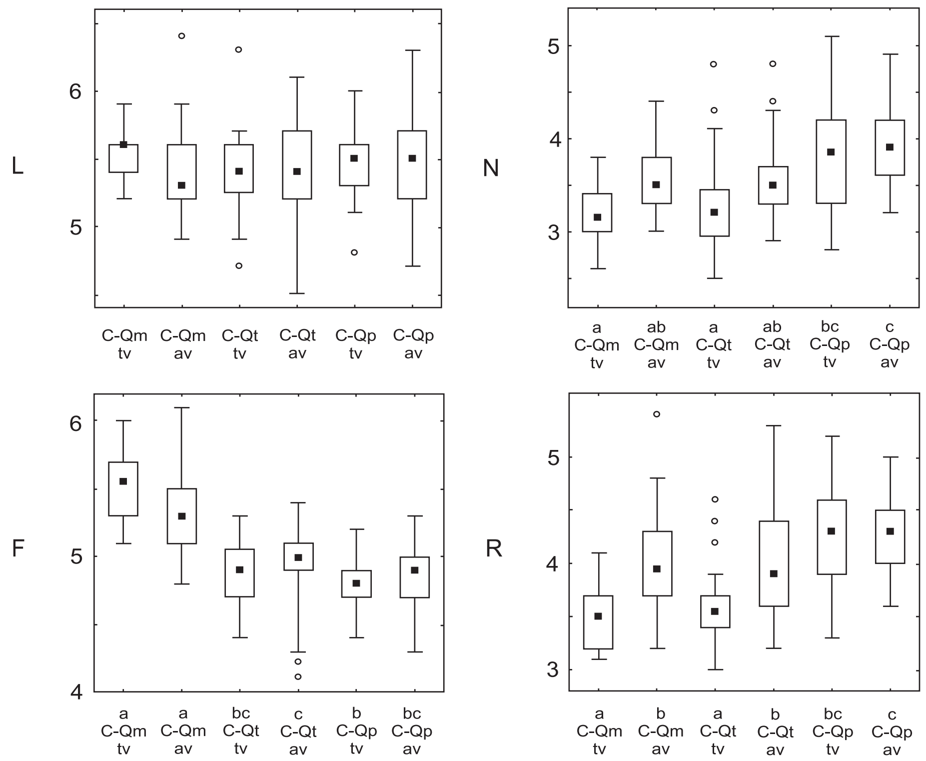


Fig. 38. Ellenberg indicator values for variants of untransformed subassociations of *Calamagrostio arundinaceae-Quercetum*
Explantions: tv – typical variant; av – variant with *Anemone nemorosa*; communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$); Kruskal-Wallis test (N = 304), L – light H = 9.94, p = 0.0770 n.s., F – soil moisture H = 121.51, $p < 0.001$, R – soil productivity H = 70.38, $p < 0.001$, soil reaction H = 88.91, $p < 0.001$. For other explanations, see Fig. 17

observed irrespective of the stage of degeneration of the subassociation (Tables 8 and 9, as well as A17 and A18) (Fig. 36 and 37).

Differential species of *Ca-Q polygonatetosum* in the variant with *Anemone nemorosa* include: *Fragaria vesca*, *Hypericum perforatum*, *Veronica chamaedrys*, *Anemone nemorosa*, *Viola riviniana*, etc. In comparison to the article cited above (Brzeg *et al.* 2001), the variant with *Anemone nemorosa* is better defined floristically here. Out of the 4 differential species listed in the cited publication, only *Anemone nemorosa* has preserved its status. By contrast, *Melica nutans* and *Galeopsis tetrahit* proved to be differential species of the subassociation, while *Malus sylvestris* is too rare.

Analysis of selected site indicators

The habitat variation of the association *Calamagrostio-Quercetum*, determined on the basis of floristic features, is noticeable irrespective of the stage of degeneration of the studied phytocoenoses. This conclusion is additionally confirmed by results of PCA Figs. 28 and 29) and Kruskal-Wallis test (Figs. 38 and 39), taking into account Ellenberg indicator values.

Patches of both variants of *Ca-Q typicum* and *Ca-Q polygonatetosum* were dominated by plants of moderately moist sites (F=5), while patches of *Ca-Q molinietosum* contained significantly more plants typical of slightly more moist soils. The distribution of values of Ellenberg indicators of fertility (N) and soil reaction (R) indicate that sites of this oak forest type were poor (N=3), or – at most – intermediate (N=4) between poor and moderately rich in nutrients, while their pH is highly acidic (R=3) or moderately acidic (R=5). Significantly lowest values of indicators N and R were recorded in patches of the typical variant, within both the *Ca-Q molinietosum* and *Ca-Q typicum.* Light conditions of the forest floor were nearly the same in all relevés of *Calamagrostio-Quercetum*, favourable mostly for half shade plants (L=5).

6.3.4. *Galio sylvatici-Carpinetum* (R. Tx. 1937) Oberd. 1957

Basic documentation

As mentioned above, the present study of acid oak forests includes only some oak-hornbeam forests, i.e. those classified in the literature as their acidophilous forms. In the classification proposed by Krotoska (1966), they include the *Gs-C holcetosum* mollis and *Gs-C calamagrostietosum arundinaceae*. According to W. Matuszkiewicz & A. Matuszkiewicz (1985), both the syntaxa jointly correspond to one subassociation, the *Gs-C polytrichetosum*, which is more broadly defined (see also p. 35 of the present monograph). The oak-hornbeam forest *Gs-C holcetosum* (=*Querco-Carpinetum holcetosum*) is represented here by 112

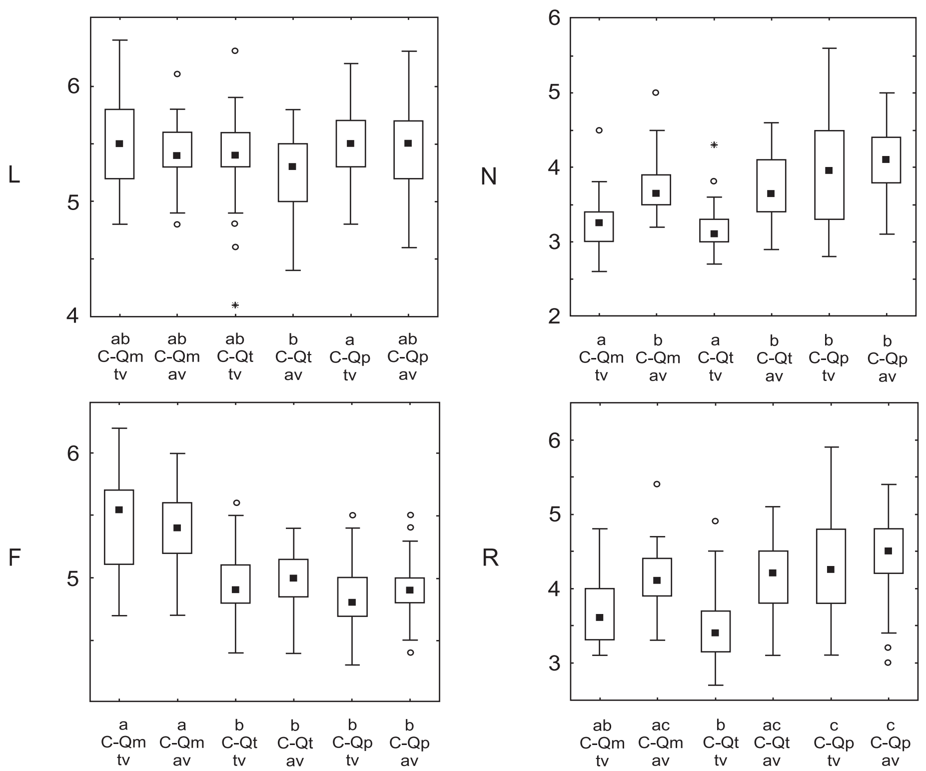


Fig. 39. Ellenberg indicator values for variants of subassociations of *Calamagrostio arundinaceae-Quercetum* in stage I of degeneration
Explanations: communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$); Kruskal-Wallis test ($N = 291$), L – light $H = 11.17$, $p = 0.0482$ n.s., F – soil moisture $H = 89.80$, $p < 0.001$, N – soil productivity $H = 9824$, $p < 0.001$, R – soil reaction $H = 91.81$, $p < 0.001$. For other explanations, see Fig. 17

relevés found in 11 publications. Many of them (52) were extracted from articles by Macicka (1984) or Macicka & Wilczyńska (1990, 1991, 1992), and 22 from Krotoska (1966). The *Gs-C calamagrostietosum* was reported in only 3 publications and documented with 47 relevés: 24 presented by Ferchmin (1966, 1980), and 23 by Boiński (1973). Results of the phytosociological analysis presented below, in many cases did not confirm the original authors' diagnoses, for both the *Gs-C holcetosum mollis* and *Gs-C calamagrostietosum*, at least in relation to their definitions presented here. Out of the initial set of 112 relevés, in the table of *Gs-C holcetosum* (Table 10, col. 1-4), only 84 are left. These include 61 relevés classified here as the variant with *Lysimachia vulgaris* (including 9 of its degenerated form), 11 as the typical variant, and 12 as the variant with *Solidago virgaurea*. The second subassociation, *Gs-C calamagrostietosum,* is represented by only 9 relevés (Table 10, col. 5) out of the initial set of 47 relevés. The other relevés are assigned to other forms of *Galio-Carpinetum*, substitute forest communities, or even to the *Ca-Q molinietosum*. It must be emphasized once again that the present study was not aimed at description of the other subassociations of *Galio-Carpinetum* presented in Table 10 (col. 6 and 7), namely the *Gs-C lathyretosum* and *Gs-C typicum*. That is why their phytosociological documentation is incomplete here, and the tables below include probably only their poorest, fragmentary, and at least partly transformed forms. Thus the present section describes the floristic structure, major diagnostic features and variation of the 2 acidophilous subassociations of Central European oak-hornbeam forest (the *Gs-C holcetosum mollis* and *Gs-C calamagrostietosum arundinaceae*), as well as their transformation by human activity, in comparison with the other units of *Galio-Carpnetum* in the analysed material.

Distribution

Patches of the analysed forms of the association *Gs-C* (Table 10, col. 1, 3-7) are distributed in 37 ATPOL squares (Fig. 40). According to the forest regionalization system (see Fig. 4c), 23 of them are located in the Wielkopolska-Pomeranian Region, 13 in the Silesian Region (Kraina Śląska), and only one in the Mazovia-Polesie Region (Kraina Mazowiecko-Podlaska). Most of them are concentrated in the southern part of the study area, i.e. in the Krotoszyn District, Wrocław District (Dzielnica Wrocławska), and Lower Silesian Plan (Równina Dolnośląska). The first 2 districts belong to a group of several regions where Central European oak-hornbeam forest is most frequent in Poland (Matuszkiewicz J. M. 1996, 2001a). The cited author estimated also that this association covers the largest areas in the districts: Wielkopolska-Kujawy Lowland (Nizina Wielkopolsko-Kujawska) and the Wrocław Lowland

(Nizina Wrocławska). The small number of localities (4) within the Wielkopolska-Kujawy Lowland results from the exclusion of other (i.e. not acidophilous) forms of oak-hornbeam forest in the present study. Krotoska (1966) suggested that the oak-hornbeam forest *Gs-C holcetosum* is associated with the areas affected by the older glaciation. Thus she confirmed the earlier opinion of Preising (1943), who noted also that the subassociation with *Lathyrus vernus* is linked with the areas affected by the last glaciation (after Krotoska 1996). As shown below, the variant with *Lysimachia vulgaris* of the subassociation *Gs-C holcetosum* corresponds to the *Gs-C holcetosum* as defined by Krotoska (1966). Its distribution pattern remains roughly the same, although its documentation has been supplemented with more recent relevés. Most of its 25 localities (80%), according to the geobotanical regionalization of J. M. Matuszkiewicz (1993; see Fig. 4b here), are found in the South Wielkopolska Subregion, mostly in the Kalisz Plateau, Trzebnica Hills (Wzgórza Trzebnickie), and the Barycz Valley (Dolina Baryczy). Krotoska (1966) analysed 41 relevés of *Gs-C holcetosum*, including 13 identified by Krotoska and Piotrowska (1962), as the association *Pino-Quercetum*. Except one relevé, all the others were located in the Kalisz Plateau (corresponding to the Krotoszyn District according to the forest regionalization system). Thus they show a clear relationship with the so-called Krotoszyn Plateau.

The small number of relevés representing subassociations with *Calamagrostis arundinacea* and with *Lathyrus vernus* does not allow a reliable description of their distribution in the study area. However, it is noteworthy that all its localities are found in the northern part of the study area, where the landscape has clearly been shaped by the last glaciation.

Subdivision based on habitat variation and anthropogenic dynamics

A detailed phytosociological analysis revealed that the relevés classified here as the association *Galio*

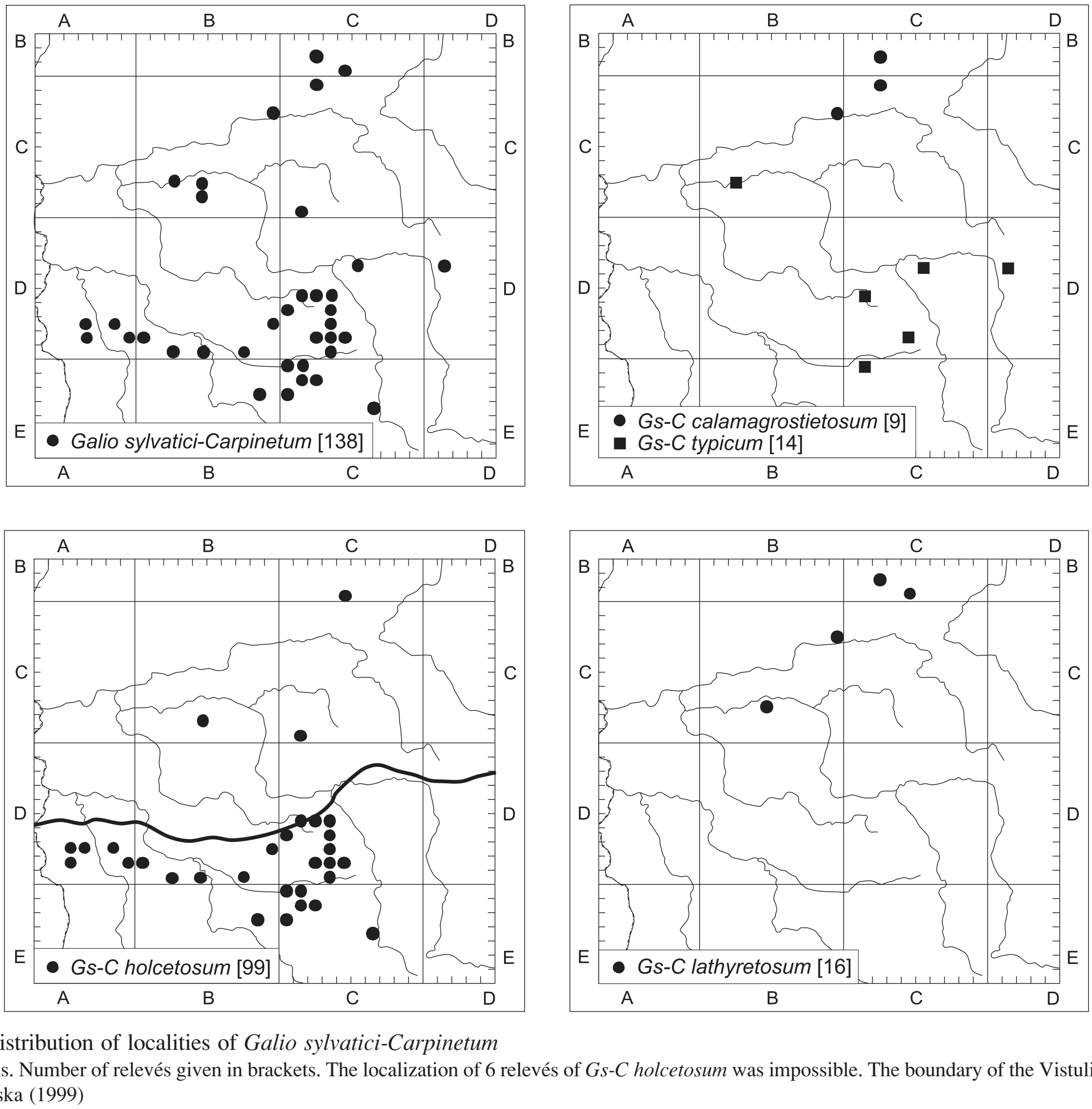


Fig. 40. Distribution of localities of *Galio sylvatici-Carpinetum*
Explanations. Number of relevés given in brackets. The localization of 6 relevés of *Gs-C holcetosum* was impossible. The boundary of the Vistulian glaciation after Gilewska (1999)

sylvatici-Carpinetum represent several subassociations (Table 10). These include:

- *Gs-C holcetosum mollis* Preising 1943 *ex* Krotoska 1966 (col. 1, 2, 3, 4, 8) – as shown above, is well documented in Wielkopolska. The performed analysis showed that it is differentiated into 3 variants: with *Lysimachia vulgaris*, typical, and with *Solidago virgaurea*.
- *Gs-C calamagrostietosum arundinaceae* Preising 1943 *ex* Krotoska 1966 (col. 5) – is very poorly studied; its floristic distinctness was not confirmed by W. Matuszkiewicz and A. Matuszkiewicz (1985). Similarly, it is not taken into account in the monograph of J.M. Matuszkiewicz (2001a).
- *Gs-C lathyretosum verni* Preising 1943 *ex* Krotoska 1966 (col. 6) – thoroughly investigated by Krotoska (1966, 1972). Its distinctness was confirmed by W. Matuszkiewicz & A. Matuszkiewicz (1985).
- *Gs-C typicum* Oberd. 1957 (col. 7) – is exceptionally well documented in Poland. In the synoptic table of W. Matuszkiewicz & A. Matuszkiewicz (1985), the Wielkopolska race of this syntaxon includes 499 relevés. The cited authors assigned to the subassociation, as a variant, also its forms classified by Krotoska (1966), and many other authors, as a separate subassociation: the *Gs-C stachyetosum sylvaticeae sensu auct.* (the proper name: *Gs-C circaeetosum* Oberd. 1957).

Column 9 of that table presents the species composition of a substitute forest community on a potential site of deciduous forest from the class *Querco-Fagetea*. The habitat variation of *Galio sylvatici-Carpinetum*, outlined above, was fully confirmed by the results of PCA analysis of 130 relevés (Fig. 41a). All the relevés of *Gs-C holcetosum mollis* form a well-defined cluster. The second cluster is differentiated into 2 groups, more similar floristically. One of them comprises 78% of relevés of *Gs-C calamagrostietosum*, while the other, 94% of relevés of *Gs-C lathyretosum*. The floristic justification of such an arrangement of the relevés is presented in Fig. 41b. It illustrates the distribution of the species that distinguish the analysed subassociations on the plot of the first two PCA components.

Galio sylvatici-Carpinetum holcetosum mollis Preising 1943 *ex* Krotoska 1966

Nomenclature type: *Galio sylvatici-Carpinetum* (R. Tx. 1937) Oberd. 1957 *holcetosum mollis* Preising 1943 *ex* Krotoska 1966 Tab. 10, rel. 2 (Krotoska 1966) *lectotypus hoc loco*
Synonym: *Galio sylvatici-Carpinetum polytrichetosum* W. Matuszkiewicz, A. Matuszkiewicz 1985 *nom. inval.* (Art. 5) p.p.
D. subass.: *Dicranella heteromalla*, *Frangula alnus*, *Hieracium laevigatum*, *Holcus mollis*, *Hypnum cupressiforme*, *Melampyrum pratense*, *Pohlia nutans*, *Polytrichastrum formosum*, [*Quercus robur* dominant in the group of acidophilous subassociations]

In the present study, 145 relevés have been assigned to this subassociation, and 40 of them describe degenerated form (Table 10, col. 1-4 and 8). Their species composition is presented in Tables A20-A22.

The canopy of untransformed phytocoenoses of the subassociation was usually composed of several tree

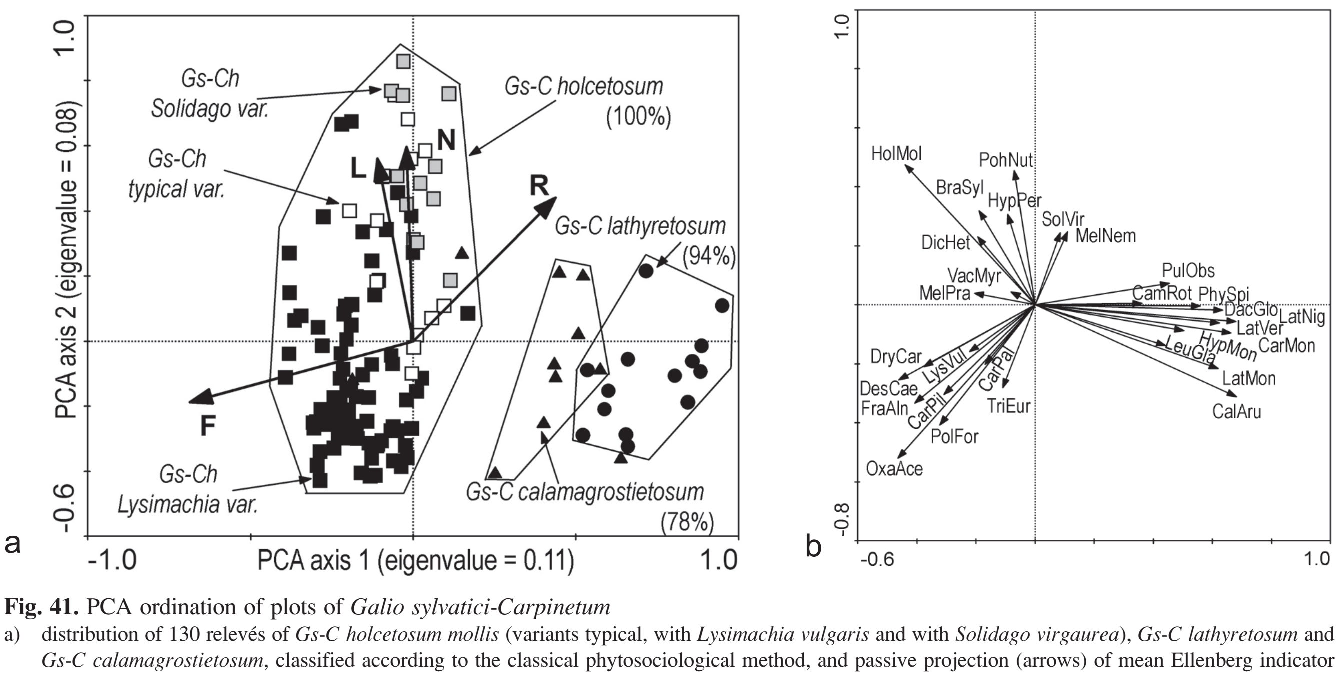


Fig. 41. PCA ordination of plots of *Galio sylvatici-Carpinetum*

a) distribution of 130 relevés of *Gs-C holcetosum mollis* (variants typical, with *Lysimachia vulgaris* and with *Solidago virgaurea*), *Gs-C lathyretosum* and *Gs-C calamagrostietosum*, classified according to the classical phytosociological method, and passive projection (arrows) of mean Ellenberg indicator values: F – soil moisture, L – light, N – soil productivity, R – soil reaction
b) distribution of differential species of the subassociations (see Table 10)

species (mean 3; range 1-6), which most often formed 2 layers (Fig. 42). The upper tree layer (a1) had a mean coverage of 58% (range 15-90%) and was dominated by *Quercus robur*. The contribution of *Q. petraea* was higher in the typical variant and in the variant with *Solidago virgaurea*. The dominant tree species was accompanied by *Betula pendula*, *Fagus sylvatica*, *Pinus sylvestris*, *Picea abies*, and *Tilia cordata*. The lower tree layer (a2) had a mean coverage of 49% (range 5-100%), and its major component was *Carpinus betulus*. It was accompanied by the above-mentioned tree species except *Pinus sylvestris*. Much less often, the canopy was composed of only one layer. Its coverage ranged from 50% to 100% (mean 73%), mainly due to *Quercus robur*, which was accompanied by *Carpinus betulus* (often as a codominant). In some patches of that group, the tree layer included also some minor components: *Pinus sylvestris*, *Betula pendula*, and *Fagus sylvatica*. In degenerated phytocoenoses of *Gs-C holcetosum mollis* (Table A 21, relevés 1-30), the canopy was more often one-layered, and its coverage varied from 55% to 85% (Fig. 42). If the canopy was 2-layered, the coverage of the lower tree layer ranged from 5% to 70% (mean 36%), so it was lower than in untransformed patches. The canopy, irrespective of its structure, was composed mostly of *Quercus robur*, like in untransformed patches. However, the degenerated phytocoenoses were clearly distinguished by smaller contributions of *Carpinus betulus* and *Tilia cordata*, certainly due to human impact. Moreover, in some relevés, the contribution of *Pinus sylvestris* was considerable, and *Quercus rubra* was present in 2 relevés.

The coverage of the shrub layer (b) in both the degenerated and untransformed patches of *Gs-C holcetosum*, ranged from 0% to 75%. In untransformed phytocoenoses, this layer was composed mostly of *Carpinus betulus*, but substantial contributions of *Corylus avellana*, *Tilia cordata*, *Padus avium*, and *Picea abies* were recorded in several relevés. In degenerated patches, contributions of *Carpinus* and *Tilia* were lower.

The percent cover of the herb layer (c) varied widely (from 15% to 100%) but was not dependent on the stage of degeneration. In many relevés (40%), facies were formed mostly by *Stellaria holostea*, *Holcus mollis, Maianthemum bifolium*, *Convallaria majalis*, and *Poa nemoralis*. Facies of the last 2 mentioned species were particularly frequent in the typical variant and in the variant with *Solidago virgaurea*. The degenerated form was distinguished by a higher frequency of facies with *Vaccinium myrtillus*.

The moss layer was very poorly developed in a vast majority of relevés. Only rarely the contribution of bryophytes was higher, reaching up to 50% of the area. Constant components of this layer were *Polytrichastrum formosum* and *Atrichum undulatum*.

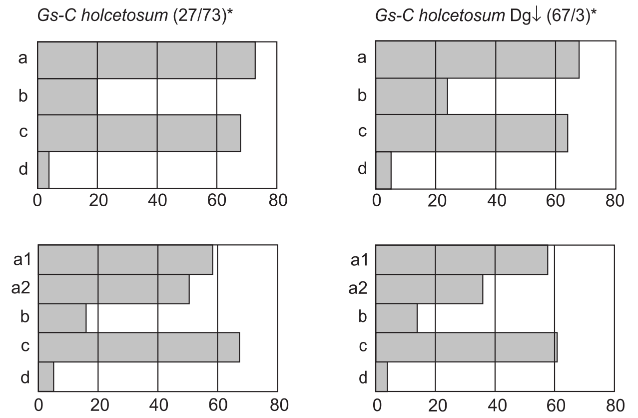


Fig. 42. Scheme of the vertical structure of untransformed *Galio sylvatici-Carpinetum holcetosum mollis* and of its degeneration stages

Explanations. One and two-layered tree-stands are shown on separate diagrams; bars denote the percent cover of vegetation layers; * percent contributions of relevés with one/two-layered canopy

The *Gs-C holcetosum*, in comparison with the other subassociations, is well-defined, distinguished by species of acidic sites (Table 10). Two of them (*Holcus mollis* and *Polytrichastrum formosum*), as well as *Vaccinium myrtillus*, were also differential species of *Gs-C polytrichetosum* in the table of W. Matuszkiewicz and A. Matuszkiewicz (1985), which presented the whole range of habitat variation of *Galio-Carpinetum* in Poland.

Table 10, composed of 105 relevés of this subassociation, includes 256 plant species. In individual relevés, 18-56 plant species were recorded (mean 34). The characteristic species combination of *Gs-C holcetosum* consists of diagnostic species of the association (with low constancy in the table) and of the alliance *Carpinion betuli* (*Carpinus betulus, Stellaria holostea*, etc.), other species of the order *Fagetalia sylvaticeae*, and class *Querco-Fagetea* (*Anemone nemorosa*, *Viola reichenbachiana*, *Atrichum undulatum*, *Poa nemoralis*, etc.), class *Quercetea robori-petraeae* (*Holcus mollis*, *Polytrichastrum formosum*, etc.), class *Vaccinio-Piceetea* (mostly *Vaccinium myrtillus*), and general forest species (*Quercus robur*, *Luzula pilosa*, and *Maianthemum bifolium*.

The subassociation *Gs-C holcetosum mollis* can be subdivided into 3 moisture variants: with *Lysimachia vulgaris* (wet; Table 10, col. 1 and 2), typical (col. 3), and with *Solidago virgaurea* (fresh; col. 4). Most of the species that distinguish the first variant (*Carex pallescens*, *C. pilulifera*, *Deschampsia caespitosa*, *Dryopteris carthusiana* and *Lysimachia vulgaris*) were regarded by Krotoska (1966) as differential species of the subassociation *Gs-C holcetosum mollis*. The typical variant has no diagnostic species. Differential species of the last mentioned variant include: *Brachypodium sylvaticum*, *Hypericum perforatum*, *Melampyrum nemorosum*, and *Solidago virgaurea*, as well as (in common with the *Gs-C calamagrostietosum* and *Gs-C lathyretosum*) *Campanula persicifolia*, *Hieracium sabaudum*, and *Quercus petraea*. The subassociation *Gs-C holcetosum* defined in this way, differs from its original definition by Krotoska (1966). In the classification proposed here, this syntaxon includes not only the phytocoenoses developed, according to the cited author, on specific moist sites with compact soils and surface-water gleying (which correspond to the variant with *Lysimachia vulgaris*), but also the forms of *Galio-Carpinetum* (variants: typical and with *Solidago virgaurea*) occupying less moist and less acidic sites.

The *Gs-C holcetosum* in the variant with *Lysimachia vulgaris* can be further subdivided (Table A20) into 2 subvariants and geographic races. The subvariant with *Pulmonaria obscura* (relevés 1-6) is distinguished by the presence of several species typical of more fertile oak-hornbeam forest sites (*Corylus avellana, Adoxa moschatellina*, *Asarum europaeum*, *Glechoma hederacea*, *Lysimachia nummularia*, and *Plagiomnium affine*). This is the most fertile form of *Gs-C holcetosum*, most similar to the *Gs-C typicum*. It corresponds to, and is represented by the same relevés as the local variant with *Pulmonaria obscura*, distinguished by Krotoska (1966) within the *Gs-C holcetosum*. All the other relevés in Table A20 were classified as the typical subvariant (relevés 6-81). It comprises the other local variants (typical, with *Carex brizoides*, and with *Calamagrostis arundinacea*), distinguished by the cited author. Those syntaxa did not have any clear groups of differential species, so they are not retained in the present study. Some relevés of the variant with *Carex brizoides* are grouped in that table (relevés 77-81), and distinguished as a facies. It is noteworthy that the cited author described also the *Gs-C caricetosum brizoidis*. That subassociation, as defined by Krotoska (1966, 1972) belongs to the group of moist and fertile oak-hornbeam forests, where it forms a poorer subgroup.

Several relevés of the variant with *Lysimachia vulgaris* within the subassociation *Gs-C holcetosum* (Table A20, relevés 70-76) represent the south-eastern race of this syntaxon, distinguished already by Krotoska (1966). The cited author emphasized that this form of oak-hornbeam forest is loosely linked with the regional association *Galio-Carpinetum*. The constant participation of *Cruciata glabra*, one of differential species of subcontinental oak-hornbeam forest *Tilio-Carpinetum*, indicates that this form is related to it.

All the relevés of impoverished *Gs-C holcetosum* have been classified here as the variant with *Lysimachia vulgaris* (Table 10, col. 2; Table A21). In original authors' diagnoses, they were usually included in tables of *Galio-Carpinetum* (12 relevés) or *Pino-Quercetum* (8 relevés). They are distinguished by a much smaller contribution of *Carpinus betulus* to the tree layer, and, at most, a very small admixture of other diagnostic species of *Gs-C* and of the alliance *Carpinion betuli*. Moreover, some relevés are characterized by a low number (3-4) of species of the class *Querco-Fagetea*. According to the criteria proposed by Faliński (1966), they must be diagnosed as the Central European oak-hornbeam forest *Galio sylvatici-Carpinetum holcetosum* in stages II or III of degeneration. Apart from the markedly lower contribution of *Carpinus*, human impact is reflected also in a considerable admixture of *Pinus sylvestris* or *Quercus rubra* in the tree layer.

A specific form of degeneration of *Galio sylvatici-Carpinetum*, provisionally identified as the community *Oxalis acetosella-Pinus sylvestris*, is documented in col. 8 of Tables 10 and A21 (relevés 31-40). The canopy was 2-layered, dominated by *Pinus* and *Carpinus* (or *Quercus*). The shrub layer was usually absent. The herb layer reached a high coverage and was dominated by *Oxalis acetosella*. Bryophytes were usually absent. Most of the relevés of this type of oak-hornbeam forest were poor in species (17-28 species, only exceptionally up to 47). Its species composition is distinguished by a lower contribution of species of the class *Querco-Fagetea*, but first of all, by a lack of diagnostic species of both the association *Galio sylvatici-Carpinetum* and the alliance *Carpinion betuli*, except for *Carpinus betulus*. Thus the classification of the community *Oxalis acetosella-Pinus sylvestris* as *Galio sylvatici-Carpinetum* is doubtful. However, bearing in mind the constant participation of *Carpinus* and several species of the order *Fagetalia sylvaticae* and of the class *Querco-Fagetea*, as well as the lack of species locally characteristic of the association *Calamagrostio-Quercetum*, it is assumed here that this community is a degeneration/regeneration form of the subassociation *Gs-C holcetosum mollis* in the variant with *Lysimachia vulgaris*. Among the differential species of the subassociation, only *Holcus mollis* shows a high constancy.

Galio sylvatici-Carpinetum calamagrostietosum arundinaceae Preising 1943 *ex* Traczyk 1962

Nomenclature type (protologue): *Galio-Carpinetum calamagrostietosum* (Preising 1943), tab. synopt. I, col. 35 (Traczyk 1962b)

Nomenclature type: *Galio* (*silvatici*)-*Carpinetum calamagrostietosum* (Oberd. 1957), tab. 31, rel. 15 (Boiński 1973) *neotypus hoc loco*

Synonym: *Galio sylvatici-Carpinetum polytrichetosum* W. Matuszkiewicz, A. Matuszkiewicz 1985 *nom. inval.* (Art. 5) *p.max.p.*

D. subass.: *Campanula rotundifolia*, *Festuca ovina* (?), *Leucobryum glaucum*, *Polygonatum odoratum*

D. subass. in relation to *Gs-C holcetosum mollis*: *Astragalus glycyphyllos*, *Calamagrostis arundinacea*, *Campanula persicifilia*, *Carex digitata*, *Hepatica nobilis*, *Lathyrus montanus*, *Lilium martagon*, *Viola riviniana*, *Quercus petraea* and others in common with the *Gs-C. lathyretosum verni*.

This subassociation is represented in the present study by only 9 relevés (Table 10, col. 5; Table A23, relevés 1-9). All of them were originally reported by Boiński (1973), who diagnosed most of them as the *Gs-C calamagrostietosum arundinaceae* (in the typical variant or with *Fagus sylvatica*).

The canopy of *Gs-C calamagrostietosum* was composed of 1-2 layers. The upper layer consisted of *Quercus petraea* and/or *Q. robur*. The dominant species of the lower tree layer was *Carpinus betulus*. Minor species in both tree layers were *Fagus sylvatica* and rarely *Tilia cordata*. The shrub layer was relatively well-developed. It was composed mostly of *Carpinus*, *Fagus*, and *Quercus petraea*. The herb layer was dominated by one of the following species: *Calamagrostis arundinacea* (sometimes accompanied by *Convallaria majalis* or *Athyrium filix-femina* as co-dominants), or *Poa nemoralis* and *Oxalis acetosella*. A well-developed moss layer was present in only few relevés. The most frequent moss species was *Polytrichastrum formosum*.

In individual relevés of this subassociation, 26-46 species were recorded (Fig. 43). The characteristic species combination of *Gs-C calamagrostietosum* includes diagnostic species of the association and of the alliance *Carpinion* (*Carpinus betulus*, *Galium sylvaticum*, *Festuca heterophylla* and *Stellaria holostea*), but also the relatively frequent other species of the classes *Querco-Fagetea* (*Carex digitata*, *Melica nutans*, *Galeobdolon luteum*, *Poa nemoralis,* etc.) and *Quercetea robori-petraeae* (*Calamagrostis arundinacea*, *Hieracium sabaudum*, *H. lachenalii*, *Lathyrus montanus*), the less frequent plants of mixed coniferous forests from the class *Vaccinio-Piceetea* (mainly *Vaccinium* my*rtillus*), and finally forest species with a wider ecological scale (*Convallaria majalis*, *Majanthemum bifolium*, *Mycelis muralis*, etc.).

Differential species of *Gs-C calamagrostietosum* are: *Campanula rotundifolia*, *Leucobryum glaucum*, *Polygonatum odoratum*, *Trientalis europaea*, and *Vaccinium myrtillus* (Table 10, col. 5). The diagnostic value of the last 2 mentioned species is confirmed only regionally. Boiński (1973: 63) indicated the following differential species of the subassociation: *Quercus petraea*, *Sorbus aucuparia, Calamagrostis arundinacea*, *Vaccinium myrtillus*, *Pteridium aquilinum*, *Solidago virgaurea*, *Hieracium lachenalii*, *Polytrichastrum formosum*, *Pleurozium schreberi* and *Leucobryum glaucum*. He emphasized that they are "nearly exclusively characteristic species of the classes *Quercetea robori-petraeae* and *Vaccinio-Piceetea*."

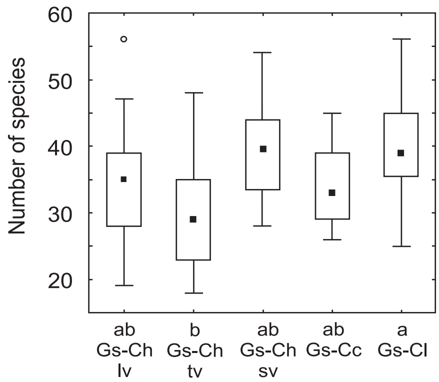


Fig. 43. Variation in number of species in relevés of subassociations and variants of *Galio sylvatici-Carpinetum*
Explanations: Communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$). Kruskal-Wallis test ($N = 130$), $H = 11.98$, $p = 0.0175$. GCh – *Galio sylvatici-Carpinetum holcetosum,* lv – variant with *Lysimachia vulgaris*, tv – typical variant, sv – variant with *Solidago virgaurea*; GCc – *Gs-C calamagrostietosum arundinaceae*; GCl – *Gs-C lathyretosum verni*. For other explanations, see Fig. 17

The *Gs-C calamagrostietosum* is synonymous with the *Querco-Carpinetum warto-vistulense calamagrostietosum*, described by Preising (1943) from Wielkopolska (Traczyk 1962b; Krotoska 1966).

Galio sylvatici-Carpinetum lathyretosum verni Preising 1943 *ex* Krotoska 1966

Most of the 16 relevés assigned here to this subassociation (Table 10, col. 6; Table A23, relevés 10-25) were initially diagnosed by Boiński (1973) as the *Galio sylvatici-Carpinetum calamagrostietosum*.

The canopy of *Gs-C lathyretosum* was usually 2-layered. The upper layer was dominated by *Quercus petraea* (with admixture of *Q. robur*, *Fagus sylvatica*, or *Tilia cordata*), while the lower layer, by *Carpinus*. The shrub layer was usually well-developed, composed mostly of the species that formed also the canopy, but with a lower contribution of *Quercus*. Plants of the herb layer in many relevés reached a high coverage. In individual patches, facies were formed by *Calamagrostis arundinacea*, *Convallaria majalis*, *Poa nemoralis*, and *Galium odoratum*. The moss layer was well-developed in only several relevés, and its major components were *Polytrichastrum formosum* and *Atrichum undulatum*.

The relevés documenting the *Gs-C lathyretosum* (Fig. 43) were usually rich in species (25-56). In Tables 10 and A23, this subassociation is distinguished by e.g. the presence of many relatively constant species diagnostic for the *Galio-Carpinetum* and the alliance *Carpinion betuli* (*Carpinus betulus*, *Galium sylvaticum*, *Festuca heterophylla*, *Stellaria holostea*, and *Tilia cordata*). Other well-represented groups are also characteristic species of the order *Fagetalia sylvaticae* and of the class *Querco-Fagetea* (*Carex digitata*, *Galeobdolon luteum*, *Lathyrus niger*, *Melica nutans*, *Poa nemoralis*, *Pulmonaria obscura*, *Viola reichenbachiana* etc.), as well as of the class *Quercetea robori-petraeae* (*Calamagrostis arundinacea*, *Hieracium lachenalii*, *Lathyrus montanus*, etc.). Among the plants with a wider ecological scale, a high constancy in the table was reached by e.g. *Convallaria majalis*, *Dactylis glomerata*, *Maianthemum bifolium*, *Mycelis muralis*, *Sorbus aucuparia*, and *Veronica chamaedrys*. It must be stressed that species of the class *Vaccinio-Piceetea* are infrequent in this subassociation.

Assignment of the relevés described above to the subassociation *Gs-C lathyretosum* is not problematic. In comparison with the other subunits of oak-hornbeam forest compiled in Table 10, this subassociation is characterized by a relatively long list of differential species (Table 10, col. 6). Four of them (*Lathyrus niger*, *L. vernus*, *Phyteuma spicatum*, and *Pulmonaria obscura*) were also classified as differential species of the subassociation by Krotoska (1966) and/or W. Matuszkiewicz & A. Matuszkiewicz (1985). Other species of this rank, indicated by the cited authors, are included in Table 10 in the group of differential species of moderately dry oak-hornbeam forests (*Calamagrostis arundinacea*, *Campanula persicifolia*, *Carex digitata*, *Festuca heterophylla, Lathyrus montanus*, and *Quercus petraea*). A high constancy in the table was reached by *Galium sylvaticum*. As emphasized by both Traczyk (1962a) and Krotoska (1966), this species reaches its phytosociological optimum in patches of *Gs-C lathyretosum*. This is consistent with results of an analysis of the synoptic table of W. Matuszkiewicz & A. Matuszkiewicz (1985). This finding is also confirmed in Table 10.

The above description of the subassociation *Gs-C lathyretosum* is not typical for this syntaxon. In comparison with the synoptic table of W. Matuszkiewicz & A. Matuszkiewicz (1985), which presents e.g. the species composition of the Wielkopolska race of the subassociation, the contribution of acidophilous species is increased here (e.g. *Calamagrostis arundinacea*, *Hieracium lachenalii*, and *H. sabaudum*). In my opinion, this form of *Gs-C lathyretosum* should be distinguished as a variant with *Calamagrostis arundinacea*. This variant would be the poorest syntaxon within the subassociation. The presence of the above-mentioned species indicates that it is related to the acidophilous oak forest *Ca-Q polygonatetosum*. Because of the presence of xerothermophilous species, it is also somewhat similar to the thermophilous oak forest *Potentillo albae-Quercetum*.

Galio sylvatici-Carpinetum typicum Oberd. 1957

In the present study, 14 relevés have been assigned to this subassociation. Their authors diagnosed them as the *Gs-C holcetosum mollis* (7 relevés), or did not identify them to the level of subassociation. Their common feature is the presence of several acidophilous species. Among them, constant components of the table are *Hieracium sabaudum* and *Vaccinium myrtillus*.

The studied phytocoenoses are characterized by a 2-layered canopy, composed of *Quercus robur* and *Carpinus betulus* (Table A22, relevés 25-38). Such a structure is typical for oak-hornbeam forest. The presence of diagnostic species (most constant in the table: *Carpinus betulus*, *Tilia cordata*, and *Ranunculus auricomus*) indicates that they represent the association *Galio sylvatici-Carpinetum*. The diagnosis at the level of subassociation is justified by the lack or very low contribution of differential species of the known subassociations within the syntaxon (see Table 10). The above-mentioned acidophilous species (*Hieracium sabaudum* and *Vaccinium myrtillus*), as shown in Table 10, are not associated with the *Gs-C holcetosum*. The relatively small number of species in individual relevés and the low constancy in that table of some species of the class *Querco-Fagetea* indicate that this is a impoverished form of the subassociation.

Analysis of selected site indicators

The above description of the habitat variation of *Galio-Carpinetum* is additionally confirmed by results of analyses of Ellenberg indicator values. The PCA ordination diagram (Fig. 41a) indicates that the distribution of relevés along the first ordination axis is related to decreasing moisture (F) and increasing soil reaction (R), while along the second axis, it is related to increasing light (L) and soil fertility values (N). Kruskal-Wallis test brings similar results (Fig. 44). Values of the indicators change only slightly, fitting within the range reflecting moderate soil moisture (F=5), moderate acidity (R=5), and moderate fertility (N=5). Light conditions at the forest floor were favourable for half shade plants (L=5). The most wet and acidic sites are indicated in the patches of *Gs-C holcetosum* in the variant with *Lysimachia vulgaris* (Fig. 44).

Substitute forest communities from the class *Querco-Fagetea*

Column 9 of the synoptic Table 10 (see also Table A24) includes relevés whose simplified and impoverished species composition enables their identification only to the class level. Individual relevés were assigned by their authors to several associations, sometimes as degenerated forms. Most often they were identified as the *Galio-Carpinetum* (13 relevés, including 9 as the *Gs-C holcetosum* and 4 as the *Gs-C calamagrostietosum*), mixed coniferous forest (8 relevés including *Pino-Quercetum* and *Querco-Pinetum*), *Potentillo albae-Quercetum* (7), *Calamagrostio-Quercetum* (6), or as "oak forest from the class *Querco-Fagetea* with *Pinus*" (5).

The canopy in some of the relevés was dominated by *Pinus sylvestris*. In the others, usually pure stands of *Q. petraea* or *Q. robur* prevailed. It is noteworthy that the floristic composition included many species of the order *Fagetalia sylvaticae* and of the class *Querco-Fagetea*, as well as of the class *Quercetea robori-petraeae*. Among species of the class *Vaccinio-Piceetea*, apart from *Pinus sylvestris*, also *Vaccinium myrtillus* and *Pleurozium schreberi* were frequent. They indicated that those communities are related to pine forest stands. Another well-represented group was the class *Artemisietea vulgaris* (Table A24).

The lack or very low contribution of regionally differential species of *Querco-Pinetum* (*Dicranum polystetum*, *Hylocomium splendens*, and *Vaccinium myrtillus*) indicates that this association is not represented in Table 10, not even as strongly degenerated forms. The floristic analysis does not make it possible to confirm or exclude that the relevés describe potential sites of *Galio sylvatici-Carpinetum*, *Potentilo albae-Quercetum* or even *Calamagrostio arundinaceae-Quercetum*.

6.3.5. *Potentillo albae-Quercetum* Libbert 1933 *nom. invers.*

Basic documentation

The habitat variation of thermophilous oak forest *Potentillo albae-Quercetum*, presented in the synoptic Table 11, is documented by 242 relevés. These include degenerated forms (88 relevés) and substitute forest communities occupying potential sites of thermophilous oak forest (56 relevés). The remaining 98 relevés have been classified here as untransformed form of the association (Table 11, col. 1-8, and Tables A25, A27, and A28). Additionally, analytic tables show the separated groups of relevés recorded probably in heterogeneous patches (Table A25, relevés 38-45), and older relevés documenting patches that presumably include also fragments of shrub communities of forest edges (Table A27, relevés 24-36). Those 21 relevés are not taken into account in the above-mentioned synoptic tables. The relevés of untransformed form of *Potentillo-Quercetum* were usually diagnosed (38 relevés) by their authors only to the association level. Another 58 relevés were assigned to several subassociations: the *Pa-Q brachypodietosum* (32), *Pa-Q poëtosum* (10), *Pa-Q typicum* (6), *Pa-Q molinietosum* (8), *Pa-Q lathyretosum* (1), and *Pa-Q astrantietosum* aff. (1). It is noteworthy that only 4 relevés were diagnosed as a variant of the association of thermophilous oak forest, as defined by Brzeg & Kasprowicz (2001).

Degenerated forms of *Potentillo albae-Quercetum* and substitute forest communities on potential sites of the association are documented in the synoptic Table

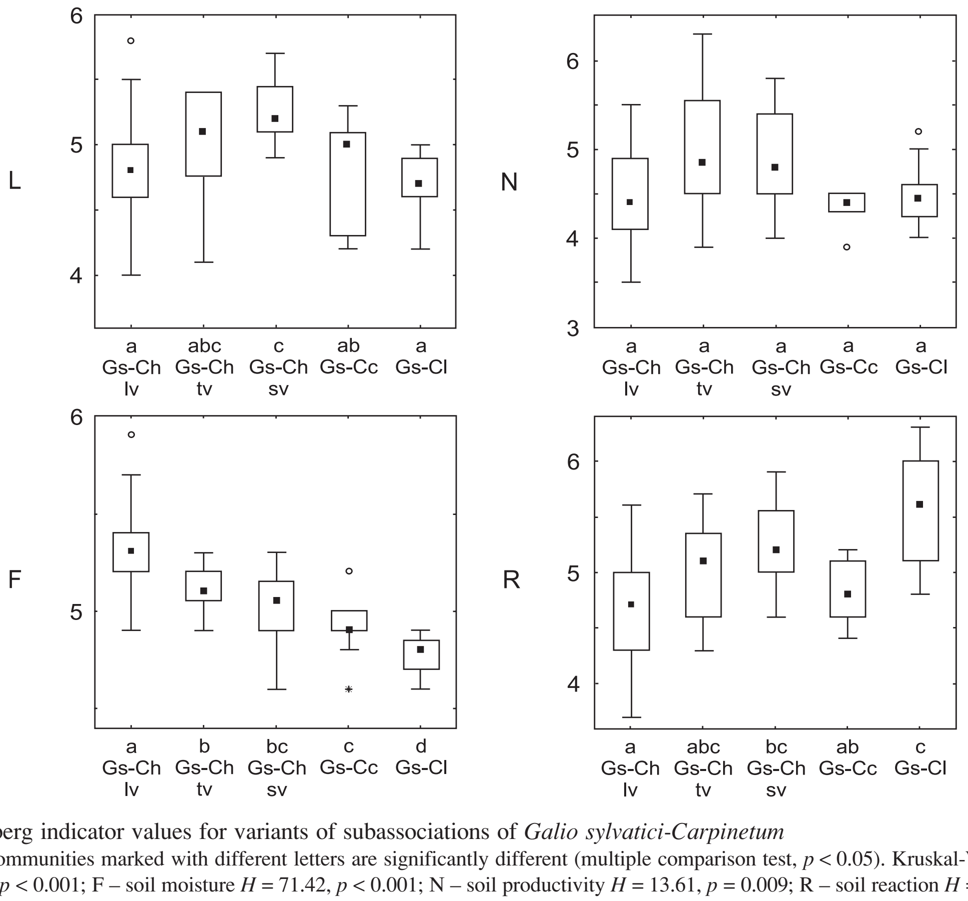


Fig. 44. Ellenberg indicator values for variants of subassociations of *Galio sylvatici-Carpinetum*
Explanations: Communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$). Kruskal-Wallis test ($N = 130$), L – light $H = 23.26$, $p < 0.001$; F – soil moisture $H = 71.42$, $p < 0.001$; N – soil productivity $H = 13.61$, $p = 0.009$; R – soil reaction $H = 37.42$, $p < 0.001$. GCh – *Galio sylvatici-Carpinetum holcetosum,* lv – variant with *Lysimachia vulgaris*, tv – typical variant, sv – variant with *Solidago virgaurea*; GCc – *Gs-C calamagrostietosum arundinaceae*, GCl – *Gs-C lathyretosum*. For other explanations, see Fig. 17

11 (col. 9-11 and 12-14) and in the analytic Tables A26, A29, and A30.

Distribution

Well-developed patches of *Potentillo albae-Quercetum* (98 relevés) are located in 13 basic ATPOL squares (Fig. 45). Most of them (12), according to the geobotanical regionalization of J.M. Matuszkiewicz (2008a), are situated in the Brandenburg-Wielkopolska Division, mostly in the eastern and north-eastern parts of the Noteć-Lubusz Region and in the southern part of the Kujawy Region. This association is less frequent in the eastern part of the Central Wielkopolska Region. One locality is situated in the western part of the South Polish Upland Division (Dział Wyżyn Południowopolskich), more precisely in the Łódź-Wieluń Plateau Region (Kraina Wysoczyzn Łódzko-Wieluńskich).

According to the forest regionalization system (Trampler *et al.* 1990), most of the analysed localities (10) of *Potentillo albae-Quercetum* in the study area are distributed in the Wielkopolska-Pomeranian Region, especially in its subunit, the Wielkopolska-Kujawy Lowland.

Patches of thermophilous oak forest in stage II of degeneration are documented in 23 localities (Fig. 46). Their distribution roughly corresponds to the location of untransformed patches of the association. Much more common are the degenerated forms of *Potentillo albae-Quercetum*, particularly those representing the typical subassociation. They were found in 13 basic ATPOL squares, while untransformed ones, only in 5.

Subdivision based on habitat variation and anthropogenic dynamics

Results of the classical phytosociological analysis show that in the collected database, 261 relevés represent the association *Pa-Q* or its substitute forest communities. It must be emphasized that most of them were similarly identified in the original publications. Results of this study indicate that thermophilous oak forest can develop in the study area as several syntaxa of various ranks, conditioned by natural site variation. At the level of subassociations, these include (Table 11):

- *Potentillo albae-Quercetum astrantietosum* Jakubowska-Gabara 1993 (col. 1),

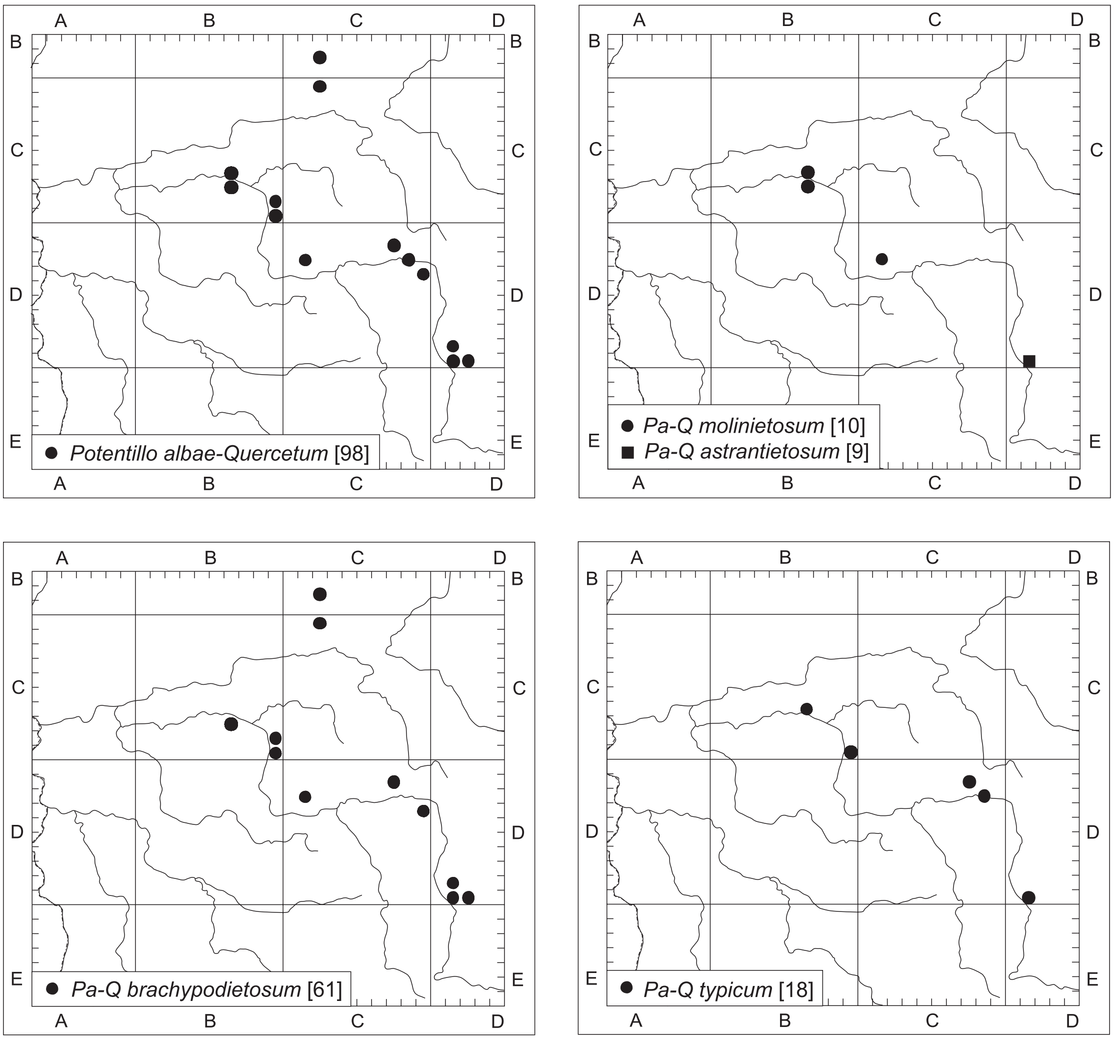


Fig. 45. Distribution of localities of untransformed *Potentillo albae-Quercetum* (number of relevés in brackets)

- *Potentillo albae-Quercetum molinietosum* Brzeg *et* Kasprowicz 2001 *ex* Kasprowicz 2010 *subass. nova* (col. 2, 3, 9),
- *Potentillo albae-Quercetum typicum* Preising 1943 *ex* W. *et* A. Mat. 1956 (col. 4, 5, 10),
- *Potentillo albae-Quercetum brachypodietosum pinnati* M. Wojterska *et* Wiszniewska 1996 *ex* Kasprowicz 2010 *subass. nova* (col. 6-8, 11)

Table 11 comprises also a substitute forest community on a potential site of this association (col. 12-14).

The present analysis of the habitat variation of the association *Potentillo albae-Qurcetum* is based on the concept of Brzeg & Kasprowicz (2001), briefly described already on p. 36 of the present monograph. The cited authors suggested that 3 subassociations should be distinguished. They are conditioned by soil moisture: the *Pa-Q molinietosum* on moist sites, *Pa-Q typicum* on fresh sites, and *Pa-Q brachypodietosum pinnati* on the driest and warmest sites. Within the subassociations, trophic variants were distinguished, reflecting the varied fertility of the soils (with *Asarum europaeum*, typical, and with *Pleurozium schreberi*). The subassociation *Pa-Q astrantietosum,* which was initially regarded as a synonym of *Pa-Q molinietosum* (Wojterska & Wiszniewska 1996; Wojterska *et al.* 2006), is in the present study considered to be a separate unit within moist sites. All the syntaxa except the typical subassociation (which was also variously defined), have been distinguished relatively recently and do not have a sufficient phytosociological documentation, not only in Wielkopolska, but also throughout the distribution range of the association. Presumably, some of the relevés documenting it, represent heterogeneous patches, including various subassociations or variants. In Table A25, relevés 38-45 are distinguished as a separate group, whose species composition includes a mixture of differential species of subassociations found on more moist sites (*Pa-Q astrantietosum* and *Pa-Q molinietosum*), and of the subassociation found on drier soils (*Pa-Q brachypodietosum*).

The picture of variation of *Pa-Q*, based on results of a PCA analysis of 98 well-developed patches of the association (Fig. 47), does not fully reflect its habitat variation presented above. In the PCA ordination diagram, a well-defined unit is the *Pa-Q astrantietosum.*

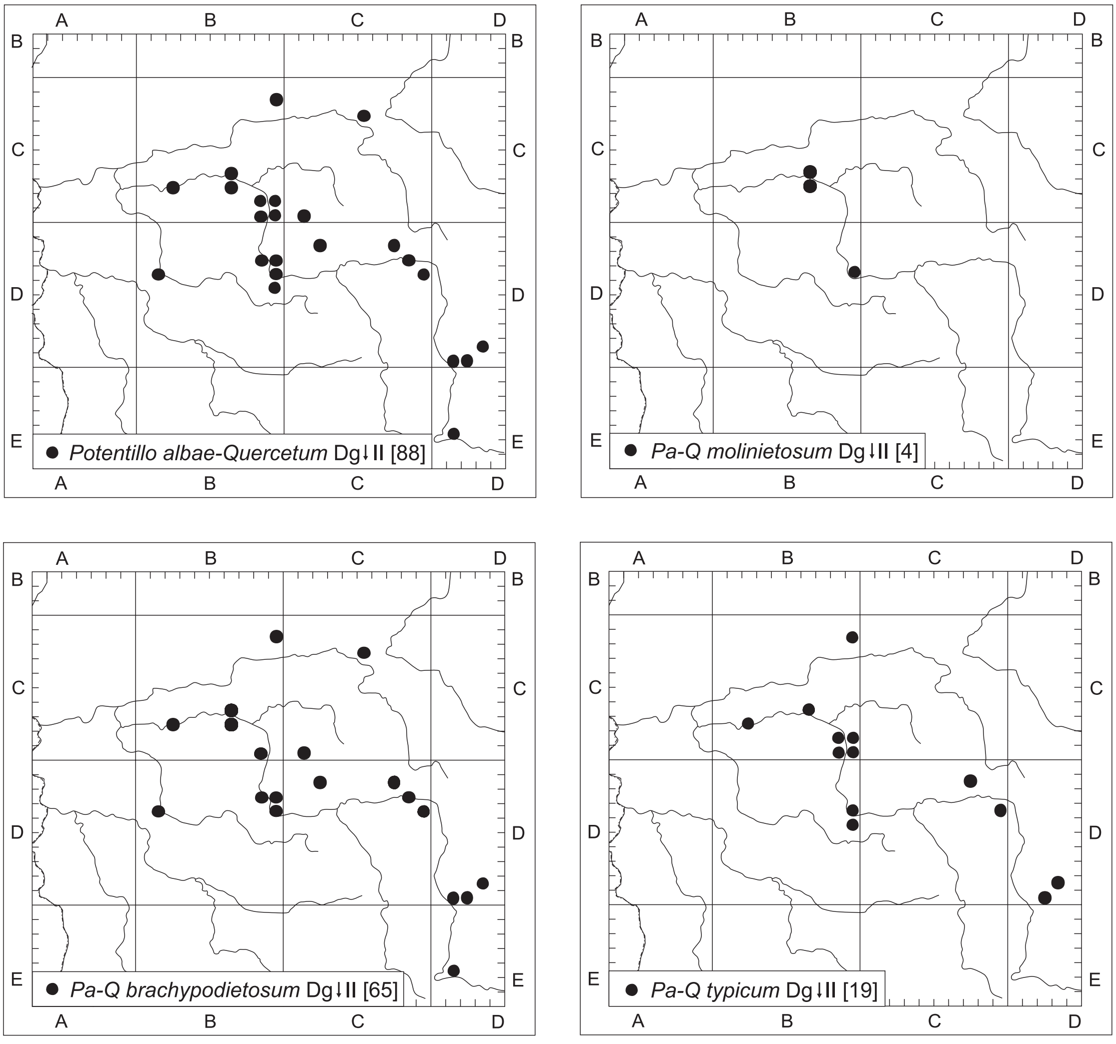


Fig. 46. Distribution of localities of *Potentillo albae-Quercetum* in stage II of degeneration (number of relevés in brackets)

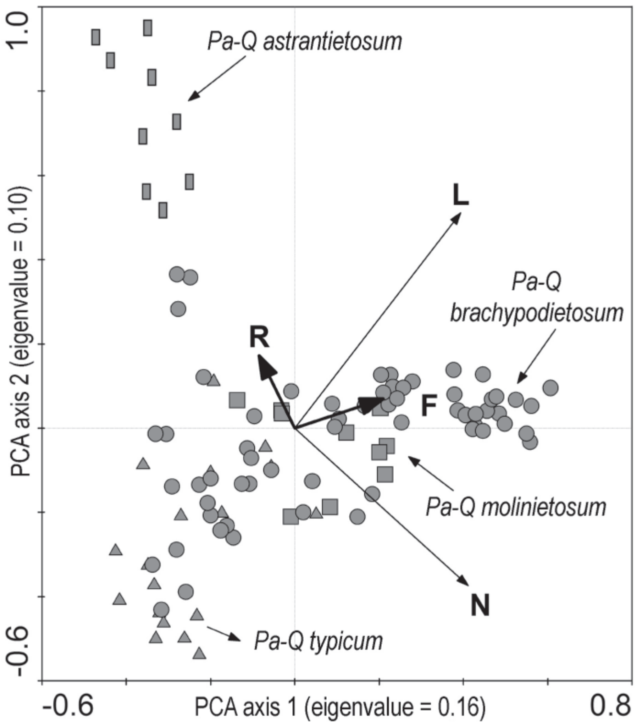


Fig. 47. PCA ordination of plots of subassociations of *Potentillo albae-Quercetum*, relevés classified according to the classical phytosociological method, and passive projection (arrows) of mean Ellenberg indicator values

Explanations: F – soil moisture, L – light, N – soil productivity, R – soil reaction

This is consistent with results of an earlier report (Jakubowska-Gabara 1993: Fig. 48). Relevés of the other subassociations form one cluster, where only the *Pa-Q typicum* can be partly distinguished.

The species composition of untransformed patches of *Potentillo albae-Quercetum* (Table 11, col. 1-8) was briefly described on p. 41. Its analysis shows that, in the study area, the association has a typical species combination. Its characteristic species are well-represented. These include e.g. *Ranunculus polyanthemos*, *Potentilla alba*, *Pulmonaria angustifolia*, and *Festuca amethystina* ssp. *ritschlii*. The first 2 of them reach a high constancy in at least some forms of thermophilous oak forest presented in this table. By contrast, the last 2 species are found mostly in patches of *Pa-Q brachypodietosum*. This, however, is probably not typical of the subassociation, but is mostly due to the inclusion of relevés from the "Świetlista Dąbrowa" Reserve near Obrzycko, which protects exceptionally well-developed phytocoenoses of *Potentillo albae-Quercetum*. Among species of the order *Quercetalia pubescentis*, the most abundant are *Campanula persicifolia* and *Carex montana*, and in some subassociations also *Lathyrus niger* and *Hypericum montanum*.

The degenerated form of *Pa-Q* (Table 11, col. 9-11) is characterized by a lower frequency (or even absence

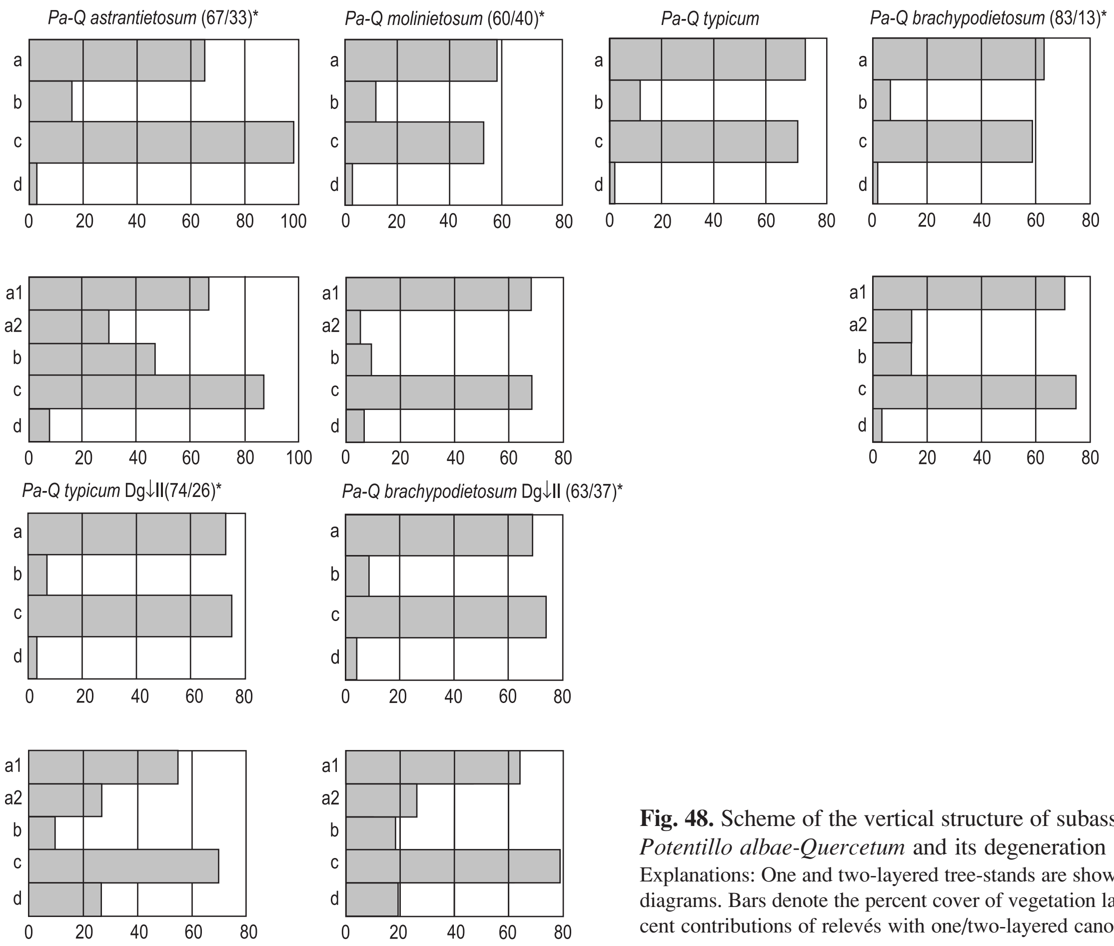


Fig. 48. Scheme of the vertical structure of subassociations of *Potentillo albae-Quercetum* and its degeneration stages (Dg)

Explanations: One and two-layered tree-stands are shown on separate diagrams. Bars denote the percent cover of vegetation layers; * – percent contributions of relevés with one/two-layered canopy in some subassociations) of characteristic species of the association and of the order *Quercetalia pubescentis*. Considering the concept of Faliński (1966), these features suggest that this form of thermophilous oak forest represents stage II of its degeneration.

Potentillo albae-Quercetum astrantietosum Jakubowska-Gabara 1993

In this study, only 9 relevés are identified as this subassociation (Table 11, col. 1, Table A25). Most of its patches had a one-layered canopy composed of *Quercus robur*, sometimes with a small contribution of *Q. petraea*, *Pinus sylvestris*, *Populus tremula*, and *Betula pendula* (Fig. 48). If the canopy was 2-layered, then the lower tree layer included *Carpinus betulus*, but the major component was *Corylus avellana*. Due to the latter species, the coverage of the shrub layer in several relevés was exceptionally high, as compared to other patches of thermophilous oak forest. In comparison with the other subassociations, patches of *Pa-Q astrantietosum* are distinguished by an exceptionally dense herb layer, in most relevés reaching full coverage under a one-layered canopy. *Galium schultesii* and *Melampyrum nemorosum* were most abundant, forming facies in some patches. Bryophytes were represented by only 1-3 species in individual relevés, and did not form a well-defined layer.

The relevés were floristically rich and included 61-86 (on average 72) species (Fig. 49). The species composition of this subassociation is typical for thermophilous oak forest. Despite the lack of *Potentilla alba* in the studied relevés, their identification as the association *Potentillo albae-Quercetum* does not raise any doubts.

All the relevés classified here as representing the *Pa-Q astrantietosum* were identified by their author (Jakubowska-Gabara 1994) as the subassociation *Pa-Q poëtosum* Sokołowski 1963. According to the cited author, the latter subassociation is developed on brown soils and is characterized by a high contribution of species of the class *Querco-Fagetea* as well as meadow plants. This makes it somewhat similar to the *Potentillo albae-Quercetum trollietosum* described from the Białowieża Forest by W. Matuszkiewicz & A. Matuszkiewicz (1956). However, these features are typical not only for the *Pa-Q poëtosum*, but also for the *Pa-Q astrantietosum*. Jakubowska-Gabara (1994), who described this subassociation, indicated that its differential species are: *Astrantia major*, *Angelica sylvestris*, *Succisa pratensis*, *Molinia caerulea*, *Lathyrus pratensis*, and *Sanguisorba officinalis*. In her Table 12, comparing the *Pa-Q typicum* and *Pa-Q astrantietosum*, the latter subassociation is clearly distinguished also by *Laserpitium prutenicum* (Jakubowska-Gabara 1994). The diagnostic value of 4 of these species for the *Pa-Q astrantietosum* (*A. major*, *A. sylvestris*, *L. prutenicum*,

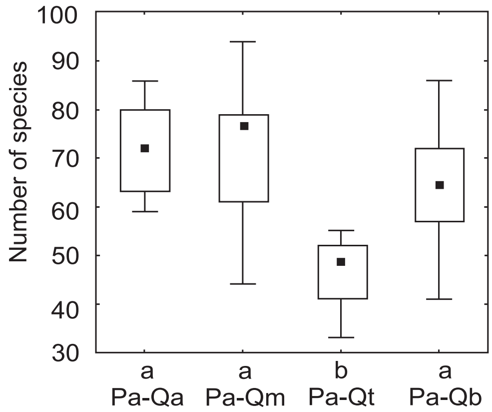


Fig. 49. Variation in number of species in relevés of subassociations of untransformed *Potentillo albae-Quercetum*
Explanations: Communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$). Kruskal-Wallis test ($N = 98$), $H = 34.67$, $p < 0.001$. For other explanations, see Fig. 17

and *L. pratensis*) is confirmed also in tables presented here (Tables 11 and A25). Thus the subassociation is very different from the *Pa-Q poëtosum*. It must be emphasized that in the original table of Sokołowski (1963), who described *Pa-Q poëtosum,* 3 species of that group and *Molinia caerulea* are missing, while *Laserpitium prutenicum* is present in 30% of relevés. Apart from that group, most of the species reaching in the study area an optimum in patches of *Pa-Q astrantietosum*, or even found exclusively in its patches (see Table 11), are probably not differential for the subassociation in other areas (see also e.g. the *Pa-Q rosetosum gallicae*, Kaźmierczakowa 1971). Some of them (*Galium schultesii*, *Melittis melissophyllum*) are differential for other geographic races of thermophilous oak forest (Wojterska *et al*. 2006).

According to Jakubowska-Gabara (1993), the *Pa-Q astrantietosum* is a thermophilous oak forest type conditioned by livestock grazing, and it is found on potential sites of oak-hornbeam forest.

In Table A25 (relevés 1-9) of the subassociation *Pa-Q astrantietosum*, 2 forms can be clearly distinguished. One of them has no differential species, while the other (with *Geranium* sanguineum) is characterized by the presence of several xerothermophilous species generally regarded as diagnostic for the *Pa-Q brachypodietosum* (*G. sanguineum*, *Pimpinella saxifraga*, *Sedum maximum*, etc.). At the current stage of research on this subassociation, it is difficult to determine if those forms reflect natural site conditions, or the form with *Geranium sanguineum* illustrates mixed patches of *Pa-Q astrantietosum* and *Pa-Q brachypodietosum pinnati*. If we compare the ecological spectrum of the above-mentioned plants and differential species of *Pa-Q astrantietosum*, the latter hypothesis seems more likely.

The studied patches of *Pa-Q astrantietosum* show a low variation in species composition, irrespective of local site conditions. They probably represent the typical variant.

Potentillo albae-Quercetum molinietosum Brzeg *et* Kasprowicz 2001 *ex* Kasprowicz 2010 *subass. nova*

Nomenclature type: *Potentillo albae-Quercetum petraeae molinietosum* M. Wojterska *et* Wiszniewska 1996 *Asarum var*. (rel. M12 in the text, Brzeg & Kasprowicz 2001: 189) *holotypus hoc loco*
Synonym: *Potentillo albae-Quercetum molinietosum* M. Wojterska *et* Wiszniewska 1996 *in* Brzeg *et* Kasprowicz 2001 *nom. inval.* (Art. 5)
D. subass.: *Carex nigra*, *C. ovalis*, *Cnidium dubium*, *Hypericum maculatum*, *Juncus effusus*, *Lysimachia vulgaris*, *L. nummularia*, *Molinia caerulea* [and locally as differential for a group of humid subassociations: *Carex pallescens*, *Deschampsia caespitosa*, *Hieracium sabaudum*, *Platanthera bifolia*, *Ranunculus acris*, *Scorzonera humilis*, *Selinum carvifolia*, *Succisa pratensis*]

In this study, only 10 relevés represent the *Pa-Q molinietosum* (Table A25, relevés 10-19). Most of them were recorded in the „Świetlista Dąbrowa" Reserve, which protects one of the best-preserved patches of the association *Potentillo albae-Quercetum*, not only on the scale of Wielkopolska (Wojterska *et al.* 2006; see also Wojterska *et al.* 2001; Wojterska & Wiszniewska 1996). Patches of this subassociation were found in small local depressions. They were much rarer there than the *Pa-Q brachypodietosum pinnati,* which covered larger areas.

The canopy in the studied relevés of *Pa-Q molinietosum* was usually one-layered. In some cases, an ill-defined lower tree layer developed, but its coverage did not exceed 5% (Fig. 48). The number of species forming the canopy in individual patches varied from 1 to 6 (mean 3). However, the major species was *Quercus robur*, and only rarely *Q. petraea* or their hybrid (*Quercus* ×*rosacea*). In one relevé, *Pinus sylvestris* was a major admixture. Minor admixtures were sometimes *Fagus sylvatica* or *Sorbus aucuparia*. The shrub layer, with coverage varying from 5% to 25%, was present in all relevés. It was composed of *Corylus avellana*, *Frangula alnus*, young *Fagus sylvatica*, *Quercus robur*, etc. The herb layer covered 40-90% of plot area (Fig. 48). In only 2 relevés, facies were formed by *Convallaria majalis* (relevé 10) or *Vaccinium myrtillus* (relevé 19). In the other relevés, the cover-abundance of any herbaceous species did not exceed 2 on the Braun-Blanquet scale. The moss layer was poorly developed (coverage ranging from negligible to 15%) or absent. In several relevés, the number of moss species was relatively high (up to 10).

The *Pa-Q molinietosum* is represented by floristically rich relevés, with 44-94 species (on average 71) (Fig. 49). In total, 178 plant taxa were recorded there.

The table of this subassociation includes most of characteristic and differential species of the association (Table A25). Moreover, this syntaxon is well-defined floristically by a clearly distinguished group of differential species. Among them, the highest constancy in the table was reached by *Molinia caerulea*, *Hypericum maculatum*, *Lysimachia vulgaris*, and (in common with the *Pa-Q astrantietosum*) *Deschampsia caespitosa*.

The studied phytocoenoses of *Pa-Q molinietosum* represent 2 variants (Table A25): typical (relevés 10-15) and with *Pleurozium schreberi* (relevés 16-19). The latter variant is distinguished by species of highly acidic sites (*Hypnum cupressiforme*, *Pseudoscleropodium purum*, and *Pyrola minor*).

Transformed patches of *Pa-Q molinietosum*, representing stage II of degeneration, are documented by 4 relevés (Table A26, relevés 1-4). In comparison with untransformed patches, the degenerated form has a shorter list of differential species and is poorly distinguished.

Potentillo albae-Quercetum typicum Preising 1943 *ex* W. *et* A. Mat. 1956

Nomenclature type (protologue): *Querceto-Potentilletum albae typicum* (Preis. 1943) *em*. Mat. 1956, tab. synopt. 1,2,3, col. 17 acc. Libbert 1933 (Matuszkiewicz W. & Matuszkiewicz A. 1956: 34-35, 38-39, 52)
Nomenclature type: Die *Quercus-Potentilla alba*-Assoziation, tab. XXV, rel. 2 (Libbert 1933, p. 297-299) *neotypus hoc loco* (*lectotypus ass. propos.*)

In the present study, 37 relevés have been assigned to this subassociation. These include 18 relevés representing untransformed communities (Table 11, col. 4-5; Table A25, relevés 20-37), while the other 19 have been classified as stage II of degeneration (Table 11, col. 10; Table A26, relevés 5-23).

The canopy in all patches of *Pa-Q typicum* was one-layered (Fig. 48). Its coverage ranged from 40% to 90% (mean 75%). In individual patches, it was composed of only 1-2, rarely 3 species. The dominant species was usually *Quercus petraea* or (less often) *Q. robur*. In many relevés, *Pinus sylvestris* was an admixture. However, this species was recorded nearly exclusively in phytocoenoses of the fertile variant with *Asarum europaeum*. This suggests that it was planted there. In degenerated patches, the canopy is usually one-layered (Fig. 48), with a similar species composition as in untransformed phytocoenoses. Two-layered canopies varied widely. The coverage of the upper layer (a1) ranged from 30 to 100%, while that of the lower layer (a2), from 5% to 70%. The a1 layer was composed mostly of various proportions of *P. sylvestris* and *Q. petraea*, and rarely also of *Q. robur*. The a2 layer consisted of both *Quercus* spp., and in one relevé also of *Fagus sylvatica*.

The shrub layer (b) in untransformed patches was absent in some relevés, very poorly developed in some others, but sometimes reached a relatively high coverage (15-50%). It was composed of *Carpinus betulus*, *Corylus avellana*, *Q. petraea*, *Q. robur*, *Fagus sylvatica*, and *Sorbus aucuparia*. In degenerated phytocoenoses, the shrub layer consisted of the same species, and its coverage varied from negligible to 20%, or this layer was absent (in several relevés).

Plants of the herb layer in untransformed patches covered 40-90% of plot area. In several relevés, poorly defined facies were formed by *Convallaria majalis*, *Melica nutans*, *Melampyrum pratense*, *Vaccinium myrtillus,* etc. Degenerated phytocoenoses had similar herbaceous vegetation, but in several relevés *Vaccinium myrtillus* was more abundant. In well-developed phytocoenoses, the moss layer was absent in a few relevés, while in others it was composed of 1-5 species, but the layer was poorly developed. In many degenerated forest stands, the structure and species composition of the moss layer were similar. In several relevés, however, bryophytes played a more important role, covering 15-35% or even 70%.

Relevés of untransformed *Pa-Q typicum* contained 33-55 species (mean 47). In comparison with relevés of the other subassociations of thermophilous oak forest, they were poorer in species (Fig. 49). The typical subassociation has no differential species. The studied patches can be identified with 2 of the 3 variants proposed by Brzeg and Kasprowicz (2001). These include the typical variant without differential species (Table A25, relevés 31-37; Table 11, col. 4) and the variant with *Asarum europaeum*, distinguished mostly by plants of mesophilous deciduous forests from the class *Querco-Fagetea* (*Carex digitata*, *Galium sylvaticum*, *Lathyrus vernus*, and *Viola reichenbachiana*) (Table A25, relevés 20-30; Table 11, col. 5).

All the 11 relevés documenting the variant with *Asarum europaeum* are extracted from a table of *Querco-Potentilletum*, containing 18 relevés (Nowaczyk 1964). They were recorded in 1957-1959 in the Zielonka Forest (Puszcza Zielonka) near Poznań. Out of the remaining 7 relevés in that table, 2 have been assigned in the present study to the degenerated form of the typical subassociation (Table A26, relevés 7 and 23), while the others (5) to the *Pa-Q brachypodietosum* (Table A27, relevés 25; Table A28, relevés 1, 2, 4, and 8). According to M. Wojterska and Wiszniewska (1996), all the relevés of Nowaczyk (1964) represent the *Pa-Q lathyretosum verni nom. inval*, proposed by those authors. Jakubowska-Gabara (1993, 1996) analysed repeated relevés in the patches studied by Nowaczyk (1964), and showed that over the period of 32 years, the floristic features specific to thermophilous oak forest disappeared to a large extent. For example, all species of the order *Quercetalia pubescentis* disappeared completely, while contributions of all groups of species to the herb layer (except those of the order *Fagetalia*) decreased dramatically. According to Jakubowska-Gabara (1993), thermophilous oak forest had been transformed there into plant communities similar to the *Calamagrostio-Quercetum*, while some patches represented an impoverished form of *Galio-Carpinetum*. The species composition of phytocoenoses documented from the Zielonka Forest by Jakubowska-Gabara (1993), presented in synoptic tables, suggests that their diagnosis as the *Calamagrostio-Quercetum* (at least as defined here) is not justifiable. The features highlighted in the table of the cited author, seem to indicate an on-going regeneration of oak-hornbeam forests: (1) increased contributions of *Carpinus betulus* (in the tree and shrub layer), *Corylus avellana*, and *Festuca gigantea*; (2) high frequency of other species of the order *Fagetalia sylvaticae* (*Galium sylvaticum*, *Atrichum undulatum*, *Viola reichenbachiana*) and of the class *Querco-Fagetea* (*Carex digitata*, *Brachypodium sylvaticum*, *Festuca heterophylla*, and *Hepatica nobilis*); and (3) lowered contributions of some acidophilous species, which are diagnostic for *Calamagrostio arundinaceae-Quercetum* (*Festuca ovina*, *Melampyrum pratense*, *Polytrichastrum formosum*). It is also noteworthy that the studied patches lacked the regionally characteristic species of the association *Calamagrostio-Quercetum* (*Hieracium lachenalii*, *H. laevigatum*, *H. sabaudum*). M. Wojterska & Wiszniewska (1996) reported that in the study area in the 1990s, impoverished patches of *Potentillo-Quercetum* were found, and in fact they still exist.

The relevés classified as the *Pa-Q typicum* in stage II of degeneration varied widely in species number (19-62, mean 39). In Table A26 (relevés 5-23), 2 groups of relevés were distinguished, corresponding to the variant with *Pleurozium schreberi* (relevés 5-12) and the typical variant (relevés 13-23). Nearly all the relevés of the former variant are distinguished by a considerable admixture of *Pinus sylvestris*, which may be the major cause of the increased contribution of acidophilous species.

Potentillo albae-Quercetum brachypodietosum pinnati M. Wojterska *et* Wiszniewska 1996 *ex* Kasprowicz 2010 *subass. nova*

Synonym: *Potentillo albae-Quercetum brachypodietosum* M. Wojterska *et* Wiszniewska 1996 *nom. inval.* (Art. 3g, 5 KNF)

Nomenclature type: *Potentillo albae-Quercetum* Libb. 1933, tab. 1, rel. 2 (Wojterska, Wiszniewska 1996: 48-52) *holotypus hoc loco*

D. subass. (reg.): *Anthericum ramosum*, *Brachypodium pinnatum*, *Euphorbia cyparissias*, *Galium verum*, *Geranium sanguineum*, *Peucedanum cervaria*, *Pimpinella* *saxifraga* and locally others of Ch. *Festuco-Brometea et Trifolio-Geranietea sanguinei*

In the present study, 126 relevés have been assigned to this subassociation. Among them, 61 have been classified as untransformed form (Table 11, col. 6-8), while 65 as the degenerated form (Table 11, col. 11). Their detailed floristic structure is presented in the analytic Tables A27-A29.

In patches of *Pa-Q brachypodietosum* the canopy was usually one-layered (Fig. 48). This tendency was less conspicuous in degenerated phytocoenoses. The coverage of the canopy varied widely, from 35% to 85% (mean 61%) in the untransformed form, and from 25% to 100% (mean 69%) in the degenerated form. In both the forms, if the canopy was one-layered, it usually consisted of only one species (63% and 68%, respectively). It was typically composed of *Quercus* sp. (*Q. robur* or, less often, *Q. petraea* or *Quercus* × *rosacea*), but in several degenerated patches it consisted of *Pinus sylvestris*. Other forest stands with one-layered canopy were generally composed of 2-3 tree species. If the canopy was 2-layered, the upper layer consisted of *Quercus* spp. and an admixture of *Pinus sylvestris*. The less dense lower tree layer was dominated by *Q. robur* and *Q. petraea*.

The shrub layer (b), mostly formed by *Frangula alnus*, was usually poorly developed. Its coverage was higher in degenerated patches.

The herb layer (c) covered 30% to 100% of plot area. Its coverage was the lowest in untransformed patches with a one-layered canopy. In many relevés no facies were formed, while in other relevés, the herb layer was dominated mostly by *Brachypodium pinnatum*, *Convallaria majalis*, and *Melica nutans*.

In most phytocoenoses of this subassociation, the moss layer was poorly developed (coverage ranging from negligible to 10%, exceptionally 35%) or even absent. Only in some degenerated patches, mosses (chiefly *Pleurozium schreberi*), covered 50% to 80% of plot area.

The studied patches of *Pa-Q brachypodietosum* were rich in species: 41-86 in the untransformed form (Fig. 49) and 22-92 in degenerated ones. In comparison with the other subassociations presented in the synoptic Table 11, the *Pa-Q brachypodietosum* is well-defined floristically. This applies both to untransformed communities (col. 6-8) and degenerated ones (col. 11). Differential species of this subassociation include only plants whose phytosociological optimum is in non-forest communities: xerothermic grasslands from the class *Festuco-Brometea* (*Euphorbia cyparissias*, *Brachypodium pinnatum*, *Pimpinella saxifraga*, etc.), or thermophilous forest edge communities from the class *Trifolio-Geranietea* (*Anthericum ramosum*, *Geranium sanguineum*, etc.).

In the study area, the *Pa-Q brachypodietosum* can develop in 3 trophic variants distinguished by Brzeg & Kasprowicz (2001): with *Pleurozium schreberi*, typical, and with *Asarum europaeum*. In well-developed patches of this subassociation (Table 11, col. 6-8), these syntaxa clearly differ in species composition.

Among differential species of *Pa-Q brachypodietosum* in the variant with *P. schreberi*, particularly noteworthy are species of the class *Vaccinio-Piceetea* (*P. schreberi*, *Pseudoscleropodium purum*, and *Vaccinium vitis-idaea*) (Table 11, col. 6, Table A27, relevés 1-23). Within the trophic variant with *Pleurozium schreberi*, 2 forms of this community are distinguished (Table A27): with *Filipendula vulgaris* (relevés 1-13) and with *Polygonatum odoratum* (relevés 14-23). The first one is a group of relevés that are richer in species, also those diagnostic for thermophilous oak forest. These communities were usually pure stands of *Quercus robur*. They are also distinguished by the constant presence of species of the class *Artemisietea vulgaris* (*Geum urbanum*, *Galeopsis pubescens*, *Impatiens parviflora*, *Urtica dioica*, etc.). All of them were recorded on the Natura 2000 site "Dąbrowy Obrzyckie". The form with *Polygonatum odoratum*, documented mostly by more recent relevés, is distinguished by the presence of *Geranium sanguineum*, *Hieracium murorum*, *Peucedanum oreoselinum*, *Polygonatum odoratum*, and *Pteridium aquilinum*, as well as *Quercus petraea,* which is the major component of the forest stands, usually formed by 2-3 tree species. These floristic differences between the 2 forms probably reflect differences in their state of preservation and are mostly due to human impact. In light of results of this study, further research is needed to explain the influence of the structure and species composition of forest stands (especially the pure stands of *Q. robur* or *Q. petraea*, resulting from forest management) on the species composition of patches of thermophilous oak forest.

The group of relevés classified in this study as the *Pa-Q brachypodietosum* in the variant with *Pleurozium schreberi* includes also 8 historical relevés of thermophilous oak forest from Dziewicza Góra near Poznań (Wojterska & Wojterski 1953). They are presented in the analytic Table A27 (relevés 24-31). The other 5 relevés of the cited authors are listed in separate columns of table (relevés 32-36). Four of them were recorded in patches of non-forest communities, perhaps only temporarily lacking the canopy. The last one represents the *Pa-Q brachypodietosum* in the typical variant. The analysed group of relevés is characterized by the presence of many diagnostic species of *Potentillo-Quercetum*. In contrast to average patches of this association, those relevés are characterized by: (1) the presence of many species reaching their phytosociological optimum in non-forest communities (especially in thermophilous forest edge communities from the class *Trifolio-Geranietea*, or xerothermic swards from the class *Festuco-Brometea*); (2) a relatively small contribution of mesophilous deciduous forests from the class *Querco-Fagetea*; and (3) a relatively small contribution of species typical of coniferous forests from the class *Vaccinio-Piceetea*. Those relevés of Wojterska & Wojterski (1953) were probably recorded in sparsely wooded patches, perhaps comprising also fragments of forest edge communities. Nearly 40 years later, in 10 of the above-mentioned 13 patches, phytosociological investigations were repeated (Jakubowska-Gabara 1993). The cited author reported significant changes in the vertical structure and species composition of the community. First of all, the contribution of *Pinus sylvestris* decreased in the upper tree layer. Secondly, the lower tree layer developed, composed of *Quercus petraea* and *Sorbus aucuparia*. Thirdly, species number per relevé decreased remarkably (on average it was 39% lower). This applies especially to plants of the order *Quercetalia pubescentis* and of the class *Trifolio-Geranietea*. Finally, species with a wider ecological scale became more abundant (particularly *Calamagrostis arundinacea* and *Impatiens parviflora*). According to the cited author, the species composition of the studied phytocoenoses indicates that thermophilous oak forest was replaced there by communities similar to the *Calamagrostio-Quercetum*. An analysis of the synoptic table of Jakubowska-Gabara (1993), in light of the definition of that association proposed in the present study, does not confirm her diagnosis. In both the tables, diagnostic species of *Calamagrostio arundinaceae-Quercetum* are represented nearly exclusively by *Calamagrostis arundinacea*, while the others are absent (*Hieracium lachenalii*, *H. laevigatum*, *H. sabaudum*) or much less frequent (*Festuca ovina*). Some characteristic or differential species of the class *Quercetea robori petraeae*, except *Pteridium aquilinum*, are infrequent (*Melampyrum pratense*, *Polytrichastrum formosum*) or absent (*Carex pilulifera*, *Holcus mollis*).

The typical variant of *Pa-Q brachypodietosum* has no differential species, but is characterized by a constant presence of many diagnostic species of the association and of the subassociation (Table 11, col. 7; Table A28, relevés 16-38). Most of the relevés documenting the *Pa-Q brachypodietosum* in the typical variant were recorded on the above-mentioned Natura 2000 site "Dąbrowy Obrzyckie".

The *Pa-Q brachypodietosum* in the variant with *Asarum europaeum* is dominated by plants of the class *Querco-Fagetea* (Table 11, col. 8; Table A28, relevés 1-15). These include also species of the order *Fagetalia sylvaticae* (*Galium sylvaticum*, *Lathyrus vernus* and *Stellaria holostea*), but their constancy in the table is not high. In comparison with the typical variant, this variant is poorer in species, also in diagnostic species of the association. The higher contribution of plants of mesophilous deciduous forests, and in some relevés also of *Carpinus betulus*, indicates that those communities are dynamically associated with basiphilous moderately dry oak-hornbeam forests.

The habitat variation of *Pa-Q brachypodietosum* in stage II of degeneration (Table A29) resembles that of well-preserved forms of thermophilous oak forest. The variant with *Pleurozium schreberi* (relevés 1-21) has similar differential species. In some of its patches (relevés 1-9), the forest stand was dominated by *Pinus sylvestris*. Presumably, like in the above-mentioned degenerated patches of the typical subassociation, the contribution of acidophilous species in this group of relevés was not associated with natural site conditions. The typical variant (relevés 22-56) has no differential species. The variant with *Asarum europaeum* (relevés 57-65) is poorly distinguished, and its differential species are present, but infrequent, also in relevés of the other 2 variants.

Analysis of selected site indicators

Results of the statistical analysis taking into account Ellenberg indicator values (Fig. 50) illustrate well the habitat variation of the association *Potentillo albae-Quercetum* presented above. Light conditions at the forest floor were favourable for plants that were slightly more light-demanding (L=6) than half shade plants (L=5). The lowest L values were recorded in patches of *Pa-Q typicum*. Soil indicators values varied only slightly between the subassociations, and generally showed that the sites were poor in nutrients (N=4), moderately acidic (R=5), and moderately moist (F=5). The significantly highest contribution of plants typical of more moist and acidic sites was recorded in the *Pa-Q molinietosum*. The typical subassociation is distinguished by the significantly lowest L values. This may explain the lowest number of species recorded it its patches (Fig. 49). Values calculated for the *Pa-Q astrantietosum* are probably not representative, because of the above-mentioned shortcomings of the group of relevés representing the subassociation.

Substitute forest communities on potential sites of *Potentillo albae-Quercetum*

Most (33) of the 56 relevés collected in the last 3 columns of Table 11 were initially diagnosed by their authors as substitute forest communities on potential sites of thermophilous oak forest. However, as many as 17 relevés were classified by their authors as the association *Potentillo albae-Quercetum*.

In the canopy of substitute forest communities, a major role is played by *Pinus sylvestris*, accompanied by *Quercus robur* and *Q. petraea* or their hybrids and

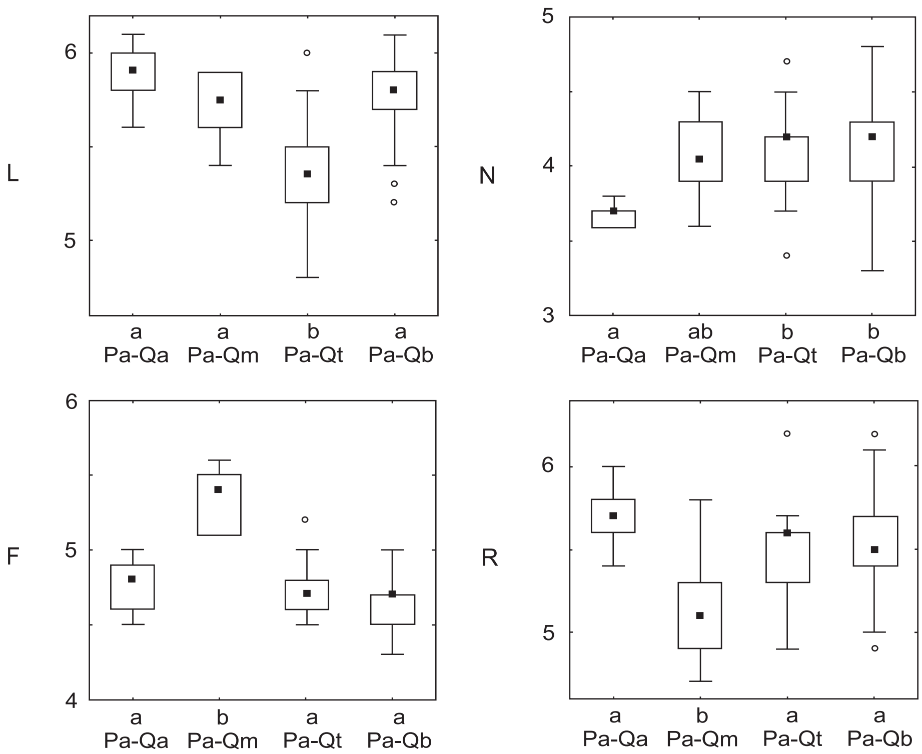


Fig. 50. Ellenberg indicator values for subassociations of untransformed *Potentillo albae-Quercetum*
Explanations: Communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$). Kruskal-Wallis test ($N = 98$), L – light $H = 29.57$, $p < 0.001$, F – soil moisture $H = 30.52$, $p < 0.001$, N – soil productivity $H = 13.77$, $p = 0.0032$, R – soil reaction $H = 16.01$, $p = 0.0011$. For other explanations, see Fig. 17

Betula pendula (Table A30). In individual relevés, 2 other tree species were recorded: *Fagus sylvatica* and *Picea abies*. Both of them are definitely not typical for thermophilous oak forest. The shrub layer was composed mostly of the species listed above, as well as *Frangula alnus* and *Padus serotina*. The last mentioned species was present in most relevés, and its coverage usually varied from negligible to 25%, but in some cases it reached 40-80%. The herb layer was characterized by a high variation in structure, and covered 15-100% of plot area. In relatively many relevés, as compared to thermophilous oak forest in general, facies were formed by *Brachypodium pinnatum*, *Convallaria majalis*, *Deschampsia flexuosa*, *Calamagrostis epigejos*, *Rubus idaeus*, etc. The moss layer did not play any major role as a rule (coverage ranging from negligible to 25%), and was absent in many relevés. In only several relevés, mosses (chiefly *Pleurozium schreberi* and *Pseudoscleropodium purum*) covered a higher proportion of plot area (40-80%).

The substitute forest communities, as shown in the analytic Table A30, can be divided into 3 forms: with *Deschampsia caespitosa* (relevés 1-15), typical (relevés 16-36), and with *Peucedanum oreoselinum* (relevés 37-56). They directly correspond to subassociations of *Potentillo-Quercetum*, presented above, i.e. the *Pa-Q molinietosum, Pa-Q typicum*, and *Pa-Q brachypodietosum,* respectively. Within those forms, groups of species differential for trophic forms (of lower rank) are marked in Table A30. These units correspond to variants within subassociations of thermophilous oak forest. The unit corresponding to the variant with *Asarum europaeum* is distinguished by species of the class *Querco-Fagetea* (*Carex digitata*, *Galium sylvaticum*, *Hepatica nobilis*). Species of the class *Vaccinio-Piceetea* (*Juniperus comminus*, *Pleurozium schreberi*, *Pseudoscleropodium purum* and *Vaccinium vitis-idaea*) are differential for the form corresponding to the variant with *Pleurozium schreberi*. All the forms are not as well-defined floristically as the corresponding variants among well-developed patches of the association *Potentillo albae-Quercetum*. Moreover, most of the phytocoenoses corresponding to the variant with *Pleurozium schreberi* are characterized by a high contribution of *Pinus* in the tree layer.

6.3.6. *Querco roboris-Pinetum* Kozł. 1926 *em.* J. M. Mat. 1988 *nom. invers. nom. conserv.*

Basic documentation

As a result of a critical analysis of the collected set of relevés, 172 relevés have been classified as this association in the present study. In the synoptic Table 3 (discussed above), which describes typologically the well-developed forest communities, the association *Querco roboris-Pinetum* is represented by 165 relevés. The other 7 relevés probably document mixed patches of *Qr-P molinietosum* and *Qr-P coryletosum* (Table A34).

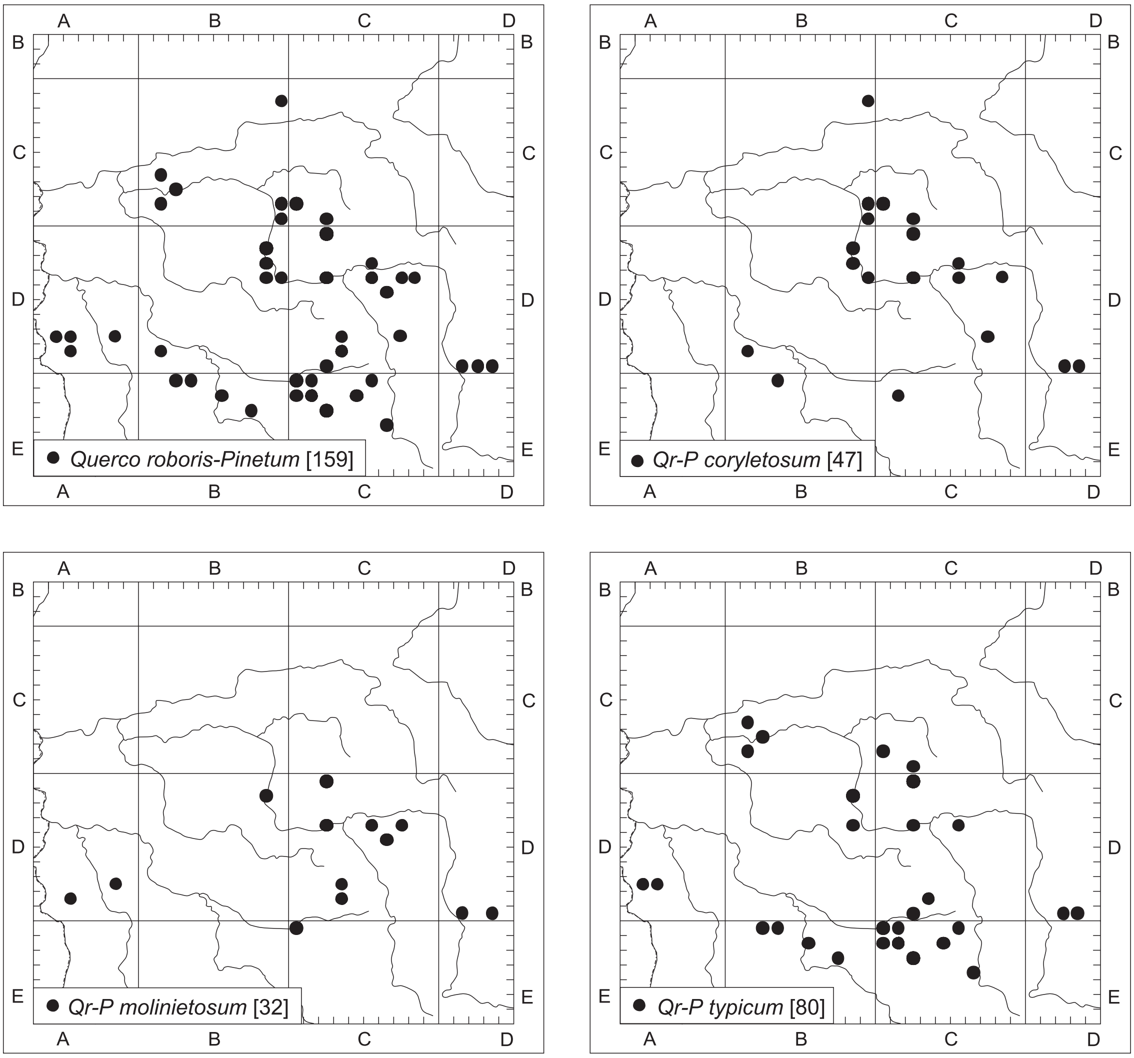


Fig. 51. Distribution of localities of *Querco roboris-Pinetum*
Explanations: Number of relevés given in brackets. The localization of 6 relevés was impossible (4 of *Qr-P molinietosum* and 2 of *Qr-P typicum*)

Those relevés were not taken into account in synoptic tables. The habitat variation of the association is presented in the synoptic Table 12 and in the analytic Tables A31-A33. Additionally, separate columns of Table 12 (col. 4 and 5) and Table A35, include substitute forest communities that probably develop on potential sites of *Querco-Pinetum*.

Distribution

Relevés of this association are distributed in 44 basic ATPOL squares (Fig. 51). According to the geobotanical regionalization of Poland by J.M. Matuszkiewicz (2008a, see Fig. 4b here), they are located mostly in the South Wielkopolska Subregion (36%) as well as in the Central Wielkopolska Region (35%) and the Noteć-Lubusz Region (20%). Patches of 2 of its subassociations, i.e. the *Qr-P molinietosum* (situated in 14 localities) and *Qr-P coryletosum* (19 localities) are linked with the eastern part of the study area. The most widespread subassociation of mixed coniferous forest in the study area is the *Qr-P typicum*, found in 29 localities.

On the scale of Poland, phytosoenoses of *Qr-P molinietosum* are quite frequent in the eastern part, while rare in other regions (Matuszkiewicz J. M. 1988). However, in the works of J. M. Matuszkiewicz (1988, 2001), the subassociation was relatively poorly documented, as it was represented there by 72 relevés, and none of them was recorded in Wielkopolska. As emphasized by W. Matuszkiewicz and J. M. Matuszkiewicz (1996), in some parts of Poland its documentation needs to be supplemented.

Subdivision based on habitat variation and anthropogenic dynamics

Forest stands of this association can develop in the study area in 3 forms, which clearly differ in species composition. J. M. Matuszkiewicz (1988) accorded them the rank of subassociations. Individual authors documenting this association usually did not take into account its internal variation. In the tables of subassociations of this association, only about 20% of relevés were identified by their authors to the level of subassociations (22% of *Qr-P molinietosum*, 15% of *Qr-P typicum*, and 24% of *Qr-P coryletosum*). Despite this, only 7 relevés represent the above-mentioned mixed patches of several subassociations (Table A34). This indicates that patches of individual subassociations of continental mixed coniferous forest in the field are clearly separated and probably cover relatively large and homogeneous areas.

The habitat variation of the association *Querco roboris-Pinetum*, presented in the synoptic table (Table 12), is additionally confirmed by PCA results (Fig. 52a). The relevés diagnosed by the classical phytosociological analysis as the *Qr-P molinietosum* and *Qr-P coryletosum*, form 2 clusters in the PCA ordination diagram. These clusters include, respectively, 94% and 79% of relevés of those subassociations. Relevés of *Qr-P typicum* are intermediate between them. The floristic justification of results of this ordination procedure is the distribution of species along the first and second ordination axes (Fig. 52b).

Querco roboris-Pinetum molinietosum J. M. Mat. 1988 *nom. inval.*

In the present study, 36 relevés have been assigned to this subassociation (Table A31). The number of species in individual relevés varied from 17 to 42 (Fig. 53).

The canopy in patches of *Qr-P molinietosum* was subdivided into 2 layers slightly more frequently than composed of only one layer (Fig. 54). The coverage of the upper layer (a1) usually did not exceed 70%, compared to 25% in the lower layer (a2). If the canopy was one-layered, its coverage reached 40-80%. Its major component was *Pinus sylvestris*. If the canopy was 2-layered, this species was often the only component of a1. Presumably the contribution of *Pinus* in all subassociations of *Querco-Pinetum* was artificially increased as a result of forest management (see J.M. Matuszkiewicz 1988). It was often accompanied by *Betula pendula* and *Quercus robur*. Other species, like *Q. petraea*, *Populus tremula*, *Picea abies*, and *Sorbus aucuparia*, were recorded in a smaller number of relevés (Table A31). The coverage of the shrub layer (b) varied from negligible to 60% (Fig. 54). In only few relevés, *Frangula alnus*, *Picea abies Quercus robur*, or *Sorbus aucuparia* were abundant.

The herb layer (c) was always well-developed, and covered 40-100% of the area of the studied relevés. In most of the communities, facies were formed, usually by *Vaccinium myrtillus*, *Pteridium aquilinum*, *Molinia caerulea* and/or *Festuca ovina*.

The moss layer (d) in most of the relevés (61%) reached a high coverage of 50-90%. In individual relevés, it was composed of 3-12 species. Facies were formed most often by *Pleurozium schreberi*. In the other 39% of relevés, bryophytes represented by 1-8 species covered up to 40% of plot area. The highest constancy in the table was reached by *Polytrichastrum formosum*, *Dicranum polysetum*, and *Pseudoscleropodium purum*.

The group of differential species of *Qr-P molinietosum* in the study area includes 10 taxa (Table A31). Like in the reviews of phytosociological data from all parts of Poland (Matuszkiewicz J. M. 1988: Table 1; 2001: Table 3.1), *Molinia caerulea* has the highest diagnostic value. This group includes also *Populus tremula*. It is one of differential species of the association *Populo tremulae-Quercetum*, described by Sokołowski

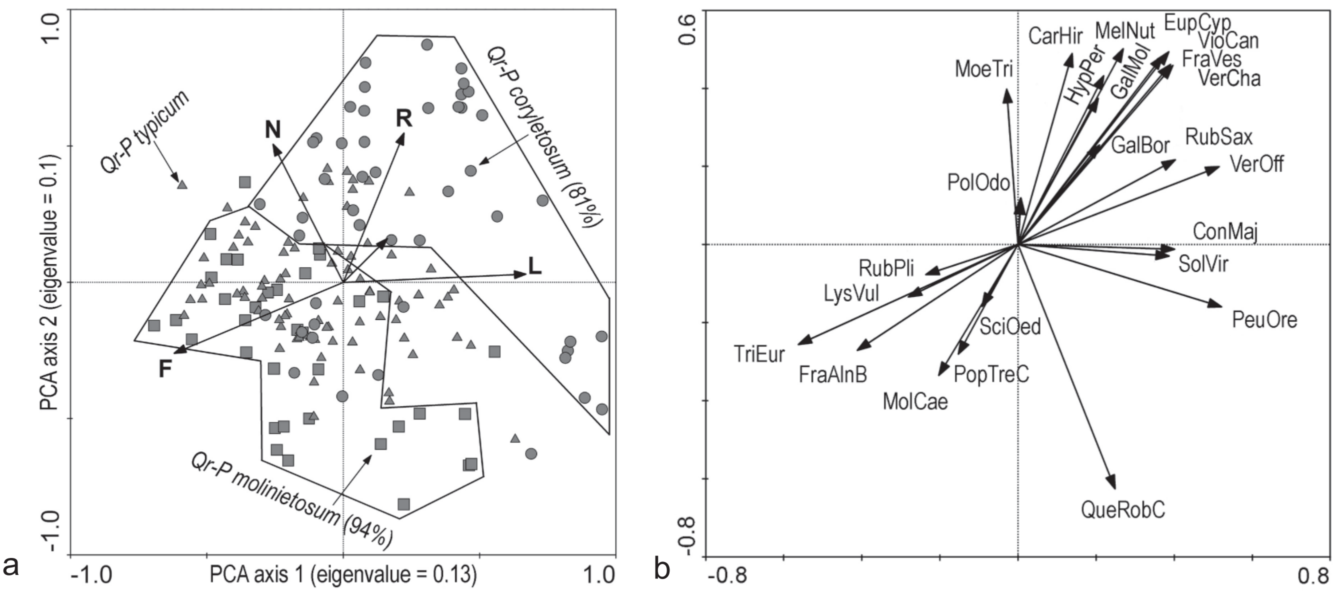


Fig. 52. PCA ordination of plots of *Querco roboris-Pinetum*

a) Distribution of 165 relevés classified according to the classical phytosociological method, and passive projection (arrows) of mean Ellenberg indicator values, F – soil moisture, L – light, N – soil productivity, R – soil reaction

b) Distribution of differential species of *Qr-P molinietosum* and *Qr-P coryletosum* (see Table 12)

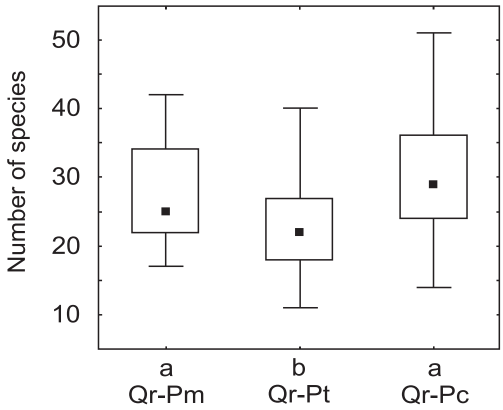


Fig. 53. Variation in number of species in relevés of subassociations of *Querco roboris-Pinetum*
Explanations: Communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$). Kruskal-Wallis test ($N = 165$), $H = 23.93$, $p < 0.001$. For other explanations, see Fig. 17

(1980). However, J.M. Matuszkiewicz (1988) concluded that its separation is not sufficiently justified, so it must be classified as a synonym of *Qr-P molinietosum*. Such a solution was also accepted by Ratyńska *et al.* (2010) and earlier by Brzeg & Wojterska (2001; under the name *Festuco ovinae-Pinetum*).

Querco roboris-Pinetum typicum J. M. Mat. 1988 *nom. inval.*

The typical subassociation is represented by 82 relevés, i.e. nearly half of all relevés documenting the association in the study area (Table 12). In comparison with the other subassociations, relevés of *Qr-P typicum* are significantly poorer in species (Fig. 53).

In most (62%) of relevés of *Querco-Pinetum typicum*, the canopy was 2-layered (Fig. 54). The mean coverage of the upper layer (a1) (51%) was then lower than the mean coverage of one-layered canopy in the remaining forest stands (61%). In all relevés, the dominant canopy species was *Pinus sylvestris*, accompanied by *Quercus robur, Q. petraea*, *Betula pendula*, and rarely also *Picea abies*. The coverage of the lower layer (a2), usually dominated by *Quercus* spp., ranged from several to 65% (mean 26%). In some communities, *Picea abies* or *Fagus sylvatica* were relatively abundant (Table A32).

The shrub layer (b) was present in most of the relevés (96%), but only in some of them (9%) its coverage was high (40-70%).

Plants of the herb layer (c) covered a large proportion of plot area (mean 71%). In as many as 90% of the analysed relevés, facies were formed, composed mostly of *Vaccinium myrtillus*, and rarely of *Pteridium aquilinum*, *Calamagrostis arundinacea,* or several other species (Table A32).

The moss layer (d) was highly variable. In 40% of relevés, bryophytes (mostly *Pleurozium schreberi*) covered at least 50% of plot area. The number of species of this layer in individual relevés varied from 0 to 10.

Within the subassociation *Qr-P typicum*, 2 variants can be distinguished: typical (Table A32, relevés 1-63), and with *Fagus sylvatica*. Differential species of the latter variant include also *Calluna vulgaris*, *Leucobryum glaucum*, and *Deschampsia flexuosa* (Table A32, relevés 64-82). The typical variant has no differential species.

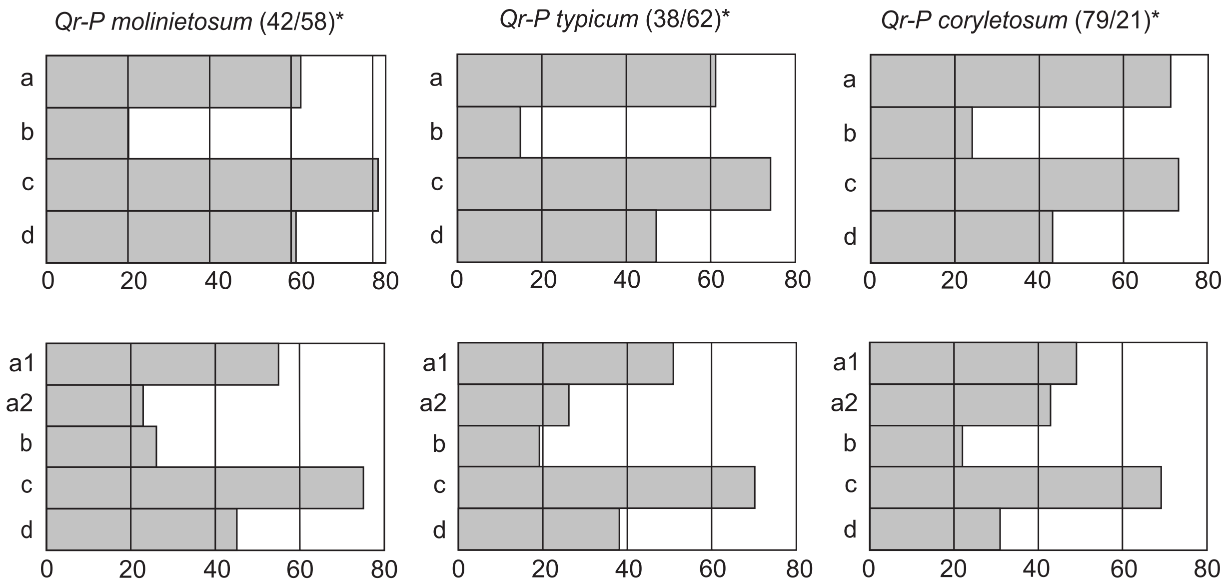


Fig. 54. Scheme of the vertical structure of subassociations of *Querco roboris-Pinetum*
Explanations: One and two-layered tree-stands are shown on separate diagrams. Bars denote the percent cover of vegetation layers; * percent contributions of relevés with one/two-layered canopy

Querco roboris-Pinetum coryletosum J. M. Mat. 1988 *nom. inval.*

In the present study, 47 relevés have been assigned to this subassociation (Table 12, col. 3; Table A33). In respect of species richness, they are similar to the *Qr-P molinietosum* (Fig. 53).

In most patches of this subassociation (79%), the canopy was one-layered, and its coverage varied from 40% to 85% (Fig. 54). Its major component was *Pinus sylvestris*, often accompanied by *Quercus robur*. If the canopy was 2-layered, *Pinus* was found exclusively in the upper layer. Other components of the canopy were then most often *Q. robur* and *Betula pendula*.

The coverage of the shrub layer in individual relevés of *Qr-P coryletosum* varied widely, from negligible to 60%. It was composed of *Q. robur*, *Q. petraea*, *B. pendula*, and *Frangula alnus*. In 17% of relevés, the shrub layer was absent (Table A33).

The herb layer, irrespective of canopy structure, reached a mean coverage of 70%. In most of the relevés, the herb layer formed facies composed of abundant *Vaccinium myrtillus*, rarely of *Calamagrostis arundinacea*, *Pteridium aquilinum,* etc. (Table A33).

In respect of the contribution of bryophytes, the subassociation can be divided into 2 forms represented in Table A33 by similar numbers of relevés. One form is distinguished by a well-developed moss layer (coverage 40-90%), and facies composed mostly of *Pleurozium schreberi* or rarely of *Pseudoscleropodium purum* and *Dicranum polysetum*. The other form includes communities where bryophytes were absent or their coverage was up to 30%. The number of species of bryophytes and (rarely) lichens, varied between relevés and ranged from 0 to 7.

The synoptic Table 12, showing the floristic structure of the 3 subassociations of *Querco roboris-Pinetum*, provides convincing evidence confirming their separateness. The *Qr-P coryletosum* has the longest list of differential species. Among them, the most valuable diagnostic species are: *Convallaria majalis*, *Moehringia trinervia*, *Fragaria vesca*, *Rubus saxatilis*, and *Veronica officinalis*. Most of them, except e.g. *Convallaria majalis* and *Moehringia trinervia*, are considered as differential for this subassociation also by J.M. Matuszkiewicz (1988: Table 1). At the same time, the cited author reported that this subassociation is distinguished by the presence of species of the class: *Querco-Fagetea*, such as *Carex digitata*, *Viola reichenbachiana* (=*V. sylvestris*), *Melica nutans*, *Corylus avellana*, *Anemone nemorosa*, and *Atrichum undulatum*. By contrast, in Table 12, out of this group only *Melica nutans* proves to be differential for the *Qr-P coryletosum*. Most of the other species of that group have a low constancy or, like *Viola reichenbachiana* and *Anemone nemorosa*, show other site preferences.

Analysis of selected site indicators

Ellenberg indicator values (Fig. 55) vary only slightly between the relevés. They correspond to moderately moist soils (F=5), which are acidic (R=3), poor in nutrients (N=3), while light conditions of the forest floor are favourable for shade-tolerant plants (L=3). Phytocoenoses of *Qr-P molinietosum* are colonized by plants typical of relatively wet and most acidic sites, whereas in the *Qr-P coryletosum* a majority of plants are typical of more fertile sites, less moist and less acidic. A similar picture of the habitat variation of *Querco-Pinetum* is presented by PCA results (Fig. 52a).

Substitute forest communities related to the *Querco roboris-Pinetum*

Two main criteria were used in this study when assigning relevés to the group of substitute forest communities closely related to the *Querco-Pinetum* (Table 12, col. 4 and 5): (1) absence or scanty contribution of differential species for the *Querco-Pinetum*, e.g. *Dicranum polysetum*, *Vaccinium vitis-idaea*, *Hylocomnium splendens* or *Calluna vulgaris* (except *Pleurozium schreberi*, which was often abundant, and *Pseudoscleropodium purum*, which was sometimes abundant); and (2) poor representation of characteristic species of the class *Quercetea robori-petraeae*. Considering the species composition of the whole group of communities (see also Table A35), and the constant participation of *Pleurozium schreberi* and *Vaccinium myrtillus* in the relevés, they belong to the class *Vaccinio-Piceetea*. Probably the patches occupy potential sites of *Querco roboris-Pinetum*. However, it cannot be excluded that at least some of the more fertile communities of this group (Table 12, col. 5) occupy potential sites of acidophilous oak forests, poor oak-hornbeam forests, and perhaps also of thermophilous oak forest. Zerbe (2003) noted that the anthropogenic association *Pleurozio schreberi-Pinetum*, distinguished by him, occupies potential sites of forests from the order *Quercetalia robori-petraeae*. This was supposedly evidenced by the contribution of diagnostic species of that order (*Carex pilulifera*, *Deschampsia flexuosa*, *Polytrichum formosum*, *Veronica officinalis*), and of self sown *Quercus petraea* and *Q. robur*.

This group of communities can be divided into 3 floristically well-defined forms. They correspond to the habitat variation of the association *Querco roboris-Pinetum*. The first form, with *Molinia caerulea* (Table A35, relevé 1) is represented by only one relevé and is not included in Table 12. The typical form includes relevés that are generally poor in species (13-38, mean 20). Their canopy was usually dominated by *Pinus sylvestris*. In the herb layer, facies were usually formed by *Pteridium aquilinum*, *Calamagrostis arundinacea* or *Vaccinium myrtillus*, and rarely also by *Deschampsia*

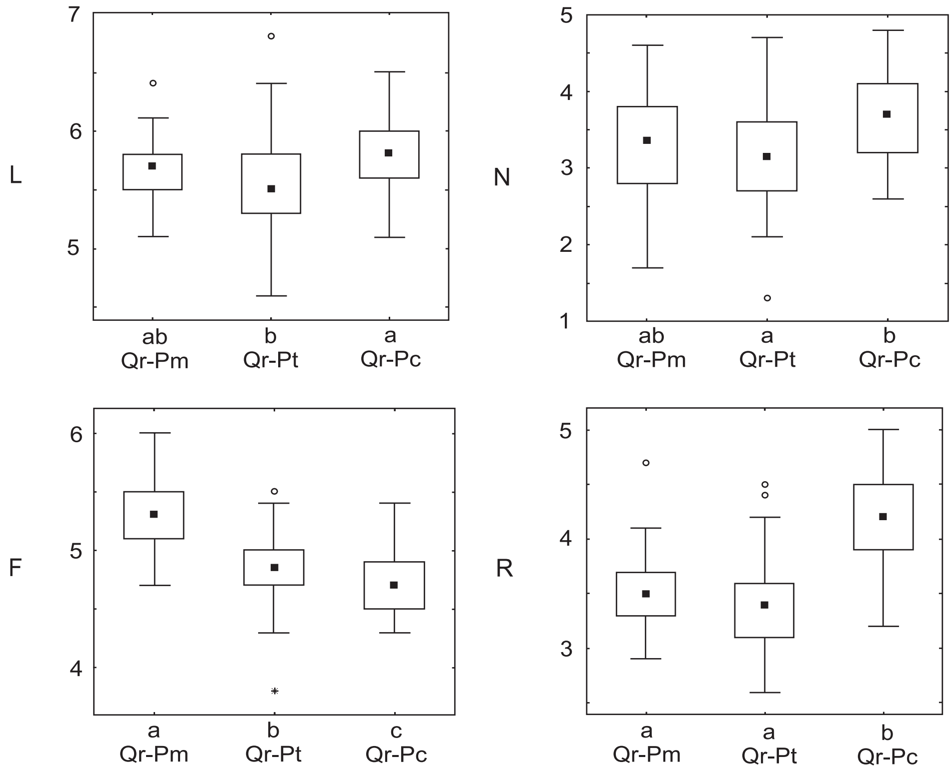


Fig 55. Ellenberg indicator values for subassociations of *Querco roboris-Pinetum*
Explanations: Communities marked with different letters are significantly different (multiple comparison test, $p < 0.05$). Kruskal-Wallis test ($N = 165$), L – light $H = 2078$, $p < 0.001$, F – soil moisture $H = 52.77$, $p < 0.001$, R – soil reaction $H = 63.14$, $p < 0.001$, N – soil productivity $H = 12.55$, $p – 0.0019$. For other explanations, see Fig. 17

flexuosa, *Festuca ovina*, *Calamagrostis epigejos* or *Rubus* sp. The moss layer in several relevés was poorly developed, while in others, well-developed, and most often dominated by *Pleurozium schreberi*. The third form, with *Hypericum perforatum*, is distinguished also by the presence of *Fragaria vesca*, *Moehringia trinervia*, etc., and corresponds to the subassociation *Qr-P coryletosum*. In the relevés representing it, the major component of the tree layer was *Pinus sylvestris*. In most of them, the herb layer was well-developed and dominated by *Vaccinium myrtillus*, *Calamagrostis epigejos*, *Rubus idaeus* or *Pteridium aquilinum*.

6.3.7. *Serratulo-Pinetum* J. M. Mat. 1988 *ex* Brzeg *in* Brzeg *et* M. Wojterska 2004

Basic documentation

The association *Serratulo-Pinetum* in Wielkopolska is located near the western limit of its range. Its patches (Table A36 relevés 1-6) found and documented by Brzeg (2001) are its only localities known so far in this region. According to the cited author, they seem to be natural and even ancient on the Rychwał Plain (Równina Rychwalska). One of the factors maintaining them in the landscape for centuries was extensive livestock grazing. Table A36 includes also relevés documenting phytocoenoses with similar species composition (relevés 7-13). Olaczek (1986), their author, reported that most of them were young *Pinus* stands on potential sites of thermophilous oak forest (relevés 7 and 10-13). These pure *Pinus* stands, planted on former farmland, were subject to grazing, removal of the leaf litter, and uncontrolled felling. The other 2 relevés (8 and 9), according to the cited author, document acidophilous oak forest (named "*Calamagrosti-Quercetum petraeae*"), developed in a natural form on an undoubtedly primeval site (Olaczek 1986).

Distribution

The analysed patches are located in 4 basic ATPOL squares (Fig. 56). According to the geobotanical regionalization of J. M. Matuszkiewicz (1993), these are south-eastern parts of the Central Wielkopolska Region and the north-western part of the Central Małopolska Upland Region (Kraina Wyżyn Środkowomałopolskich).

Vertical structure and species composition

The canopy was dominated by *Pinus sylvestris* in most of the studied relevés. It was composed of 1-2 layers, and its coverage was relatively low, up to 60%. The dominant was sometimes accompanied by single specimens of *Betula pendula*, *Picea abies*, *Quercus robur*, and *Q. petraea*. The last mentioned species was the dominant in one relevé (9). The coverage of the shrub layer, composed mostly of *Juniperus communis* and young *Pinus*, ranged from 0 to 40%. Plants of the herb layer covered 40-90% of plot area. This layer was composed mostly of *Calluna vulgaris*, *Convallaria majalis*, *Festuca ovina*, *Vaccinium myrtillus*, and *V. vitis-idaea*. The moss layer reached a high coverage (20-95%) and was formed by 15 species. Among them, the most abundant was *Pleurozium schreberi*, while *Dicranum polysetum* and *Hylocomium splendens* were also frequent.

In the 13 relevés of *Serratulo-Pinetum*, 148 plant species were recorded, including 18 taxa of bryophytes and lichens. Individual relevés contained 31-64 plant species. Patches of *Serratulo-Pinetum* were much richer in species than relevés of subcontinental mixed coniferous forest *Querco roboris-Pinetum* and of most of the other associations analysed in this study (Fig. 16).

Variation

The studied patches of *Serratulo-Pinetum*, in respect of habitat variation, represent a homogeneous form of this association. Its characteristic species combination was presented above (see p. 42). Presumably, all the relevés in Table A36 represent a degenerated, impoverished floristically form of the association. This results both from the location of the studied plant communities (near the western limit of the distribution range of the association) and from the human impact. Some of them (relevés 1-6) are more similar to untransformed patches, as they contain many characteristic and differential species of the association. In the group of more degenerated communities (relevés 7-13), 2 patches (relevés 8 and 9) include *Quercus petraea*, and thus are apparently related to the association *Serratulo-Quercetum*, described by Pallas (2003).

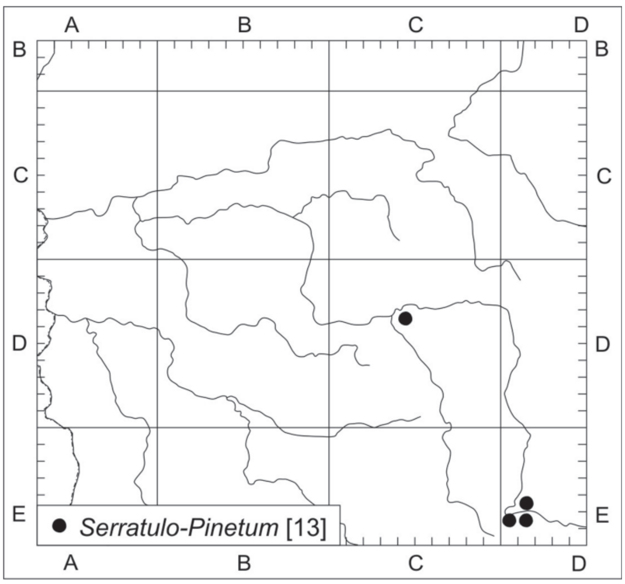


Fig. 56. Distribution of localities of *Serratulo-Pinetum* (number of relevés given in brackets)

6.3.8. Substitute forest communities

Basic documentation

Substitute forest communities were partly discussed above: those occupying potential sites of thermophilous oak forest *Potentillo albae-Quercetum* (Table 11), continental mixed coniferous forest *Querco roboris-Pinetum* (Table 12), or some ill-defined forests from the class *Querco-Fagetea* (Table 10). Here, yet another group of relevés is presented. They cannot be identified with types of natural vegetation even at the class level. These communities, described by 63 relevés collected in Table A37, were usually diagnosed by their authors as the *Pino-Quercetum* (18), substitute forest communities (11), or *Calamagrostio arundinaceae-Quercetum* (11).

Vertical structure and species composition

In many relevés, the canopy was dominated by *Pinus sylvestris* (Table A37, relevés 1-33). In quite many of them (11), this species formed monocultures. In the other relevés, it was accompanied by *Quercus petraea*, *Q. robur* (or their hybrids), *Betula pendula* and, only in single relevés, by *Carpinus betulus* and *Fagus sylvatica*. Only few forest stands were dominated by deciduous trees: *Quercus* spp. (relevés 34-43, and 49-54), or *Betula* spp. (relevés 44-48). Moreover, some of the forest stands were monocultures of *Picea abies*, *Robinia pseudacacia*, and *Larix decidua*. The shrub layer usually did not play any major role. In only several relevés, its coverage reached higher values (40-80%), thanks to abundant *Frangula alnus*, *Picea abies*, *Sorbus aucuparia*, or *Quercus robur*. The studied patches varied also in the coverage of the herb layer, ranging from negligible to 100%. In many relevés, facies were formed, mostly by *Calamagrostis epigejos*, *Pteridium aquilinum*, and *Vaccinium myrtillus*. Bryophytes were absent in numerous relevés. In several relevés, their coverage reached 35-50%, thanks to mosses typical of coniferous forests: *Pleurozium schreberi* or *Pseudoscleropodium purum*.

The documented patches of forest communities were relatively poor in species (6-26, exceptionally 34). Beside *Pinus sylvestris* in the tree layer, a high constancy in the table was reached mostly by forest species with a wider ecological scale (*Dryopteris carthusiana*, *Deschampsia flexuosa*, *Frangula alnus*, *Oxalis acetosella*, *Sorbus aucupria*, and *Quercus robur* in the herb layer) and plants of cleared areas and forest gaps, of the class *Epilobietea angustifolii* (*Calamagrostis epigejos*, and *Rubus idaeus*). Among forest species with a narrower ecological spectrum, only *Vaccinium myrtillus* was recorded more often.

The relevés collected in Table A37 represent unspecific communities, often synusial: *Pinus sylvestris-Vaccinium myrtillus*, *Pinus sylvestris-Deschampsia flexuosa*, *Pinus sylvestris-Calamagrostis epigejos*, *Betula pendula-Frangula alnus* or *Quercus petraea-Calamagrostis arundinacea*. Less numerous relevés are characterized by both short floristic list and sparse vegetation of the forest floor.

7. Discussion

Many issues have already been discussed above. This chapter is focussed on controversial questions whose solutions require further research. These questions concern the syntaxonomy, geographic variation, origin, dynamics, and protection of the studied forest types.

7.1. Syntaxonomy

During the last several dozen years, various concepts of classification of acidophilous oak forests were proposed, but none of them has been widely accepted. Thus it is reasonable to present the system used in this study against the wider, Central European background. This enables its precise justification, especially in the phytogeographic context (Table 13). The proposed concept of classification of acidophilous oak forests is based on an earlier suggestion of Pallas (1996), modified by Brzeg *et al.* (2000a, 2001).

Acidophilous oak forests have been assigned here to the class *Quercetea robori-petraeae*, with the single order *Quercetalia roboris.* The status of the latter syntaxon is widely disputed (e.g. Oberdorfer 1987, 1988, 1992a, 1992b; Pott 1995; Härdtle *et al.* 1997; Dierschke 2004; Härdtle 2004). As shown above (section 5.1), this order is often placed in the class *Querco-Fagetea* (Table 1). According to that classification, the class comprises a vast majority of European deciduous and mixed forests (except *Alnetea glutinosae* and usually also *Salicetea purpureae*), including all forms of beech and oak forests characteristic for Europe. However, that syntaxon is then very heterogeneous and comprises also extremely oligotrophic forms of acidophilous oak forests, which in West Europe correspond to coniferous forests from the class *Vaccinio-Piceetea*, well-developed in the eastern and northern parts of the continent. The contribution of characteristic species of *Querco-Fagetea* in these oak forests is very low. According to the broader definition of the class, it is represented there only by *Quercus petraea*, *Q. robur*, *Anemone nemorosa*, and *Convallaria majalis* (see Oberdorfer 1992a; Härdtle *et al.* 1997). In contrast, W. Matuszkiewicz (2001, see also 2003) concluded that the distinct species composition and site preferences of acidophilous oak forests, as compared to other deciduous forests, justify their inclusion in a separate class, regionally vicariant to coniferous forests. An analysis of Table 1, discussed above, suggests that syntaxonomic decision at the class level is associated neither with geographic region nor with study period, and seems to be a matter of convention. Nevertheless, Pallas (2003) argued that authors' decisions may be affected by the geographic scope of their research, because in north-western Europe the order *Quercetalia roboris* includes a lower contribution of the more demanding deciduous forests than in the southern part of their range. Formally, each syntaxonomic solution is correct. Härdtle *et al.* (1997) presented both versions of phytosociological system placing the order *Quercetalia roboris* either in the class *Querco-Fagetea* or in *Quercetea robori-petraeae*. Confusion is raised, however, when in one publication on European vegetation, the order *Quercetalia roboris* Tx. 1931, defined in the same way, is assigned to the class *Querco-Fagetea* (Bohn 2003) or *Quercetea robori-petraeae* (Pallas 2003). Thus it is advisable to promote consistently only one system.

The first alliance from the order *Quercetalia roboris* (Table 13) is the narrowly defined *Quercion roboris* Malcuit 1929 *em.* Pallas 1996. It includes Atlantic acidophilous oak forests, found in West Europe and Germany. They are not shown in the table because their ranges of distribution do not comprise the area of Poland.

Advocates of the inclusion of the order *Quercetalia roboris* in the class *Querco-Fagetea,* most often place in this order also poor beech forests, as the alliance *Luzulo-Fagion,* parallel to the alliance *Quercion roboris* (Table 1). However, in the present study, the group of poor beech forests is excluded from this order and also from the class *Quercetea robori-petraeae*. This is based on the justification of W. Matuszkiewicz (2001), who consistently assigned acid beech forests to the suballiance *Luzulo-Fagenion*, alliance *Fagion sylvaticae*, order *Fagetalia*, and class *Querco-Fagetea*. He emphasized that such a solution is justified by floristic, ecological, biogeographic, and sylvicultural aspects. Acidophilous beech forests, in their extreme forms, are very poor in species. Frequently, *Fagus sylvatica* is the only species of the class *Querco-Fagetea* playing an important role in them. Moreover, the *Fagus*-dominated forests are very shaded, which is unfavourable for many light-demanding species typical for acidophilous oak forests (Härdtle *et al.* 2003, 2005). The poor beech forest *Deschampsio flexuosae-Fagetum* (=*Luzulo pilosae-Fagetum*) is distinguished by the absence or negligible contribution of those species (*Pteridium aquilinum*, *Hieracium umbellatum*, *H. laevigatum*, *H. sabaudum*, *Lathyrus montanus*, etc.). W. Matuszkiewicz & A. Matuszkiewicz (1973) considered it as a significant feature differentiating between the 2 groups of communities.

Thus acidophilous beech forests are poor in species of both the *Querco-Fagetea* and *Quercetea robori-petraeae*, but their inclusion in the *Querco-Fagetea*, maintains the coherence of beech forests in the syntaxonomic system.

The classification proposed here accepts also the above-mentioned proposal to separate from the alliance *Quercion roboris* Malcuit 1929 the narrowly defined alliances *Agrostio capillaris-Quercion* Scam. *et* Pass. 1959 *em*. Brzeg, Kasprowicz *et* Krotoska 2001 and *Dicrano scoparii-Quercion roboris* Pass. 1968 (Brzeg *et al.* 2000a, 2001; Brzeg & Kasprowicz 2001). In comparison to the initial concept of Pallas (1996), the *Agrostio capillaris-Quercion* is more broadly defined here, i.e. including the alliances *Molinio caeruleae-Quercion roboris* and *Vaccinio myrtilli-Quercion*. Previously, the alliance defined in this way was named *Vaccinio myrtilli-Quercion* (Brzeg *et al.* 2000a). Brzeg *et al.* (2001) renamed it as *Agrostio capillaris-Quercion* and precisely described the alliance (defined as in the present study), presenting the nomenclatural type (lectotype) of this syntaxon, a list of its synonyms and pseudonyms, and a list of characteristic and geographically differential species (see Table 13). The alliance comprises acidophilous oak forests distributed in the northern and eastern Central European (i.e. sub-boreal-sub-continental) parts of the range of the class *Quercetea robori-petraeae*. Thus the alliance embraces most of acidophilous oak forests found in Poland: the *Betulo pendulae-Quercetum roboris*, *Calamagrostio arundinaceae-Quercetum petraeae* (incl. *Fago-Quercetum petraeae* R.Tx. 1955 *nom. inval.*), *Molinio caeruleae-Quercetum roboris*, and *Molinio arundinaceae-Quercetum roboris*.

The alliance *Dicrano scoparii-Quercion roboris* Pass. 1968 includes oak forests rich in lichens and mosses, and its geographic distribution is azonal. In Poland it is represented by 2 poorly studied associations. The first one, *Aulacomnio androgyni-Quercetum roboris*, has been described relatively recently (Brzeg *et al.* 2000a), and its phytosociological documentation is poor. The second one, *Cladonio portentosae-Quercetum petraeae*, included in the regional (Brzeg & Wojterska 2001) and national (Ratyńska *et al.* 2010) lists of plant communities, was only announced by Brzeg & Kasprowicz (2001), and its basic documentation has not been published so far.

The last association of acidophilous oak forest, the *Luzulo luzuloidis-Quercetum petraeae*, undoubtedly found in Poland, represents the alliance *Hieracio lachenalii-Quercion petraeae* Pallas 1996 (=*Genisto germanicae-Quercion roboris* R. *et* Z. Neuh. 1967 *nom. inval.*). The alliance is a vicariant of the *Agrostio capillaris-Quercion*, and of the Atlantic *Quercion roboris*, and comprises moderately thermophilous, acidophilous oak forests found in the submontane-upland, southern and south-eastern parts of the Central European range of communities of the class *Quercetea robori-petraeae*. Table 13 does not show other associations of this alliance, reported from the Czech Republic and Slovakia, where this syntaxon has its centre of distribution, namely the *Vaccinio vitis-idaeae-Quercetum* Oberd. 1957, *Viscario-Quercetum* Stöcker 1965, *Genisto germanicae-Quercetum roboris* Aichinger 1933, *Festuco ovinae-Quercetum roboris* Šmarda 1961 (Neuhäuslová 2001; Jarolímek *et al.* 2008). According to both cited publications, the alliance includes also the association *Molinio arundinaceae-Quercetum roboris*, but according to the classification proposed in the present study, it must be assigned to the alliance *Agrostio capillaris-Quercion* (see Table 13).

The system presented above applies to Central Europe and is supported by a rich documentation. The eastern part of the range of acidophilous oak forests from the class *Quercetea robori-petraeae* still needs to be studied. Results of research conducted in recent years in Ukraine move the eastern limit of distribution of those forests markedly outside Central Europe (see section 5.1). Thus it can be assumed that acidophilous oak forests of the alliance *Agrostio capillaris-Quercion* are found at least in north-western Ukraine. Probably this area includes also localities of 2 associations known from Central Europe, i.e. the *Calamagrostio arundinaceae-Quercetum* and *Molinio caeruleae-Quercetum*.

7.2. Geographic diversity

The study area is located in the intermediate zone between the western sub-Atlantic region and the eastern sub-continental region, so it could be expected that this would be reflected in the distribution of localities of the studied plant associations. An analysis of the maps of their distribution, presented above, does not confirm this assumption in the case of localities of the association *Calamagrostio arundinaceae-Quercetum* (Figs. 26f and 30-33), which is the most widespread acidophilous oak forest type in Wielkopolska. Localities of this association (and its subassociations) in the study area do not show any density gradient in the east-west direction. This applies both to well-preserved communities and those showing slight symptoms of degeneration (Fig. 26f) or those classified as stages II and III of degeneration (Figs. 32-33). A detailed analysis did not reveal any significant floristic differences in geographic distribution of *Calamagrostio arundinaceae-Quercetum*, either. By contrast, such differences are noticeable among localities and phytocoenoses of the association *Querco roboris-Pinetum*, which in the study area is found in its marginal, northernmost localities.

Maps of distribution of localities of subassociations of *Querco roboris-Pinetum* (Fig. 51) show that patches of *Qr-P molinietosum* and *Qr-P coryletosum* are located mostly in the eastern part of the study area. As shown above (p. 82 in section 6.3.6), in Wielkopolska the relevés of the latter subassociation are characterized by a smaller contribution of species of the class *Querco-Fagetea*, as compared to the relevés documenting the subassociation in central and eastern Poland (Matuszkiewicz J. M. 1988). The cited author emphasized that the documentation of the subassociation *Querco roboris-Pinetum coryletosum* probably includes some relevés recorded in anthropogenic communities on potential sites of poorer oak-hornbeam forest. His hypothesis was confirmed in many later studies reporting that patches of „*Pino-Quercetum*" are spontaneously transformed into mesophilous woods (Medwecka-Kornaś & Gawroński 1990; Michalik 1991; Mitchell & Cole 1998; Woziwoda 2002; Brzeziecki 2008). Thus it can be assumed that the contribution of species of the class *Querco-Fagetea* in the table 1 of this subassociation, presented by J.M. Matuszkiewicz (1988), is overestimated to some extent. Nevertheless, in the relevés of *Qr-P coryletosum* presented here, the canopy is dominated by *Pinus sylvestris*, while the contribution of deciduous trees is relatively low. This undoubtedly results from forest management and causes a decrease in the contribution of also other plants of mesophilous broadleaved forests. It is impossible to determine the natural species composition of this association, as most or even all of its phytocoenoses have been markedly modified by human interference. To some extent, its reconstruction can be partly based on an analysis of mixed coniferous forests in areas where woods from the class *Vaccinio-Piceetea* find optimum sites and mesophilous broadleaved forests from the class *Querco-Fagetea* are near the limit of their range. In comparison with their counterparts in Central Europe, mixed coniferous forests in e.g. Lithuania and southern Finland are characterized by a richer representation of characteristic species of the classes *Vaccinio-Piceetea* and *Querco-Fagetea* (see also Čiuplys 2004; Kasprowicz & Wojterska 2004). Thus the decrease in contribution of species of both the classes in mixed coniferous forests, progressing towards the western limit of distribution of communities from the class *Vaccinio-Piceetea*, and especially of the alliance *Dicrano-Pinion*, may be natural phenomenon. However, in many cases, it is distorted by forest management, which commonly favoured *Pinus sylvestris* until recently.

7.3. Vegetation dynamics

Individual species of trees significantly affect soil-forming processes, cycling of elements, organic matter decomposition, and productivity of ecosystems. This issue has been studied for a long time (e.g. Binkley & Giardina 1998; Augusto *et al*. 2002; Hobbie *et al*. 2006; Jacob *et al*. 2010). Results of research conducted in an experimental plot established in 1970-1971, in a clear-cut area of an about 80-year-old pine monoculture (Szymański 1982) show that individual species of trees forming pure stands have a very significant, specific influence on environmental conditions, observed within a relatively short time. A detailed description of that experimental plot, and results of various studies conducted there, can be found, for example, in a paper by Knight *et al*. (2008). The phytosociological data presented below in 2 relevés (Kasprowicz unpubl. data), collected in 2 parts of that plot, show very significant floristic differences between spontaneous plant communities developed under the canopy of *Quercus*. After 36 years, a relatively rich plant community developed in the young oak stand. Its species composition clearly indicates that it represents the acidophilous oak forest *Calamagrostio arundinaceae-Quercetum*. A similar species composition was recorded in 2 other patches, developed under the canopy of *Quercus robur* in a potential site of a mixed deciduous forest (labelled by Polish foresters as LMśw). After the same 36-year period, at initially identical environmental conditions, only 12 species were recorded under *Fagus*, i.e. about a quarter of the number of species recorded under *Quercus*. The plant community with *Fagus* includes hardly any diagnostic species, so it is a substitute forest community. This comparison clearly illustrates the above-mentioned differences in habitat-forming features of *Quercus* and *Fagus*, manifested not only in the very different light conditions under the canopy of each species (Knight *et al*. 2008), but also in litter production and soil properties (Reich *et al*. 2005).

Calamagrostio arundinaceae-Quercetum (Plot No. 11, 10.07.2006 (a 65%, b 0.5%, c 40%, d 15%, 225 m^2, 44 species): Ch. Ass.: *Hieracium lachenalii* +, *H. sabaudum* r; Ch. et D. *Quercetea robori-petraeae*: *Carex pilulifera* 2, *Dicranella heteromalla* +, *Holcus mollis* 2, *Lophocolea heterophylla* +, *Polytrichastrum formosum* +, Ch. *Querco-Fagetea: Acer platanoides* c +, *A. pseudoplatanus* b +, c 1, *Atrichum undulatum* 2, *Fagus sylvatica* c r, *Poa nemoralis* +, *Tilia cordata* b +, c 1; *Viola riviniana* 2; Ch. *Molinio-Arrhenatheretea*: *Juncus effusus* r, *Poa pratensis* +, *Taraxacum officinale* r; Ch. *Calluno-Ulicetea*: *Agrostis capillaris* 1, *Carex ovalis* +, *Luzula multiflora* +, *Veronica officinalis* +. Others: *Quercus robur* a 4, c +, *Brachythecium rutabulum* +, *Calamagrostis epigejos* +, *Conyza canadensis* +, *Fallopia convolvulus* +, *Frangula alnus* c +, *Kindbergia praelonga* +, *Larix decidua subsp. decidua* c r, *Moehringia trinervia* 2; *Padus serotina* b +, c +, *Plagiomnium affine* 2, *Poa palustris* +, *Pseudotsuga menziesii* c r, *Rubus corylifolius* +, *R. idaeus* +, *R. pedemontanus* 1, *R. seebergensis* +, *Rubus sp.* +, *Rumex acetosella* r, *Sambucus nigra c* +, *S. racemosa* c r, *Sciuro-hypnum oedipodium* +, *Sorbus aucuparia* c +.

Substitute forest community (Plot No. 13, 10.07.2006 (a 95%, c +, d +, 399 m^2, 12 species): Ch. *Querco-Fagetea*: *Fagus* *sylvatica* a 5, *Acer pseudoplatanus* c +, *Atrichum undulatum* +; Ch. *Calluno-Ulicetea*: *Pohlia nutans* +. Others: *Brachythecium albicans* r, *Ceratodon purpureus* +, *Conyza canadensis* r, *Fallopia convolvulus* r, *Moehringia trinervia* r, *Padus serotina* c r, *Quercus robur* c r, *Q. rubra* c r.

In all the communities analysed here, the canopy was composed of a small number of species. The mean number was the lowest in patches of *Aulacomnio androgyni-Quercetum*, *Serratulo-Pinetum*, *Calamagrostio arundinaceae-Quercetum*, and *Potentillo albae-Quercetum* (Fig. 16). In relevés of the last 2 mentioned associations, the canopy was usually one-layered, dominated by *Quercus* sp. (*Q. petraea* or *Q. robur*, Figs. 34 and 48), and in many communities it consisted of only one species. Thus, considering also the above evidence of the habitat-forming role of *Quercus*, it can be hypothesized that existence of these communities is determined by the *Quercus*-dominated canopy. The hypothesis is commonly accepted in relation to the *Potentillo-Quercetum*. In this context, the question of naturalness of oak forest stands is particularly important. Undoubtedly, in the past, many oak forests were intensively utilized (mostly through livestock grazing and raking of leaf litter), and the dominance of oak trees in the present forest stands is an intentional or side effect of forest management, which was already discussed in chapter 2. Neuhäusl & Neuhäuslová-Novotná (1967) came to a conclusion that in European lowlands, no ancient oak woodland unaffected by human activity has been preserved, so “the classification of acidophilous oak forests and mixed forests with oak is somewhat hypothetical and based only on a comparison of cultural modifications initial associations”. Results of later studies, cited above, not only confirmed this opinion but some of them also indicate that acidophilous oak forests are secondary communities (see section 5.2). Anthropogenic origin of oak forest stands seems to be additionally confirmed by the commonly observed lack of effective natural regeneration of both major *Quercus* species (*Q. petraea* and *Q. robur*) in oak woodlands. Thus it cannot be excluded that not only thermophilous oak forest, as argued recently by J. M. Matuszkiewicz (2007b), but also acidophilous oak forests are semi-natural communities, dependent on both natural conditions and human activity. However, it is also probable that human impact disturbed to a large extent a still unknown natural mechanism of functioning of oak forest ecosystems, as apparently evidenced by recent reports on spontaneous regeneration of *Quercus* under the canopy of pine forests (see chapter 2) or on fenced plots (as observed e.g. in oak forests on the Krotoszyn Plateau).

If the hypothesis about the anthropogenic origin of acidophilous oak forests and their secondary character was accepted, then it would be necessary to determine the corresponding type of potential natural vegetation or initial community. For oak forests distributed within the range of *Fagus*, it could be acidophilous beech forest. This diagnosis is justified by the gradual replacement of acidophilous oak forests by beech forests, commonly observed in the last few decades. Many authors cited above (chapter 2), regard it as a symptom of regeneration of beech forests earlier replaced by foresters with oak forest stands. A similar opinion was earlier expressed by J. M. Matuszkiewicz (2007a, 2007c, see section 5.2.1) in relation to the decreasing area of patches of *Fago-Quercetum* and *Luzulo luzuloidis-Quercetum*. In areas located outside the range of distribution of *Fagus*, no such clear directional changes are recorded in acidophilous oak forests. Their patches there, also those protected as nature reserves, seem to be stable. In the study area their species composition is highly variable, because of the wide range of sites occupied by them. The poorest communities among them are moist, closely related to coniferous forests from the class *Vaccinio-Piceetea*. The richest ones (within the class *Quercetea robori-petraeae*) are similar to deciduous forests from the class *Querco-Fagetea* (oak-hornbeam forests and thermophilous oak forests). These features seem to indicate the natural character of those communities. Utilization of oak forests, practiced for centuries, could lead to strong, sometimes irreversible soil degradation (see Walentowski & Scheuerer 2004). Thus it cannot be excluded that some patches of acidophilous oak forests colonize disturbed sites of poorer forms of oak-hornbeam forest. However, it seems unlikely that this mechanism is responsible for the genesis of acidophilous oak forests, regarded as a forest ecosystem type.

The questions discussed above require further research on permanent fenced plots, excluded from direct human impact and located throughout the distribution range of communities from the class *Quercetea robori-petraeae*. It would be particularly interesting to determine the role of various tree species in shaping and functioning of acidophilous oak forests. This applies not only to *Quercus* spp. (*Q. petraea*, *Q. robur*), and *Fagus sylvatica*, but also to *Carpinus betulus*, *Pinus sylvestris*, *Betula pentula*, *B. pubescens*, and *Populus tremula*.

7.4. Nature protection

All associations of acidophilous oak forests were classified both in Wielkopolska and generally in Poland as threatened communities: vulnerable (V) or of indeterminate threat (I) (Brzeg & Wojterska 2001; Ratyńska *et al*. 2010). However, in the Polish NATURA 2000 network, among communities from the class *Quercetea robori-petraeae*, only the Pomeranian acidophilous birch-oak forest *Betulo pendulae-Quercetum* *roboris* is protected[9]. This association is in Poland the only identifier of habitat 9190 ("old acidophilous oak woods with *Quercus robur* on sandy plains") according to the Decrees of the Minister of Environment (Regulation... 2005, 2010). These Decrees are based on an interpretation of that unit for the purposes of Natura 2000 by Danielewicz & Pawlaczyk (2004a). As shown above (see section 5.2.1), the definition of this association proposed by the cited authors, in relation to its habitat variation, is controversial. However, the map of distribution of *Betulo-Quercetum*, presented in the cited publication, does not raise any doubts. The association is found exclusively in the narrow coastal zone (a few dozen km away from the sea coast). The cited authors claim that their interpretation of habitat 9190 is consistent with its definition presented in the Interpretation Manual of Europaean Union Habitats. So far in Poland (updated in March 2011), habitat 9190 has been recorded in 154 Special Areas of Conservation, and in one Special Protection Area (http://natura2000.gdos.gov.pl)/. In all their Standard Data Forms (SDFs) (available exclusively in Polish), habitat 9190 is named "Pomeranian birch-oak forest (*Betulo-Quercetum*)". However, only about 25 of them are situated within the potential range of distribution of the association. All the others are located in western Poland, from Pomerania to lower altitudes in the Western Sudetes, where the *Betulo-Quercetum* (at least as defined in Poland and West Europe, see section 5.2.1) is certainly absent. This error is partly corrected in the descriptive section of SDFs, whose authors listed names of recorded associations of acidophilous oak forests, but this was the case in only 12 SDFs. The major cause of the confusion is Annex 1 to Decision no. 5 of Director-General of the State Forests of 30 January 2007, about inventories of habitats and plants. The Annex recommends to include in habitat 9190 "all acid oak forests (*Calamagrostio-Quercetum*, *Molinio-Quercetum*, *Fago-Quercetum*, *Luzulo-Quercetum*), and not only the Pomeranian *Betulo-Quercetum*". The text of the Annex also emphasized that the Decree of the Minister of Environment of 2005 would be corrected. That Decision formed a basis for the work of special expert teams whose goals included the verification of habitats at the existent Natura 2000 sites.

In conclusion, considering the current Decree of the Minister of Environment of 2010, all the areas where habitat 9190 was recorded need to be verified soon. Perhaps it will be necessary to remove the information about habitat 9190 from most of the SDFs. Undoubtedly, however, for more effective nature conservation, not only in Poland but also in Europe, it would be favourable to change the above-mentioned Decree and classify as habitat 9190 all acidophilous oak forests from the class *Quercetea robori-petraeae* found in Poland.

[9] Forms of *Betulo-Quercetum* and of *Fago-Quercetum* which developed on coastal dunes were assigned to the habitat 2180 (Namura-Ochalska 2004)

8. Conclusions

1. The 1655 vegetation relevés analysed in this study were recorded in patches of acidophilous oak forests from the class *Quercetea robori-petraeae* or closely related forest communities from the classes *Querco-Fagetea* and *Vaccinio-Piceetea*. These numerous relevés were selected from 59 published or unpublished studies conducted in the Wielkopolska region and adjacent areas, so this is the first such a large-scale comparison of this group of plant communities.
2. A detailed analysis of the major concepts of classification of acidophilous oak forests from the order *Quercetalia roboris* (Table 1) allowed correction of the previous solutions. The resultant coherent system of classification of these communities in Central Europe is shown in Table 13.
3. The classical phytosociological methods, along with multivariate ordination (DCA and/or PCA) and analyses taking into account Ellenberg indicator values, were used to determine the range of habitat variation of the studied communities and following subdivision (subassociations, variants).
4. The analysis of species composition and vertical structure allowed identification of the major floristic and structural features that distinguish well-developed forms of the studied associations from their degenerated forms and substitute forest communities.
5. The distribution of the documented localities of all associations and subassociations in the study area is presented in cartograms on the ATPOL grid. For many syntaxa, this is the first cartographic presentation of their ranges of distribution in Wielkopolska. The range of distribution of *Calamagrostio arundinaceae-Quercetum*, analysed earlier by J. M. Matuszkiewicz (1988, 2001a) as well as W. Matuszkiewicz & J. M. Matuszkiewicz (1996), is expanded and presented in greater detail here.
6. In the study area, phytocoenoses of 7 plant associations of this group of forest communities were recorded (Fig. 57). These include: (a) acidophilous oak forests from the class *Quercetea robori-petraeae*, namely *Aulacomnio androgyni-Quercetum roboris* Brzeg *et* Kasprowicz *in* Brzeg *et al.* 2000, *Molinio caeruleae-Quercetum roboris* (R. Tx. 1937) Scam. *et* Pass. 1959 *em.* Brzeg, Kasprowicz *et* Krotoska 1989, and *Calamagrostio arundinaceae-Quercetum petraeae* (Hartm. 1934) Scam. *et* Pass. 1959 *em.* Brzeg, Kasprowicz et Krotoska 1989; (b) closely related oak forests from the class *Querco-Fagetea*,

namely acidophilous forms of the oak-hornbeam forest *Galio sylvatici-Carpinetum* and the thermophilous oak forest *Potentillo albae-Quercetum*; and (c) mixed coniferous forests from the class *Vaccinio-Piceetea*, namely *Querco roboris-Pinetum* and *Serratulo-Pinetum*).

7. The analysed and revised syntaxa are described here in accordance with the International Code of Phytosociological Nomenclature (Weber *et al*. 2000). Considering the priority principle, authors of descriptions of the considered syntaxa are given (to the level of subassociations), and their major synonyms are listed. Nomenclatural types are designated here for 2 subassociations of Central European oak-hornbeam forest *Galio sylvatici-Carpinetum*, namely the *Gs-C calamagrostietosum arundinaceae* Preising 1943 *ex* Traczyk 1962, and *Gs-C holcetosum mollis* Preising 1943 *ex* Krotoska 1966, and for 3 subassociations of thermophilous oak forest *Potentillo albae-Quercetum*: *Pa-Q typicum* Preising 1943 *ex* W. *et* A. Mat. 1956 and 2 subassociations new to science: the *Pa-Q molinietosum* Brzeg *et* Kasprowicz 2001 *ex* Kasprowicz 2010 *subass. nova* and *Pa-Q brachypodietosum pinnati* M. Wojterska *et* Wiszniewska 1996 *ex* Kasprowicz 2010 *subass. nova*). No nomenclatural types are designated for the association *Galio sylvatici-Carpinetum*, its subassociations *Gs-C lathyretosum verni* Preising 1943 *ex* Krotoska 1966, *Gs-C typicum* Oberd. 1957, and subassociations of the mixed coniferous forest *Querco roboris-Pinetum* (the *Qr-P molinietosum* J.M. Mat. 1988 *nom. inval.*, *Qr-P typicum* J.M. Mat.1988 *nom. inval.*, and *Qr-P coryletosum* J.M. Mat. 1988 *nom. inval.*), because these syntaxa are not represented in the collected set of relevés by their most typical forms. For the *Galio sylvatici-Carpinetum*, this results from the applied selection criteria (limitation to acidophilous forms), whereas for the *Querco roboris-Pinetum*, from the location of the study area at the edge of its distribution range.
8. This study shows that the analysed associations can be subdivided into 16 subassociations and 23 variants. In some cases, an analysis of large sets of relevés confirmed and validated some of the earlier defined syntaxa of various ranks, including alliances (*Agrostio capillaris-Quercion* and *Dicrano scoparii-Quercion roboris*), associations (*Aulacomnio androgyni-Quercetum*, and *Molinio caeruleae-Quercetum*) or subassociations and/or variants of *Calamagrostio arundinaceae-Quercetum*, *Galio sylvatici-Carpinetum*, *Potentillo albae-Quercetum*, and *Querco roboris-Pinetum*.
9. The presented results confirm the preliminary diagnoses of Brzeg *et al.* (1998, 2000) as well as Brzeg & Kasprowicz (2001), who reported that patches of *Aulacomnio androgyni-Quercetum roboris* and *Molinio caeruleae-Quercetum roboris* are rare in the study area. Their subdivision proposed in the cited articles, based on ecological variation, is maintained here. It is additionally justified by results of statistical tests of their relevés, taking into account Ellenberg indicator values. Among the considered forest communities from the classes *Quercetea robori-petraeae* and *Querco-Fagetea*, these associations are distinguished by the lowest soil reaction value, which makes them similar to the *Querco roboris-Pinetum*. They share with mixed coniferous forests also a low species diversity of the herb layer (including species of old deciduous forests) and the medium continentality index (intermediate between weakly sub-Atlantic and weakly subcontinental). The *Molinio caeruleae-Quercetum* has the highest soil moisture value (which indicates the wettest sites), as compared to all the other considered associations.
10. Clear separation of degenerated forms (at stages I, II, and III of degeneration, as defined by Faliński 1966), as well as of substitute forest communities, allowed a clearer classification of the studied syntaxa. The best example is the separation of the *Molinio caeruleae-Quercetum* from the *Calamagrostio arundinaceae-Quercetum molinietosum.*
11. This study shows that the association *Calamagrostio arundinaceae-Quercetum* is represented in the study area exclusively by its Wielkopolska race and it is common there. As many as 792 relevés (48% of all the analysed relevés) have been assigned to the association in this study (Fig. 57). However, most of them (476) are degenerated patches. Previously, only 79 relevés were identified as degenerated forest stands of this association.
12. The presented results confirm a clear habitat variation of *Calamagrostio arundinaceae-Quercetum*, in respect of both moisture (subassociations: the *Ca-Q molinietosum*, *Ca-Q typicum*, and *Ca-Q polygonatetosum*) and fertility (variants: typical and with *Anemone nemorosa*), reported earlier by Brzeg *et al.* (2001) as well as Brzeg and Kasprowicz (2001) but on the basis of a much smaller set of relevés. This study shows that the variation is noticeable also among degenerated forms, even among communities representing stage III of degeneration. The variation can be noticed easily in field conditions. Only 12 relevés (out of the total number of 792 relevés of the association) have mixed floristic features, of both the *Ca-Q molinietosum* and *Ca-Q polygonatetosum*. The analysed subassociations and variants of the association significantly differ in Ellenberg indicator values.
13. Individual subassociations of *Calamagrostio arundinaceae-Quercetum* differ in frequency. This

is most noticeable among untransformed communities and among those in stage I of degeneration. The *Ca-Q molinietosum* (20 and 23 localities, respectively) was much rarer than the other 2 subassociations: the *Ca-Q typicum* (36 and 40 localities) and *Ca-Q polygonatetosum* (52 and 40 localities).

14. This study did not confirm the presence of *Ca-Q scorzoneretosum humilis* Grosser 1964 and *Pyrolo secundae-Quercetum petraeae* Pass. 1957 in the study area. All the relevés from Wielkopolska that were included in the tables of those associations by Pallas (1996) in fact represent the *Calamagrostio arundinaceae-Quercetum*. This is consistent with the initial diagnoses made by authors of the relevés (Fabiszewski & Faliński 1967; Krotoska 1978). Relevés misidentified as the *Ca-Q scorzoneretosum* are classified here as stage I of degeneration of *Ca-Q typicum* in the typical variant, while those misidentified as the *Pyrolo-Quercetum*, represent in fact the *Ca-Q polygonatetosum* in the typical variant, partly in stage I of degeneration.

15. The documented acidophilous oak-hornbeam forests are represented in the study area by 2 subassociations of Central European oak-hornbeam forest: the *Galio sylvatici-Carpinetum holcetosum mollis* (105 relevés) and *Gs-C calamagrostietosum arundinaceae* (9 relevés). These syntaxa correspond to a more broadly defined subassociation *Gs-C polytrichetosum*, described by W. Matuszkiewicz & A. Matuszkiewicz (1985). This study shows that the *Gs-C holcetosum mollis* can be subdivided into 3 earlier unknown variants: with *Lysimachia vulgaris* (corresponding to the subassociation *Gs-C holcetosum*, as defined by Krotoska 1966), typical, and with *Solidago virgaurea*. The *Gs-C holcetosum mollis* in the variant with *Lysimachia vulgaris* can develop in 2 trophic subvariants: typical or with *Pulmonaria obscura*. The latter subvariant is the most fertile form of this subassociation, similar to *Gs-C typicum*.

16. The subassociation *Gs-C calamagrostietosum* is very poorly studied, represented by only 9 relevés from the Krajna Lakeland (Pojezierze Krajeńskie) (Boiński 1973), and requires further research. The cited author defined the subassociation more broadly, as he included in it also relevés classified here as the *Gs-C lathyretosum verni*.

17. The presented results confirm the concept of Brzeg & Kasprowicz (2001), summarizing earlier hypotheses of Jakubowska-Gabara (1993) as well as Wojterska & Wiszniewska (1996), about the ecological variation of the association *Potentillo albae-Quercetum*. This study shows that the 3 subassociations conditioned by soil moisture content (*Pa-Q molinietosum*, *Pa-Q typicum*, and *Pa-Q brachypodietosum pinnati*), distinguished by those authors, must be supplemented with the *Pa-Q astrantietosum*. In the study area, the *Pa-Q brachypodietosum* was the most frequent among them. Its patches developed in 3 trophic variants: with *Pleurozium schreberi*, typical, or with *Asarum europaeum*.

18. Results of this study do not support the hypothesis of Jakubowska-Gabara (1993) that as a result of regression, patches of the thermophilous oak forest *Potentillo albae-Quercetum* can be gradually transformed into the *Calamagrostio-Quercetum*. The present study shows that in both localities investi-

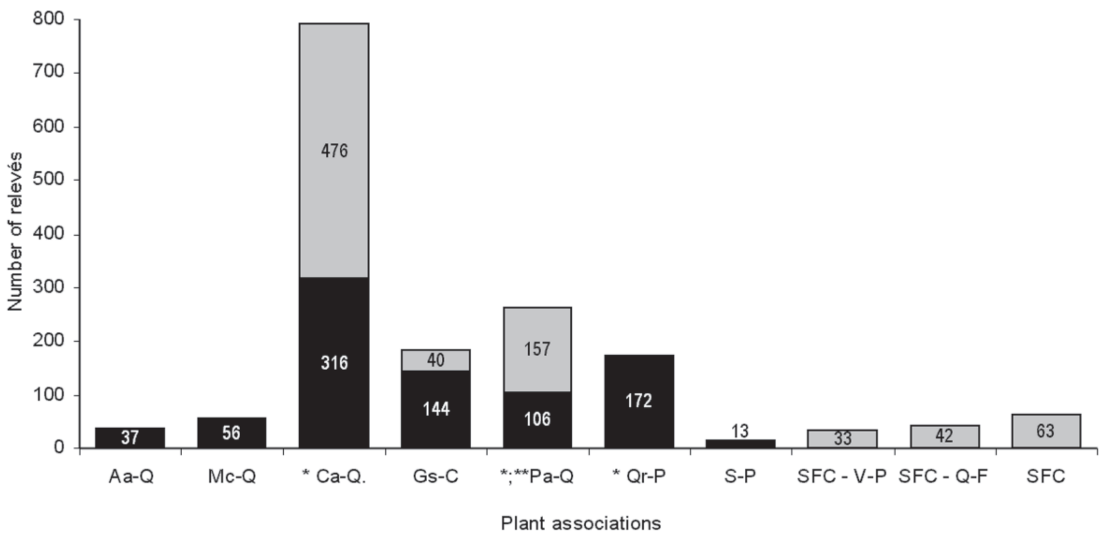


Fig. 57. Numbers of relevés assigned to major plant associations in this study
Explanations: black – untransformed communities, grey – degenerated or substitute forest communities (SFC), * untransformed communities include complexes of *Ca-Q molinietosum/polygonatetosum* (12 relevés), *Pa-Q astrantietosum/molinietosum* (8), *Qr-P molinietosum/coryletosum* (7), ** – degenerated communities include 13 relevés of *Pa-Q* of Wojterska & Wojterski (1953) and 56 relevés classified as substitute forest communities (SFC) on potential sites of *Pa-Q*; further explanations in the text

gated by the cited author in the Zielonka Forest near Poznań, the analysed communities still represent the class *Querco-Fagetea*. Thus the available literature does not include any documented examples of transformation of patches of the *Potentillo albae-Quercetum* into the *Calamagrostio arundinaceae-Quercetum* or other communities from the class *Quercetea robori-petraeae*.

19. The continental mixed coniferous forest *Querco roboris-Pinetum* is represented in the study area by all its known subassociations conditioned by ecological variation. The most widespread is *Qr-P typicum*, found in 28 localities, while the *Qr-P coryletosum* and *Qr-P molinietosum* were recorded in 19 and 13 localities, respectively.
20. The phytosociological documentation of subassociations of *Querco roboris-Pinetum* has been greatly enriched in this study. So far, most researchers in the study area did not take into account this aspect in their publications. Despite this, only 7 of the 172 relevés identified here as this association were recorded in mixed or intermediate patches.
21. Most of the moisture-demanding associations (or subassociations) are distributed chiefly in the southern part of the study area. This part is located outside the range of the last glaciation (Vistulian), and is characterized by higher precipitation. Such a distribution pattern is typical for the *Aulacomnio androgyni-Quercetum*, *Molinio caeruleae-Quercetum*, *Calamagrostio arundinaceae-Quercetum molinietosum*, and *Galio sylvatici-Carpinetum holcetosum mollis* in the variant with *Lysimachia vulgaris*. According to the geobotanical regionalization of J. M. Matuszkiewicz (1993, 2008a), their localities are found mainly within the South Wielkopolska Subregion. The first 2 of them, and to a lesser extent also the *Ca-Q molinietosum*, are concentrated within the Krotoszyn Plateau, and can be regarded as characteristic for the Kalisz Plateau, which is part of that Subregion. Also most of localities of the moist mixed coniferous forest *Querco roboris-Pinetum molinietosum*, are situated south of the limit of the last glaciation. Like localities of *Qr-P coryletosum*, they are concentrated in the eastern part of the study area.
22. An analysis of 318 relevés identified by their authors as the association *Pino-Quercetum* revealed their heterogeneity. According to the adopted syntaxonomic criteria, these relevés represent 5 plant associations as well as substitute forest communities (Fig. 58). These include:
    - *Calamagrostio arundinaceae-Quercetum* – most of the 125 relevés (92) represent stage I (45), II (34), or III (13) of degeneration. Untransformed patches are documented by 30 relevés, while another 3 were recorded in intermediate or mixed communities of 2 subassociations: the *Ca-Q molinietosum* and *Ca-Q polygonatetosum*. The best documented subassociation was the *Ca-Q molinietosum* (53 relevés, including 15 of untransformed communities and 38 of degenerated ones). *Ca-Q typicum* was represented by 44 relevés (10 and 34 relevés, respectively), while the *Ca-Q polygonatetosum*, by only 25 relevés (5 and 20 relevés, respectively).
    - *Querco roboris-Pinetum* – 122 relevés have been classified as this association. These include 20

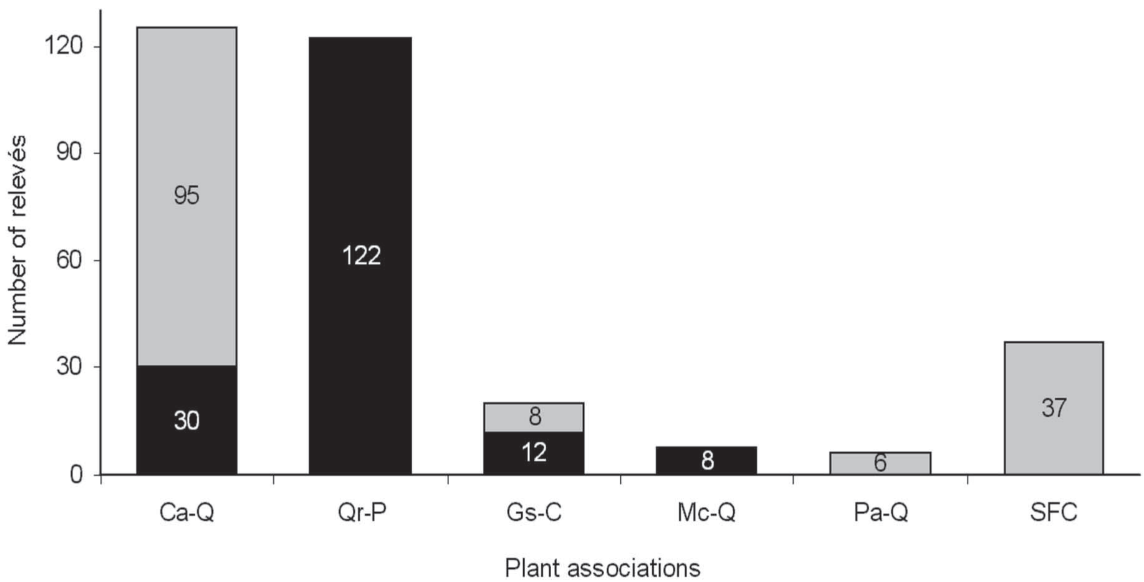


Fig. 58. Proper classification of 318 relevés originally identified as *Pino-Quercetum*
Explanations: black – untransformed communities, grey – degenerated or substitute forest communities (SFC); further explanations in the text

of *Qr-P molinietosum*, 65 of *Qr-P typicum*, 35 of *Qr-P coryletosum*, and 2 of mixed *Qr-P molinietosum*/*Qr-P coryletosum*.

- *Galio sylvatici-Carpinetum* – Central European oak-hornbeam forest is represented here by 20 relevés, earlier classified as the *Pino-Quercetum*. All of them were recorded in patches of *Gs-C holcetosum mollis* in the variant with *Lysimachia vulgaris*, and 8 of them document degenerated communities.
- *Molinio caeruleae-Quercetum roboris* – 6 of the 8 relevés derive from a table of *Pino-Quercetum* in the variant with *Molinia caerulea* (Krotoska & Piotrowska 1962). Earlier on, Brzeg and Kasprowicz (2001) identified them as the association *Molinio caeruleae-Quercetum*.
- *Potentillo albae-Quercetum* – its documentation includes 6 relevés, diagnosed earlier as the *Pino-Quercetum*. All of them represent this community in stage II of degeneration.
- The group of substitute forest communities comprises 37 relevés. Many of them (18) have a very simple floristic structure and cannot be identified even to the class level. Substitute forest communities from the class *Vaccinio-Piceetea* are represented by 15 relevés, while those from the class *Querco-Fagetea*, by 4 relevés. In the last group, one of the documented patches occupied the potential site of the thermophilous oak forest *Potentillo albae-Quercetum*.

23. The available literature data indicate that the range of distribution of acidophilous oak forests from the alliance *Agrostio capillaris-Quercion* and from the class *Quercetea robori-petraeae* extends outside the eastern limits of Poland and comprises north-western Ukraine and the adjacent parts of Russia and probably also of Belarus. Further research is needed to determine which communities represent acidophilous oak forests and whether they are distinct from the associations found in Poland.

Acknowledgements. I would like to express my deep gratitude to all people who kindly offered their help and showed interest in my work at its various stages. First of all, I owe gratitude and remembrance to the late Prof. Teresa Krotoska, who inspired my interest in oak forests. My thanks are also due to Professors Maria Wojterska, Andrzej Brzeg, and Bogdan Jackowiak for their generous help and valuable advice. Moreover, I am grateful to Prof. Maria Wojterska and to Prof. Andrzej Brzeg for numerous discussions. I express my gratitude to Prof. Jan Holeksa for his insightful review of the manuscript and valuable suggestions, which affected the final version of this article. I thank Prof. Bogdan Jackowiak and Dr Zbigniew Celka for their involvement in editing of my paper and Magdalena Ciupińska, MSc, and Dorota Obiegała, MSc, for technical help, especially for preparing the figures for publication. I am grateful to Sylwia Ufnalska, MSc, MA, for translating the whole manuscript and for her numerous editorial comments. Last but not least, thanks are due to my wife Lidia, for her patience and understanding.

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Appendix

Tables

Table 1. Major concepts of classification of acidophilous oak forests and beech forests from the classes *Quercetea robori-petraeae* or *Querco-Fagetea*

	Syntaxon	Source																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	*Quercetea robori-petraeae*	a	•	•	b	•	•	c	c	•	•	c	•	•	•						
2	*Querco-Fagetea*															•	•	•	•	•	a
3	*Quercetalia roboris*	a*	•	b	•	•	a	•	?	•	•	•	•	•	•	•	•	•	•	•	c
4	*Quercion roboris*	a*	•	b	•	a	c														a
5	*Violo-Quercenion*																				
6	*Vaccinio-Quercenion*																				
7	*Quercenion robori-petraeae*																				
8	*Genisto germanicae-Quercenion petraeae*																				
9	*Ilici-Fagenion*																				
10	*Hieracio lachenalii-Quercion*							a	a		a	•	•	•		•				a	
11	*Agrostio capillaris-Quercion*									•											
12	*Dicrano scoparii-Quercion roboris*									•			•								
13	*Quercion roboris*										a		•	b	b	b	b		b		
14	*Vaccinio myrtilli-Quercion petraeae*											•	•	•	•	•					
15	*Agrostio capillaris-Quercion*												•	•	•	•					
16	*Quercion robori-pyrenaicae*													a	•	a	b		a		
17	*Molinio caeruleae-Quercion roboris*												•		•		•				
18	*Hymenophyllo-Quercion petraeae*														•	•			•		
19	*Castaneo-Quercion petraeae*														•	•					
29	*Convallario majali-Quercion roboris*					•															
21	*Pino-Quercion*					a	b														
22	*Vaccinio myrtilli-Quercion roboris*																	•			
23	*Luzulo-Fagion*																		•	•	•
24	*Ilici-Fagion*																		•		
25	*Luzulo-Fagetalia*				•																
26	*Luzulo-Fagion*				•																
27	*Pino-Quercetalia*							•													
28	*Pino-Quercion*							•													

Explanations: Black dots indicate classification according to the name given in the second column of the table, while synonyms denoted with small letters are listed under the table. Source: 1 – Braun-Blanquet (1950), Matuszkiewicz W. (1967, 1981, 2001); Hartmann & Jahn (1967); Matuszkiewicz J. M. (1988, 2001); Zaręba (1988b); Brzeg & Wojterska (1996); Matuszkiewicz W. & Matuszkiewicz J. M. (1996); Wysocki & Sikorski (2002); 2 – Pott (1995); 3 – Schubert *et al*. (2001); 4 – Härdtle *et al*. (1997); 5 – Onyshchenko (2006); 6 – Solomakha (2008); 7 – Jarolímek *et al*. (2008); 8 – Chytrý & Tichý (2003); 9 – Brzeg *et al*. (2000a, 2001), Brzeg & Wojterska (2001), Ratyńska *et al*. (2010), Danielewicz & Pawlaczyk (2006); 10 – Neuhäusl & Neuhäuslová-Novotná (1967); 11 – Kwiatkowski (2001); 12 – Pallas (1996); 13 – Pallas (2000); 14 – Pallas (2003); 15 – Dierschke (2004); 16 – Bardat *et al*. (2004); 17 – Semenishchenkov (2009); 18 – Rivas-Martinez *et al*. (2001); 19 – Wallnöfer *et al*. (1993), Chytrý & Vicherek (1995); 20 – Korotkov *et al*. (1991); 21 – Dierschke (1994); 22 – Härdtle *et al*. (1997); 23 – Rennwald (2000); 24 – Härdtle & Welss (1992); 25 – Rodwell *et al*. (2000); 26 – Lawesson (2004); 27 – Müller (1991); 28 – Oberdorfer (1992b); 29 – Doing (1975); 30 – Willner *et al*. (2005); Syntaxon:1 – *Quercetea robori-petraeae* Br.-Bl. & R.Tx. 1943 = [a] *Quercetea robori-sesiliflorae* Br.-Bl. *et* R. Tx 1943, [b] *Quercetea roboris* Br.-Bl. *et* R. Tx 1943, [c] *Quercetea robori-petraeae* Br.-Bl. *et* R. Tx. *ex* Oberd. 1957; 2 – *Querco-Fagetea* Br.-Bl. *et* Vlieg. *in* Vlieg. 1937 = [a] *Querco-Fagetea* Br.-Bl. *et* Vlieg. 1937 *em.* Klika 1939, [b] *Querco-Fagetea* Br.-Bl. *et* Vlieg. 1937 *em.* Oberd. 1992, [c] *Querco-Fagetea* Br.-Bl. *et* Vlieg. *in* Vlieg. 1937 *em.* Oberd. *et* Th. Müller 1979; 3 – *Quercetalia roboris* R.Tx. 1931 = [a] *Quercetalia robori-petraeae* R.Tx. 1931, [a*]: *Quercetalia robori-sessiliflorae* Tx. 1931 acc. to Braun-Blanquet (1950), *Quercetalia roboris* Tx. 1931 acc. to W. Matuszkiewicz (2001), [b] *Quercetalia robori-petraeae* R.Tx (1931) 1937, [c] *Quercetalia robori-petraeae* Tx. 1931 *em.* Doing Kraft et Westhoff 1959, [d] *Quercetalia robori-petraeae* Tx. 1931 *ex* Tx. 1937 *em* Riv.-Mart. 1973, [e] *Quercetalia robori-petraeae* – no author given; 4 – *Quercion roboris* Malcuit 1929 = [a] *Quercion robori-petraeae* Br.-Bl. 1932, [a*]: *Quercion robori-sessiliflorae* (Malcuit 1929) Br.-Bl. 1932 acc. to Braun-Blanquet 1950, *Quercion robori-petraeae* (Malcuit 1929) Br.-Bl. 1937 acc. to Matuszkiewicz J. M. (2001), *Quercion robori-petraeae* Br.-Bl. 1937 acc. to Matuszkiewicz W. & Matuszkiewicz J. M. 1996, [b] *Quercion robori-petraeae* Malcuit 1929, [c] *Quercion robori-petraeae* Br.-Bl. *et* Tx. 1932, [d] *Quercion robori-petraeae* (Malcuit 1929) Br.-Bl. 1937; 5 – *Violo-Quercenion* Doing 1975; 6 – *Vaccinio-Quercenion* Doing 1975; 7 – *Quercenion robori-petraeae* (Br.-Bl. 1932) Riv.-Mart. 1982; 8 – *Genisto germanicae-Quercenion petraeae* (R. *et* Z. Neuh. 1967) Oberd. 1992; 9 – *Ilici-Fagenion* (Br.-Bl. 67) Tx. 79 *em.* Oberd. 84; 10 – *Hieracio lachenalii-Quercion* Pallas 1996 = [a] *Genisto germanicae-Quercion* Neuhäusl et Neuhäuslová-Novotná 1967 nom. inval.; 11 – *Agrostio capillaris-Quercion* Scam. *et* Pass. 1959 *em.* Brzeg, Kaspr. *et* Krot. 2001; 12 – *Dicrano scoparii-Quercion roboris* Passarge 1968; 13 – *Quercion roboris* Malcuit 1929 *em.* Pallas 1996 = [a] *Quercion roboris* (Malquit 1929) Tx. 1930, [b] *Quercion roboris* Malcuit 1929; 14 – *Vaccinio myrtilli-Quercion petraeae* Pallas 1996; 15 – *Agrostio capillaris-Quercion* Scam. *et* Pass. 1959 em. Pallas 1996; 16 – *Quercion robori-pyrenaicae* (Br.-Bl. *et al.* in P. Silva *et al.* 1950) Riv.-Mart.1975 = [a] *Quercion pyrenaicae* Rivas Goday *ex* Rivas-Martínez 1963, [b] *Quercion robori-pyrenaicae* (Br.-Bl., P. Silva, Rozeira & Fontes 1956) Rivas-Mart. 1975 *nom. nud.*; 17 – *Molinio caeruleae-Quercion roboris* Scam. *et* Pass. 1959; 18 – *Hymenophyllo-Quercion petraeae* Pallas 2000; 19 – *Castaneo-Quercion petraeae* Soó 1964; 20 – *Convallario majali-Quercion roboris* Shevchyk *et al.* 1996; 21 – *Pino-Quercion* Medwecka-Kornaś in Medwecka-Kornaś *et al*. 1959 = [a] incl. *Vaccinio myrtilli-Quercion roboris* Bulokhov et Solomeshch 2003, [b] *Pino-Quercion* Medwecka-Kornaś 1959; 22 – *Vaccinio myrtilli-Quercion roboris* Bulokhov *et* Solomeshch 2003; 23 – *Luzulo-Fagion* Lohm. *et* Tx. *in* Tx. 1954 = [a] *Deschampsio flexuosae-Fagion* Soó (1962) 1964 *em.* Tx. 1979; 24 – *Ilici-Fagion* Br.-Bl. 1967; 25 – *Luzulo-Fagetalia* Scam. *et* Pass. 1959; 26 – *Luzulo-Fagion* Lohm. *et* Tx. *in* Tx. 1954; 27 – *Pino-Quercetalia* Soó 1962; 28 – *Pino-Quercion* Medwecka-Kornaś in Medwecka-Kornaś *et al*. 1959; ? – no data

21	22	23	24	25	26	27	28	29	30
•	b	•	•	•	•	c	b	?	?
d	•	•	b	a	•	b	b	e	•
a	•	•	a	d	•	a	a	a	•
								•	
								•	
						•	•		
						•	•		
							•		
•	•	•	•			a		•	

Table 2. Geographic variation of *Calamagrostio arundinaceae-Quercetum* in Poland (after Brzeg & Kasprowicz 2001, modified)

Calamagrostio arundinaceae-Quercetum petraeae
Ch. Ass. *Lathyrus montanus* (reg. opt.), *Hieracium lachenalii* (reg. opt.), *H. laevigatum* (reg. opt.), *H. sabaudum* (reg. opt.)
D. Ass. *Calamagrostis arundinacea*, *Festuca ovina*, *Quercus petraea*

West Pomeranian race	Wielkopolska race	South Polish race
(= *Fago-Qurcetum* p.p.) D.: *Fagus sylvatica*, *Quercus petraea* (opt.), *Lathyrus montanus, Deschampsia flexuosa, Mnium hornum*	D.: *Quercus robur* (opt.), small contribution of: *Lathyrus montanus*, *Fagus sylvatica*, and *Deschampsia flexuosa*; lack of southern species	(*incl. Quercetum medioeuropaeum*, *Luzulo luzuloidis-Quercetum petraeae* auct. p.p.) D.: *Fagus sylvatica*, *Quercus petraea*, *Abies alba*, *Picea abies*, *Lathyrus montanus*, *Deschampsia flexuosa, Calamagrostis villosa*, *Cruciata glabra*, *Polygonatum verticillatum*, *Rubus hirtus*, *Senecio ovatus*

Table 3. Floristic differentiation of the studied plant associations (based on 787 relevés)

Successive number of syntaxon		1		2		3		4		5		6		7	
Number of relevés		37		56		304		114		98		165		13	
Number of taxa		113		135		343		284		319		267		148	
Mean number of taxa in relevé		30		26		30		34		62		26		43	
Ch., *D. *Aulacomnio androgyni-Quercetum roboris*															
*Pohlia nutans** (C-U)		92	*364*	38	*27*	30	*43*	21	*26*	12	*5*	38	*110*	38	*19*
Dicranella heteromalla (opt.)		84	*246*	29	*22*	30	*50*	32	*39*	4	*2*	5	*5*	-	-
*Plagiothecium curvifolium** (V-P)		65	*32*	14	*7*	3	*15*	3	*1*	-	-	10	*19*	-	-
Aulacomnium androgynum		65	*93*	2	*1*	3	*1*	-	-	-	-	-	-	-	-
*Dicranum scoparium** (V-P)		73	*73*	-	-	9	*22*	2	*1*	2	*1*	37	*119*	46	*92*
*Hypnum cupressiforme**		70	*205*	9	*4*	29	*28*	25	*25*	17	*9*	13	*20*	38	*88*
Mnium hornum		68	*80*	2	*1*	4	*9*	7	*22*	-	-	1	*3*	-	-
Plagiothecium laetum (opt.)		65	*69*	18	*9*	3	*2*	4	*6*	1	*1*	4	*2*	-	-
Lophocolea heterophylla		54	*27*	12	*6*	3	*1*	-	-	1	*1*	4	*25*	-	-
Plagiothecium denticulatum		54	*39*	21	*11*	3	*2*	4	*2*	-	-	1	*1*	-	-
Herzogiella seligeri		30	*15*	-	-	1	*0*	3	*5*	-	-	-	-	-	-
*Thuidium tamariscinum** (V-P)		27	*26*	7	*4*	1	*1*	4	*2*	-	-	2	*14*	-	-
*Cladonia coniocraea** (C-U)		22	*23*	-	-	1	*0*	-	-	-	-	-	-	-	-
D. *Molinio caeruleae-Quercetum roboris*															
Betula pubescens subsp. *pubescens* (V-P)	a	-	-	29	*186*	2	*8*	4	*10*	-	-	3	*5*	-	-
Betula pubescens subsp. *pubescens* (V-P)	b-c	-	-	20	*18*	-	-	1	*0*	-	-	7	*15*	-	-
Molinia caerulea (M-A)		19	*9*	100	*5518*	12	*30*	5	*18*	11	*106*	21	*307*	15	*8*
Rubus nessensis		5	*3*	34	*49*	2	*1*	-	-	-	-	3	*4*	-	-
Polytrichum commune (S-C)		11	*64*	21	*49*	-	-	-	-	-	-	-	-	-	-
Sphagnum girgensohnii (V-P)		-	-	12	*61*	-	-	-	-	-	-	-	-	-	-
Ch., *D. *Calamagrostio arundinaceae-Quercetum petraeae*															
Quercus petraea *	a	8	*217*	12	*930*	70	*3688*	24	*1008*	45	*2165*	31	*727*	15	*500*
Quercus petraea *	b-c	5	*3*	16	*86*	62	*317*	21	*128*	42	*268*	42	*485*	23	*504*
*Calamagrostis arundinacea** (Qrp)		19	*34*	50	*307*	62	*1297*	18	*363*	41	*258*	40	749	54	*488*
*Festuca ovina** (Qrp)		22	*57*	18	*41*	69	*589*	17	*16*	53	*164*	70	*694*	92	*1338*
Hieracium lachenalii		5	*3*	2	*1*	75	*122*	28	*41*	44	*38*	10	*5*	38	*19*
Hieracium sabaudum		16	*6*	2	*1*	56	*96*	22	*38*	17	*31*	1	*1*	-	-
Hieracium laevigatum		5	*3*	2	*1*	38	*57*	17	*47*	12	*5*	3	*1*	-	-
Lathyrus montanus		-	-	-	-	6	*19*	15	*50*	5	*29*	1	*3*	-	-
Ch., D. *Galio sylvatici-Carpinetum*; ^Ch. *Carpinion betuli															
Carpinus betulus	a	95	*5197*	23	*530*	12	*295*	75	*3225*	6	*30*	2	*25*	-	-
Carpinus betulus	b-c	81	*163*	57	*32*	27	*135*	85	*770*	27	*128*	19	*92*	8	*4*
Tilia cordata	a	-	-	-	-	2	*15*	20	*580*	2	*5*	-	-	-	-
Tilia cordata	b-c	-	-	2	*1*	5	*3*	21	*352*	4	*7*	2	*1*	8	*4*
Stellaria holostea^		19	*46*	16	*16*	14	*42*	62	*654*	9	*44*	1	*1*	-	-
*Melampyrum nemorosum**		-	-	-	-	5	*18*	29	*213*	15	*213*	-	-	-	-
*Festuca heterophylla**		5	*3*	2	*1*	16	*38*	24	*69*	40	*201*	3	*17*	-	-
*Galium sylvaticum**		-	-	-	-	-	-	8	*67*	15	*76*	1	*1*	-	-
Dactylis polygama^		-	-	-	-	3	*14*	17	*71*	17	*35*	-	-	-	-
*Ranunculus auricomus**		-	-	-	-	-	-	12	*14*	2	*0*	1	*0*	-	-
Galium schultesii^		-	-	-	-	-	-	-	-	14	*322*	-	-	-	-
Ch., D. *Potentillo albae-Quercetum*; ^Ch. *Quercetalia pubescentis															
Galium boreale (M-A)		-	-	-	-	12	*39*	3	*16*	89	*471*	10	*18*	38	*19*
Betonica officinalis (M-A)		-	-	-	-	3	*3*	1	*0*	77	*287*	-	-	-	-
*Potentilla alba**		-	-	-	-	1	*0*	-	-	72	*509*	1	*1*	-	-
*Ranunculus polyanthemos**		-	-	-	-	-	-	-	-	60	*51*	-	-	-	-
*Carex montana**		-	-	-	-	4	*8*	-	-	74	*404*	-	-	-	-
Campanula persicifolia^		-	-	-	-	9	*6*	11	*21*	84	*174*	-	-	38	*51*
Hypericum montanum^		-	-	-	-	2	*1*	2	*1*	41	*38*	2	*1*	8	*4*
Lathyrus niger^		-	-	-	-	3	*4*	2	*1*	38	*157*	1	*0*	-	-
Primula veris^		-	-	-	-	1	*0*	3	*1*	29	*13*	-	-	-	-
*Pulmonaria angustifolia**		-	-	-	-	-	-	-	-	33	*97*	-	-	-	-
Serratula tinctoria (M-A)		-	-	-	-	1	*0*	-	-	24	*131*	1	*0*	15	*39*
Platanthera bifolia^		-	-	-	-	3	*1*	4	*2*	12	*5*	-	-	-	-
Festuca amethystina subsp. *ritschlii**		-	-	-	-	-	-	-	-	7	*2*	-	-	-	-
D. *Querco roboris-Pinetum* et *Serratulo-Pinetum*															
Pinus sylvestris (V-P)	a	3	*47*	32	*271*	31	*522*	12	*67*	31	*359*	100	*4558*	100	*4461*
Pinus sylvestris (V-P)	b-c	27	*6*	14	*6*	15	*7*	4	*1*	5	*2*	50	*179*	85	*908*
Dicranum polysetum (V-P)		3	*1*	4	*2*	1	*1*	-	-	1	*5*	49	*452*	62	*885*
Pleurozium schreberi (V-P)		41	*20*	20	*18*	29	*118*	7	*34*	17	*83*	91	*2963*	100	*4558*
Vaccinium vitis-idaea (V-P)		3	*1*	2	*9*	9	*12*	-	-	23	*10*	77	*582*	100	*1127*
Hylocomium splendens (V-P)		27	*26*	5	*3*	4	*2*	1	*0*	1	*1*	27	*137*	69	*662*
Calluna vulgaris (C-U)		-	-	2	*1*	1	*0*	-	-	-	-	35	*173*	92	*827*
Pseudoscleropodium purum (V-P)		3	*1*	12	*14*	12	*49*	-	-	20	*76*	41	*625*	15	*138*
Rubus saxatilis (V-P)		-	-	2	*1*	10	*25*	7	*7*	47	*198*	19	*76*	31	*50*
Leucobryum glaucum (V-P)		14	*53*	11	*5*	13	*20*	6	*3*	2	*1*	25	*109*	8	*4*
Ch., D. *Serratulo-Pinetum															
Juniperus communis (V-P)	b-c	3	*1*	5	*3*	15	*11*	6	*7*	32	*94*	12	*19*	92	*858*
Orthilia secunda *		-	-	-	-	5	*5*	2	*1*	-	-	13	*28*	62	*135*
Chimaphila umbellata (V-P)		-	-	-	-	-	-	-	-	-	-	1	*1*	62	*65*

Successive number of syntaxon		1		2		3		4		5		6		7	
Danthonia decumbens (C-U)		3	*1*	-	-	2	*1*	-	-	3	*6*	7	*3*	62	*65*
Hieracium pilosella (C-U)		-	-	-	-	6	*4*	-	-	8	*4*	12	*38*	62	*100*
Peucedanum oreoselinum (T-G)		-	-	-	-	9	*12*	1	*0*	20	*28*	7	*80*	54	*96*
Carex ericetorum (C-U)		-	-	-	-	-	-	-	-	-	-	6	*6*	54	*62*
Thymus serpyllum (K-C)		-	-	-	-	-	-	-	-	-	-	3	*2*	54	*62*
Koeleria grandis *		-	-	-	-	-	-	-	-	1	*1*	-	-	46	*258*
Dianthus carthusianorum (F-B)		-	-	-	-	-	-	-	-	-	-	1	*1*	38	*19*
Pulsatilla vernalis *		-	-	-	-	-	-	-	-	-	-	-	-	31	*12*
Lathyrus sylvestris (T-G)		-	-	-	-	1	*2*	1	*15*	2	*1*	-	-	31	*119*
Chamaecytisus ratisbonensis *		-	-	-	-	-	-	-	-	-	-	1	*0*	31	*119*
Genista tinctoria (C-U)		-	-	-	-	3	*2*	-	-	24	*16*	1	*0*	23	*12*
Ch. *Vaccinio-Piceetea* (V-P)															
Picea abies	a	11	*18*	23	*143*	5	*48*	5	*209*	4	*89*	16	*342*	8	*4*
Picea abies	b-c	41	*55*	70	*191*	33	*151*	26	*5*	29	*7*	40	*366*	23	*12*
Vaccinium myrtillus		78	*628*	98	*1354*	78	*1708*	55	*477*	78	*714*	98	*3972*	92	*1185*
Trientalis europaea		27	*50*	79	*579*	19	*51*	17	*24*	6	*3*	37	*175*	31	*50*
Ch., ^D. *Quercetea robori-petraeae* (Qrp)															
Carex pilulifera		97	*592*	80	*104*	65	*169*	37	*45*	31	*33*	37	*54*	23	*12*
Holcus mollis		78	*192*	41	*97*	55	*1038*	64	*757*	16	*75*	15	*21*	15	*8*
Polytrichastrum formosum^		100	*2155*	84	*237*	63	*390*	73	*400*	30	*63*	49	*362*	31	*15*
Melampyrum pratense^		62	*79*	62	*148*	74	*418*	25	*67*	82	*298*	50	*332*	46	*223*
Pteridium aquilinum^		3	*1*	41	*395*	62	*851*	19	*214*	50	*446*	65	*1568*	54	*523*
Hieracium umbellatum		-	-	-	-	10	*9*	4	*2*	13	*25*	1	*3*	-	-
Ch. *Querco-Fagetea* (Q-F)															
Fagus sylvatica	a	3	*101*	5	*3*	9	*84*	22	*374*	32	*24*	13	*289*	-	-
Fagus sylvatica	b-c	14	*7*	21	*28*	23	*91*	36	*107*	29	*186*	21	*93*	8	4
Corylus avellana	b-c	-	-	7	*22*	29	*129*	27	*453*	44	*329*	4	*4*	15	8
Anemone nemorosa		35	*42*	18	*39*	32	*172*	70	*524*	59	*627*	11	*58*	31	15
Poa nemoralis		11	*5*	20	*17*	47	*207*	75	*1146*	52	*329*	4	*8*	-	-
Atrichum undulatum		16	*8*	9	*4*	21	*24*	63	*172*	47	*99*	6	*3*	-	-
Melica nutans		-	-	-	-	26	*84*	37	*247*	99	*1141*	13	*47*	-	-
Ajuga reptans		-	-	-	-	8	*4*	37	*58*	76	*200*	2	*1*	-	-
Viola riviniana		3	*1*	-	-	18	*31*	16	*43*	46	*106*	4	*2*	46	23
Brachypodium sylvaticum		-	-	-	-	4	*6*	18	*110*	34	*183*	2	*11*	-	-
Festuca gigantea		3	*1*	-	-	4	*9*	18	*24*	39	*25*	1	*3*	-	-
Hepatica nobilis		-	-	-	-	2	*1*	4	*21*	31	*164*	-	-	-	-
Viola reichenbachiana et *riviniana*		-	-	-	-	3	*3*	8	*8*	22	*30*	1	*1*	-	-
Scrophularia nodosa		5	*1*	2	*1*	9	*4*	33	*21*	37	*21*	2	*1*	8	*1*
Carex digitata		-	-	-	-	6	*10*	20	*71*	27	*177*	5	*25*	-	-
Viola reichenbachiana		-	-	5	*3*	23	*38*	65	*241*	18	*63*	22	*38*	-	-
Milium effusum		19	*9*	12	*14*	8	*7*	35	*125*	20	*14*	2	*4*	-	-
Galeobdolon luteum		-	-	-	-	1	*2*	22	*79*	8	*39*	-	-	-	-
Polygonatum multiflorum		-	-	4	*1*	3	*1*	23	*19*	4	*2*	1	*1*	-	-
Sanicula europaea		-	-	-	-	1	*2*	24	*43*	2	*1*	-	-	-	-
Carex sylvatica		-	-	-	-	1	*0*	17	*16*	-	-	-	-	-	-
Ch. *Trifolio-Geranietea* (T-G) et *Festuco-Brometea* (F-B)															
Fragaria vesca (T-G)		-	-	2	*1*	21	*45*	26	*75*	93	*840*	23	*96*	62	*31*
Poa angustifolia (T-G)		8	*4*	-	-	23	*127*	4	*10*	65	*464*	4	*10*	62	*135*
Polygonatum odoratum (T-G)		-	-	-	-	25	*36*	3	*1*	59	*82*	8	*10*	54	*96*
Hypericum perforatum (T-G)		-	-	-	-	25	*15*	15	*7*	55	*55*	12	*11*	69	*32*
Trifolium alpestre (T-G)		-	-	-	-	2	*8*	4	*2*	74	*349*	1	*0*	23	*12*
Anthericum ramosum (T-G)		-	-	-	-	4	*3*	-	-	56	*96*	1	*0*	31	*50*
Euphorbia cyparissias (F-B)		-	-	-	-	4	*2*	1	*0*	52	*88*	8	*7*	23	*12*
Pimpinella saxifraga (F-B)		-	-	-	-	2	*1*	-	-	53	*34*	3	*4*	38	*19*
Astragalus glycyphyllos (T-G)		-	-	-	-	4	*5*	4	*10*	57	*59*	-	-	-	-
Brachypodium pinnatum (F-B)		-	-	-	-	1	*5*	-	-	49	*741*	-	-	-	-
Vicia sepium (T-G)		-	-	-	-	3	*1*	5	*7*	51	*74*	2	*1*	-	-
Clinopodium vulgare (T-G)		-	-	-	-	7	*25*	8	*8*	48	*189*	1	*0*	8	*4*
Knautia arvensis (T-G)		-	-	-	-	1	*1*	-	-	47	*60*	2	*1*	46	*20*
Sedum maximum (T-G)		3	*1*	-	-	4	*2*	5	*2*	36	*20*	1	*0*	8	*4*
Vicia cassubica (T-G)		-	-	-	-	8	*22*	2	*9*	35	*95*	2	*7*	-	-
Filipendula vulgaris		-	-	-	-	-	-	-	-	40	*96*	-	-	-	-
Galium verum (T-G)		-	-	-	-	4	*2*	1	*0*	26	*17*	2	*1*	31	*12*
Geranium sanguineum (T-G)		-	-	-	-	-	-	-	-	23	*92*	1	*0*	23	*12*
Peucedanum cervaria (T-G)		-	-	-	-	-	-	-	-	14	*6*	-	-	23	*12*
Ch. *Molinio-Arrhenatheretea* (M-A);Ch. *Scheuchzerio-Caricetea fuscae* (S-C)															
Deschampsia caespitosa (M-A)		62	*68*	23	*94*	10	*8*	53	113	24	*67*	3	*4*	8	*4*
Festuca rubra s. s. (M-A)		46	*35*	16	*16*	32	*141*	13	14	55	*148*	7	*16*	15	*42*
Juncus effusus (M-A)		35	*18*	39	*44*	7	*3*	5	2	8	*3*	1	*1*	-	-
Carex nigra (S-C)		38	*65*	43	*46*	5	*2*	-	-	5	*7*	3	*2*	-	-
Agrostis canina (S-C)		38	*31*	27	*98*	2	*4*	1	0	-	-	-	-	-	-
Lysimachia vulgaris (M-A)		27	*11*	62	*164*	10	*9*	23	34	6	*38*	9	*10*	8	*4*
Veronica chamaedrys (M-A)		-	-	2	*1*	28	*56*	44	111	93	*329*	10	*13*	23	*12*
Achillea millefolium (M-A)		-	-	-	-	5	*5*	4	2	38	*27*	4	*2*	38	*19*
Galium mollugo (M-A)		-	-	-	-	5	*7*	11	9	36	*98*	8	*10*	15	*42*
Rumex acetosa (M-A)		-	-	-	-	2	*1*	4	2	3	*1*	1	*1*	8	*4*
Dactylis glomerata (M-A)		-	-	-	-	4	*5*	18	17	20	*33*	1	*3*	-	-
Succisa pratensis (M-A)		-	-	-	-	-	-	-	-	17	*57*	-	-	23	*12*

Successive number of syntaxon		1		2		3		4		5		6		7	
Ch. *Artemisietea vulgaris*															
Moehringia trinervia		3	*1*	14	*15*	44	*102*	48	150	77	*141*	27	*68*	8	*4*
Mycelis muralis		-	-	2	*1*	32	*53*	35	33	62	*104*	9	*21*	8	*4*
Urtica dioica		-	-	2	*1*	6	*11*	6	3	54	*150*	4	*2*	-	-
Geum urbanum		-	-	-	-	2	*1*	16	8	47	*41*	1	*0*	-	-
Galeopsis pubescens		-	-	4	*2*	10	*6*	17	16	43	*67*	6	*3*	-	-
Galeopsis tetrahit		3	*1*	20	*10*	22	*42*	10	5	38	*26*	6	*6*	-	-
Impatiens parviflora		-	-	2	*9*	10	*24*	13	128	30	*198*	5	*13*	-	-
Ch. *Calluno-Ulicetea* (C-U)															
Carex pallescens		49	*24*	29	*22*	16	*18*	36	26	20	*28*	4	*2*	-	-
Carex ovalis		32	*16*	5	*3*	4	*2*	5	7	4	*2*	5	*2*	8	*4*
Agrostis capillaris		24	*24*	30	*15*	36	*199*	12	40	67	*388*	27	*52*	46	*58*
Veronica officinalis		3	*1*	-	-	32	*38*	27	21	59	*66*	18	*44*	46	*23*
Solidago virgaurea s. s.		3	*1*	11	*5*	37	*46*	29	58	47	*54*	16	*29*	38	*123*
Potentilla erecta		-	-	14	*7*	10	*8*	12	14	59	*107*	5	*8*	8	*4*
Hypericum maculatum		3	*1*	2	*1*	5	*15*	8	31	33	*87*	-	-	-	-
Luzula multiflora		22	*11*	12	*6*	25	*17*	9	4	14	*7*	7	*6*	23	*12*
Scorzonera humilis		-	-	-	-	5	*7*	1	0	14	*6*	7	*3*	23	*81*
Viola canina		-	-	-	-	1	*0*	2	1	13	*15*	12	*27*	31	*15*
Others															
Quercus robur	a	97	*3873*	93	*4429*	49	*2236*	88	3930	66	*3827*	45	*887*	23	*81*
Quercus robur	b-c	95	*211*	82	*213*	44	*130*	67	128	62	*256*	65	*781*	54	*280*
Betula pendula	a	27	*130*	46	*412*	24	*113*	22	168	14	*54*	32	*328*	38	*376*
Betula pendula	b-c	27	*12*	32	*16*	21	*47*	7	5	3	*7*	43	*109*	77	*77*
Sorbus aucuparia	a	-	-	14	*97*	5	*13*	2	9	1	*5*	7	*67*	-	-
Sorbus aucuparia	b-c	86	*53*	95	*118*	68	*178*	81	101	83	*75*	72	*357*	85	*50*
Frangula alnus	b-c	81	*256*	100	*2554*	58	*427*	67	232	77	*194*	55	*402*	54	*32*
Maianthemum bifolium		95	*319*	91	*162*	61	*302*	76	587	58	*211*	28	*75*	15	*8*
Luzula pilosa		92	*443*	57	*44*	74	*212*	70	333	86	*160*	70	*269*	54	*165*
Convallaria majalis		24	*12*	23	*20*	53	*684*	37	305	89	*978*	31	*185*	62	*527*
Oxalis acetosella		46	*21*	32	*56*	26	*91*	63	623	56	*443*	30	*162*	8	*4*
Plagiomnium affine		19	*9*	9	*13*	18	*31*	15	7	49	*102*	15	*57*	23	*12*
Dryopteris carthusiana		57	*28*	55	*51*	28	*48*	42	59	19	*13*	42	*78*	38	*19*
Anthoxanthum odoratum		19	*9*	20	*18*	47	*156*	17	54	64	*159*	29	*129*	77	*308*
Calamagrostis epigejos		43	*92*	11	*13*	21	*54*	11	21	12	*33*	27	*185*	46	*223*
Rubus idaeus		3	*1*	20	*26*	13	*21*	24	39	42	*123*	34	*161*	-	-
Rubus plicatus		-	-	21	*35*	6	*7*	12	14	4	*6*	10	*61*	15	*8*
Deschampsia flexuosa		-	-	4	*2*	13	*74*	14	57	26	*26*	18	*116*	8	*4*
Hieracium murorum		3	*1*	2	*1*	31	*40*	31	39	28	*41*	11	*11*	-	-
Campanula rotundifolia		-	-	-	-	16	*21*	6	23	45	*31*	13	*9*	31	*154*
Padus serotina	a-c	-	-	-	-	15	*19*	4	6	33	*34*	12	*45*	-	-
Rhamnus cathartica	b-c	-	-	2	*2*	1	*1*	4	2	36	*21*	2	*1*	8	*4*
Crataegus monogyna	a-c	-	-	-	-	6	*4*	23	16	22	*32*	3	*2*	-	-
Prunus spinosa	b-c	-	-	-	-	3	*3*	3	1	38	*19*	-	-	-	-
Pyrus pyraster	b-c	-	-	-	-	-	-	-	-	33	*19*	2	*1*	15	*5*

Explanations: Shortened table comprises in each column the frequency of species (in %) and cover index (italics)

1. *Aulacomnio androgyni-Quercetum roboris* (37 relevés): Brzeg *et al.* (2000a), tab. 1: 1-25 (*Aa-Q*); Błachuta (1995), tab. 4: 3,4 (*Carpino-Quercetum*); Krotoska (1966), tab. 21: 2 (Community with indefined rank); Kubiś (1982), tab. 4: 2,3,15 (*Polytrichum attenuatum-Carpinus betulus*); Kulińska (1991), tab. 2: 4,5 (*Carpino-Quercetum*); Lisiewska & Reszel (2000), tab. 3: 1,2 (*Aulacomnio androgyni-Quercetum*); Sroka (1982), tab. 1: 3,4 (*Calamagrostio-Quercetum*). **Taxa not included in the table:** Ch. *Querco-Fagetea*: *Acer pseudoplatanus* c 8,2; *Carex remota* 5,3; *Malus sylvestris* c 8,4; *Ulmus minor* a 3,14; c 3,14; Ch. *Artemisietea*: *Rubus caesius* 3,1; Ch. *Molinio-Arrhenatheretea*: *Agrostis gigantea* 3,14; *Poa palustris* 3,1; *P. trivialis* 5,3; *Ranunculus repens* 3,1; Ch. *Scheuchzerio-Caricetea fuscae*: *Carex canescens* 3,1; *Juncus conglomeratus* 3,1; Ch. *Calluno-Ulicetea*: *Cladonia chlorophaea* 3,1; *Luzula campestris* 3,1; *Polytrichum juniperinum* 3,1; Others: *Brachytheciastrum velutinum* 11,5; *Brachythecium salebrosum* 3,1; *Cladonia digitata* 3,1; *C. glauca* 8,4; *Crataegus laevigata* c 5,2; *Crataegus* sp. b 3,1; c 3,1; *Dicranodontium denudatum* 11,5; *Kindbergia praelonga* 3,1; *Luzula pallescens* 5,3; *Orthodicranum montanum* 8,4; *Polygonum minus* 3,1; *Rubus corylifolius* 3,1; *Rubus* sp. 3,1; *R. sprengelii* 11,5; *Sciuro-hypnum oedipodium* 19,9; *Sphagnum* sp. 5,3.

2. *Molinio caeruleae-Quercetum roboris* (56 relevés): Brzeg *et al.* (1989), tab. 1: 1-33 (*Mc-Q*); Krotoska, Piotrowska (1962), tab. 5: 25,35-40 (*Pino-Quercetum*); Kulińska (1991), tab. 2: 1 (*Molinio-Quercetum*); Lisiewska & Reszel (2000), tab. 3: 4 (*Mc-Q*); Sroka (1982), tab. 1: 36 (*Calamagrostio-Quercetum*), tab. 2: 13 (*Pino-Quercetum*), tab. 3: 4-14,35 (Pine-oak forest with *Molinia caerulea*). **Taxa not included in the table:** Ch. *Querco-Fagetea*: *Eurhynchium angustirete* 2,1; *Hedera helix* 9,13; *Malus sylvestris* bc 2,1; c 9,4; *Sorbus torminalis* c 2,1; Ch. *Vaccinio-Piceetea*: *Lycopodium annotinum* 2,1; Ch. *Molinio-Arrhenatheretea*: *Agrostis stolonifera* 2,1; *Poa pratensis* 4,10; *P. trivialis* 12,6; *Nardus stricta* 4,2; Ch. *Scheuchzerio-Caricetea fuscae*: *Carex canescens* 9,13; *Juncus conglomeratus* 5,11; Others: *Athyrium filix-femina* 4,2; *Aulacomnium palustre var. palustre* 9,4; *Betula obscura* a2 2,1; *Brachytheciastrum velutinum* 2,1; *Brachythecium rutabulum* 4,2; *Calamagrostis canescens* 4,2; *Carex elongata* 5,3; *C. panicea* 2,1; *C. vesicaria* 2,31; *Crataegus laevigata* c 2,1; *Larix decidua* subsp. *decidua* c 2,1; *Lepidozia reptans* 7,4; *Lophocolea bidentata* 9,4; *Lycopus europaeus* 2,1; *Plagiothecium ruthe* 2,1; *Plagiothecium* sp. 7,4; *Polygonum hydropiper* 2,1; *Populus tremula* a 2,9; a1 2,31; a2 4,18; b 4,10; bc 2,1; c 12,6; *Prunus* sp. c 4,2; *Pyrus communis* a2 2,1; b 2,1; c 9,4; *Rubus corylifolius* 12,61; *R. gracilis* c 12,14; *R. hirtus* 2,1; *R. pallidus* 4,2; *Rubus* sp. 1,5; *Salix cinerea* c 2,1; *Sciuro-hypnum oedipodium* 16,8; *S. starkei* 2,1; *Sphagnum capillifolium* 2,1; *Sph. fimbriatum* 2,1; *Sph. palustre* 2,1; *Sph. russowii* 2,31.

3. *Calamagrostio arundinaceae-Quercetum petraeae* (304 relevés): Brzeg (oryg.), tab. A13: 45; Brzeg *et al.* (2001), tab. 1: 2-4,8,9,11-13,15,17,21-26,28,30,31,35-38,40,45,46,49 (*Ca-Q molinietosum*); tab. 2: 1,4,7,9,11,13,16,18,20-26,28,29 (*Ca-Q typicum*); tab. 3: 1,2,4-6,8,9,12-19,21-36,38-41 (*Ca-Q polygonatetosum*); Błachuta (1995), tab. 4: 1,2 (*Calamagrostio-Quercetum*); Boiński (1973), tab. 50: 2,9,13,17,19,21,23-27 (*Fago-Querecetum*); Fabiszewski & Faliński (1967), tab. 9: 1,5-11 (*Calamagrostido-Quercetum*); Ferchmin (1980), tab. 17: 10,11 (*Querco-Carpinetum* – acidophilous subassociations),14 (*Querco-Carpinetum holcetosum mollis*); Gmaj (1997), tab. 9: 15 (*Calamagrostio-Quercetum convallarietosum*); Hegenbart-Magdans, Brzeg (1999), tab. 1: 2,5-10,14,15,18,20,22,29,30,33-35 (*Ca-Q*); Jakubowska-Gabara (1994), tab. 2: 1,8 (*Querco-Pinetum*); Jaroszewska (2007), tab. 1: 1-8 (*Ca-Q polygonatetosum odorati*); Jelinowski (1958), tab. 1: 1,2,4,5,6,9,10,12,15-17,23-25 (*Pino-Quercetum*); Kasprowicz (oryg.) – tab. A3: 12,46, tab. A8: 29, tab. A13: 3, 59,60; tab. A14: 1,9,10,11,26,40,54,62,64,77,86; Krotoska (1978), tab. 1: 29 (*Calamagrostio-Quercetum*); Krotoska (1983), tab. 3: 3,4 (Oak forest); Krotoska (1991), tab. 10: 15,16,20 (*Calamagrostio-Quercetum*);

Krotoska & Piotrowska (1962), tab. 5: 9,10,14,22 (*Pino-Quercetum*); Kubiś (1982), tab. 2: 6 (*Galio sylvatici-Carpinetum holcetosum mollis*), tab. 4: 1,10 (*Polytrichum attenuatum-Carpinum betulus*); Kulińska (1991), tab. 2: 2 (*Calamagrostio-Quercetum molinietosum*); Lisiewska & Reszel (2000), tab. 3: 3 (*Ca-Q molinietosum*); Macicka (1984), tab. 10: 43 (*Pino-Quercetum*), tab. 18: 1-3,5-7 (Community from the *Quercion robori-petraeae* alliance); tab. 20: 27 (*Pino-Quercetum*); Macicka & Wilczyńska (1990), tab. 13: 2-5,7,8,10,11,13-16,18,20-23 (Community from the *Quercion robori-petraeae* alliance), tab. 16: 2 *Pino-Quercetum fagetosum*), tab. 17: 13,18,21 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991), tab. 12: 2,4,8,9,11-13,15,16,18 (Community from the *Quercion robori-petraeae* alliance), tab. 13: 5 (*Calamagrostio-Quercetum*); Macicka & Wilczyńska (1992), tab. 4: 27 (*Galio-Carpinetum holcetosum*), tab. 6: 1,4 (*Pino-Quercetum*); Nachotko (1982), tab. 1: 3-6,14 (*Calamagrosti-Quercetum* form with *Calamagrostis arundinacea*), tab. 2: 1-8,10-12 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 3: 3,4,8,9,12 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 4: 1,5,6,9,13,14,21,22 (Oak forest with share of termophilous species); tab. 5: 4,6,9,10,14 (Oak forest with *Holcus mollis*); Olaczek (1986), tab. 4: 9 (*Calamagrosti-Quercetum petraeae*); Ratyńska (2001), tab. 176: 5,6 (*Calamagrostio-Quercetum petraeae convallarietosum*); Robińska (1977), tab. 3: 5,23,33 (*Pino-Quercetum*), tab. 5: 5 (*Pino-Quercetum* – degenerated forms); Siwczak (1977), tab. 3: 8,9,10,11,14,16-20,23,27,28 (*Calamagrostio-Quercetum*); Sroka (1982), tab. 1: 5,12,14,18 (*Calamagrostio-Quercetum*), tab. 2: 3 (*Pino-Quercetum*); Szwed (1979), tab. 12: 3,5 (*Calamagrostio-Quercetum*); Wojterska (2003), tab. 16: 2,5,7,11,15,16,18,20 (*Calamagrostio-Quercetum*); Zielińska (1994), tab. 5: 2,4,5,7,8-10,12,13 (*Calamagrostio-Quercetum convallarietosum*); tab. 6: 3-6,10 (*Calamagrostio-Quercetum convallarietosum*). **Taxa not included in the table:** Ch. *Querco-Fagetea*: *Acer platanoides* b 1,6; c 4,2; *A. pseudoplatanus* b 0,2; bc 0,0; c 4,2; *Alnus incana* a2 0,0; c 0,0; *Cerasus avium* b 1,0; c 4,1; *Dryopteris filix-mas* 4,3; *Epipactis helleborine* 0,0; *Eurhynchium angustirete* 0,0; *Fraxinus excelsior* c 2,1; *Galium odoratum* 1,2; *Hedera helix* 1,4; *Hypochoeris maculata* 0,0; *Impatiens noli-tangere* 1,0; *Lilium martagon* 1,0; *Malus sylvestris* b 2,1; bc 1,0; c 8,4; *Melica uniflora* 0,0; *Padus avium* a2 0,2; b 1,2; c 2,1; *Phyteuma spicatum* 1,0; *Ribes uva-crispa* b 0,0; c 1,0; *Stachys sylvatica* 0,0; *Ulmus minor* c 0,0; *Viburnum opulus* c 2,1; *Viola mirabilis* 0,2; Ch. *Vaccinio-Piceetea*: *Cladonia furcata* 1,0; *Diphasiastrum complanatum* 0,0; *Dryopteris dilatata* 2,1; *Galium rotundifolium* 2,2; *Lycopodium annotinum* 0,2; *L. clavatum* 1,2; *Monotropa hypopitys* s. s. 1,1; *Ptilium crista-castrensis* 0,0; *Pyrola minor* 1,2; *P. rotundifolia* 1,0; *Viscum album* subsp. *austriacum* 1,0; Ch. *Trifolio-Geranietea* (TG) et *Festuco-Brometea* (FB): *Carex caryophyllea* (FB) 0 2; *Galium album* (TG) 3 3; *G. album* fo. *dumetorum* (TG) 3,2; *Poa compressa* (FB) 1,2; *Seseli annuum* (FB) 0,0; *Silene nutans* subsp. *nutans* (TG) 2,1; *Thalictrum minus* (FB) 0,0; *Trifolium medium* (TG) 0,0; *Vicia dumetorum* (TG) 1,6; *Vincetoxicum hirundinaria* (TG) 1,0; Ch. *Artemisietea*: *Aegopodium podagraria* 1,0; *Chaerophyllum temulum* 0,0; *Epilobium montanum* 0,0; *Fallopia dumetorum* 5,5; *Galium aparine* 3,4; *Geranium robertianum* 3,3; *Glechoma hederacea* 0,0; *Heracleum sphondylium* 0,0; *Lapsana communis* s. s. 0,0; *Linaria vulgaris* 1,0; *Rubus caesius* 5,2; *Torilis japonica* 1,0; Ch. *Molinio-Arrhenatheretea*: *Agrostis gigantea* 1,0; *A. stolonifera* 1,3; *Alopecurus pratensis* 0,0; *Angelica sylvestris* 1,2; *Arrhenatherum elatius* 5,10; *Campanula patula* s.s. 3,2; *Carex hirta* 1,0; *Cerastium holosteoides* 0,0; *Dianthus superbus* s. s. 0,0; *Festuca pratensis* 1,13; *Galium uliginosum* 1,0; *Geum rivale* 0,0; *Holcus lanatus* 2,1; *Lathyrus pratensis* 1,7; *Leontodon autumnalis* 0,0; *L. hispidus* 0,0; *Leucanthemum vulgare* 0,0; *Lotus corniculatus* 1,0; *L. uliginosus* 0,0; *Lychnis flos-cuculi* 0,0; *Lysimachia nummularia* 0,0; *Poa pratensis* 10,29; *P. trivialis* 1,0; *Potentilla reptans* 0,0; *Prunella vulgaris* 2,1; *Ranunculus acris* s. s. 0,0; *Rhytidiadelphus squarrosus* 0,0; *Selinum carvifolia* 1,0; *Stellaria graminea* 3,3; *Taraxacum officinale* 5,2; *Vicia cracca* 1,1; Ch. *Scheuchzerio-Caricetea fuscae*: *Juncus conglomeratus* 2,1; Ch. *Calluno-Ulicetea*: *Cladonia pyxidata* 0,0; *Genista germanica* 1,0; *Hypnum jutlandicum* 1,7; *Luzula campestris* 1,2; *Nardus stricta* 1,0; *Polytrichum juniperinum* 3,3; *Potentilla anglica* 1,0; Others: *Abies alba* c 0,0; *Aesculus hippocastanum* c 1,0; *Agrostis sp.* 0,0; *Athyrium filix-femina* 3,1; *Aulacomnium palustre* var. *palustre* 0,0; *Berberis vulgaris* b 0,0; *Brachytheciastrum velutinum* 3,3; *Brachythecium rutabulum* 3,7; *B. salebrosum* 0,0; *Brachythecium* sp. 1,2; *Bryum* sp. 1,0; *Calamagrostis canescens* 0,2; *Carex acutiformis* 0,6; *C. brizoides* 0,0; *Cephalozia* sp. 1,0; *Cerastium semidecandrum* 0,0; *Ceratodon purpureus* 1,1; *Chamaenerion angustifolium* 2,1; *Cladonia glauca* 1,1; *Cladonia* sp. 0,0; *Conyza canadensis* 1,1; *Cornus sanguinea* b 1,2; c 2,1; *Crataegus laevigata* b 1,4; c 2,0; *Cruciata glabra* 0,6; *Dicranum bonjeanii* 1,0; *Equisetum hyemale* 0,0; *Euonymus europaea* c 2,1; *Fallopia convolvulus* 7,11; *Galium palustre* 0,0; *Gnaphalium sylvaticum* 0,0; *Hieracium barbatum* 0,0; *H. cymosum* 1,0; *Hieracium* sp. 0,0; *Kindbergia praelonga* 2,3; *Larix decidua* subsp. *decidua* a 1,2; a1 0,0; *Larix decidua* subsp. *decidua* c 1,0; *Lepidozia reptans* 0,0; *Ligustrum vulgare* c 0,0; *Lonicera periclymenum* b 0,2; c 0,6; *Lophocolea bidentata* 0,0; *Luzula pallescens* 1,0; *Malus* sp. c 0,0; *Melandrium rubrum* 0,0; *Mnium sp.* 1,0; *Orthodicranum montanum* 1,0; *Oxyrrhynchium hians var. hians* 0,2; *Plagiomnium cuspidatum* 1,1; *P. rostratum* 1,0; *Plagiothecium sp.* 1,1; *Platanthera chlorantha* 0,0; *Polypodium vulgare* 1,16; *Populus alba* c 0,0; *P. tremula* a 0,2; a1 1,3; a2 1,0; b 4,7; bc 1,0; c 9,7; *Prunus* sp. c 1,0; *Pseudotsuga taxifolia* a 0,6; b 0,0; c 0,0; *Pyrus communis* a 0,0; a2 1,0; b 2,1; bc 0,0; c 7,3; *Quercus rubra* a 0,2; a1 0,6; b 1,2; c 2,3; *Quercus x rosacea* a 5,203; a1 2,46; a2 1,3; b 1,0; c 4,9; *Ranunculus sardous* 1,0; *Ribes nigrum* c 0,0; *Robinia pseudacacia* a 1,13; b 1,8; c 1,4; *Rosa canina* b 0,0; c 0,0; *Rosa* sp. bc 0,0; *Rubus* cfr. *hirtus* 1,0; *R. corylifolius* 2,4; *R. gracilis* c 2,1; *R. hirtus* 0,0; *R. pallidus* 1,2; *R. radula* 0,0; *R. schleicheri* 1,0; *R. serpens* 0,0; *Rubus* sp. 7,7; *R. sprengelii* 5 5; *R. x corylifolius* 1 1; *Rumex acetosella* 6,4; *Sagina procumbens* 0,0; *Salix cinerea* c 1,0; *Sambucus nigra* b 0,0; . c 1,1; *Sambucus racemosa* c 0,0; *Sarothamnus scoparius* c 2,3; *Sciuro-hypnum oedipodium* 16,23; *Scutellaria galericulata* 0,2; *Senecio ovatus* 0,0; *S. sylvaticus* 0,0; *S. vulgaris* 0,0; *Silene vulgaris* 1,0; *Sphagnum capillifolium* 0,0; *S. fimbriatum* 0,0; *Stellaria media* 3,19; *Symphoricarpos albus* c 0,0; *Thalictrum aquilegiifolium* 0,2; *Trichodon cylindricus* 0,0; *Trifolium arvense* 0,0; *Vicia sativa* 0,0; *Viscaria vulgaris* 1,1.

4. *Galio sylvatici-Carpinetum betuli* (114 relevés): Boiński (1973), tab. 31: 12,14,15-17,19,20,22 (*Galio-Carpinetum calamagrostietosum*), tab. 50: 1,3,6,7,12 (*Fago-Quercetum*); Ferchmin (1966), tab. 8: 2-5, 7-14 (*Querco-Carpinetum calamagrostietosum*); Ferchmin (1980), tab. 17: 8,15 (*Querco-Carpinetum*); Jelinowski (1958), tab. 1: 11,18-20,27 (*Pino-Quercetum*); Kamionka (1971), tab. 10: 15-25 (*Galio-Carpinetum holcetosum*); Krotoska (1966), tab. 10: 1-4, 6-12, 14 (*Gs-C holcetosum mollis*), tab. 11: 1-5 (*Gs-C holcetosum mollis* typical variant, form with *Vaccinium myrtillus*); Krotoska & Piotrowska (1962), tab. 5: 1,3-5,16,17,19 (*Pino-Quercetum*); Kubiś (1982), tab. 2: 1,2 (*Gs-C holcetosum mollis*); Maciejewska-Rutkowska *et al.* (2001), tab. 2, zdj. 1 (*Gs-C holcetosum*); Macicka (1984), tab. 10: 37,41,44,45,47 (*Galio-Carpinetum holcetosum*); Macicka & Wilczyńska (1990), tab. 9: 1-7,9,10,12-14 (*Gs-C holcetosum*); Macicka & Wilczyńska (1991), tab. 9: 1-14 (*Gs-C holcetosum*); Macicka & Wilczyńska (1992), tab. 4: 18-24,28,29 (*Gs-C holcetosum*); Kasprowicz (oryg.) – tab. A20: 40,44; Wojterska (2003): 14: 28,31 (*Gs-C holcetosum mollis*); Sroka (1982), tab. 1: 19 (*Calamagrostio-Quercetum*). **Taxa not included in the table:** Ch. *Querco-Fagetea*: *Acer campestre* a2 3,38; b 3, 5; c 8, 4; *A. platanoides* a2 1,4; b 1,0; c 10,4; *A. pseudoplatanus* a1 1,4; a2 2,20; b 1,0; c 11,9; *Adoxa moschatellina* 10,28; *Asarum europaeum* 6,7; *Campanula trachelium* 2,5; *Carex remota* 1,0; *Cephalanthera longifolia 1,0; Cerasus avium* a1 1,4; a2 1,4; b 4,10; c 4,2; *Circaea lutetiana* 1,4; *Daphne mezereum* c 1,0; *Dryopteris filix-mas* 23,35; *Equisetum sylvaticum* 1,0; *Eurhynchium angustirete* 14,11; *Festuca altissima* 2,20; *Ficaria verna* 4,2; *Fraxinus excelsior* b 5,11; c 9,4; *Galium odoratum* 9,57; *Hedera helix* 8,23; *Impatiens noli-tangere* 3,1; *Lathyrus vernus* 2,1; *Lilium martagon* 1,0; *Lonicera xylosteum* c 1,0; *Malus sylvestris* bc 4,2; c 4,2; *Melica uniflora* 2,0; *Mercurialis perennis* 1,0; *Padus avium* a 2,0; b 12,84; c 15,15; *Paris quadrifolia* 3,1; *Phyteuma spicatum* 5,3; *Plagiomnium undulatum* 1,0; *Pulmonaria obscura* 12,26; *Ranunculus lanuginosus* 1,0; *Ribes spicatum* b 1,0; bc 1,0; c 2,1; *R. uva-crispa* b 2,1; *Sorbus torminalis* a2 1,0; b 1,0; c 4,2; *Stachys sylvatica* 8,3; *Tilia platyphyllos* b 1,0; c 1,0; *Ulmus laevis* a1 1,0; *U. minor* b 1,4; *Viburnum opulus* c 9,12; *Viola odorata* 1,0; Ch. *Vaccinio-Piceetea*: *Dryopteris dilatata* 1,0; *Galium rotundifolium* 10,32; *Pyrola minor* 1,0; *P. rotundifolia* 2,1; Ch. *Trifolio-Geranietea:* *Silene nutans* subsp. *nutans* 2,9; *Vicia dumetorum* 5,3; Ch. *Artemisietea*: *Aegopodium podagraria* 16,35; *Alliaria petiolata* 4,6; *Anthriscus sylvestris* 3,1; *Chaerophyllum temulum* 4,6; *Epilobium montanum* 1,0; *Euphorbia esula* 1,0; *Fallopia dumetorum* 4,2; *Galeopsis bifida* 1,0; *Galium aparine* 10,36; *Geranium robertianum* 12,10; *Glechoma hederacea* 9,8; *Heracleum sphondylium* 4,2; *Humulus lupulus* 3,1; *Lapsana communis* s. s. 1,0; *Melandrium album* 1,0; *Rubus caesius* 10,5; *Torilis japonica* 3,1; *Tussilago farfara* 1,0; Ch. *Molinio-Arrhenatheretea*: *Angelica sylvestris* 3,1; *Arrhenatherum elatius* 4,16; *Campanula patula* s.str. 1,0; *Carex cespitosa* 1,0; *C. hirta* 1,0; *Holcus lanatus* 3,1; *Lathyrus pratensis* 2,1; *Lotus corniculatus* 1,0; *Lychnis flos-cuculi* 1,0; *Lysimachia nummularia* 8,16; *Pimpinella major* 1,0; *Poa palustris* 1,0; *Poa pratensis* 12,25; *P. trivialis* 6,11; *Potentilla reptans* 3,1; *Prunella vulgaris* 2,1; *Ranunculus acris* s. s. 1,0; *R. repens* 2,1; *Saxifraga granulata* 2,1; *Selinum carvifolia* 4,2; *Stellaria graminea* 4,2; *Taraxacum officinale* 4,2; *Vicia cracca* 3,20; Ch. *Calluno-Ulicetea*: *Agrostis stolonifera* 2,1; Others: *Abies alba* a 1,4; c 2,1; *Athyrium filix-femina* 19,100; *Brachytheciastrum velutinum* 8,4; *Brachythecium rutabulum* 6,3; *Carex brizoides* 7,203; *C. elongata* 1,0; *Carex* sp. 1,0; *Cerastium arvense* 1,0; *Chamaenerion angustifolium* 1,0; *Cornus sanguinea* b 4,6; c 1,4; *Crataegus laevigata* b 2,9; c 1,0; *C. monogyna et laevigata* b 2,16; bc 4,2; c 6,7; *Crataegus sp.* c 5,7; *Cruciata glabra* 10,17; *Euonymus europaea* b 9,4; c 11,10; *Eurhynchium sp.* 1,0; *Fallopia convolvulus* 3,1; *Fissidens taxifolius* 2,1; *Galium palustre* 2,1; *Larix decidua* subsp. *decidua* a1 1,0; *Listera ovata* 1,0; *Lonicera periclymenum* b 1,4; 1,33; *Luzula pallescens* 1,0; *Oxalis fontana* 1,0; *Oxyrrhynchium hians* 11,6; *Plagiomnium cuspidatum* 1,0; *Plagiothecium cavifolium* 1,0; *Poa annua* 1,0; *Pohlia lescuriana* 21,26; *Polygonatum verticillatum* 3,5; *Polypodium vulgare* 1,0; *Populus tremula* a 1,4; a1 3,24; a2 3,1; b 4,6; bc 1,0; c 5,3; *Pyrus communis* a2 2,5; b 4,6; c 6,3; *Quercus rubra* a 3,24; a2 1,0; b 1,0; c 3,1; *Q.* x *rosacea* a1 1,33; b 1,0; c 2.1; *Ranunculus sardous* 1,0; *Rhizomnium punctatum* 1,0; *Rhodobryum roseum* 1,0; *Robinia pseudacacia* a 2,5; a1 1,0; *Rosa canina* c 3,1; *Rosa sp.* bc 1,0; c 2,1; *Rubus corylifolius* 1,0; *R. gracilis* 1,0; *R. hirtus 6,7; R. cfr. hirtus* 4,17; *R. serpens* 1,0;

Rubus sp. 11,5; *Rumex acetosella 4,2; Sambucus nigra* b 3,9; 5,3; *Sambucus racemosa* b 1,0; c 1,0; *Sciuro-hypnum oedipodium* 2,1; *Silene* sp. 1,0; *Solanum dulcamara* 1,0; *Stellaria media* 17,32; *Thuidium philibertii* 1,0; *Thuja gigantea* c 1,0; *Veronica hederifolia* 2,5.

5. *Potentillo albae-Quercetum petraeae* (98 relevés): Brzeg & Kasprowicz (2001): 1 (*Pa-Q brachypodietosum*), 2 (*Pa-Q typicum*), 3 (*Pa-Q molinietosum*); Boiński (1973), tab. 46: 1-4,6 (*Pa-Q*); Gmaj (1997), tab. 6: 3 (*Pa-Q lathyretosum verni*), tab. 7: 1,3 (*Pa-Q* – degenerated forms); Jakubowska-Gabara (1994), tab. 1: 1-10 (*Pa-Q poëtosum*, 16-18,23 (*Pa-Q typicum*); Jaroszewska (2007), tab. 2: 1,4-6,8,9,11 (*Pa-Q brachypodietosum pinnati*); Krotoska (1991), tab. 11: 2,4-6,9,10,12 (*Pa-Q*), Nowaczyk (1964), tab. 9: 1-16 (*Querco-Potentilletum albae*); Wojterska et all. (2006), tab. 1: 7,10,11,13,15,19,20,22-26 (*Pa-Q brachypodietosum*), tab. 2: 1-5,8,9 (*Pa-Q molinietosum*); Wojterska & Wiszniewska (1996), tab. 1: 1-13 (*Pa-Q brachypodietosum pinnati*), 16 (*Pa-Q typicum*), 17 (*Pa-Q astrantietosum*); Wojterska *et al*. (2001), tab. 1: 4-9, 11-14 (*Pa-Q*). **Taxa not included in the table:** Ch. *Querco-Fagetea*: *Acer platanoides* c 3,1; *A. pseudoplatanus* b 1,1, c 1,1; *Adoxa moschatellina* 1,1; *Asarum europaeum* 3,2; *Astrantia major* 5,7; *Campanula trachelium* 1,1; *Cerasus avium* b 1,1, c 13,5; *Daphne mezereum* b 1,1, c 5,3; *Dryopteris filix-mas* 4,2; *Epipactis helleborine* 3,6; *Equisetum sylvaticum* 1,1; *Euonymus verrucosus* b 2,6, c 3,2; *Eurhynchium angustirete* 2,1; *Fraxinus excelsior* b 2,1 c 12,4; *Galium odoratum* 4,11; *Hierochloë australis* 1,1; *Hypochoeris maculata* 5,16; *Lathyrus vernus* 14,16; *Lilium martagon* 13,16; Malus sylvestris a2 2,1, b 5,3, c 16,7; *Melittis melissophyllum* 10,63; *Neottia nidus-avis* 1,1; *Padus avium* b 14,6, c 17,7; *Phyteuma spicatum* 4,1; *Pulmonaria obscura* 4,2; *Ribes uva-crispa* c 1,1; *Sorbus torminalis* c 1,1; *Stachys sylvatica* 1,1; *Ulmus glabra* c 1,1; *U. minor* c 1,1; *Viburnum opulus* b 5,3, c 9,5; Ch. *Vaccinio-Piceetea*: *Cladonia furcata* 1,1; *Pyrola minor* 3,10; Ch. *Trifolio-Geranietea* et *Festuco-Brometea*: *Acinos arvensis* (*F-B*) 1,1; *Agrimonia eupatoria* (*T-G*) r,2; *Ajuga genevensis* (*F-B*) 3,2; *Asparagus officinalis* (*F-B*) 1,1; *Asperula tinctoria* (*F-B*) 1,1; *Avenula pratensis* (*F-B*) s,2; *Campanula bononiensis* (*T-G*) 1,0; *C. glomerata* (*F-B*) 12,24; *C. rapunculoides* (*T-G*) 2,18; *Coronilla varia* (*T-G*) 8,8; *Festuca trachyphylla* (*F-B*) 1,1; *Galium album* (*T-G*) 11,24; *Origanum vulgare* (*T-G*) 2,6; *Poa compressa* (*F-B*) 1,1; *Silene nutans* subsp. *nutans* (*T-G*) 18,9; *Thalictrum minus* (*F-B*) 11,9; *Trifolium medium* (*T-G*) 4,2; *T. montanum (F-B) 1,1; Veronica spicata (F-B) 1,1; Vicia dumetorum (T-G) 3,6; Vincetoxicum hirundinaria (T-G) 6,8;* Ch. *Artemisietea*: *Aegopodium podagraria* 2,6; *Alliaria petiolata* 19,23; *Anthriscus sylvestris* 8,22; *Chaerophyllum temulum* 6,2; *Epilobium* montanum 2,1; *Equisetum arvense* 2,1; *Fallopia dumetorum* 2,1; *Galium aparine* 20,62; *Geranium pratense* 2,1; *G. robertianum* 22,42; *Glechoma hederacea 2,1; Heracleum sibiricum 3,2; H. sphondylium 4,1;* *Lapsana communis* s. s. 11,6; *Linaria vulgaris* 7,4; *Rubus caesius* 2,23; *Tanacetum vulgare* 1,1; *Torilis japonica* 16,60; Ch. *Molinio-Arrhenatheretea*: *Agrostis gigantea* 4,19; *Angelica sylvestris* 8,22; *Arrhenatherum elatius* 5,7; *Avenula pubescens* 2,1; *Briza media* 4,2; *Campanula patula* s.str. 2,0 *Carex hirta* 16,48; *Centaurea jacea* 2,1; *Cerastium holosteoides* 1,1; *Cnidium dubium* 16,126; *Dianthus superbus* s. s. 2,1; *Festuca pratensis* 2,1; *Laserpitium prutenicum* 8,31; *Lathyrus pratensis* 7,4; *Leontodon autumnalis* 1,0; *Lysimachia nummularia* 3,6; *Phleum pratense* 2,1; *Pimpinella major* 6,12; *Plantago lanceolata* 4,2; *Poa pratensis* 17,13; *P. trivialis* 4,2; *Prunella vulgaris* 2,1; *Ranunculus acris* s. s. 10,9; *Sanguisorba officinalis* 2,1; *Selinum carvifolia* 13,16; *Stellaria graminea* 9,18; *Taraxacum officinale* 27,7; *Trollius europaeus* 3,2; *Vicia cracca* 2,1; Ch. *Scheuchzerio-Caricetea fuscae*: *Juncus conglomeratus* 1,1; Ch. *Calluno-Ulicetea*: *Polytrichum juniperinum* 2,1; Others: *Abies alba* c 1,1; *Acer negundo* c 1,0; *Adenophora liliifolia* 2,1; *Agrostis gigantea x canina* 1,5; *Aquilegia vulgaris* 2,1; *Athyrium filix-femina* 1,1; *Berberis vulgaris* b 2,1; *Brachytheciastrum velutinum* 11,6; *Brachythecium rutabulum* 21,10; *B. salebrosum* 2,1; *Bromus benekenii* 2,1; *Carex acutiformis* 1,1; *C. flacca* 4,7; *C. guestphalica* 1,1; *C. spicata* 1,0; *Centaurea phrygia* 2,1; *Ceratodon purpureus* 1,1; *Chamaenerion angustifolium* 3,1; *Chenopodium album* 2,1; *Cladonia glauca* 1.1; *Conyza canadensis* 2,1; *Cornus sanguinea* b 4,7, c 4,2; *Crataegus laevigata* b 18,34; c 9,4; *Crataegus sp*. c 1.1; *Cruciata glabra* 1,18; *Digitalis grandiflora* 6,3; *Euonymus europaea* c 7,4; *Fallopia convolvulus* 37,32; *Galium mollugo* et *dumetorum* 5,7; *Hypochoeris radicata* 1,0; *Kindbergia praelonga* 1,1; *Koeleria pyramidata* 1,1; *Lupinus polyphyllus* 11,22; *Luzula pallescens* 1,1; *Malus* sp. C 1,1; *Mentha arvensis* 2,1; *Oxyrrhynchium hians* var. *hians* 1,1; *Phalaris arundinacea* 2,1; *Plagiomnium cuspidatum* 5,24; *Poa nemoralis x compressa* 1,1; *Pohlia lescuriana* 12,5; *Populus tremula* a 2,6; a2 1,1, b 6,8, c 9,9; Pyrus communis b 7,8, c 11,5; *Quercus* x *rosacea* a 3,133, a1 5,80, a2 3,19, b 2,6, c 4,7; *Robinia pseudacacia* c 1,0; *Rosa canina* b 1,1, c 8,3; *Rosa sp.* C 1,1; *R. tomentosa* b 2,1; *Rosulabryum capillare* 1,1; *Rubus corylifolius* 14,13; *R. gracilis* 4,2; *Rubus* sp. 1,1; *R. sprengelii* 9,13; *Rumex acetosella* 3,1; *Sambucus nigra* c 1,1; *Sarothamnus scoparius* c 1,1; *Sciuro-hypnum oedipodium* 14,38; *Scutellaria galericulata* 2,6; *Senecio sylvaticus* 3,0; *S. vernalis* 1,0; *Silene vulgaris* 1,1; *Stellaria media* 5,20; *Thalictrum aquilegiifolium* 14,26; *Vicia hirsuta* 3,1; *Vicia* sp. 1,0; *Viola* sp. 2,1; *Viscaria vulgaris* 12,11.

6. *Querco roboris-Pinetum* (165 relevés): Balcerkiewicz *et al*. (1994) tab. 3: 2,3,5-7,9,11-14 (*Qr-P*); Berdowski & Kwiatkowski (1992), tab. 7: 2 (*Qr-P*); Brzeg *et al*. (2000a), tab. 2: 41,42 (*Festuco ovinae-Pinetum*); Brzeg (2004), tab. 1: 1,2,4-14 (*Qr-P*); Ferchmin (1980), tab. 21: 3-5 (*Pino-Quercetum*); Jakubowska-Gabara (1994), tab. 2: 2-7,10,13-15 (*Querco-Pinetum*); Kaczyńska (1964), tab. 5: 1-6,8-15 (*Pino-Quercetum*); Krotoska & Piotrowska (1962), tab. 5: 34 (*Pino-Quercetum*); Macicka (1984), tab. 20: 3,4,6,7,11-13,17,19,22,24,29,30 (*Pino-Quercetum*); tab. 29: 14,17 (Plantation of pine on the habitat of deciduos and mixed forests); Macicka & Wilczyńska (1990), tab. 16: 1,4,5,8,9,12-15,17 (*Pino-Quercetum fagetosum*); tab. 17: 1-3,6,8,15-17,22,26-29 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991): tab. 14: 5,6,14,21 (*Pino-Quercetum*); Macicka & Wilczyńska (1992); tab. 6: 2,3,5,7,8 (*Pino-Quercetum*); Macicka-Pawlik & Wilczyńska (1996), tab. 28, 2,4 (*Pino-Quercetum*); Kasprowicz (oryg.), tab. A32: 12,69; Nowaczyk (1964), tab. 7: 1-12, 14-18 (*Pino-Quercetum*); Ratyńska (2001), tab. 176, 8 (*Calamagrostio-Quercetum petraeae*); Robińska 1977, tab. 3; 4,6-8,10,12,13, tab. 5: 1 (*Pino-Quercetum* – degenerated forms); Sroka (1982), tab. 2: 4,6,8-12,15 (*Pino-Quercetum*); Szwed (1979), tab. 16: 1-4,10-11,16-18,20-22,24-32 (*Pino-Quercetum*); Wojterska (1976), tab. 11: 1,2,3 (*Pino-Quercetum*); Pawłow & Czech (1959), tab. 3: 13,16 (Mixed coniferous forest); Wojterska (2003), tab. 16: 23 (*Calamagrostio-Quercetum polygonatetosum*); **Taxa not included in the table:** Ch. *Querco-Fagetea*: *Acer platanoides* a2 1,3; b 2,1; bc 1,3; c 7,3; *A. pseudoplatanus* a2 2,17; b 5,18; bc 2,1; c 5,5; *Cerasus avium* a2 1,0; b 1,0; bc 1,0; c 1,0; *Dryopteris filix-mas* 7,3; *Equisetum sylvaticum* 1,0; *Eurhynchium angustirete* 1,0; *Fraxinus excelsior* c 1,0; *Lilium martagon* 1,0; *Luzula luzuloides* 1,0; *Malus sylvestris* b 1,1; bc 1,0; c 2,1; *Padus avium* b 1,0; *Ribes spicatum* bc 1,3; *R. uva-crispa* c 1,0; *Ulmus laevis* b 1,0; Ch. *Vaccinio-Piceetea*: *Cladonia arbuscula* 1,1; *C. furcata* 3,2; *C. rangiferina* 1,0; *Diphasiastrum complanatum* 1,3; *Dryopteris dilatata* 8,25; *Galium rotundifolium* 5,5; *Lycopodium annotinum* 1,3; *L. clavatum* 3,7; *Ptilium crista-castrensis* 2,14; *Pyrola minor* 1,0; *P. rotundifolia* 1,1; *Viscum album* subsp. *austriacum* 2,1; Ch. *Trifolio-Geranietea* (TG) et *Festuco-Brometea* (FB): *Artemisia campestris* (FB) 1,0; *Campanula rapunculoides* (TG) 1,0; *Festuca pallens* (FB) 2,23; *F. trachyphylla* (FB) 1,11; *Galium album* (TG) 1,0; *Silene nutans* subsp. *nutans* (TG) 1,1; *S. otites* (FB) 1,0; Ch. *Artemisietea*: *Epilobium montanum* 1,0; *Galium aparine* 1,0; *Geranium robertianum* 2,1; *Lapsana communis* s.s. 1,0; *Linaria vulgaris* 2,1; *Medicago lupulina* 1,0; *Rubus caesius* 5,5; *Tussilago farfara* 1,0; Ch. *Molinio-Arrhenatheretea*: *Agrostis gigantea* 1,11; *Arrhenatherum elatius* 5,29; *Campanula patula* s.s. 1,0; *Carex hirta* 8,46; *Poa pratensis* 2,4; *Potentilla reptans* 1,0; *Ranunculus acris* s.s. 1,0; *R. repens* 1,3; *Selinum carvifolia* 1,0; *Stellaria graminea* 2,1; Ch. *Scheuchzerio-Caricetea fuscae*: *Juncus conglomeratus* 1,0; Ch. *Calluno-Ulicetea*: *Cladonia chlorophaea* 2,1; *C. fimbriata* 1,0; *C. pyxidata* 2,4; *Hypnum jutlandicum* 4,18; *Nardus stricta* 1,0; *Polytrichum juniperinum* 4,2; *Ptilidium ciliare* 2,4; *Scabiosa canescens* 1,0; Others: *Abies alba* a1 1,11; a2 2,20; b 1,6; c 2,4; *Agrostis vinealis* 1,1; *Amelanchier ovalis* bc 1,0; *Athyrium filix-femina* 3,4; *Atrichum tenellum* 1,0; *Brachytheciastrum velutinum* 1,1; *Brachythecium rutabulum* 2,4; *Carex divulsa* 1,3; *Carex* sp. 1,0; *C. vulpina* 1,0; *Cerastium arvense* 1,0; *C. semidecandrum* 1,1; *Cerastium* sp. 1,0; *Ceratodon purpureus* 2,1; *Chamaenerion angustifolium* 5,2; *Chondrilla juncea* 1,0; *Cladonia digitata* 1,0; *C. macilenta* 1,0; *Corynephorus canescens* 2,4; *Crataegus laevigata* b 2,1; c 1,0; *C. x subsphaericea* c 1,0; *Cruciata glabra* 1,0; *Euonymus europaea* b 1,0; c 1,0; *Fallopia convolvulus* 1,0; *Funaria hygrometrica* 1,0; *Hieracium* sp. 1,0; *Koeleria glauca* 1,0; *Larix decidua* subsp. *decidua* a1 1,11; a2 1,3; bc 1,0; c 1,0; *Lophocolea bidentata* 1,1; *Marchantia polymormpha* 1,0; *Musci indet* 1,0; *Orthodicranum montanum* 1,0; *Oxyrrhynchium hians* var. *hians* 1,0; *Pinus strobus* a2 1,0; c 1,0; *Plagiomnium cuspidatum* 1,1; *P. elatum* 1,1; *P. rostratum* 2,1; *Plagiothecium* sp. 1,11; *Pohlia lescuriana* 1,0; *Polypodium vulgare* 1,11; *Populus nigra* a 1,0; c 1,0; *P. tremula* a 1,3; a1 1,14; a2 7,30; b 10,50; c 15,29; *Pyrus communis* b 2,1; c 1,0; *Quercus rubra* a1 1,0; a2 4,28; b 1,0; bc 4,5; c 1,0; *Q. x rosacea* a 3,144; a2 1,45; c 5,16; *Rhizomnium punctatum* 1,0; *Robinia pseudacacia* b 1,0; *Rosa* sp. c 1,0; *Rosulabryum capillare* 1,0; *Rubus* cfr. *hirtus* 4,18; *R. grabowskii* 2,1; *R. gracilis* c 5,14; *R. schleicheri* 1,1; *Rubus* sp. 14,106; *R. sprengelii* 5,11; *Rumex acetosella* 21,56; *Salix caprea* c 1,1; *Sambucus nigra* c 1,0; *S. racemosa* c 1,0; *Sarothamnus scoparius* c 2,1; *Sciuro-hypnum oedipodium* 11,42; *Senecio sylvaticus* 4,2; *S. vernalis* 1,0; *S. vulgaris* 1,1; *Sphagnum capillifolium* 1,0; *Stellaria media* 3,4; *Vicia* sp. 1,0; *Viola* sp. 1,1; *Viscum album* subsp. *album* 2,1.

7. *Serratulo-Pinetum* (13 relevés)*:* Brzeg (2004), tab. 1: 15-20 (*Serratulo-Pinetum*); Olaczek (1986), tab. 3: 4-8 (Pine tree-stands in the habitat of light oak forest), tab. 4; 4,5 (*Calamagrosti-Quercetum petraeae*). **Taxa not included in the table:** Ch. *Querco-Fagetea*: *Cerasus avium* bc 8,1; *Dryopteris filix-mas* 15,8; *Viburnum opulus* b 8,4; *Cladonia furcata* 31,15; *Cl. rangiferina* 8,4; *Diphasiastrum complanatum* 8,4; *Monotropa hypopitys* s.s. 38,16; *Pyrola chlorantha* 8,4; *P. minor* 8,4; *Viscum album subsp. austriacum* 8,4; Ch. *Trifolio-Geranietea* (TG) et *Festuco-Brometea* (FB)**:** *Ajuga genevensis* (FB) 8,4; *Coronilla varia* (TG) 8,4; *Potentilla heptaphylla* (FB) 8,4; *Silene nutans* subsp. *nutans* (TG) 8,4; *Trifolium montanum* (FB) 15,8; *Veronica spicata* (FB) 8,4; *Vincetoxicum hirundinaria* (TG) 8,4; *Ch. Artemisietea*: *Equisetum arvense* 8,4; Ch. *Molinio-Arrhenatheretea*: *Carex hirta* 15,8; *Cerastium holosteoides* 31,12; *Holcus lanatus* 8,4; *Plantago* *lanceolata* 8,4; Ch. *Calluno-Ulicetea*: *Arctostaphylos uva-ursi* 15,8; *Luzula campestris* 15,8; *Ptilidium ciliare* 8,4; *Scabiosa canescens* 15,8; Others: *Agrostis vinealis* 8,4; *Armeria maritima* 15,5; *Cetraria islandica* 8,4; *Chamaenerion angustifolium* 8,4; *Cladonia cervicornis* subsp. *verticillata* 8,4; *C. foliacea* 8,4; *Corynephorus canescens* 8,4; *Festuca psammophila* 8,4; *Helichrysum arenerium* 8,4; *Hypochoeris radicata* 8,4; *Hypogymnia physodes* 8,4; *Jasione montana* 15,8; *Populus tremula* a1 8,38; a2 8,38; b 8,4; c 15,8; *Pyrus communis* c 8,4; *Quercus rubra* bc 8,481; *Rosa* sp. b 15,8; c 8,4; *Rubus grabowskii* 8,4; *Rubus* sp. 8,4; *Rumex acetosella* 31,15; *Sarothamnus scoparius* b 15,42; c 8,4; *Sciuro-hypnum oedipodium* 23,46; *Scleranthus perennis* 8,4; *Silene vulgaris* 8,4.

Table 4. Spearman rank correlation between mean values of: Ellenberg indicator values (A), cover of layers (B), number of species (C) and ordination scores of relevés for the DCA axes

	DCA axis 1	DCA axis 2	DCA axis 3	DCA axis 4
(A) Ellenberg indicator values				
R (soil reaction)	0.8805 **	0.0079 ns	-0.0411 ns	-0.0181 ns
N (soil fertility)	0.6488 **	-0.2516 **	0.0262 ns	-0.1581 **
F (soil moisture)	-0.3376 **	-0.7556 **	-0.0911 *	0.1104 *
L (light)	-0.0580 ns	0. 5100 **	0.0447 ns	0.6074 **
K (continentality)	-0.6156 **	0.0946 *	0.0575 ns	0.2036 **
(B) Cover of layers [%]				
Herb layer (d)	-0.5501 **	0.2411 **	0.3121 **	-0.0337 ns
Moss layer (c)	0.0833 *	0.0842 *	-0.1845 **	-0.0367 ns
(C) Number of species				
Querco-Fagetea^ (Q-F)	0.8300 **	-0.2431 **	0.0244 ns	-0.1457 **
Trifolio-Geranietea (T-G)	0.6609 **	0.3215 **	-0.0295 ns	0.2509 **
Quercetalia pubescentis (Q.pu)	0.6061 **	0.1168 *	-0.1001 *	0.1506 **
Herb layer (c)	0.6390 **	-0.0920 *	0.0611 ns	0.3041 **
Moss layer (d)	-0.4284 **	-0.0344 ns	0.4242 **	0.0659 ns
Festuco-Brometea (F-B)	0.4403 **	0.2511 **	0.0038 ns	0.3279 **
Vaccinio-Piceetea^ (V-P)	-0.5812 **	0.4075 **	0.0545 ns	0.1517 **
Scheuchzerio-Caricetea fuscae (S-Cf)	-0.3535 **	-0.3803 **	-0.0829 *	0.3164 **
Quercetea robori-petraeae (Qrp)	-0.0093 ns	-0.2098 **	0.1754 **	0.0972 *

Explanations: ** $p<0.001$; * $0.01<p\leq 0.05$; ns – non significant. ^ Tree species were not taken into account

Table 5. Floristic differentiation of *Aulacomnio androgyni-Quercetum roboris* reflecting habitat variation

Successive number of syntaxon		1		2		3		4	
Number of relevés		4		10		11		12	
Number of taxa		51		67		84		78	
Mean number of taxa in relevé		25		30		32		30	
Ch., *D. *Aulacomnio androgyni-Quercetum roboris*									
*Pohlia nutans** (C-U)		75	*575*	100	*615*	91	*200*	92	*233*
Dicranella heteromalla (opt.)		75	*263*	100	*365*	64	*268*	92	*121*
*Plagiothecium curvifolium** (V-P)		50	*25*	50	*25*	64	*32*	83	*42*
*Dicranum scoparium** (VP)		100	*163*	80	*130*	73	*36*	58	*29*
Mnium hornum		100	*475*	60	*30*	36	*18*	92	*46*
*Hypnum cupressiforme**		75	*263*	90	*360*	45	*105*	75	*150*
Lophocolea heterophylla		75	*38*	60	*30*	36	*18*	58	*29*
Aulacomnium androgynum		50	*25*	80	*130*	45	*105*	75	*75*
Plagiothecium laetum (loc. opt.)		75	*150*	70	*125*	73	*36*	50	*25*
Plagiothecium denticulatum (loc. opt.)		25	*13*	70	*35*	45	*23*	58	*67*
*Thuidium tamariscinum** (V-P)		75	*38*	30	*15*	18	*9*	17	*46*
Herzogiella seligeri		25	*13*	20	*10*	18	*9*	50	*25*
*Cladonia coniocraea** (C-U)		25	*13*	30	*60*	9	*5*	25	*13*
D. *Aa-Q anemonetosum nemorosae*									
Oxalis acetosella		-	-	30	*7*	45	*23*	75	*38*
Agrostis canina (S-C)		25	*13*	-	-	64	*73*	50	*25*
Juncus effusus (M-A)		-	-	10	*5*	64	*32*	42	*21*
Anemone nemorosa (Q-F)		-	-	-	-	45	*105*	67	*33*
Milium effusum (Q-F)		-	-	-	-	18	*9*	42	*21*
Stellaria holostea (Q-F)		-	-	-	-	9	*5*	50	*138*
Plagiomnium affine		-	-	10	*5*	36	*18*	17	*8*
Atrichum undulatum (Q-F)		25	*13*	-	-	27	*14*	17	*8*
Poa nemoralis (Q-F)		-	-	-	-	27	*14*	8	*4*
Ch., *D. *Quercetea robori-petraeae*									
*Polytrichastrum formosum**		100	*2250*	100	*2025*	100	*2545*	100	*1875*
Carex pilulifera		75	*263*	100	*580*	100	*491*	100	*804*
Holcus mollis		50	*25*	80	*85*	73	*273*	92	*263*
*Melampyrum pratense**		75	*38*	70	*121*	73	*118*	42	*21*
Calamagrostis arundinacea		-	-	20	*55*	27	*14*	17	*46*
Festuca ovina		25	*13*	30	*15*	27	*168*	8	*4*
Hieracium sabaudum		25	*3*	10	*5*	18	*9*	17	*5*
Hieracium lachenalii		25	*13*	-	-	9	*5*	-	-
Ch. *Vaccinio-Piceetea* (V-P)									
Pinus sylvestris	a	-	-	-	-	-	-	8	*146*
Pinus sylvestris	c	25	*3*	10	*5*	45	*12*	25	*3*
Picea abies	a	-	-	-	-	18	*50*	17	*8*
Picea abies	b-c	-	-	80	*155*	45	*37*	17	*8*
Pleurozium schreberi		-	-	90	*45*	55	*27*	-	-
Hylocomium splendens		-	-	40	*20*	55	*68*	-	-
Trientalis europaea		-	-	60	*120*	36	*59*	-	-
Vaccinium myrtillus		25	*13*	100	*400*	100	*1550*	58	*179*
Leucobryum glaucum		25	*13*	10	*175*	9	*5*	17	*8*
Ch. *Querco-Fagetea* (Q-F)									
Carpinus betulus	a	100	*5000*	90	*4625*	91	*5454*	100	*5501*
Carpinus betulus	b-c	75	*38*	80	*225*	73	*132*	92	*183*
Ch. *Calluno-Ulicetea* (C-U)									
Carex pallescens		25	*13*	50	*25*	64	*32*	42	*21*
Carex ovalis		-	-	30	*15*	45	*23*	33	*17*
Agrostis capillaris		25	*13*	10	*5*	27	*55*	33	*17*
Luzula multiflora		-	-	40	*20*	18	*9*	17	*8*
Ch. *Scheuchzerio-Caricetea fuscae* (S-C) et *Molinio-Arrhenatheretea* (M-A)									
Deschampsia caespitosa (M-A)		75	*150*	40	*20*	73	*36*	67	*108*
Festuca rubra s. s. (M-A)		-	-	50	*25*	64	*73*	42	*21*
Carex nigra (S-C)		25	*13*	50	*25*	55	*182*	17	*8*
Lysimachia vulgaris (M-A)		-	-	30	*7*	27	*14*	33	*17*
Molinia caerulea (M-A)		-	-	20	*10*	27	*14*	17	*8*
Others									
Quercus robur	a	75	*2813*	100	*4250*	91	*3954*	100	*3833*
Quercus robur	b-c	75	*38*	100	*470*	100	*91*	100	*163*
Sorbus aucuparia	c	75	*38*	90	*37*	82	*41*	92	*83*
Betula pendula	a	-	-	10	*5*	54	*378*	25	*50*
Betula pendula	c	25	*13*	30	*15*	36	*18*	17	*5*
Frangula alnus	b-c	50	*150*	60	*145*	100	*286*	92	*358*
Luzula pilosa		75	*263*	90	*385*	100	*409*	92	*583*
Maianthemum bifolium		100	*1013*	100	*185*	91	*209*	92	*300*
Dryopteris carthusiana		25	*13*	30	*15*	64	*32*	83	*42*
Calamagrostis epigejos		75	*38*	30	*15*	55	*182*	33	*92*
Anthoxanthum odoratum		50	*25*	40	*20*	9	*5*	-	-
Convallaria majalis		25	*13*	30	*15*	27	*14*	17	*8*
Rubus sprengelii		-	-	40	*20*	-	-	-	-

Explanations: Shortened table comprises in each column the frequency of species (in %) and cover index (italics).
1. *Aulacomnio androgyni-Quercetum roboris typicum* typical variant (4 relevés): Brzeg *et al*. (2000a), tab. 1: 1-3 (*Aa-Q typicum* typical variant; Kubiś (1982), tab. 4: 15 (*Polytrichum attenuatum-Carpinus betulus*).
2. *Aulacomnio androgyni-Quercetum roboris typicum* variant with *Pleurozium schreberi* (10 relevés): Brzeg *et al*. (2000a), tab. 1: 4-10; Lisiewska & Reszel (2000), tab. 3: 1 (*Aa-Q typicum*); Kulińska (1991), tab. 4: 4,5 (*Carpino-Quercetum*).
3. *Aulacomnio androgyni-Quercetum roboris anemonetosum nemorosae* variant with *Pleurozium schreberi* (11 relevés): Brzeg *et al*. (2000a), tab. 1: 11-17 (*Aa-Q anemonetosum nemorosae* variant with *Pleurozium schreberi*); Krotoska (1966), tab. 21: 2; Kubiś (1982), tab. 4: 2,3 (Community *Polytrichum attenuatum-Carpinus betulus*); Sroka (1982), tab. 1: 3 (*Calamagrostio arundinaceae-Quercetum*).
4. *Aulacomnio androgyni-Quercetum roboris anemonetosum nemorosae* typical variant (12 relevés): Brzeg *et al*. (2000a), tab. 1: 18-25 (*Aa-Q anemonetosum nemorosae* typical variant; Błachuta (1995), tab. 4: 3,4 (*Carpino-Quercetum*); Lisiewska & Reszel (2000), tab. 3: 2 (*Aa-Q anemonetosum nemorosae*); Sroka (1982), tab. 1: 4 (*Calamagrostio arundinaceae-Quercetum*).

Table 6. Floristic differentiation of *Molinio caeruleae-Quercetum roboris* reflecting habitat variation

Successive number of syntaxon		1		2		3	
Number of relevés		27		9		20	
Number of taxa		113		79		87	
Mean number of taxa in relevé		25		31		25	
D. *Molinio caeruleae-Quercetum roboris*							
Molinia caerulea		100	*5806*	100	*5417*	100	*5175*
Rubus nessensis		26	*46*	56	*28*	35	*63*
Polytrichum commune		19	*89*	44	*22*	15	*8*
Ch., *D. *Quercetea robori-petraeae* (Qrp)							
*Polytrichastrum formosum**		85	*221*	100	*478*	75	*150*
Carex pilulifera		78	*89*	89	*94*	80	*130*
*Melampyrum pratense**		52	*156*	78	*39*	70	*188*
Holcus mollis		41	*100*	33	*17*	45	*130*
*Pteridium aquilinum**		22	*378*	44	*261*	65	*478*
Dicranella heteromalla		33	*33*	44	*22*	15	*8*
Festuca ovina		33	*83*	11	*6*	-	-
Plagiothecium laetum (loc. opt.)		22	*11*	33	*17*	5	*3*
Plagiothecium denticulatum		15	*7*	56	*28*	15	*8*
Lophocolea heterophylla		11	*6*	33	*17*	5	*3*
Ch. *Vaccinio-Picetea* (V-P)							
Picea abies	a	19	*43*	33	*306*	25	*206*
Picea abies	b-c	70	*106*	78	*35*	70	*376*
Pinus sylvestris	a	52	*440*	11	*15*	15	*138*
Pinus sylvestris	c	19	*8*	11	*6*	10	*3*
Vaccinium myrtillus		100	*1259*	100	*1644*	95	*1350*
Trientalis europaea		81	*631*	78	*739*	75	*438*
Pleurozium schreberi		26	*30*	22	*11*	10	*5*
Plagiothecium curvifolium		11	*6*	22	*11*	15	*8*
Hylocomium splendens		4	*2*	22	*11*	-	-
Leucobryum glaucum		22	*11*	-	-	-	-
Ch. *Querco-Fagetea*							
Fagus sylvatica	a	-	-	33	*17*	-	-
Fagus sylvatica	b-c	19	*8*	33	*72*	20	*35*
Carpinus betulus	a	4	*19*	33	*617*	45	*1183*
Carpinus betulus	b-c	44	*70*	100	*728*	55	*1238*
Anemone nemorosa		15	*70*	22	*11*	20	*8*
Milium effusum		11	*22*	22	*11*	10	*5*
Stellaria holostea		4	*2*	11	*6*	35	*40*
Poa nemoralis		15	*24*	-	-	35	*16*
Ch. *Scheuchzerio-Caricetea fuscae* et *Molinio-Arrhenatheretea*							
*Lysimachia vulgaris**		52	*143*	78	*89*	70	*228*
Carex nigra		37	*52*	78	*39*	35	*40*
*Juncus effusus**		33	*50*	67	*33*	35	*40*
Agrostis canina		26	*93*	44	*72*	20	*118*
*Deschampsia caespitosa**		26	*46*	22	*11*	20	*195*
Festuca rubra s. s.*		11	*6*	33	*17*	15	*30*
D. var. et subvar.							
Betula pubescens (V-P)	a	7	*4*	56	*589*	45	*248*
Betula pubescens (V-P)	c	11	*6*	44	*22*	20	*33*
Calamagrostis arundinacea (Qrp)		-	-	89	*522*	100	*625*
Sphagnum girgensohnii		-	-	78	*378*	-	-
Carex canescens (S-C)		-	-	56	*78*	-	-
Sphagnum fimbriatum		-	-	11	*6*	-	-

Successive number of syntaxon		1		2		3	
Ch. *Calluno-Ulicetea* (C-U)							
Pohlia nutans		41	*37*	56	*28*	25	*13*
Agrostis capillaris		30	*15*	33	*17*	30	*15*
Carex pallescens		19	*26*	44	*22*	35	*18*
Solidago virgaurea s. s.		-	-	11	*6*	25	*13*
Others							
Quercus robur	a	85	*3699*	100	*4639*	100	*5321*
Quercus robur	b-c	74	*90*	100	*534*	85	*236*
Betula pendula	a	52	*575*	56	*289*	35	*248*
Betula pendula	c	37	*19*	33	*17*	25	*13*
Quercus petraea	a	37	*1463*	11	*700*	5	*313*
Quercus petraea	b-c	26	*111*	11	*6*	5	*88*
Sorbus aucuparia	a	11	*159*	22	*61*	15	*30*
Sorbus aucuparia	b-c	93	*135*	100	*56*	95	*123*
Frangula alnus	b-c	100	*2863*	100	*2594*	100	*2118*
Maianthemum bifolium		85	*219*	100	*200*	95	*68*
Dryopteris carthusiana		63	*65*	44	*68*	50	*25*
Luzula pilosa		52	*59*	44	*22*	70	*33*
Rubus idaeus		30	*48*	11	*6*	10	*5*
Oxalis acetosella		30	*81*	33	*17*	35	*40*
Anthoxanthum odoratum		22	*11*	11	*6*	20	*33*
Convallaria majalis		11	*22*	44	*22*	30	*15*
Aulacomnium palustre var. *palustre*		4	*2*	33	*17*	5	*3*
Rubus gracilis		11	*6*	22	*7*	10	*28*
Plagiomnium affine		7	*20*	22	*11*	5	*3*
Sciuro-hypnum oedipodium		15	*7*	22	*11*	15	*8*
Galeopsis tetrahit		19	*9*	11	*6*	25	*13*
Populus tremula	a	4	*19*	-	-	15	*138*
Populus tremula	b-c	7	*6*	11	*6*	25	*38*
Rubus plicatus		37	*52*	-	-	10	*28*
Rubus corylifolius		26	*126*	-	-	-	-

Explanations: Shortened table comprises in each column the frequency of species (in %) and cover index (italics).

1. *Molinio caeruleae-Quercetum roboris* typical variant (27 relevés): Brzeg *et al*. (1989), tab. 2: 1-14 (*Mc-Q* typical form; Sroka (1982), tab. 1: 35 (*Calamagrostio arundinaceae-Quercetum*), tab. 2: 13 (*Pino-Quercetum*), tab. 3: 4-14 (Pine-Oak forest with *Molinia caerulea*).

2. *Molinio caeruleae-Quercetum roboris* variant with *Calamagrostis arundinacea* subvariant with *Carex canescens* (9 relevés): Brzeg *et al.* (1989), tab. 2: 27-33 (*Mc-Q* form with *Calamagrostis arundinacea* variant with *Carex canescens* and *Sphagnum girgensohnii*); Lisiewska & Reszel (2000), tab. 3: 4 (*Molinio caeruleae-Quercetum* variant with *Anemone nemorosa*); Kulińska (1991), tab. 2: 1 (*Molinio-Quercetum*).

3. *Molinio caeruleae-Quercetum roboris* variant with *Calamagrostis arundinacea* typical subvariant (20 relevés): Brzeg *et al.* (1989), tab. 2: 15-26 (*Mc-Q* form with *Calamagrostis arundinacea* typical variant; Krotoska & Piotrowska (1962), tab. 5: 25, 36-40 (*Pino-Quercetum*); Sroka (1982), tab. 1: 36 (*Calamagrostio arundinaceae-Quercetum*).

Table 7. Floristic composition of subassociations of *Calamagrostio arundinaceae-Quercetum*, depending on stage of degeneration

Successive number of syntaxon		1	2	3	4	5	6	7	8	9	10	11	12
Number of relevés		56	79	169	64	91	136	47	28	35	15	24	36
Number of taxa		216	210	273	225	222	271	167	120	194	104	132	172
Mean number of taxa in relevé		35	26	30	30	19	25	26	22	27	22	21	23
Ch., *D. *Calamagrostio arundinaceae-Quercetum petraeae*													
*Quercus petraea**	a-c	41	63	88	30	79	93	49	64	77	27	54	86
*Festuca ovina**		59	70	72	64	81	72	64	71	89	27	42	17
*Calamagrostis arundinacea**		61	48	70	53	49	60	2	21	9	20	21	72
Hieracium lachenalii		80	77	73	28	31	26	2	-	6	7	29	6
Hieracium laevigatum		43	43	34	8	5	5	-	-	3	7	-	3
Hieracium sabaudum		52	59	56	14	16	15	2	4	-	-	12	3
Lathyrus montanus		4	9	5	2	4	1	-	-	-	-	-	-
Ch., *D. *Quercetea robori-petraeae*													
Carex pilulifera		89	70	55	69	57	38	83	75	74	33	38	11
Holcus mollis		86	62	41	64	42	38	72	68	43	27	17	6
*Polytrichastrum formosum**		86	68	54	69	43	38	83	68	66	47	46	8
*Melampyrum pratense**		84	82	66	66	59	52	64	39	60	60	33	28
*Pteridium aquilinum**		43	72	63	58	59	71	53	57	57	33	46	61
Dicranella heteromalla		25	46	24	22	31	30	23	46	29	7	12	3
D. *Ca-Q molinietosum*													
Quercus robur	a-c	93	61	33	81	35	21	74	57	51	60	58	25
Picea abies (V-P)	a-c	64	39	20	56	20	19	57	50	6	40	33	17
Frangula alnus	b-c	96	58	45	80	41	47	100	46	54	73	58	33
Molinia caerulea		50	4	4	44	5	3	55	-	-	67	-	3
Lysimachia vulgaris		39	1	4	58	3	5	38	-	6	73	4	3
Trientalis europaea (V-P)		64	20	4	53	9	5	49	11	14	40	-	6
Carex pallescens (C-U)		57	8	7	55	8	7	43	11	9	27	-	6
Potentilla erecta (C-U)		41	1	4	34	2	3	19	4	11	47	-	6
Deschampsia caespitosa		34	5	4	39	2	3	28	-	6	20	4	6
Juncus effusus		29	4	1	27	2	2	23	-	-	27	-	3
Carex nigra		27	-	-	16	1	-	19	-	-	20	4	-
Carex ovalis (C-U)		16	-	1	14	1	1	11	4	-	7	4	-
Agrostis canina		11	-	-	19	-	-	13	-	-	7	-	-
D. *Ca-Q polygonatetosum odorati*													
Convallaria majalis		29	27	73	47	45	74	23	7	43	7	12	75
Moehringia trinervia		18	22	63	22	12	58	26	36	49	27	25	67
Mycelis muralis		16	11	47	8	3	38	11	7	26	7	25	22
Galeopsis tetrahit		12	10	30	9	13	30	17	4	20	20	12	36
Melica nutans (Q-F)		4	9	41	11	11	39	2	4	34	13		53
Hieracium murorum		4	11	49	8	7	29	2	7	34	-	12	11
Veronica officinalis (C-U)		9	14	48	14	10	24	11	14	49	-	17	8
Polygonatum odoratum		-	8	41	5	1	25	-	4	17	-		33
Festuca heterophylla (Q-F)		5	4	25	6	3	18	2	-	3	7		11
Fallopia convolvulus		2	4	10	2	1	12	-	4	11	-		28
Urtica dioica		2		9	2	3	12	2	-	6	7		28
Rubus caesius		4	3	6	6	-	9	2	-	9	-		22
Ch. *Vaccinio-Piceetea* (V-P)													
Pinus sylvestris	a-c	39	38	40	45	31	46	47	71	51	73	79	67
Vaccinium myrtillus		86	78	75	92	75	62	96	96	63	93	75	69
Pleurozium schreberi		41	29	24	38	20	25	32	61	43	33	58	28
Pseudoscleropodium purum		20	6	12	14	4	7	17	11	9	27	17	17
Juniperus communis	b-c	14	18	14	11	13	17	13	7	23	-	4	14
Dicranum scoparium		5	11	9	3	11	8	9	25	14	7	33	-
Rubus saxatilis		4	5	14	16	9	15	2	-	14	7	4	25
Ch. *Querco-Fagetea* (Q-F)													
Carpinus betulus	a-c	68	30	17	59	19	9	53	11	17	40	25	6
Fagus sylvatica	a-c	36	29	19	34	18	24	40	32	20	33	21	17
Malus sylvestris	a-c	23	6	6	23	-	4	9	-	-	-	-	-
Corylus avellana	b-c	7	22	40	6	13	32	4	-	20	13	-	22
Anemone nemorosa		50	29	27	38	19	19	34	14	17	13	8	33
Viola reichenbachiana		32	20	22	38	14	15	23	32	31	27	12	22
Poa nemoralis		36	42	53	17	23	40	17	21	23	20	8	39
Atrichum undulatum		12	24	22	20	12	18	13	29	20	7	-	6
Stellaria holostea		30	20	7	22	7	1	13	4	3	-	4	3
Viola riviniana		11	11	24	12	5	8	2	4	11	7	8	8
Ch. *Calluno-Ulicetea* (C-U)													
Agrostis capillaris		54	33	31	36	16	22	30	54	37	20	25	22
Pohlia nutans		36	35	25	27	35	31	23	54	29	13	38	3
Luzula multiflora		29	25	24	20	19	18	11	18	20	-	25	6
Solidago virgaurea s.s.		25	29	44	27	13	31	19	-	17	7	12	-
Hypericum maculatum		21	1	1	20	1	1	9	-	14	-	-	3
Others													
Betula pendula	a-c	39	44	30	30	23	18	38	57	29	53	50	25
Sorbus aucuparia	a-c	86	67	63	86	59	68	83	57	80	67	71	64

Successive number of syntaxon		1	2	3	4	5	6	7	8	9	10	11	12
Luzula pilosa		89	68	71	80	77	67	87	57	80	60	54	58
Maianthemum bifolium		88	61	52	80	38	32	66	32	17	80	29	44
Oxalis acetosella		62	23	16	48	19	6	53	29	20	33	21	25
Dryopteris carthusiana		61	13	24	47	23	18	55	36	26	53	42	47
Festuca rubra s.s.		54	20	31	31	18	24	30	7	29	20	21	8
Anthoxanthum odoratum		52	48	44	39	21	30	36	36	46	13	17	14
Hypnum cupressiforme		36	28	27	16	12	17	17	21	9	13	21	6
Veronica chamaedrys		27	24	30	19	13	28	4	-	37	7	12	17
Calamagrostis epigejos		27	15	21	23	13	17	45	50	37	33	38	33
Rubus idaeus		16	8	15	19	12	14	32	36	17	27	38	22
Deschampsia flexuosa		7	16	13	8	14	14	11	39	23	13	46	25
Fragaria vesca		18	13	26	17	14	24	13	-	23	13	4	25
Hypericum perforatum		18	16	32	11	13	18	11	18	31	13	8	17
Poa angustifolia		25	5	31	17	13	17	11	-	34	13	8	22
Plagiomnium affine		11	11	24	11	10	18	15	7	26	7	17	14
Rubus sp.		11	8	6	12	8	10	15	18	20	20	21	11
Campanula rotundifolia		2	15	21	5	4	10	2	14	3	7	4	8
Padus serotina	b-c	5	8	21	5	2	7	-	4	6	-	17	17
Rumex acetosella		4	3	8	6	8	6	6	25	11	-	21	6

Explanations: Shortened table comprises in each column the frequency of species (in %).

1-3. *Calamagrostio arundinaceae-Quercetum petraeae* – untransformed form – source of the relevés as given under the Table 8

1. *Ca-Q molinietosum* (56 relevés)

2. *Ca-Q typicum* (79 relevés)

***3.* *Ca-Q polygonatetosum odorati* (169 relevés)**

4-6. *Calamagrostio arundinaceae-Quercetum petraeae* in stage I of degeneration – source of the relevés as given under the Table 9

4. *Ca-Q molinietosum* (64 relevés)

5. *Ca-Q typicum* (91 relevés)

6. *Ca-Q polygonatetosum odorati* (136 relevés)

7-9. *Calamagrostio arundinaceae-Quercetum petraeae* in stage II of degeneration

7. *Ca-Q molinietosum* (47 relevés): Brzeg *et al.* (2001), tab. 1: 1,10,20,32,43 (*Ca-Q molinietosum*); Borysiak *et al.* (1998), tab. 2: 9 (*Calamagrostio-Quercetum*); Jakubowska-Gabara (1994), tab. 2: 18 (*Querco-Pinetum molinietosum* – degenerated form); Jelinowski (1958), tab. 1: 21,28,29,30 (*Pino-Quercetum*); Kamionka (1971), tab. 12: 2 (Community of acidophilous oak forest); Krotoska & Piotrowska (1962), tab. 5: 2,29,33 (*Pino-Quercetum*); Kubiś (1982), tab. 2 (*Galio-Carpinetum holcetosum*), tab. 4: 7 (*Polytrichum attenuatum-Carpinus betulus*); Macicka (1984), tab. 29: 11 (Plantation of pine on the habitat of deciduos and mixed forests); Macicka & Wilczyńska (1991), tab. 12: 3,23 (Community from the *Quercion robori-petraeae* alliance); Macicka-Pawlik & Wilczyńska (1996), tab. 31: 12,13 (Substitute forest communities); Olaczek (1986), tab. 4: 8 (*Calamagrosti-Quercetum petraeae*); Sroka (1982), tab. 1: 2, 15-17,21,22,24-27,29,30,32-34 (*Calamagrostio-Quercetum*), tab. 2: 14,16,17,19,20 (*Pino-Quercetum*), tab. 3: 1-3 (Pine-oak forest with *Molinia caerulea*); Wojterska (2003), tab. 17: 5 (Acidophilous oak forests from the *Quercetea robori-petraeae* class).

8. *Ca-Q typicum* (28 relevés): Kamionka (1971), tab. 12: 13 (Community of acidophilous oak forest); Krotoska (1978), tab. 1: 23, 27 (*Calamagrostio-Quercetum*); Macicka (1984), tab. 18: 4 (Community from the *Quercion robori-petraeae* alliance); tab. 20: 16,21,26 (*Pino-Quercetum fagetosum*); Macicka & Wilczyńska (1990), tab. 13: 9 (Community from the *Quercion robori-petraeae* alliance), tab. 16: 16 (*Pino-Quercetum fagetosum*), tab. 17: 4,5,10,11,14 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991), tab. 12: 21 (Community from the *Quercion robori-petraeae* alliance), tab. 14: 4,15,16,17,20 (*Pino-Quercetum*); Nachotko (1982), tab. 3: 10 (*Calamagrosti-Quercetum* form with *Festuca ovina*); Olaczek (1986), tab. 4: 12 (*Calamagrosti-Quercetum petraeae*); Pawłow & Czech (1959), tab. 3: 14 (Mixed coniferous forest); Sroka (1982), tab. 2: 5 (*Pino-Quercetum*); Szwed (1979), tab. 16: 6,12 (*Pino-Quercetum*); Wojterska (2003), tab. 16: 14,21 (*Calamagrostio-Quercetum typicum*).

9. *Ca-Q polygonatetosum odorati* (35 relevés): Berdowski & Kwiatkowski (1992), tab. 7: 4 (*Querco roboris-Pinetum*); Brzeg *et al.* (2001), tab. 2: 15 (*Ca-Q typicum* variant with *Anemone nemorosa*); Borysiak *et al.* (1998), tab. 2: 10 (*Calamagrostio-Quercetum*); Ferchmin (1980), tab. 19: 12 (*Potentillo albae-Quercetum*); Kamionka (1971), tab. 12: 3,7,10,12 (Community of acidophilous oak forest); Krotoska (1978), tab. 1: 24 (*Calamagrostio-Quercetum*); Krotoska (1991), tab. 6: 7 (*Galio-Carpinetum* – Form of deformation with the share of some acidophilous species), tab. 10: 3,4,8,9 (*Calamagrostio-Quercetum*), 13 (*Calamagrostio-Quercetum* – degenerated forms); Macicka (1984), tab. 20: 14 (*Pino-Quercetum fagetosum*), 29: 18 (Community from the *Quercion robori-petraeae* alliance); Macicka & Wilczyńska (1990), tab. 17: 20,23 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991), tab. 12: 10,14 (Community from the *Quercion robori-petraeae* alliance), tab. 14: 7 (*Pino-Quercetum*); Kasprowicz (orig.), tab. A17: 31; Nachotko (1982), tab. 1: 9,12,13 (*Calamagrosti-Quercetum* form with *Calamagrostis arundinacea*), tab. 3: 11 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 3: 1,6 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 4: 3,19 (Oak forest with share of termophilous species), tab. 6: 3,5: (Oak forest from the *Querco-Fagetea* class with share of *Pinus sylvestris*); Olaczek (1986), tab. 4: 2,3 (*Calamagrosti-Quercetum petraeae*); Robińska (1977), tab. 3: 11 (*Pino-Quercetum*); Sroka (1982), tab. 1: 7 (*Calamagrostio-Quercetum*); Wojterska (2003), tab. 16: 12,13 (*Calamagrostio-Quercetum typicum*).

10-12. *Calamagrostio arundinaceae-Quercetum petraeae* in stage III of degeneration

10. *Ca-Q molinietosum* (15 relevés): Brzeg *et al.* (2001), tab. 1: 42 (*Ca-Q molinietosum*); Gmaj (1997), tab. 9: 3 (*Calamagrostio-Quercetum molinietosum*); Jakubowska-Gabara (1994), tab. 2: 12 (Community *Picea-Vaccinium* on the habitat of *Querco-Pinetum typicum*), 16 (*Querco-Pinetum molinietosum* – degenerated form; Krotoska & Piotrowska (1962), tab. 5: 28,31 (*Pino-Quercetum*); Kubiś (1982), tab. 4: 4,5 (*Polytrichum attenuatum-Carpinus betulus*); Macicka & Wilczyńska (1991), tab. 14: 2,3 (*Pino-Quercetum*); Macicka-Pawlik & Wilczyńska (1996), tab. 31: 9 (Substitute forest communities); Robińska (1977), tab. 3: 26,31 (*Pino-Quercetum*); Sroka (1982), tab. 1: 11,13 (*Calamagrostio-Quercetum*).

11. *Ca-Q typicum* (24 relevés): Brzeg *et al.* (2001), tab. 2: 32 (*Ca-Q typicum*, variant with *Anemone nemorosa*); Borysiak *et al.* (1998), tab. 2: 8 (*Calamagrostio-Quercetum*); Gmaj (1997), tab. 9: 7 (*Calamagrostio-Quercetum typicum*); Hegenbart-Magdans & Brzeg (1999), tab. 1: 36 (*Calamagrostio-Quercetum polygonatetosum*); Kamionka (1971), tab. 12: 14 (Community of acidophilous oak forest); Krotoska (1978), tab. 1: 28 (*Calamagrostio-Quercetum*); Krotoska (1991), tab. 10: 1,2 (*Calamagrostio-Quercetum*); Kubiś (1982), tab. 4: 9,12 (*Polytrichum attenuatum-Carpinus betulus*); Macicka (1984), tab. 20: 2 (*Pino-Quercetum typicum*), 15 (*Pino-Quercetum fagetosum*), tab. 29: 5 (Plantation of pine on the habitat of deciduos and mixed forests); Macicka & Wilczyńska (1991), tab. 14: 8,18 (*Pino-Quercetum*); Macicka & Wilczyńska (1992), tab. 6: 6 (*Pino-Quercetum*); Macicka-Pawlik & Wilczyńska (1996), tab. 31: 4,8 (Substitute forest communities); tab. 28: 5 (*Pino-Quercetum*); Kasprowicz (orig), tab. A7: 27 (Substitute forest communities on the habitat of *Calamagrostio arundinaceae-Quercetum typicum*); Olaczek (1986), tab. 4: 13 (*Calamagrosti-Quercetum petraeae*); Ratyńska (2001), tab. 176: 9 (*Calamagrostio-Quercetum petraeae convallarietosum*); Wojterska (2003), tab. 16: 4 (*Calamagrostio-Quercetum polygonatetosum*).

12. *Ca-Q polygonatetosum odorati* (36 relevés): Gmaj (1997), tab. 9: 5,6 (*Calamagrostio-Quercetum typicum*), 16-18 (*Calamagrostio-Quercetum convallarietosum*), tab. 11: 3 (*Calamagrostio-Quercetum* – degenerated forms), tab. 12: 1,3 (*Calamagrostio-Quercetum* – degenerated forms); Hegenbart-Magdans & Brzeg (1999), tab. 3: 2-7 (*Calamagrostio-Quercetum* – degenerated forms, tab. 1: 16,17,27 (*Calamagrostio-Quercetum polygonatetosum odorati*);

Kamionka (1971), tab. 12: 8 (Community of acidophilous oak forest); Krotoska (1991), tab. 10: 2,10,12 (*Calamagrostio-Quercetum*); Kasprowicz (orig.), tab. A18: 3,13,21 (Substitute forest communities on the habitat of *Calamagrostio arundinaceae-Quercetum polygonatetosum*); Nachotko (1982), tab. 1: 9,12,13 (*Calamagrosti-Quercetum* form with *Calamagrostis arundinacea*), tab. 3: 11 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 6: 6 (Oak forest from the *Querco-Fagetea* class with share of *Pinus sylvestris*); Nowiński (1964), tab. 7: 19 (*Pino-Quercetum*); Ratyńska (2001), tab. 176: 4,7 (*Calamagrostio-Quercetum petraeae convallarietosum*); Siwczak (1977), tab. 3: 15,21 (*Calamagrostio-Quercetum*); Wojterska (2003), tab. 16: 3 (*Calamagrostio-Quercetum polygonatetosum*).

Table 8. Floristic differentiation of *Calamagrostio arundinaceae-Quercetum* reflecting habitat variation in untransformed communities

Successive number of syntaxon		1		2		3		4		5		6	
Subassociations		*molinietosum*				*typicum*				*polygonatetosum*			
Number of relevés		14		42		36		43		78		91	
Number of taxa		114		198		143		181		170		254	
Mean number of taxa in relevé		31		36		22		29		24		35	
Ch., *D. *Calamagrostio arundinaceae-Quercetum petraeae*													
*Quercus petraea**	a-c	50	*1575*	38	*924*	72	*4515*	56	*2192*	96	*6416*	80	*4385*
Hieracium lachenalii		93	*143*	76	*69*	81	*76*	74	*140*	62	*104*	82	*169*
*Calamagrostis arundinacea**		71	*1318*	57	*329*	44	*876*	51	*841*	76	*2235*	65	*1320*
*Festuca ovina**		64	*393*	57	*163*	75	*996*	65	*334*	71	*690*	74	*688*
Hieracium laevigatum		43	*21*	43	*43*	42	*46*	44	*74*	28	*47*	40	*73*
Hieracium sabaudum		36	*82*	57	*60*	58	*78*	60	*114*	53	*65*	59	*140*
Lathyrus montanus		7	*4*	2	*1*	3	*1*	14	*88*	-	-	9	*19*
Ch., *D. *Quercetea robori-petraeae*													
Carex pilulifera		100	*575*	86	*180*	69	*192*	70	*198*	41	*87*	67	*150*
Holcus mollis		71	*871*	90	*2339*	33	*458*	86	*1915*	19	*251*	60	*951*
*Polytrichastrum formosum**		93	*1225*	83	*773*	72	*579*	65	*355*	41	*131*	65	*249*
*Melampyrum pratense**		79	*136*	86	*506*	78	*402*	86	*517*	58	*353*	74	*436*
*Pteridium aquilinum**		43	*771*	*43*	*314*	*78*	*813*	*67*	*1124*	69	*1072*	58	*808*
Dicranella heteromalla		43	*21*	19	*31*	58	*101*	35	*38*	22	*69*	26	*33*
D. *Ca-Q molinietosum*													
Betula pubescens (V-P)	a-c	14	*7*	10	*57*	-	-	-	-	-	-	-	-
Quercus robur	a-c	79	*4329*	98	*4999*	39	*1271*	79	*3872*	13	*337*	49	*2308*
Picea abies (V-P)	a-c	57	*394*	67	*692*	31	*311*	47	*210*	10	*5*	29	*61*
Frangula alnus	b-c	93	*2236*	98	*1277*	47	*182*	67	*434*	38	*33*	51	*186*
Trientalis europaea (V-P)		50	*89*	69	*217*	8	*16*	30	*78*	1	*6*	7	*8*
Carex pallescens (C-U)		64	*96*	55	*70*	3	*1*	12	*6*	-	-	12	*11*
Molinia caerulea		79	*200*	40	*130*	6	*3*	2	*1*	5	*8*	2	*1*
Potentilla erecta (C-U)		29	*14*	45	*33*	-	-	2	*1*	1	*1*	5	*8*
Carex nigra		50	*25*	19	*10*	-	-	-	-	-	-	-	-
Lysimachia vulgaris		29	*46*	43	*41*	-	-	2	*1*	1	*1*	5	*3*
Deschampsia caespitosa		21	*11*	38	*40*	6	*3*	5	*2*	3	*1*	4	*2*
Juncus effusus		29	*14*	29	*13*	6	*3*	2	*1*	-	-	2	*1*
Carex ovalis (C-U)		21	*11*	14	*7*	-	-	-	-	-	-	2	*1*
Hylocomium splendens (V-P)		21	*11*	14	*7*	-	-	2	*1*	-	-	1	*1*
Agrostis canina		14	*39*	10	*15*	-	-	-	-	-	-	-	-
D. *Ca-Q polygonatetosum odorati*													
Convallaria majalis		14	*39*	33	*149*	28	*206*	26	*202*	88	*1513*	59	*737*
Moehringia trinervia		29	*46*	14	*18*	14	*7*	28	*44*	60	*158*	65	*165*
Hieracium murorum		-	-	5	*2*	11	*6*	12	*16*	33	*51*	62	*80*
Veronica officinalis (C-U)		7	*4*	10	*4*	8	*4*	19	*9*	31	*33*	63	*91*
Mycelis muralis		7	*4*	19	*10*	19	*35*	5	*2*	41	*71*	52	*98*
Polygonatum odoratum		-	-	-	-	8	*17*	7	*3*	50	*60*	34	*60*
Melica nutans (Q-F)		7	*36*	2	*12*	11	*6*	7	*3*	37	*146*	44	*141*
Galeopsis tetrahit		14	*4*	12	*6*	8	*17*	12	*6*	35	*122*	26	*22*
Festuca heterophylla (Q-F)		-	-	7	*4*	3	*14*	5	*2*	21	*49*	30	*77*
Galium boreale		-	-	2	*12*	-	-	9	*187*	21	*33*	15	*7*
D. *Anemone nemorosa* var.													
Carpinus betulus (Q-F)	a-c	50	*93*	74	*1249*	11	*238*	47	*1114*	-	-	25	*223*
Poa nemoralis (Q-F)		7	*4*	45	*208*	47	*74*	37	*197*	54	*171*	53	*326*
Anemone nemorosa (Q-F)		36	*171*	55	*70*	3	*1*	51	*371*	6	*25*	45	*317*
Oxalis acetosella		14	*7*	79	*246*	3	*14*	40	*172*	-	-	30	*104*
Veronica chamaedrys		-	-	36	*61*	3	*1*	42	*112*	6	*37*	51	*74*
Fragaria vesca		-	-	24	*33*	-	-	23	*122*	9	*4*	41	*72*
Viola riviniana (Q-F)		-	-	14	*7*	6	*2*	16	*69*	-	-	45	*67*
Viola reichenbachiana (Q-F)		-	-	43	*64*	6	*15*	33	*48*	9	*4*	33	*65*
Stellaria holostea (Q-F)		7	*36*	38	*82*	3	*1*	35	*99*	-	-	12	*49*
Atrichum undulatum (Q-F)		-	-	17	*8*	6	*3*	40	*62*	5	*3*	37	*43*
Hypericum perforatum		-	-	24	*33*	3	*1*	28	*14*	6	*3*	54	*26*
Hypericum maculatum		7	*4*	26	*54*	-	-	2	*41*	-	-	2	*6*
Milium effusum (Q-F)		-	-	14	*7*	3	*1*	16	*8*	-	-	10	*15*
Ajuga reptans (Q-F)		-	-	19	*9*	3	*1*	5	*2*	6	*3*	9	*4*

Successive number of syntaxon		1		2		3		4		5		6	
Ch. *Vaccinio-Piceetea* (V-P)													
Pinus sylvestris	a-c	64	*1863*	31	*431*	44	*682*	33	*253*	40	*575*	41	*424*
Juniperus communis	b-c	21	*11*	12	*6*	19	*9*	16	*21*	17	*10*	11	*11*
Vaccinium myrtillus		93	*3061*	83	*1946*	72	*2208*	84	*1802*	68	*1187*	80	*1593*
Pleurozium schreberi		64	*482*	33	*210*	31	*100*	28	*171*	21	*33*	27	*73*
Vaccinium vitis-idaea		29	*46*	-	-	17	*33*	7	*14*	9	*4*	9	*9*
Pseudoscleropodium purum		29	*311*	17	*40*	8	*4*	5	*23*	8	*10*	16	*75*
Leucobryum glaucum		21	*11*	10	*15*	14	*44*	26	*34*	8	*10*	11	*15*
Ch. *Querco-Fagetea* (Q-F)													
Fagus sylvatica	a-c	36	*279*	36	*173*	36	*424*	23	*59*	9	*99*	27	*180*
Malus sylvestris	a-c	14	*7*	26	*15*	-	-	9	*7*	-	-	10	*5*
Corylus avellana	b-c	-	-	7	*5*	25	*25*	19	*22*	45	*373*	35	*90*
Ch. *Calluno-Ulicetea* (C-U)													
Agrostis capillaris		64	*64*	50	*318*	17	*21*	47	*197*	14	*30*	46	*382*
Pohlia nutans		36	*18*	36	*29*	33	*113*	37	*19*	21	*43*	29	*38*
Luzula multiflora		29	*14*	29	*14*	28	*26*	23	*12*	22	*22*	25	*13*
Solidago virgaurea s. s.		21	*11*	26	*12*	28	*38*	30	*36*	36	*35*	52	*84*
Others													
Betula pendula	a-c	64	*250*	31	*39*	39	*172*	49	*276*	10	*63*	46	*224*
Sorbus aucuparia	a-c	79	*339*	88	*173*	56	*105*	77	*208*	56	*140*	69	*248*
Populus tremula	a-c	36	*54*	14	*17*	14	*32*	21	*35*	-	-	9	*18*
Padus serotina	b-c	14	*11*	-	-	-	-	7	*13*	21	*34*	22	*23*
Luzula pilosa		93	*407*	88	*348*	69	*207*	67	*226*	68	*146*	74	*173*
Maianthemum bifolium		79	*611*	90	*524*	56	*185*	65	*392*	56	*138*	48	*297*
Anthoxanthum odoratum		50	*25*	52	*187*	39	*32*	56	*227*	32	*39*	55	*279*
Dryopteris carthusiana		43	*54*	67	*95*	14	*6*	12	*6*	15	*25*	31	*81*
Festuca rubra s. s.		36	*171*	60	*194*	11	*6*	28	*171*	19	*60*	41	*219*
Calamagrostis epigejos		29	*46*	26	*86*	19	*69*	12	*6*	12	*28*	30	*81*
Poa angustifolia		21	*11*	26	*88*	6	*3*	5	*2*	22	*127*	38	*271*
Hypnum cupressiforme		14	*7*	43	*75*	28	*26*	28	*24*	22	*16*	31	*20*
Rubus plicatus		21	*11*	10	*5*	3	*1*	5	*2*	-	-	8	*19*
Rubus idaeus		14	*7*	17	*8*	8	*3*	7	*3*	8	*10*	21	*53*
Sciuro-hypnum oedipodium		14	*7*	14	*29*	8	*17*	12	*6*	13	*35*	24	*22*
Campanula rotundifolia		7	*4*	-	-	6	*3*	23	*51*	17	*30*	25	*18*
Plagiomnium affine		-	-	14	*29*	14	*32*	9	*5*	19	*27*	29	*53*
Deschampsia flexuosa		7	*4*	7	*14*	25	*269*	9	*55*	4	*2*	21	*104*

Explanations: Shortened table comprises in each column the frequency of species (in %) and cover index (italics).

1. *Calamagrostio arundinaceae-Quercetum petraeae molinietosum* typical variant (14 relevés): Brzeg *et al.* (2001), tab. 1 (*Ca-Q molinietosum*): 2-4 (*Ca-Q molinietosum* typical variant), 8,13,23,24,26 (*Ca-Q molinietosum* variant with *Anemone nemorosa*); Krotoska & Piotrowska (1962), tab. 5: 10,22 (*Pino-Quercetum*); Kasprowicz (orig.) tab. A3: 12; Olaczek (1986), tab. 4: 9 (*Calamagrosti-Quercetum petraeae*); Robińska (1977), tab. 3: 23 (*Pino-Quercetum*); Sroka (1982), tab. 2: 3 (*Pino-Quercetum*).

2. *Calamagrostio arundinaceae-Quercetum petraeae molinietosum* variant with *Anemone nemorosa* (42 relevés): Brzeg *et al.* (2001), tab. 1: 9,11,12,15,17,21,22,25,28,30,31,35,37,38,40,45,46,49 (*Ca-Q molinietosum* variant with A*nemone nemorosa*); Błachuta (1995), tab. 4: 2 (*Calamagrostio-Quercetum*); Ferchmin (1980), tab. 17: 14 (*Querco-Carpinetum holcetosum mollis*); Jelinowski (1958), tab. 1: 2,4,6,12,16,23-25 (*Pino-Quercetum*); Krotoska & Piotrowska (1962), tab. 5: 9,14 (*Pino-Quercetum*); Kulińska (1991), tab. 2: 2 (*Calamagrostio-Quercetum molinietosum*); Lisiewska & Reszel (2000), tab. 3: 3 (*Ca-Q molinietosum*); Macicka (1984), tab. 10: 43 (*Pino-Quercetum*); Macicka & Wilczyńska (1990), tab. 13: 3 (Community from the *Quercion robori-petraeae* alliance), Macicka & Wilczyńska (1991), tab. 12: 8,15 (Community from the *Quercion robori-petraeae* alliance); Kasprowicz (orig.), tab. A3: 46; Sroka (1982), tab. 1: 5,12,14,18 (*Calamagrostio-Quercetum*).

3. *Calamagrostio arundinaceae-Quercetum petraeae typicum* typical variant (36 relevés): Brzeg *et al.* (2001), tab. 2 (*Ca-Q typicum*): 1,4-7 (*Ca-Q typicum* typical variant), 9 (*Ca-Q typicum* variant with A*nemone nemorosa*); Jelinowski (1958), tab. 1: 1,17 (*Pino-Quercetum*); Kubiś (1982), tab. 4: 1 (*Polytrichum attenuatum-Carpinus betulus*); Macicka (1984), tab. 18: 7 (Community from the *Quercion robori-petraeae* alliance); tab. 20: 27 (*Pino-Quercetum*); Macicka & Wilczyńska (1990), tab. 13: 2,10 (Community from the *Quercion robori-petraeae* alliance), 17: 18 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991), tab. 12: 12 (Community from the *Quercion robori-petraeae* alliance); Macicka & Wilczyńska (1992), tab. 6: 1 (*Pino-Quercetum*); Wojterska (2003), tab. 16: 5,11,15,18,20 (*Calamagrostio-Quercetum*); Nachotko (1982), tab. 1: 4,5 (*Calamagrosti-Quercetum* form with *Calamagrostis arundinacea*), tab. 2: 1,2,11,12 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 3: 4,9 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 4: 1 (Oak forest with share of termophilous species); Robińska (1977), tab. 3: 5,33 (*Pino-Quercetum*); Siwczak (1977), tab. 3: 9,23 (*Calamagrostio-Quercetum*); Szwed (1979), tab. 12: 3 (*Calamagrostio-Quercetum*).

4. *Calamagrostio arundinaceae-Quercetum petraeae typicum* variant with *Anemone nemorosa* (43 relevés): Brzeg *et al.* (2001), tab. 2:11,13,16,18,20-26,28,29 (*Ca-Q typicum* variant with *Anemone nemorosa*), tab. 3: 1 (*Ca-Q polygonatetosum odorati* typical variant); Boiński (1973), tab. 50: 9,13,17,19,23 (*Fago-Quercetum*); Jakubowska-Gabara (1994), tab. 2: 1 (*Querco-Pinetum*); Jelinowski (1958), tab. 1: 5 (*Pino-Quercetum*); Kubiś (1982), tab. 2: 6 (*Galio sylvatici-Carpinetum holcetosum mollis*), tab. 4: 10 (*Polytrichum attenuatum-Carpinus betulus*); Macicka (1984), tab. 18: 3,6 (Community from the *Quercion robori-petraeae* alliance); Macicka & Wilczyńska (1990), tab. 13: 8,13,15,16,18,21 (Community from the *Quercion robori-petraeae* alliance), tab. 16: 2 *Pino-Quercetum fagetosum*), tab. 17: 21 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991), tab. 12: 2,11 (Community from the *Quercion robori-petraeae* alliance); Nachotko (1982), tab. 4: 5 (Oak forest with share of termophilous species); tab. 5: 6 (Oak forest with *Holcus mollis*); Ratyńska (2001), tab. 176: 6 (*Calamagrostio-Quercetum petraeae convallarietosum*); Siwczak (1977), tab. 3: 20 (*Calamagrostio-Quercetum*); Szwed (1979), tab. 12: 5 (*Calamagrostio-Quercetum*); Zielińska (1994), tab. 6: 5,6 (*Calamagrostio-Quercetum convallarietosum*).

5. *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* typical variant (78 relevés): Brzeg (orig.), tab. A13: 45; Brzeg *et al.* (2001), tab. 3 (*Ca-Q polygonatetosum odorati*): 12 (*Ca-Q polygonatetosum* typical variant), 38,39 (*Ca-Q polygonatetosum* variant with *Anemone nemorosa*); Fabiszewski & Faliński (1967), tab. 9: 1,5-11 (*Calamagrostido-Quercetum /sessilis/*); Hegenbart-Magdans & Brzeg (1999), tab. 1: 2,5-10,14,15,18,20,22,29,30,33-35 (*Calamagrostio arundinaceae-Quercetum petraeae*); Jakubowska-Gabara (1994), tab. 2: 1 (*Querco-Pinetum*); Jaroszewska (2007), tab. 1: 1,4-7 (*Ca-Q polygonatetosum odorati*); Krotoska (1978), tab. 1: 29 (*Calamagrostio-Quercetum*); Krotoska (1983), tab. 3: 4 (Oak forest); Macicka (1984), tab. 18: 1 (Community from the *Quercion robori-petraeae* alliance); Macicka & Wilczyńska (1990), tab. 17: 13 (*Pino-Quercetum typicum*); Kasprowicz (orig.), tab. A13: 3,59,60; Nachotko (1982), tab. 1: 3,6 (*Calamagrosti-Quercetum* form with *Calamagrostis arundinacea*), tab. 2: 3-8,10 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 3: 12 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 4: 6,13 (Oak forest with share of termophilous species); tab. 5: 4,14 (Oak forest with *Holcus mollis*); Ratyńska (2001), tab. 176: 5 (*Calamagrostio-Quercetum petraeae convallarietosum*); Robińska (1977), tab. 5: 5 (*Pino-Quercetum* Dg); Siwczak (1977), tab. 3: 8,10,11,14,16-19,27 (*Calamagrostio-Quercetum*); Wojterska (2003), tab. 16: 7 (*Calamagrostio-Quercetum*); Zielińska (1994), tab. 5: 4,5,7,8,10,12,13 (*Calamagrostio-Quercetum convallarietosum*); tab. 6: 3,4,10 (*Calamagrostio-Quercetum convallarietosum*).

6. *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* variant with *Anemone nemorosa* (91 relevés): Brzeg *et al*. (2001), tab. 3 (*Ca-Q polygonatetosum odorati*): 2,4-68,9, (*Ca-Q polygonatetosum* typical vararиant), 13-19,21-36,40-41 (*Ca-Q polygonatetosum* variant with *Anemone nemorosa*); Błachuta (1995), tab. 4: 1 (*Calamagrostio-Quercetum*); Boiński (1973), tab. 50: 2,21,24-27 (*Fago-Quercetum*); Ferchmin (1980), tab. 17: 10,11 (*Querco-Carpinetum* – acidophilous subassociations); Gmaj (1997), tab. 9: 15 (*Calamagrostio-Quercetum convallarietosum*); Jaroszewska (2007), tab. 1: 2,3,8 (*Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati*); Jelinowski (1958), tab. 1: 9,10 (*Pino-Quercetum*); Krotoska (1983), tab. 3: 3 (Oak forest); Krotoska (1991), tab. 10: 15,16,20 (*Calamagrostio-Quercetum*); Macicka (1984), tab. 18: 2,5 (Community from the *Quercion robori-petraeae* alliance); Macicka & Wilczyńska (1990), tab. 13: 4,7,11,14,20,23 (Community from the *Quercion robori-petraeae* alliance) Macicka & Wilczyńska (1991), tab. 12: 4,9,12,13,16 (Community from the *Quercion robori-petraeae* alliance), tab. 13: 5 (*Calamagrostio-Quercetum*); Macicka & Wilczyńska (1992), tab. 6: 4 (*Pino-Quercetum*); Kasprowicz (orig.), tab A14: 1,9,10,11,26,40,54,62,64,77,86; Nachotko (1982), tab. 1: 14 (*Calamagrosti-Quercetum* form with *Calamagrostis arundinacea*), tab. 3: 3,8 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 4: 9,14,21,22 (Oak forest with share of termophilous species); tab. 5: 9,10 (Oak forest with *Holcus mollis*); Siwczak (1977), tab. 3: 28 (*Calamagrostio-Quercetum*); Wojterska (2003), tab. 16: 2,16 (*Calamagrostio-Quercetum*); Zielińska (1994), tab. 5: 2,9 (*Calamagrostio-Quercetum convallarietosum*).

Table 9. Floristic differentiation of *Calamagrostio arundinaceae-Quercetum* reflecting habitat variation in stage I of degeneration (Dg ↓ I)

Successive number of syntaxon		1		2		3		4		5		6	
Subassociations		*molinietosum*				*typicum*				*polygonatetosum*			
Number of relevés		26		38		59		32		73		63	
Number of taxa		136		200		146		172		174		242	
Mean number of taxa in relevé		26		34		15		27		20		31	
Ch., *D. *Calamagrostio arundinaceae-Quercetum petraeae petraeae*													
*Quercus petraea**	a-c	42	*1402*	21	*482*	78	*4671*	62	*2995*	88	*4974*	81	*4598*
*Calamagrostis arundinacea**		77	*1285*	37	*611*	68	*1318*	16	*386*	78	*2578*	40	*806*
*Festuca ovina**		62	*248*	66	*442*	88	*469*	69	*380*	73	*712*	71	*881*
Hieracium lachenalii		19	*62*	34	*41*	20	*25*	50	*39*	19	*28*	35	*86*
Hieracium laevigatum		4	*2*	11	*5*	2	*1*	12	*6*	3	*1*	8	*4*
Hieracium sabaudum		4	*0*	21	*22*	12	*14*	25	*13*	11	*17*	21	*44*
Lathyrus montanus		-	-	3	*1*	-	-	12	*63*	-	-	2	*1*
Ch., *D. *Quercetea robori-petraeae*													
Carex pilulifera		62	*135*	74	*266*	56	*103*	59	*125*	32	*63*	44	*72*
Holcus mollis		58	*337*	68	*1804*	20	*626*	81	*2711*	26	*164*	52	*1252*
*Polytrichastrum formosum**		58	*412*	76	*584*	39	*165*	50	*267*	32	*98*	46	*161*
*Melampyrum pratense**		65	*215*	66	*341*	54	*311*	69	*667*	40	*149*	67	*314*
*Pteridium aquilinum**		62	*808*	*55*	*1026*	*56*	*823*	*66*	*1180*	*81*	*1072*	*60*	*775*
Dicranella heteromalla		23	*29*	21	*11*	34	*61*	25	*41*	26	*37*	35	*39*
Hieracium umbellatum		-	-	-	-	2	*1*	9	*5*	21	*69*	6	*3*
D. *Ca-Q molinietosum*													
Betula pubescens (V-P)	a-c	15	*44*	13	*68*								
Quercus robur	a-c	69	*3165*	89	*4230*	25	*832*	56	*2222*	10	*314*	33	*1214*
Picea abies (V-P)	a-c	50	*365*	61	*632*	10	*44*	38	*178*	19	*73*	21	*124*
Frangula alnus	b-c	81	*1102*	79	*897*	29	*191*	62	*175*	44	*41*	51	*88*
Molinia caerulea		69	*494*	26	*117*	8	*19*	-	-	3	*8*	3	*9*
Lysimachia vulgaris		50	*125*	63	*103*	3	*2*	3	*16*	8	*40*	2	*1*
Trientalis europaea (V-P)		42	*73*	61	*337*	2	*8*	22	*106*	3	*8*	8	*52*
Carex pallescens (C-U)		38	*37*	66	*149*	-	-	22	*11*	5	*3*	10	*5*
Potentilla erecta (C-U)		31	*15*	37	*18*	-	-	9	*5*	-	-	6	*3*
Deschampsia caespitosa		27	*13*	47	*59*	-	-	6	*2*	-	-	6	*3*
Juncus effusus		15	*25*	34	*17*	2	*1*	3	*2*	1	*1*	3	*1*

Successive number of syntaxon		1		2		3		4		5		6	
Carex nigra		19	*75*	13	*7*	2	*1*	-	-	-	-	-	-
Carex ovalis (C-U)		12	*6*	16	*20*	2	*1*	-	-	1	*1*	2	*1*
Agrostis canina		19	*44*	18	*33*	-	-	-	-	-	-	-	-
D. *Ca-Q polygonatetosum odorati*													
Convallaria majalis		62	*456*	37	*223*	56	*200*	25	*302*	88	*1680*	62	*824*
Moehringia trinervia		-	-	37	*17*	7	*3*	22	*11*	52	*104*	65	*122*
Mycelis muralis		-	-	13	*18*	-	-	9	*5*	33	*63*	44	*112*
Galeopsis tetrahit		-	-	16	*7*	8	*12*	22	*11*	37	*229*	22	*37*
Melica nutans (Q-F)		12	*88*	11	*74*	5	*31*	22	*25*	18	*80*	43	*152*
Hieracium murorum		-	-	13	*30*	7	*11*	6	*17*	18	*21*	41	*90*
Veronica officinalis (C-U)		4	*2*	21	*9*	10	*5*	9	*5*	12	*6*	38	*55*
Polygonatum odoratum		8	*4*	3	*1*	-	-	3	*2*	32	*32*	17	*30*
Festuca heterophylla (Q-F)		-	-	11	*50*	2	*1*	6	*119*	25	*155*	11	*13*
D. *Anemone nemorosa* var.													
Carpinus betulus (Q-F)	a-c	58	*1187*	61	*1357*	10	*184*	34	*733*	7	*5*	19	*185*
Oxalis acetosella		19	*10*	68	*563*	2	*8*	50	*322*	-	-	13	*185*
Anemone nemorosa (Q-F)		4	*0*	61	*158*	2	*1*	50	*161*	10	*70*	30	*263*
Viola reichenbachiana (Q-F)		4	*2*	61	*167*	3	*9*	34	*84*	4	*2*	29	*43*
Poa nemoralis (Q-F)		4	*2*	26	*49*	8	*41*	50	*109*	23	*66*	60	*443*
Veronica chamaedrys		-	-	32	*164*	-	-	38	*89*	3	*1*	57	*124*
Fragaria vesca		4	*2*	26	*114*	2	*1*	38	*114*	3	*1*	48	*87*
Atrichum undulatum (Q-F)		-	-	34	*41*	3	*2*	28	*28*	3	*1*	35	*52*
Hypericum perforatum		-	-	18	*45*	3	*2*	31	*30*	1	*1*	38	*26*
Hypericum maculatum (C-U)		4	*2*	32	*182*	2	*1*	-	-	-	-	2	*1*
Ajuga reptans (Q-F)		-	-	32	*15*	-	-	12	*20*	3	*8*	25	*54*
Stellaria holostea (Q-F)		15	*6*	26	*117*	-	-	19	*66*	-	-	2	*8*
Crataegus monogyna	b-c	-	-	24	*28*	2	*1*	3	*2*	5	*3*	5	*11*
Galium boreale		4	*19*	8	*28*	-	-	28	*81*	14	*48*	22	*32*
Pyrus communis	b-c	15	*10*	11	*5*	7	*3*	12	*6*	5	*9*	21	*10*
Clinopodium vulgare		-	-	5	*3*	-	-	9	*5*	3	*1*	25	*41*
Ch. *Vaccinio-Piceetea* (V-P)													
Pinus sylvestris	a-c	54	*1863*	39	*509*	44	*1227*	22	*597*	58	*1961*	32	*477*
Juniperus communis	b-c	4	*2*	16	*8*	8	*4*	22	*149*	18	*9*	16	*35*
Vaccinium myrtillus		100	*3540*	87	*1393*	85	*2830*	56	*1884*	63	*1384*	60	*915*
Pleurozium schreberi		27	*48*	45	*400*	15	*117*	28	*134*	21	*109*	30	*208*
Leucobryum glaucum		15	*90*	16	*53*	20	*54*	6	*17*	10	*58*	5	*10*
Rubus saxatilis		19	*62*	13	*42*	6	*19*	12	*20*	10	*23*	22	*54*
Ch. *Querco-Fagetea* (Q-F)													
Fagus sylvatica	a-c	42	*319*	29	*99*	12	*120*	31	*422*	21	*84*	27	*417*
Malus sylvestris	a-c	19	*10*	26	*13*	5	*3*	-	-	3	*1*	5	*2*
Corylus avellana	b-c	-	-	8	*141*	7	*12*	25	*122*	32	*220*	33	*176*
Ch. *Calluno-Ulicetea* (C-U)													
Solidago virgaurea s. s.		38	*54*	18	*8*	7	*3*	25	*13*	23	*23*	40	*33*
Agrostis capillaris		27	*79*	42	*336*	10	*57*	28	*42*	11	*12*	35	*225*
Pohlia nutans		27	*13*	26	*13*	37	*54*	31	*97*	33	*82*	29	*120*
Luzula multiflora		15	*8*	24	*24*	15	*7*	25	*13*	11	*35*	25	*20*
Danthonia decumbens		23	*29*	3	*1*	3	*2*	3	*2*	1	*1*	-	-
Others													
Betula pendula	a-c	38	*237*	24	*224*	24	*198*	25	*13*	19	*86*	16	*71*
Sorbus aucuparia	a-c	88	*56*	84	*76*	59	*53*	62	*69*	63	*73*	71	*173*
Luzula pilosa		77	*125*	82	*195*	76	*263*	78	*322*	60	*150*	75	*175*
Maianthemum bifolium		65	*119*	89	*504*	22	*49*	69	*317*	23	*66*	43	*179*
Dryopteris carthusiana		46	*39*	47	*34*	15	*22*	38	*33*	16	*14*	21	*9*
Anthoxanthum odoratum		19	*10*	53	*232*	15	*52*	31	*150*	18	*27*	44	*37*
Festuca rubra s. s.		19	*27*	39	*332*	15	*8*	22	*11*	12	*12*	37	*383*
Calamagrostis epigejos		12	*23*	32	*63*	12	*76*	16	*166*	16	*79*	17	*64*
Poa angustifolia		12	*6*	21	*34*	14	*22*	12	*20*	11	*103*	24	*121*
Rubus idaeus		19	*10*	18	*155*	7	*3*	22	*25*	11	*5*	17	*43*
Plagiomnium affine		12	*6*	11	*49*	7	*40*	16	*8*	14	*42*	22	*52*

Explanations: Shortened table comprises in each column the frequency of species (in %) and cover index (italics).

1. *Calamagrstio arundinaceae-Quercetum petraeae molinietosum* typical variant in stage I of degeneration (26 relevés): Brzeg *et al.* (2001), tab. 1: 5 (*Ca-Q molinietosum* typical variant), 27,29,34,47,48 (*Ca-Q molinietosum* variant with *Anemone nemorosa*); Krotoska (1966), tab. 21: 1; Krotoska, Piotrowska (1962), tab. 5: 13,15,18,20,21,26 (*Pino-Quercetum*); Kuświk *et al.* (1991), tab. 1: 8 (*Ca-Q molinietosum*); Macicka (1984), tab. 20: 23 (*Galio-Carpinetum holcetosum*); Macicka & Wilczyńska (1991), tab. 12: 22 (Community from the *Quercion robori-petraeae* alliance); Kasprowicz (orig.), tab. A4: 3; Olaczek (1986), tab. 4: 10 (*Calamagrosti-Quercetum petraeae*); Robińska (1977), tab. 3: 17,19,27,29,30 (*Pino-Quercetum*); Siwczak (1977), tab. 3: 12,25 (*Calamagrostio-Quercetum*); Sroka (1982), tab. 1: 23 (*Calamagrostio-Quercetum*).

2. *Calamagrostio arundinaceae-Quercetum petraeae molinietosum* variant with *Anemone nemorosa* in stage I of degeneration (38 relevés): Brzeg *et al.* (2001), tab. 1: 6,7,14,16,18,19,33,36,39,41,44,50 (*Ca-Q molinietosum* variant with A*nemone nemorosa*); Boiński (1973), tab. 50: 5,8,11 (*Fago-Quercetum*); Ferchmin (1980), tab. 17: 12,13 (*Querco-Carpinetum holcetosum mollis*); Ferchmin (1980), tab, 21: 2 (*Pino-Quercetum*); Gmaj (1997), tab. 9: 1,4 (*Calamagrostio-*

Quercetum convallarietosum), tab. 11: 5 (*Ca-Q* – degeneration forms); Jelinowski (1959), tab. 1: 7,8 (*Pino-Quercetum*); Kamionka (1971), tab. 12: 5,11 (Acidophilous oak forest); Krotoska & Piotrowska (1962), tab. 5: 11,12 (*Pino-Quercetum*); Kubiś (1982), tab. 2: 3,7 (*Galio sylvatici-Carpinetum holcetosum mollis*); Kasprowicz (orig.), tab. A5: 17; Robińska (1977), tab. 3: 20 (*Pino-Quercetum*); Sroka (1982), tab. 2: 2 (*Pino-Quercetum*); Sroka (1982), tab. 1: 6,8,10,20,31 (*Calamagrostio-Quercetum*).

3. *Calamagrostio arundinaceae-Quercetum petraeae typicum* typical variant in stage I of degeneration (59 relevés): Brzeg *et al*. (2001), tab. 2: 3,8 (*Ca-Q typicum* typical variant), 10,19,27 (*Ca-Q typicum Anemone nemorosa* var.); Borysiak *et al*. (1988), tab. 2: 11 (*Calamagrostio-Quercetum*); Jaroszewska (2007), tab. 1: 11 (*Ca-Q polygonatetosum odorati*); Kamionka (1971), tab. 12: 15 (Acidophilous oak forest); Krotoska (1978), tab. 1: 1-19, 21,22,26 (*Calamagrostio-Quercetum*); Kubiś (1982), tab. 4: 14 (*Polytrichum attenuatum-Carpinus betulus*); Macicka & Wilczyńska (1991), tab. 12: 17,19 (Community from the *Quercion robori-petraeae* alliance), tab. 17: 12 (*Pino-Quercetum typicum*); Nachotko (1982), tab. 2: 13 (*Ca-Q* form with *Festuca ovina*), tab. 3: 2 (*Ca-Q* form with *Festuca ovina* with share of meso- and thermophilous species); Nachotko (1982), tab. 5: 1 (Oak forest with *Holcus mollis*); Ratyńska (2001), tab. 176: 3 (*Calamagrostio-Quercetum petraeae convallarietosum*); Robińska (1977), tab. 3: 1,3,24,25,32 (*Pino-Quercetum*); Siwczak (1977), tab. 3: 7,24 (*Calamagrostio-Quercetum*); Sroka (1982), tab. 1: 28 (*Calamagrostio-Quercetum*); Szwed (1979), tab. 12: 1 (*Calamagrostio-Quercetum*); Szwed (1979), tab. 16: 19 (*Pino-Quercetum*); Wojterska (2003), tab. 16: 1 (*Ca-Q polygonatetosum*) 8,12 (*Ca-Q typicum*).

4. *Calamagrostio arundinaceae-Quercetum petraeae typicum* variant with *Anemone nemorosa* in stage I of degeneration (32 relevés): Brzeg *et al*. (2001), tab. 2:12,14,17,30,31 (*Ca-Q typicum* variant with *Anemone nemorosa*); Boiński (1973), tab. 50: 14,16,20,22 (*Fago-Quercetum*); Kamionka (1971), tab. 12: 17 (Acidophilous oak forest); Kubiś (1982), tab. 2: 5 (*Galio sylvatici-Carpinetum holcetosum mollis*), Kubiś (1982), tab. 4: 8 (*Polytrichum attenuatum-Carpinus betulus*); Kulińska (1991), tab. 2: 3 (*Calamagrostio-Quercetum typicum*); Macicka & Wilczyńska (1990), tab. 13: 1,6 (Community from the *Quercion robori-petraeae* alliance), tab. 16: 6 (*Pino-Quercetum fagetosum*), tab. 17: 24 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991), tab. 12: 1 (Community from the *Quercion robori-petraeae* alliance); Wojterska (2003), tab. 16: 10 (*Ca-Q typicum*); tab. 17: 4 (Acidophilous oak forests from the *Quercetea robori-petraeae* class); Nachotko (1982), tab. 4: 4,15 (Oak forest with share of thermophilous species); tab. 5: 3,8,11,12 (Oak forest with *Holcus mollis*); Ryszewska (1977), tab. 5: 1 (*Calamagrostio-Quercetum*); Sroka (1982), tab. 1: 9 (*Calamagrostio-Quercetum*); Zielińska (1994), tab. 5: 6 (*Calamagrostio-Quercetum convallarietosum*); tab. 6: 3 (*Calamagrostio-Quercetum convallarietosum*).

5. *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* typical variant in stage I of degeneration (73 relevés): Brzeg *et al*. (2001), tab. 3: 3(*Ca-Q polygonatetosum* typical variant); Fabiszewski & Faliński (1967), tab. 9: 2-4 (*Calamagrostido-Quercetum*); Hegenbart-Magdans & Brzeg (1999), tab. 1: 3,4,11,12,13,19,21,23-26,28,31,32 (*Ca-Q polygonatetosum*); tab. 5: 6-9 (*Potentillo albae-Quercetum*); Jaroszewska (2007), tab. 1: 1,4-7 (*Ca-Q polygonatetosum*); Kamionka (1971), tab. 12: 16 (Acidophilous oak forest); Krotoska (1978), tab. 1: 20,25 (*Calamagrostio-Quercetum*); Macicka & Wilczyńska (1990), tab. 16: 7 (*Pino-Quercetum fagetosum*), tab. 17: 7 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991), tab. 12: 20 (Community from the *Quercion robori-petraeae* alliance), tab. 13: 3 (*Calamagrostio-Quercetum*), tab. 14: 11-13 (*Pino-Quercetum*); Wojterska (1976), tab. 11: 5 (*Pino-Quercetuum*); Nachotko (1982), tab. 1: 2,7,8 (*Calamagrosti-Quercetum* form with *Calamagrostis arundinacea*), tab. 2: 9,14 (*Ca-Q* form with *Festuca ovina*), tab. 4: 2,12,16,18,20 (Oak forest with share of thermophilous species); Olaczek (1986), tab. 4: 1,7 (*Calamagrosti-Quercetum petraeae*); Ratyńska (2001), tab. 176: 2 (*Calamagrostio-Quercetum petraeae convallarietosum*); Robińska (1977), tab. 3: 2,9,18,21 (*Pino-Quercetum*); Siwczak (1977), tab. 3: 1,3-6,22,26 (*Calamagrostio-Quercetum*); Zielińska (1994), tab. 5: 11 (*Calamagrostio-Quercetum convallarietosum*), tab. 6: 7 (*Calamagrostio-Quercetum convallarietosum*).

6. *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* variant with *Anemone nemorosa* in stage I of degeneration (63 relevés): Brzeg *et al*. (2001), tab. 3: 7,10,11 (*Ca-Q polygonatetosum* typical variant), 20,37 (*Ca-Q polygonatetosum Anemone nemorosa* var.); Ferchmin (1980), tab. 17: 7 (*Querco-Carpinetum holcetosum mollis*); Gmaj (1997), tab. 9: 9,11,13 (*Calamagrostio-Quercetum convallarietosum*); Hegenbart-Magdans & Brzeg (1999), tab. 3: 1 (Other foms of degeneration of *Calamagrostio-Quercetum*); Jaroszewska (2007), tab. 1: 9 (*Ca-Q polygonatetosum odorati*), tab. 4: 6 (*Potentillo albae-Quercetum* – degenerated or impoverished forms; Kamionka (1971), tab. 12: 4,6,9 (Acidophilous oak forest); Krotoska (1991), tab. 10: 6,7,11 (*Calamagrostio-Quercetum*), 14,17-19,21 (*Ca-Q* – degenerated forms); Kubiś (1982), tab. 2: 8 (*Galio-Carpinetum holcetosum mollis*); Marcysiak (2001), tab. 1: 13 (Community *Pinus-Quercus*); Macicka & Wilczyńska (1990), tab. 13: 12,17,22 (Community from the *Quercion robori-petraeae* alliance) Macicka & Wilczyńska (1990), tab. 16: 10 (*Pino-Quercetum fagetosum*), tab. 17: 9 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991), tab. 12: 6,7 (Community from the *Quercion robori-petraeae* alliance); tab. 13: 1,2,4 (*Calamagrostio-Quercetum*); Nachotko (1982), tab. 1: 1,10 (*Calamagrosti-Quercetum* form with *Calamagrostis arundinacea*), tab. 3: 5,7 (*Calamagrosti-Quercetum* form with *Festuca ovina*), tab. 4: 7,8,10,17 (Oak forest with share of thermophilous species), tab. 5; 2,5,7,13 (Oak forest with *Holcus mollis*); tab. 6: 4 (Oak forest from the *Querco-Fagetea* class); Olaczek (1986), tab. 4: 6 (*Calamagrosti-Quercetum petraeae*); Ratyńska (2001), tab. 176: 1 (*Calamagrostio-Quercetum petraeae convallarietosum*); Robińska (1977), tab. 3: 14,16 (*Pino-Quercetum*); Ryszewska (1977), tab.5: 2,3,4 (*Calamagrostio-Quercetum*); Siwczak (1977), tab. 3: 2,29,30 (*Calamagrostio-Quercetum*); Zielińska (1994), tab. 5: 3, tab. 6: 1 (*Calamagrostio-Quercetum convallarietosum*), tab. 6: 1 (*Calamagrostio-Quercetum convallarietosum*).

Table 10. Floristic differentiation of *Galio sylvatici-Carpinetum* reflecting habitat variation and human impact: untransformed communities (col. 1, 3-5), transformed form (col. 2, 6, 7, 8), and substitute forest communities (col. 9). Mainly acidophilous forms of this association are included

Successive number of syntaxon		1		2		3		4		5		6	
Subassociation						*holcetosum*				*calamagr.*		*lathyr.*	
Number of relevés		81		30		12		12		9		16	
Number of taxa		256		213		122		136		98		115	
Mean number of taxa in relevé		34		34		30		40		34		40	
Ch. *Carpinion betuli* et ^Ch., D. *Galio sylvatici-Carpinetum													
*Carpinus betulus**	a	80	*3702*	27	*404*	67	*3917*	58	*900*	67	*1112*	75	*2578*
*Carpinus betulus**	b-c	88	*795*	50	*278*	7	*471*	67	*562*	100	*1227*	100	*1441*
*Tilia cordata**	a	12	*350*	7	*34*	50	*1312*	58	*1792*	11	*56*	31	*610*
*Tilia cordata**	b-c	16	*280*	7	*18*	58	*613*	50	*488*	56	*478*	81	*972*
Acer campestre	a	1	*1*	3	*17*	8	*38*	8	*313*	-	-	-	-
Acer campestre	b-c	6	*3*	-	-	23	*20*	8	*46*	-	-	-	-
*Stellaria holostea**		63	*733*	40	*132*	42	*238*	67	*738*	78	*389*	94	*831*
Festuca heterophylla		19	*31*	17	*68*	17	*8*	42	*58*	56	*506*	81	*444*
*Galium sylvaticum^*		4	*7*	7	*3*	-	-	25	*500*	33	*117*	62	*463*
*Dactylis polygama**		17	*81*	10	*20*	17	*8*	33	*54*	33	*67*	69	*572*
*Ranunculus auricomus^*		11	*11*	-	-	8	*4*	33	*54*	-	-	25	*69*
D. *Galio sylvatici-Carpinetum holcetosum mollis*													
Quercus robur	a	95	*4266*	83	*4427*	83	*3646*	75	*3230*	44	*2222*	13	*891*
Quercus robur	b-c	73	*158*	80	*119*	58	*71*	50	*71*	11	*6*	13	*65*
Frangula alnus		79	*241*	90	*720*	33	*24*	58	*558*	11	*6*	-	-
Polytrichastrum formosum		84	*496*	43	*205*	50	*100*	25	*13*	67	*461*	19	*222*
Holcus mollis (*Qrp*)		68	*687*	70	*982*	58	*1108*	83	*1129*	11	*417*	12	*6*
Pohlia nutans (C-U)		15	*19*	17	*8*	42	*58*	58	*67*	-	-	-	-
Dicranella heteromalla (Qrp)		32	*33*	23	*27*	50	*63*	33	*92*	-	-	-	-
Deschampsia flexuosa		11	*38*	17	*38*	17	*46*	42	*238*	-	-	-	-
Hypnum cupressiforme		30	*31*	27	*43*	17	*8*	25	*13*	-	-	-	-
Melampyrum pratense		27	*64*	50	*178*	33	*196*	25	*13*	-	-	-	-
Festuca ovina (Qrp)		16	*14*	20	*148*	25	*13*	25	*50*	-	-	-	-
Hieracium laevigatum (Qrp)		19	*52*	7	*3*	17	*46*	17	*46*	-	-	6	*1*
D. *Gs-C holcetosum mollis* variant with *Lysimachia vulgaris* (moist form)													
Oxalis acetosella		81	*811*	77	*295*	-	-	17	*8*	44	*583*	19	*94*
Deschampsia caespitosa		72	*158*	47	*23*	-	-	-	-	22	*11*	6	*3*
Dryopteris carthusiana		54	*81*	60	*119*	8	*4*	17	*8*	11	*6*	6	*3*
Lysimachia vulgaris		31	*48*	53	*127*	-	-	-	-	11	*6*	-	-
Carex pallescens (C-U)		49	*36*	30	*30*	8	*4*	-	-	-	-	25	*41*
Carex pilulifera (Qrp)		46	*60*	27	*13*	25	*13*	8	*4*	11	*6*	-	-
D. *Gs-C holcetosum mollis* variant with *Solidago virgaurea*													
Solidago virgaurea s. s. (C-U)		26	*35*	20	*67*	8	*4*	83	*304*	11	*6*	44	*50*
*Melampyrum nemorosum**		22	*125*	10	*5*	8	*4*	83	*1042*	44	*172*	31	*228*
Hypericum perforatum (T-G)		12	*6*	20	*25*	-	-	58	*29*	-	-	12	*6*
Brachypodium sylvaticum (Q-F)		17	*119*	30	*158*	8	*4*	50	*242*	-	-	6	*31*
D. group of moderately dry subassociations													
Quercus petraea	a	15	*535*	20	*1074*	33	*1646*	50	*2526*	67	*2389*	81	*3375*
Quercus petraea	b-c	14	*86*	17	*43*	33	*21*	50	*263*	44	*466*	63	*203*
Hieracium sabaudum (Qrp)		15	*18*	13	*5*	8	*4*	58	*179*	56	*78*	69	*175*
Campanula persicifolia (Q-F)		-	-	3	*2*	-	-	67	*183*	44	*22*	56	*28*
Convallaria majalis		36	*246*	33	*47*	17	*354*	42	*58*	67	*1094*	75	*1597*
Calamagrostis arundinacea (Qrp)		16	*189*	27	*115*	-	-	-	-	89	*2894*	88	*2253*
Lathyrus montanus (Qrp)		11	*33*	7	*18*	8	*4*	-	-	78	*328*	81	*684*
Mycelis muralis (Av)		32	*33*	60	*132*	33	*17*	17	*8*	89	*94*	69	*119*
Galeobdolon luteum (Q-F)		20	*63*	10	*200*	17	*46*	8	*146*	67	*183*	75	*644*
Carex digitata (Q-F)		16	*57*	23	*42*	17	*150*	-	-	89	*194*	69	*253*
Galium odoratum (Q-F)		7	*36*	-	-	-	-	-	-	44	*400*	81	*1447*
Viola riviniana (Q-F)		15	*45*	13	*78*	8	*4*	-	-	56	*128*	62	*200*
Hieracium lachenalii (Qrp)		25	*29*	20	*25*	17	*8*	33	*129*	67	*83*	56	*84*
Hepatica nobilis (Q-F)		2	*1*	7	*3*	-	-	-	-	22	*250*	69	*550*
Astragalus glycyphyllos (T-G)		2	*7*	7	*3*	-	-	-	-	33	*67*	31	*44*
Galium boreale		-	-	3	*17*	-	-	-	-	33	*206*	25	*41*
Vicia sepium (T-G)		5	*2*	-	-	-	-	-	-	22	*61*	31	*44*
Trifolium alpestre (T-G)		1	*1*	-	-	-	-	8	*4*	22	*11*	31	*16*
Lilium martagon(Q-F)		-	-	7	*3*	-	-	-	-	11	*6*	31	*44*
Clinopodium vulgare (T-G)		5	*2*	3	*2*	17	*8*	25	*50*	-	-	19	*38*
D. *Galio sylvatici-Carpinetum calamagrostietosum*													
Vaccinium myrtillus (V-P)		49	*459*	70	*1515*	58	*479*	58	*696*	100	*339*	44	*106*
Leucobryum glaucum (V-P)		2	*1*	-	-	-	-	-	-	56	*28*	25	*41*
Trientalis europaea (V-P)		19	*26*	33	*32*	-	-	-	-	44	*72*	-	-
Campanula rotundifolia		2	*1*	10	*5*	-	-	8	*42*	44	*222*	6	*31*
Polygonatum odoratum (T-G)		1	*1*	-	-	-	-	-	-	22	*11*	6	*3*
D. *Galio sylvatici-Carpinetum lathyretosum*				-	-	-	-	-	-	-	-	-	-
Sorbus torminalis	a2	1	*1*	-	-	-	-	-	-	-	-	6	*31*
Sorbus torminalis	b-c	5	*3*	-	-	-	-	-	-	11	*6*	25	*100*
Lathyrus niger (Q-F)		1	*1*	-	-	-	-	-	-	11	*6*	94	*344*
Pulmonaria obscura (Q-F)		12	*28*	10	*5*	8	*4*	25	*50*	-	-	69	*544*
Dactylis glomerata		14	*7*	10	*5*	17	*8*	33	*54*	33	*67*	69	*572*
Lathyrus vernus (Q-F)		1	*1*	-	-	8	*4*	-	-	-	-	62	*481*

7		8		9	
typicum		Ox-Pi		SFC	
14		10		42	
121		87		266	
28		27		29	
93	5339	90	4550	7	66
100	1179	90	285	17	33
36	557	-	-	7	55
43	339	-	-	12	16
8	4	-	-	-	-
23	12	-	-	7	3
29	257	-	-	12	57
-	-	10	5	10	56
-	-	-	-	-	-
15	42	-	-	26	107
57	29	-	-	-	-
100	3899	20	975	45	2085
71	269	20	10	36	138
50	254	90	270	55	212
14	7	-	-	17	60
-	-	60	120	19	299
-	-	-	-	10	5
-	-	-	-	5	2
-	-	10	5	19	152
-	-	-	-	7	36
8	4	10	50	19	93
7	4	10	5	19	20
-	-	-	-	5	13
79	875	100	5750	33	170
86	43	10	175	14	7
14	7	70	125	36	50
7	4	40	231	2	1
14	7	10	5	2	1
7	4	60	30	10	5
-	-	-	-	7	14
-	-	-	-	2	12
-	-	10	5	33	17
29	168	10	5	45	363
-	-	-	-	50	2245
-	-	10	5	38	231
50	25	-	-	5	13
-	-	-	-	2	1
29	168	-	-	31	326
-	-	10	5	19	170
-	-	30	15	-	-
14	7	60	120	50	276
29	143	-	-	12	149
43	86	-	-	10	174
-	-	-	-	5	101
7	4	-	-	17	19
21	11	-	-	21	10
-	-	-	-	14	28
-	-	20	6	2	1
-	-	-	-	5	2
7	4	-	-	5	2
-	-	-	-	-	-
-	-	-	-	5	2
-	-	-	-	12	17
64	129	70	125	48	725
-	-	-	-	-	-
-	-	40	20	2	12
-	-	-	-	12	17
7	36	10	5	12	17
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	2	1
7	36	-	-	5	13
-	-	-	-	10	26
-	-	-	-	2	1

Explanations: Shortened table comprises in each column the frequency of species (in %) and cover index (italics).

1. *Galio sylvatici-Carpinetum holcetosum mollis* variant with *Lysimachia vulgaris* (81 relevés): Boiński (1973): tab. 50: 1,3,6,7 (*Fago-Querctum holcetosum mollis*); Ferchmin (1966), tab. 8: 2-4,5,7-9 (*Querco-Carpinetum calamagrostietosum*); Ferchmin (1980), tab. 17: 8 (*Querco-Carpinetum*), 15 (*Querco-Carpinetum holcetosum mollis*); Jelinowski (1958), tab. 1: 11,18-20,27 (*Pino-Quercetum*); Kamionka (1971), tab. 10: 15-20,25 (*Galio-Carpinetum holcetosum*); Krotoska (1966), tab. 10: 1-4,6-12,14 (*Galio-Carpinetum holcetosum*), tab. 11: 1-5 (*Galio-Carpinetum holcetosum mollis* – typical variant, form with *Vaccinium myrtillus)*; Krotoska & Piotrowska (1962), tab. 5: 1,3-5,16,17,19 (*Pino-Quercetum)*; Kubiś (1982), tab. 2: 1,2 (*Galio-Carpinetum holcetosum mollis)*; Macicka (1984), tab. 10: 37,41,44,45 (*Gs-C holcetosum)*; Macicka & Wilczyńska (1990), tab. 9: 2-7,9,10,13,14,29 (*Gs-C holcetosum)*; Macicka & Wilczyńska (1991), tab. 9: 1-5,9 (*Gs-C holcetosum)*; Macicka & Wilczyńska (1992), tab. 4: 29 (*Gs-C holcetosum)*; Kasprowicz (orig..), tab. A20: 40,44 (*Gs-C holcetosum mollis);* Sroka (1982), tab. 1: 19 (*Calamagrostio-Quercetum)*, Wojterska (2003), tab. 14: 28,31 (*Gs-C holcetosum mollis)*.

2. *Galio sylvatici-Carpinetum holcetosum mollis* – degenerated forms (30 relevés): Boiński (1973): tab. 50: 18 (*Fago-Querctum holcetosum mollis*); Ferchmin (1966), tab. 8: 6,16 (*Querco-Carpinetum calamagrostietosum*); Gmaj (1997), tab. 4: 7 (*Gs-C holcetosum mollis*); Jelinowski (1958), tab. 1: 14,22,26 (*Pino-Quercetum*); Krotoska (1991), tab. 6: 2,4,5 (*Galio-Carpinetum* – form of deformation with the share of some acidophilous species); Krotoska & Piotrowska (1962), tab. 5: 6,23,24,30 (*Pino-Quercetum*); Lisiewska & Reszel (2000), tab. 3: 5 (*Carex brizoides-Quercus*); Macicka (1984), tab. 10: 40,42 (*Gs-C holcetosum*), tab. 20: 8 (*Pino-Quercetum*); Macicka & Wilczyńska (1990), tab. 9: 1,8,11 (*Gs-C holcetosum*); Macicka & Wilczyńska (1992), 4: 25,26 (*Gs-C holcetosum*); Macicka-Pawlik & Wilczyńska (1996), tab. 31: 3 (Substitute forest communities); Pawłow & Czech (1959), tab. 3: 4,6 (Mixed coniferous forest); Wojterska (2003), tab. 14: 33 (*Galio sylvatici-Carpinetum holcetosum mollis*), tab. 16: 17 (*Calamagrostio-Quercetum molinietosum*), tab. 17: 3,8 (Acidophilous oak forests from the *Quercetea robori-petraeae* class).

3. *Galio sylvatici-Carpinetum holcetosum mollis* typical variant (12 relevés): Ferchmin (1966), tab. 8: 10 (*Querco-Carpinetum calamagrostietosum*); Kamionka (1971), tab. 10: 21,23,24 (*Galio-Carpinetum holcetosum*); Macicka & Wilczyńska (1991), tab. 9: 6,8,11 (*Gs-C holcetosum*); Macicka & Wilczyńska (1992), tab. 4: 22-24,28 (*Gs-C holcetosum*); Maciejewska-Rutkowska *et al.* (2001), tab. 2: 1 (*Gs-C holcetosum*).

4. *Galio sylvatici-Carpinetum holcetosum mollis* variant with *Solidago virgaurea* (12 relevés): Kamionka (1971), tab. 10: 22 (*Galio-Carpinetum holcetosum*); Macicka (1984), tab. 10: 47 (*Gs-C holcetosum*); Macicka & Wilczyńska (1990), tab. 9: 12 (*Gs-C holcetosum*); Macicka & Wilczyńska (1991), tab. 9: 7,10,12-14 (*Gs-C holcetosum*); Macicka & Wilczyńska (1992), tab. 4: 18-21 (*Gs-C holcetosum*).

5. *Galio sylvatici-Carpinetum calamagrostietosum arundinaceae* (9 relevés): Boiński (1973), tab. 31: 12, 14-17, 19,20,22 (*Galio sylvatici-Carpinetum calamagrostietosum*), tab. 50: 12 (*Fago-Querctum holcetosum mollis*).

6. *Galio sylvatici-Carpinetum lathyretosum verni* (16 relevés): Boiński (1973), tab. 31: 1-11, 13, 18,21,23 (*Galio sylvatici-Carpinetum calamagrostietosum*); Wojterska (2003), tab. 14: 36 (*Potentillo albae-Quercetum*).

7. *Galio sylvatici-Carpinetum typicum* – impoverished form (14 relevés): Brzeg (1989), tab. 22: 6-10,13,14 (*Galio sylvatici-Carpinetum*); Krotoska (1966), tab. 10: 5,13,15-17 (*Galio sylvatici-Carpinetum holcetosum mollis*); Macicka (1984), tab. 10: 38 (*Galio sylvatici-Carpinetum holcetosum*); Wojterska (2003), tab. 14: 34 (*Galio sylvatici-Carpinetum holcetosum*).

8. Community *Oxalis acetosella-Pinus sylvestris* (10 relevés): Ferchmin (1966), tab. 8: 9,15,17-23 (*Querco-Carpinetum

Successive number of syntaxon		1		2		3		4		5		6	
Carex montana (Q-F)		-	-	-	-	-	-	-	-	-	-	62	*469*
Phyteuma spicatum (Q-F)		1	*1*	-	-	-	-	25	*13*	22	*11*	50	*138*
Hypericum montanum (Q-F)		2	*1*	3	*0*	-	-	-	-	-	-	44	*22*
Vicia cassubica (T-G)		1	*6*	7	*60*	-	-	-	-	11	*56*	38	*19*
Campanula rapunculoides (T-G)		-	-	-	-	-	-	-	-	-	-	25	*350*
Brachypodium pinnatum (F-B)		-	-	-	-	-	-	-	-	-	-	25	*331*
Ch. *Querco-Fagetea* (Q-F)													
Fagus sylvatica	a	23	*334*	17	*227*	8	*459*	8	*42*	44	*1056*	25	*1266*
Fagus sylvatica	b-c	41	*67*	27	*276*	8	*8*	17	*4*	67	*745*	44	*615*
Fraxinus excelsior	a-c	9	*11*	13	*63*	33	*50*	25	*17*	-	-	-	-
Acer pseudoplatanus		1	*6*	3	*58*	8	*188*	-	-	-	-	6	*140*
Acer pseudoplatanus	b-c	9	*4*	7	*20*	25	*50*	8	*4*	33	*17*	56	*400*
Corylus avellana	b-c	22	*494*	30	*242*	25	*238*	58	*713*	11	*6*	6	*3*
Padus avium	a-c	10	*86*	13	*114*	67	*146*	33	*205*	-	-	-	-
Viburnum opulus	b-c	9	*15*	7	*3*	17	*8*	8	*4*	-	-	-	-
Anemone nemorosa		80	*571*	47	*177*	58	*179*	33	*571*	44	*500*	81	*953*
Viola reichenbachiana		56	*198*	43	*150*	92	*300*	100	*521*	67	*183*	69	*91*
Atrichum undulatum		69	*210*	40	*50*	50	*175*	67	*33*	22	*11*	38	*334*
Poa nemoralis		67	*485*	47	*248*	100	*3275*	100	*2646*	89	*2261*	100	*1184*
Melica nutans		28	*147*	43	*468*	58	*696*	42	*379*	78	*378*	75	*644*
Ajuga reptans		44	*72*	27	*28*	25	*13*	25	*50*	-	-	19	*66*
Milium effusus		42	*146*	37	*213*	-	-	8	*4*	56	*267*	44	*50*
Scrophularia nodosa		36	*18*	27	*27*	8	*4*	25	*13*	56	*78*	62	*31*
Polygonatum multiflorum		26	*24*	3	*2*	17	*8*	17	*8*	11	*6*	38	*19*
Eurhynchium angustirete		16	*14*	7	*3*	17	*8*	-	-	11	*6*	31	*72*
Platanthera bifolia		2	*1*	3	*2*	-	-	-	-	22	*11*	19	*38*
Dryopteris filix-mas		27	*36*	10	*20*	17	*83*	8	*4*	11	*6*	12	*6*
Sanicula europaea		26	*57*	10	*35*	17	*8*	33	*17*	-	-	25	*41*
Festuca gigantea		22	*32*	30	*87*	-	-	25	*13*	-	-	-	-
Adoxa moschatellina		9	*10*	3	*17*	-	-	33	*196*	-	-	6	*3*
Stachys sylvatica		5	*1*	-	-	8	*4*	33	*17*	-	-	-	-
Carex sylvatica		23	*23*	3	*2*	-	-	-	-	-	-	6	*3*
Viola reichenbachiana et riviniana		11	*11*	10	*50*	-	-	-	-	-	-	-	-
Anemone ranunculoides		-	-	-	-	-	-	-	-	-	-	-	-
Ulmus minor	a	-	-	-	-	-	-	-	-	-	-	-	-
Ulmus minor	b-c	1	*6*	7	*4*	-	-	-	-	6	*1*	-	-
Ch. *Artemisietea vulgaris*													
Moehringia trinervia		43	*144*	60	*75*	83	*296*	67	*146*	22	*11*	12	*34*
Aegopodium podagraria		11	*6*	3	*2*	33	*54*	33	*233*	11	*6*	44	*184*
Geranium robertianum		7	*4*	17	*8*	33	*54*	33	*17*	-	-	-	-
Galeopsis pubescens		11	*11*	20	*10*	25	*13*	58	*67*	-	-	-	-
Geum urbanum		14	*7*	13	*7*	17	*8*	42	*21*	-	-	12	*6*
Heracleum sphondylium		-	-	-	-	-	-	42	*21*	-	-	-	-
Urtica dioica		4	*2*	23	*12*	8	*4*	25	*13*	-	-	-	-
Impatiens parviflora		11	*68*	17	*95*	42	*717*	8	*42*	-	-	-	-
Rubus caesius		11	*6*	3	*2*	-	-	17	*8*	-	-	-	-
Ch. *Vaccinio-Piceetea* (V-P)													
Picea abies	a	6	*57*	10	*93*	8	*42*	-	-	-	-	-	-
Picea abies	b-c	36	*232*	47	*502*	-	-	-	-	11	*61*	-	-
Pinus sylvestris	a	14	*88*	37	*1551*	17	*46*	8	*4*	-	-	-	-
Pinus sylvestris	b-c	5	*1*	10	*5*	-	-	8	*4*	-	-	6	*3*
Rubus saxatilis		5	*8*	10	*62*	17	*8*	-	-	22	*11*	-	-
Galium rotundifolium		14	*44*	10	*35*	-	-	-	-	-	-	-	-
Pleurozium schreberi		4	*23*	20	*25*	17	*46*	-	-	33	*167*	25	*41*
Others													
Betula pendula	a	20	*157*	20	*77*	42	*404*	42	*133*	-	-	-	-
Betula pendula	b-c	5	*3*	10	*5*	8	*4*	8	*8*	22	*11*	-	-
Sorbus aucuparia	a	-	-	10	*20*	-	-	17	*83*	-	-	-	-
Sorbus aucuparia	b-c	84	*91*	97	*140*	75	*79*	75	*196*	78	*95*	75	*38*
Pyrus communis	a-c	5	*2*	17	*8*	17	*8*	42	*104*	11	*6*	6	*3*
Crataegus monogyna	b-c	20	*12*	13	*7*	33	*17*	42	*58*	-	-	19	*97*
Euonymus europaea	b-c	12	*7*	13	*8*	25	*12*	50	*71*	-	-	12	*6*
Populus tremula	a-c	9	*40*	13	*23*	25	*50*	25	*50*	-	-	19	*66*
Abies alba	a	1	*6*	-	-	-	-	-	-	-	-	-	-
Abies alba	c	2	*1*	-	-	-	-	-	-	-	-	-	-
Sambucus nigra	b-c	5	*8*	7	*5*	25	*50*	17	*8*	-	-	-	-
Luzula pilosa		81	*409*	57	*130*	50	*333*	33	*17*	44	*72*	56	*84*
Maianthemum bifolium		86	*672*	63	*328*	42	*379*	50	*279*	67	*511*	81	*506*
Veronica chamaedrys		38	*95*	37	*119*	25	*13*	83	*154*	67	*322*	88	*206*
Pteridium aquilinum		21	*293*	47	*388*	17	*46*	-	-	33	*17*	44	*78*
Fragaria vesca (T-G)		25	*72*	50	*168*	42	*58*	33	17	11	*194*	25	*41*
Rubus idaeus		25	*46*	50	*182*	33	*54*	8	4	22	*11*	-	-
Agrostis capillaris (C-U)		10	*31*	33	*217*	8	*4*	25	13	22	*200*	-	-
Veronica officinalis (C-U)		25	*18*	30	*30*	33	*17*	42	58	22	*11*	6	*3*
Stellaria media		11	*22*	13	*22*	33	*129*	50	25	-	-	-	-
Hieracium murorum		32	*33*	17	*23*	58	*142*	17	8	-	-	31	*16*
Anthoxanthum odoratum		11	*38*	27	*43*	17	*46*	33	17	44	*261*	6	*3*
Athyrium filix-femina		23	*94*	17	*23*	-	-	-	-	33	*428*	-	-
Brachythecium rutabulum		5	*2*	13	*7*	8	*4*	17	8	-	-	-	-

7		8		9	
-	-	-	-	-	-
7	36	-	-	2	1
-	-	-	-	10	4
-	-	-	-	5	2
-	-	-	-	-	-
-	-	-	-	-	-
14	71	20	350	5	125
-	-	-	-	19	31
43	154	10	50	17	43
-	-	-	-	5	101
14	8	-	-	14	19
7	4	20	15	24	320
-	-	20	385	17	71
14	8	10	5	5	2
79	2232	90	730	24	273
57	189	90	530	45	138
71	407	10	5	21	102
21	11	10	5	57	496
36	50	70	80	60	425
71	100	90	135	10	5
14	7	-	-	24	85
50	22	10	5	17	18
14	7	-	-	-	-
7	4	-	-	-	-
14	7	-	-	2	42
21	43	40	20	24	231
7	4	-	-	2	12
7	4	10	5	26	35
-	-	-	-	10	4
14	7	-	-	2	1
29	168	-	-	2	42
36	139	-	-	5	43
21	43	-	-	-	-
29	200	-	-	-	-
21	43	-	-	-	-
36	18	100	865	74	496
43	329	-	-	7	4
7	4	10	50	31	265
-	-	40	61	26	34
7	4	-	-	29	36
-	-	-	-	2	1
7	4	10	5	21	54
-	-	10	175	19	310
50	146	10	5	12	17
-	-	10	350	5	143
-	-	20	10	10	57
21	76	100	4050	60	2047
-	-	10	5	5	3
-	-	80	85	14	110
-	-	70	760	7	14
-	-	-	-	24	63
64	275	20	100	26	180
7	4	-	-	14	22
29	168	-	-	5	54
64	161	80	230	64	157
7	1	-	-	12	16
7	4	-	-	12	8
29	50	10	55	5	13
21	132	-	-	14	48
-	-	-	-	-	-
-	-	40	16	-	-
7	1	40	20	12	17
64	64	60	30	52	139
100	332	70	655	26	24
43	16	10	5	43	236
21	11	50	21	48	467
21	11	40	65	45	188
7	4	20	55	48	199
7	36	-	-	24	155
7	4	30	15	17	70
-	-	60	75	5	2
14	7	30	15	21	109
-	-	-	-	26	45
14	7	50	25	2	12
36	18	-	-	5	13

calamagrostietosum variant with *Pinus sylvestris*); Ferchmin (1980), tab. 17: 9 (*Querco-Carpinetum*); Macicka-Pawlik & Wilczyńska (1996), tab. 31: 11 (Substitute forest communities).

9. Substitute forest communities on the habitat of forests from the *Querco-Fagetea* class (42 relevés): Berdowski, Kwiatkowski (1992), tab. 7: 3,7 (*Querco roboris-Pinetum*); Ferchmin (1980), tab. 19: 5,7,10,13 (*Potentillo albae-Quercetum*); Gmaj (1997), tab. 4: 8,9 (*Gs-C holcetosum mollis*), tab. 9: 12,19 (*Calamagrostio arundinaceae-Quercetum*); Jakubowska-Gabara (1994), tab. 1: 15 (*Pinus-Rubus* - secondary community of *Potentillo albae-Quercetum*); Jaroszewska (2007), tab. 4: 7 (*Potentillo albae-Quercetum* – degenerated form); Krotoska 1991, tab. 6: 1,3,6,8 (*Galio-Carpinetum* – form of deformation with the share of some acidophilous species); Macicka (1984), tab. 10: 39,46,48 (*Gs-C holcetosum*), tab. 20: 20 (*Pino-Quercetum*), tab. 29: 4 (Plantation of pine on habitat of deciduos and mixed forests); Macicka & Wilczyńska (1990), tab. 16: 3 (*Pino-Quercetum fagetosum*); Macicka & Wilczyńska (1991), tab. 14: 9 (*Pino-Quercetum*); Macicka-Pawlik & Wilczyńska (1996), tab. 31: 19 (Substitute forest communities); Marcysiak (2001), tab. 1: 12 (*Potentillo albae-Quercetum*); Nachotko (1982), tab. 6:1,2,7 (Oak forest from the *Querco-Fagetea* class); Pawłow & Czech (1959), tab. 3: 5,7,21 (Mixed coniferous forest); Ryszewska (1977), tab. 5: 5 (*Calamagrostio-Quercetum*); Wojterska (2003), tab. 14: 27,29,30,32 (*Galio sylvatici-Carpinetum holcetosum mollis*), 38 (*Potentillo albae-Quercetum*; Zielińska (1994), tab. 5: 14-16 (*Calamagrostio-Qurcetum convallarietosum*).

Table 11. Floristic differentiation of *Potentillo albae-Quercetum* reflecting habitat variation and human impact: untransformed communities (col. 1-8), stage II of degeneration (col. 9-11), and substitute forest communities (col. 12-14)

Successive number of syntaxon		1		2		3		4		5		6		7		8	
Number of relevés		9		4		6		7		11		23		23		15	
Number of taxa		126		132		155		123		111		204		186		200	
Mean number of taxa in relevé		72		81		64		43		49		69		65		56	
*Ch., ^D. ***Potentillo albae-Quercetum***																	
Ch. *Quercetalia pubescentis*																	
Campanula persicifolia		67	83	75	28	67	108	57	29	64	155	91	259	96	191	100	219
Galium boreale^ (M-A)		67	133	100	588	100	200	71	100	100	491	96	450	96	773	73	497
Betonica officinalis^ (M-A)		100	1367	100	30	100	200	29	14	73	33	70	230	91	293	60	141
*Carex montana**		78	756	100	275	100	350	86	171	-	-	91	448	83	394	67	591
*Ranunculus polyanthemos**		89	194	75	38	50	18	29	9	36	15	74	51	83	64	20	9
Lathyrus niger		89	622	-	-	-	-	43	86	100	255	4	22	13	5	73	363
*Potentilla alba**		-	-	100	255	100	200	43	16	91	250	74	652	91	1116	67	331
Primula veris		-	-	-	-	17	2	14	7	18	9	22	9	68	34	25	13
Hypericum montanum		33	17	-	-	-	-	43	86	64	73	30	35	35	31	80	41
Platanthera bifolia		-	-	25	13	67	33	-	-	9	5	4	0	22	8	-	-
*Pulmonaria angustifolia**		-	-	-	-	17	2	-	-	-	-	52	163	74	237	13	34
Festuca amethystina subsp. *ritschlii**		-	-	-	-	-	-	14	7	-	-	17	5	9	3	-	-
D. Group of moist subassociations																	
Succisa pratensis (M-A)		100	489	75	263	50	18	14	1	-	-	-	-	5	2	-	-
Deschampsia caespitosa (M-A)		56	28	100	588	50	592	14	7	-	-	9	3	22	6	27	13
Carex pallescens (C-U)		56	78	100	50	67	183	-	-	-	-	13	26	14	3	6	3
Hieracium sabaudum (Qrp)		78	139	75	263	50	93	-	-	-	-	13	5	-	-	6	3
Selinum carvifolia (M-A)		44	22	75	150	33	92	-	-	-	-	4	2	14	7	-	-
Scorzonera humilis (C-U)		56	28	-	-	50	12	14	7	-	-	13	5	-	-	12	6
Ranunculus acris s. s. (M-A)		67	33	50	138	17	2	-	-	-	-	-	-	-	-	6	3
D. *Pa-Q astrantietosum*																	
Viburnum opulus (Q-F)	b-c	67	56	-	-	-	-	-	-	18	9	-	-	-	-	12	6
Pyrus communis	a-c	78	117	-	-	-	-	14	7	-	-	13	5	-	-	12	6
Cornus sanguinea	b-c	44	89	-	-	17	8	-	-	-	-	-	-	-	-	-	-
Euonymus europaea	b-c	44	22	-	-	17	8	14	7	-	-	-	-	5	2	-	-
Populus tremula	a-c	67	161	-	-	17	8	-	-	-	-	9	7	5	25	6	3
Crataegus monogyna	b-c	78	272	-	-	33	17	29	14	-	-	26	10	14	5	12	9
Galium schultesii (Q-F)		100	3000	-	-	-	-	14	71	-	-	4	22	-	-	19	222
Melampyrum nemorosum (Q-F)		100	1950	-	-	-	-	14	7	-	-	4	2	-	-	25	203
Serratula tinctoria (M-A)		100	1144	-	-	17	8	43	86	-	-	13	26	13	3	33	75
Melittis melissophyllum (Q-F)		89	622	-	-	-	-	14	7	-	-	-	-	-	-	6	31
Campanula glomerata (M-A)		89	194	-	-	17	8	-	-	-	-	4	2	5	2	6	3
Hieracium umbellatum (Qrp)		89	194	-	-	17	8	14	7	-	-	9	24	-	-	6	3
Holcus mollis (Qrp)		78	428	-	-	-	-	-	-	-	-	4	22	5	80	44	78
Laserpitium prutenicum (M-A)		89	333	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Angelica sylvestris (M-A)		89	244	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peucedanum cervaria (T-G)		67	33	-	-	-	-	-	-	-	-	17	3	14	5	6	3
Stellaria graminea (M-A)		67	133	-	-	-	-	-	-	9	5	-	-	-	-	12	34
Astrantia major (Q-F)		56	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hypochoeris maculata (Q-F)		56	178	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pimpinella major (M-A)		56	128	-	-	-	-	-	-	-	-	4	2	-	-	-	-
Plantago lanceolata (M-A)		44	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trifolium medium (T-G)		44	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lathyrus pratensis (M-A)		44	22	25	13	-	-	-	-	-	-	-	-	-	-	12	6
Coronilla varia (T-G)		33	67	-	-	-	-	-	-	9	5	9	4	9	3	-	-
Trollius europaeus (M-A)		33	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pulmonaria obscura (Q-F))		33	17	-	-	-	-	14	7	-	-	-	-	-	-	-	-
Phyteuma spicatum (Q-F)		22	11	-	-	-	-	-	-	-	-	-	-	9	1	-	-
D. *Pa-Q molinietosum*																	
Crataegus laevigata	b-c	-	-	100	613	83	133	-	-	-	-	13	1	41	15	12	6
Hypericum maculatum (C-U)		-	-	100	163	67	108	-	-	-	-	48	81	50	219	12	34
Molinia caerulea (M-A)		-	-	100	1125	100	975	-	-	-	-	-	-	5	2	-	-
Lysimachia vulgaris M-A)		-	-	25	13	67	600	-	-	-	-	4	2	-	-	-	-
Cnidium dubium (M-A)		-	-	75	150	33	300	-	-	-	-	26	126	23	320	-	-
Juncus effusus (M-A)		-	-	50	15	50	18	-	-	-	-	-	-	9	3	6	3
Carex nigra (S-C)		-	-	50	138	33	17	14	7	-	-	-	-	-	-	-	-
Carex ovalis (C-U)		-	-	25	13	50	18	-	-	-	-	-	-	-	-	-	-
Carex flacca		-	-	100	163	-	-	-	-	-	-	-	-	-	-	-	-
Lupinus polyphyllus		-	-	75	463	17	2	14	7	-	-	13	5	14	7	-	-
Plagiomnium cuspidatum		-	-	50	138	17	8	-	-	-	-	4	76	5	2	-	-
Lysimachia nummularia M-A)		-	-	50	128	17	8	-	-	-	-	-	-	-	-	-	-
D. *Pa-Q brachypodietosum*																	
Anthericum ramosum T-G)		22	11	-	-	33	10	29	14	-	-	83	178	91	166	60	88
Euphorbia cyparissias (F-B)		22	11	-	-	17	8	-	-	18	46	87	102	74	120	60	186
Brachypodium pinnatum (F-B)		44	222	-	-	17	8	14	7	-	-	61	913	91	1870	47	522
Pimpinella saxifraga (F-B)		67	83	-	-	17	2	-	-	-	-	96	64	78	37	33	16
Sedum maximum (T-G)		56	28	-	-	-	-	14	7	27	10	39	18	39	13	53	56
Galium verum (T-G)		-	-	-	-	-	-	-	-	-	-	52	23	48	25	13	34

9		10		11		12		13		14	
4		19		65		15		21		20	
118		213		358		148		170		234	
53		39		49		52		35		38	
-	-	42	43	55	82	-	-	14	7	15	30
50	138	74	447	71	386	60	90	33	119	25	80
25	13	47	45	55	55	-	-	-	-	15	8
100	163	16	55	28	82	-	-	5	2	-	-
-	-	5	3	6	29	-	-	-	-	-	-
-	-	37	153	23	52	-	-	10	5	-	-
25	3	21	8	37	44	-	-	5	0	-	-
-	-	5	3	6	2	-	-	-	-	-	-
-	-	21	11	9	12	7	3	5	2	10	1
25	13	5	3	2	0	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	2	1	-	-	-	-	-	-
25	125	-	-	2	1	-	-	-	-	-	-
75	688	11	29	28	47	93	310	29	36	20	10
25	13	5	3	8	4	33	14	5	2	-	-
25	13	5	26	5	2	7	3	10	3	5	25
-	-	-	-	-	-	-	-	-	-	-	-
-	-	11	5	25	12	-	-	10	3	5	3
-	-	-	-	8	4	7	1	-	-	-	-
-	-	11	5	-	-	-	-	-	-	5	3
-	-	11	8	20	33	-	-	10	7	20	15
-	-	5	3	6	37	-	-	-	-	10	5
-	-	5	1	8	4	13	7	5	2	25	40
-	-	-	-	9	53	20	357	5	2	5	3
50	25	5	29	20	18	33	77	-	-	15	33
-	-	-	-	5	112	-	-	-	-	5	88
25	125	5	92	12	142	-	-	5	83	-	-
-	-	11	29	17	8	-	-	5	2	15	8
-	-	-	-	6	10	-	-	-	-	5	3
-	-	-	-	-	-	-	-	-	-	-	-
25	125	11	29	8	4			10	5	5	3
-	-	5	26	15	28	-	-	10	26	15	8
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	5	3
-	-	-	-	6	2	-	-	5	2	5	3
-	-	-	-	3	2	7	3	5	2	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	5	3	3	2	-	-	-	-	-	-
-	-	-	-	2	1	-	-	-	-	5	3
-	-	5	3	3	15	-	-	5	2	-	-
-	-	-	-	2	1	7	3	-	-	-	-
-	-	-	-	14	6	-	-	-	-	5	3
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	2	1	-	-	-	-	-	-
-	-	5	3	2	1	-	-	-	-	-	-
50	150	5	3	9	25	20	103	10	7	20	8
75	263	5	3	9	12	73	67	5	2	5	3
75	1388	11	29	12	6	40	110	5	2	-	-
100	588	-	-	11	45	67	91	5	24	5	3
25	13	-	-	-	-	-	-	-	-	-	-
75	18	-	-	5	2	20	7	5	2	5	1
25	125	-	-	-	-	7	3		-	-	-
25	13	-	-	2	1	27	13	5	0	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	5	2	-	-	-	-	-	-
25	438	-	-	3	2	47	23	10	5	-	-
25	13	-	-	5	2	-	-	-	-	-	-
25	13	5	3	32	82	-	-	5	2	40	88
-	-	26	13	55	108	13	7	5	0	65	315
50	25	11	29	45	625	87	1090	48	469	35	643
-	-	-	-	37	39	7	3	10	3	45	45
-	-	11	3	32	37	13	7	10	24	40	65
-	-	-	-	28	68	-	-	-	-	20	55

Explanations: Shortened table comprises in each column the frequency of species (in %) and cover index (italics).

1. *Potentillo albae-Quercetum astrantietosum* (9 relevés): Jakubowska-Gabara (1994), tab. 1: 1-9 (*Pa-Q poëtosum*).

2. *Potentillo albae-Quercetum molinietosum* variant with *Pleurozium schreberi* (4 relevés): Wojterska *et al*. (2006), tab. 2: 2-5 (*Pa-Q molinietosum*).

3. *Potentillo albae-Quercetum molinietosum* typical variant (6 relevés): Brzeg & Kasprowicz (2001), 1 relevé (*Pa-Q molinietosum*); Gmaj (1997), tab. 7: 3 (*Pa-Q* – degenerated forms); Wojterska & Wiszniewska (1996), tab. 1: 17 *Pa-Q astrantietosum*; Wojterska *et al.* (2006), tab. 2: 1,8,9 (*Pa-Q molinietosum.*

4. *Potentillo albae-Quercetum typicum* typical variant (7 relevés): Gmaj (1997), tab. 6 (*Pa-Q lathyretosum verni*), tab. 7: 1 (*Pa-Q* – degenerated forms); Jakubowska-Gabara (1994) tab. 1: 16 (*Pa-Q typicum*); Krotoska (1991 (tab. 11: 2,10,12 (*Pa-Q*); Wojterska & Wiszniewska (1996), tab. 1: 16 (*Pa-Q typicum*).

5. *Potentillo albae-Quercetum typicum* variant with *Asarum europaeum* (11 relevés): Nowaczyk (1964), tab. 9: 4-6,8,10-16 (*Querco-Potentilletum albae*).

6. *Potentillo albae-Quercetum brachypodietosum* variant with *Pleurozium schreberi* (23 relevés): Brzeg & Kasprowicz (2001) 1 relevé (*Pa-Q typicum* variant with *Pleurozium schreberi*); Jakubowska-Gabara (1994), tab. 1: 10 (*Pa-Q poëtosum*); Jaroszewska (2007), tab. 2: 1,4-6,8 (*Pa-Q brachypodietosum*); Krotoska (1991), tab. 11: 4,5 (*Pa-Q*); Nowaczyk (1964), tab. 9: 3 (*Querco-Potentilletum albae*); Wojterska *et al.* (2006), tab. 1: 7,10,13,15,19,20,24 (*Pa-Q brachypodietosum*); Wojterska *et al.* (2001), tab. 1: 5-9,13 (*Pa-Q*).

7. *Potentillo albae-Quercetum brachypodietosum* typical variant (23 relevés): Brzeg & Kasprowicz (2001) 1 relevé (*Pa-Q brachypodietosum* typical variant; Boiński (1973), tab. 46: 2 (*Pa-Q*); Jaroszewska (2007), tab. 2: 9,11 (*Pa-Q brachypodietosum*); Wojterska *et al.* (2006), tab. 1: 11,22,26 (*Pa-Q brachypodietosum*), Wojterska & Wiszniewska (1996), tab. 1: 1,3-13 (*Pa-Q brachypodietosum pinnati*); Wojterska *et al.* (2001), tab. 1: 4,11,12,14 (*Pa-Q*).

8. *Potentillo albae-Quercetum brachypodietosum* variant with *Asarum europaeum* (15 relevés): Boiński (1973), tab. 46: 1,3,4,6 (*Pa-Q*); Jakubowska-Gabara (1994), tab. 1: 17,18,23 (*Pa-Q typicum*); Krotoska (1991), tab. 11: 6,9 (*Pa-Q*); Nowaczyk (1964), tab. 9: 1,2,7,9 (*Querco-Potentilletum albae*); Wojterska *et al.* (2006), tab. 1: 25 (*Pa-Q brachypodietosum*); Wojterska & Wiszniewska (1996), tab. 1: 2 (*Pa-Q brachypodietosum*).

9. *Potentillo albae-Quercetum molinietosum* in stage II of degeneration (4 relevés): Robińska (1977), tab. 5: 4 (*Pino-Quercetum* – degenerated forms), Wojterska *et al.* (2006), tab. 2: 6,7 (*Pa-Q molinietosum*), tab. 3: 10 (Substitute forest communities on the habitat of *Pa-Q*).

10. *Potentillo albae-Quercetum typicum* in stage II of degeneration (19 relevés): Ferchmin (1980), tab. 19: 6 (*Pa-Q* aff.); Gmaj (1997), tab. 6: 2 (*Pa-Q lathyretosum verni*); Jakubowska-Gabara (1994), tab. 1: 25 (*Pinus-Vaccinium* – secondary community of *Pa-Q*);

Successive number of syntaxon		1		2		3		4		5		6		7		8	
Peucedanum oreoselinum (T-G)		22	61	-	-	17	8	14	71	18	9	30	35	9	23	33	16
Geranium sanguineum (T-G)		56	506	-	-	-	-	-	-	18	9	39	78	9	23	33	129
D. *Pleurozium schreberi* var.																	
Vaccinium vitis-idaea (V-P)		-	-	-	-	-	-	-	-	18	9	70	30	14	5	12	4
Pleurozium schreberi (V-P)		-	-	25	125	-	-	14	7	9	5	61	326	-	-	-	-
Pseudoscleropodium purum (V-P)		-	-	100	1125	-	-	-	-	-	-	52	120	18	9	-	-
Hypnum cupressiforme		-	-	75	38	-	-	-	-	9	5	48	24	5	2	6	3
Hieracium laevigatum (Qrp)		-	-	25	13	17	8	-	-	-	-	26	11	18	5	-	-
Pohlia nutans (C-U)		-	-	-	-	17	2	-	-	-	-	30	15	18	7	-	-
D. *Asarum europaeum* var.																	
Hepatica nobilis		11	6	50	15	33	167	43	86	73	550	9	4	9	5	67	510
Galium mollugo (M-A)		67	133	-	-	-	-	14	7	55	68	26	11	26	89	67	338
Thalictrum aquilegiifolium		44	22	-	-	-	-	-	-	64	114	-	-	-	-	13	66
Carex digitata (Q-F)		-	-	25	13	-	-	29	14	91	795	17	155	-	-	56	303
Galium sylvaticum (Q-F)		-	-	-	-	-	-	-	-	100	573	-	-	-	-	25	69
Viola reichenbachiana (Q-F)		-	-	-	-	33	167	-	-	64	73	-	-	9	25	47	241
Lathyrus vernus (Q-F)		-	-	-	-	-	-	-	-	64	114	9	4	-	-	33	16
Stellaria holostea (Q-F)		-	-	-	-	17	8	-	-	27	55	-	-	-	-	33	228
Lilium martagon (Q-F)		11	6	-	-	-	-	14	7	9	5	4	2	-	-	56	84
Ch. *Querco-Fagetea* (Q-F)																	
Carpinus betulus	a	33	167	-	-	17	8	-	-	-	-	-	-	-	-	7	117
Carpinus betulus	b-c	67	205	25	13	33	17	29	21	73	309	4	4	4	4	33	457
Corylus avellana	a-c	100	1872	75	30	33	3	57	43	73	427	26	183	22	5	40	588
Fagus sylvatica	a-c	-	-	75	275	83	417	43	93	27	555	57	113	78	105	20	334
Padus avium	a-c	-	-	50	5	50	33	43	21	-	-	57	21	23	12	19	9
Malus sylvestris	a-c	-	-	50	38	33	25	-	-	-	-	30	12	36	17	6	3
Melica nutans		100	1506	100	813	100	842	86	1714	100	614	100	915	100	1120	100	1597
Anemone nemorosa		100	2311	50	25	83	683	57	514	55	223	26	146	65	752	73	653
Poa nemoralis		89	344	75	140	100	350	57	93	18	50	61	443	39	341	33	472
Brachypodium sylvaticum		78	667	100	163	17	292	29	14	45	300	17	100	22	10	33	228
Ajuga reptans		89	433	100	275	83	117	57	93	82	245	83	159	65	112	67	278
Atrichum undulatum		78	89	100	700	17	83	-	-	73	118	43	135	57	48	20	13
Festuca heterophylla		33	17	-	-	-	-	29	786	82	245	35	37	52	21	33	625
Milium effusum		33	17	75	38	17	8	14	71	-	-	17	9	17	5	13	16
Scrophularia nodosa		56	28	25	13	17	8	14	7	9	5	52	42	30	10	53	23
Viola riviniana		100	250	100	275	83	42	-	-	-	-	43	41	48	168	40	131
Festuca gigantea		-	-	100	50	67	108	57	29	27	14	43	34	52	20	7	3
Dactylis polygama		-	-	25	13	50	308	14	7	-	-	30	54	23	10	-	-
Galeobdolon luteum		-	-	-	-	17	8	43	264	9	5	-	-	-	-	20	116
Viola reichenbachiana et riviniana		-	-	-	-	17	83	71	36	-	-	35	37	30	57	7	3
Galium odoratum		-	-	-	-	-	-	29	79	-	-	-	-	4	23	4	3
Ch., ^D. *Quercetea robori-petraeae* (Qrp)																	
Melampyrum pratense^		78	89	100	388	83	752	57	800	91	682	83	139	87	166	73	148
Pteridium aquilinum^		22	11	50	450	50	308	57	579	100	1251	35	346	35	375	73	369
Festuca ovina		67	233	75	38	33	92	43	21	36	141	78	320	35	16	53	244
Polytrichastrum formosum^		78	89	75	463	50	25	14	7	45	64	26	13	-	-	26	147
Hieracium lachenalii		78	39	75	150	67	33	57	93	-	-	52	63	30	9	40	19
Carex pilulifera		44	22	50	25	67	33	71	36	-	-	30	15	17	9	27	119
Calamagrostis arundinacea		-	-	75	150	17	83	57	336	91	795	35	130	13	5	73	622
Lathyrus montanus		-	-	-	-	-	-	-	-	-	-	-	-	4	23	27	178
Ch. *Vaccinio-Piceetea* (V-P)																	
Pinus sylvestris	a	56	128	25	938	-	-	14	7	64	1364	35	424	13	105	33	209
Pinus sylvestris	b-c	-	-	-	-	-	-	-	-	-	-	13	46	9	2	-	-
Picea abies	a	-	-	50	25	17	8	-	-	-	-	26	74	-	-	20	10
Picea abies	b-c	-	-	25	3	33	302	43	336	-	-	-	-	52	145	7	3
Juniperus communis	b-c	78	106	-	-	-	-	14	79	-	-	48	220	36	10	27	154
Rubus saxatilis		11	6	100	275	100	842	43	86	91	527	30	74	43	158	33	100
Vaccinium myrtillus		44	72	100	1825	100	767	86	1121	100	1550	83	780	65	211	73	622
Trientalis europaea		-	-	25	13	-	-	-	-	-	-	-	-	4	5	27	16
Ch. *Artemisietea vulgaris*																	
Moehringia trinervia		44	72	75	28	33	85	57	29	73	159	91	183	87	164	87	175
Galeopsis pubescens		-	-	75	150	33	92	29	14	18	9	52	143	70	75	33	16
Galeopsis tetrahit		-	-	75	38	50	100	29	14	9	5	48	20	43	40	47	19
Geum urbanum		-	-	50	25	50	100	29	14	27	14	61	50	70	31	40	75
Mycelis muralis		-	-	75	150	50	100	43	21	64	155	74	135	78	76	67	147
Urtica dioica		-	-	100	50	50	100	14	7	45	23	57	402	83	180	53	26
Impatiens parviflora		-	-	100	163	50	175	29	900	-	-	57	220	27	209	6	109
Geranium robertianum		-	-	-	-	50	18	-	-	-	-	30	35	39	39	20	144
Alliaria petiolata		-	-	25	125	17	83	14	7	-	-	26	33	39	18	7	6
Galium aparine		-	-	-	-	17	83	29	14	-	-	26	103	48	140	-	-
Lapsana communis s. s.		-	-	-	-	-	-	-	-	9	5	30	15	4	2	13	6
Linaria vulgaris		-	-	-	-	-	-	-	-	-	-	26	13	4	2	-	-
Ch. *Molimio-Arrhenatheretea* (M-A)																	
Veronica chamaedrys		100	400	100	475	100	50	71	343	100	532	83	193	100	173	93	619
Dactylis glomerata		67	83	-	-	33	17	14	7	27	55	-	-	17	25	27	72

9		10		11		12		13		14	
-	-	16	6	49	152	7	3	5	24	50	301
-	-	5	3	20	24	-	-	-	-	5	25
50	25	21	58	12	20	-	-	14	29	5	25
-	-	32	85	25	374	27	157	19	31	45	880
50	450	32	322	22	103	73	890	24	217	20	428
-	-	16	32	18	82	-	-	19	10	30	270
25	125	11	95	5	9	-	-	-	-	-	-
-	-	16	8	12	70	20	10	14	7	20	33
-	-	26	150	17	81	7	3	5	2	5	3
25	3	16	32	22	38	-	-	10	5	20	10
-	-	-	-	11	62	-	-	5	2	-	-
-	-	21	147	15	126	7	3	-	-	5	3
-	-	11	5	2	8	-	-	-	-	5	25
25	125	26	37	25	26	13	7	19	10	10	5
-	-	11	29	2	8	-	-	-	-	-	-
-	-	-	-	5	2	7	33	-	-	-	-
-	-	11	5	23	16	-	-	19	6	5	3
-	-	5	3	-	-	7	33	5	0	5	1
-	-	-	-	-	-	-	-	-	-	-	-
25	138	37	229	23	149	20	74	24	179	15	35
25	128	16	229	28	153	40	137	33	471	10	30
25	3	16	11	18	18	53	323	19	55	10	30
50	25	-	-	-	-	47	46	19	8	10	1
100	700	84	606	78	945	87	337	76	312	50	470
-	-	21	124	38	198	7	3	5	24	15	115
75	263	58	213	49	728	87	1203	81	1067	50	758
75	150	16	97	17	100	53	200	19	52	20	31
75	38	21	34	48	72	27	43	33	38	25	13
25	13	32	105	20	83	47	197	24	55	5	3
-	-	26	450	11	141	-	-	14	110	5	25
25	13	21	100	11	45	33	9	5	2	-	-
25	13	11	5	17	15	27	43	33	13	5	3
75	263	32	35	32	97	93	314	48	43	45	173
50	25	11	5	17	8	47	45	24	31	5	25
25	13	11	95	15	98	40	163	24	114	5	3
-	-	5	3	-	-	-	-	-	-	5	88
25	13	5	3	11	12	7	3	-	-	5	3
-	-	-	-	2	8	-	-	-	-	-	-
50	450	63	566	48	145	27	13	24	12	35	99
75	1065	47	624	52	495	60	687	52	1005	35	238
50	138	68	597	57	375	-	-	19	133	50	920
25	438	32	39	11	19	27	157	24	33	5	3
25	13	26	58	31	49	-	-	10	5	25	11
50	25	-	-	29	62	60	27	38	17	5	3
75	263	68	793	49	285	47	330	48	345	35	248
-	-	-	-	-	-	-	-	-	-	-	-
50	1876	47	1421	57	1514	87	2617	62	1715	85	2091
-	-	11	5	8	4	7	3	5	2	15	96
-	-	5	3	2	1	27	157	14	88	-	-
50	16	16	56	12	38	60	63	5	190	25	186
-	-	21	155	31	119			10	7	40	348
-	-	47	142	48	184	60	180	52	67	40	86
75	1500	68	1479	60	784	100	880	76	858	45	878
-	-	11	5	9	12	20	7	10	26	10	28
75	38	68	611	60	357	67	121	57	89	60	538
50	25	16	55	12	6	-	-	10	5	15	30
50	25	26	35	31	61	47	18	33	115	30	36
25	13	16	8	34	15	33	14	19	10	30	98
50	138	47	184	49	174	60	115	52	67	35	223
25	13	16	6	35	72	67	28	33	295	15	28
75	688	16	6	14	161	67	151	24	31	15	93
-	-	16	8	26	86	7	1	10	181	20	388
50	138	-	-	11	5	20	37	14	29	-	-
-	-	16	29	23	78	7	3	5	179	10	50
-	-	-	-	-	-	-	-	5	2	5	3
-	-	5	3	11	12	13	7	10	26	15	6
50	25	74	155	80	162	53	114	52	69	35	85
25	13	5	3	12	27	13	7	5	2	15	93

30 (*Pinus-Anthoxanthum* – secondary community of *Pa-Q*); Jaroszewska (2007), tab. 3: 1 (*Pa-Q typicum*), tab. 4: 1 (*Pa-Q* – degenerated forms; Krotoska (1991), tab. 11: 3 (*Pa-Q*); Nachotko (1982), tab. 4: 11 (Oak forest with share of termophilous species); Nowaczyk (1964), tab. 7: 13 (*Pino-Quercetum*), tab. 9: 17,18 (*Querco-Potentilletum albae*); Robińska (1977), tab. 3: 15,28 (*Pino-Quercetum*); Wojterska *et al.* (2006), tab. 3: 19, 30 (Substitute forest communities on the habitat of *Pa-Q*); Zielińska (1994), tab. 4: 2,6 (*Pa-Q*), tab. 6: 11: (*Calamagrostio arundinaceae-Quercetum convallarietosum*); Wojterska (2003), tab. 14: 37 (*Pa-Q*).

11. *Potentillo albae-Quercetum brachypodietosum* in stage II of degeneration (65 relevés): Brzeg (orig.), tab. A29: 39, Ferchmin (1980), tab. 19: 1-4, 8,11,15,16,18 (*Pa-Q*); Gmaj (1997), tab. 6: 1,4 (*Pa-Q lathyretosum verni*); tab. 7: 2,5-10 (*Pa-Q* – degenerated forms; Jakubowska-Gabara (1994), tab. 1: 11,14,19,20,22,24,26 (Secondary communities of *Pa-Q*); Jaroszewska (2007), tab. 2: 2,7,10 (*Pa-Q brachypodietosum*); tab. 3: 2,3,4,5 (*Pa-Q typicum*); Krotoska (1983), tab. 3: 2 (*Pa-Q* aff.); Krotoska (1991), tab. 11: 7,8,11 (*Pa-Q*); Marcysiak (2001), tab. 1: 1-8 (*Pa-Q*); Olaczek (1986), tab. 2: 1,2 (*Pa-Q*); Paciejewska (1981), 11: 2-4,6,11 (Oak forest from the *Querco-Fagetea* class with share of termophilous species); Robińska (1977), tab. 5: 2,3 (*Pino-Quercetum* – degenerated forms); Wojterska *et al.* (2006) tab. 1: 23,27,28,29,30,31 (*Pa-Q brachypodietosum* – degenerated forms), tab. 3: 20 (Substitute forest communities on the habitat of *Pa-Q*); Wojterska & Wiszniewska (1996), tab. 1: 14 (*Pa-Q*); Zielińska (1994), tab. 4: 1,5,5 (*Pa-Q*).

12. Substitute forest communities on the habitat of *Potentillo albae-Quercetum molinietosum* (15 relevés): Robińska (1977), tab. 3: 22 (*Pino-Quercetum*); Wojterska *et al.* (2006), tab. 3: 8,9,11,12,14-17,21,23,33 (secondary communities of *Pa-Q*).

13. Substitute forest communities on the habitat of *Potentillo albae-Quercetum typicum* (21 relevés): Ferchmin (1980), tab. 19: 17,19 (*Pa-Q*); Hegenbart-Magdans & Brzeg (1999), tab. 5: 10-12 (*Pa-Q*); Jakubowska-Gabara (1994), tab. 1: 27,28 (secondary communities of *Pa-Q*); Jaroszewska (2007), tab. 4: 2 (*Pa-Q* – degenerated forms); Marcysiak (2001), tab. 1: 9-11 (*Pa-Q*); Wojterska *et al.* (2006), tab. 3: 2,4,5,13,25, 26,28 (Substitute forest communities on the habitat of *Pa-Q*); Zielińska (1994), tab. 4: 7 (*Pa-Q*).

14. Substitute forest communities on the habitat of *Potentillo albae-Quercetum brachypodietosum* (20 relevés): Ferchmin (1980), tab. 19: 9,14 (*Pa-Q* aff.); Hegenbart-Magdans & Brzeg (1999), tab. 5: 1,2,5 (*Pa-Q*); Jakubowska-Gabara (1994), tab. 1: 13,29 (secondary communities of *Pa-Q*); Jaroszewska (2007), tab. 2: 3 (*Pa-Q brachypodietosum*), tab. 4: 3,4,5 (*Pa-Q* – degenerated forms); Krotoska (1991), tab. 11: 1 (*Pa-Q*); Olaczek (1986), tab. 2: 3 (*Pa-Q*), tab. 3: 1-3 (Pine plantations on the habitat of *Pa-Q*); Wojterska *et al.* (2006), tab. 3: 1,18,24 (Substitute forest communities on the habitat of *Pa-Q*).

Successive number of syntaxon		1		2		3		4		5		6		7		8	
Festuca rubra s. s.		78	139	75	150	50	25	43	21	-	-	87	200	65	250	20	144
Rumex acetosa		33	17	50	5	67	20	-	-	-	-	30	7	57	16	7	6
Achillea millefolium		44	72	-	-	17	8	-	-	-	-	70	53	48	23	33	16
Poa pratensis		67	83	-	-	-	-	14	7	36	18	9	4	-	-	27	13
Carex hirta		-	-	100	163	17	83	14	7	9	5	4	76	22	28	20	66
Taraxacum officinale		-	-	100	30	-	-	29	14	-	-	43	10	30	5	20	7
Ch. *Trifolio-Geranietea* (T-G)																	
Clinopodium vulgare		100	578	25	125	17	8	43	393	82	205	26	13	35	16	67	444
Fragaria vesca		100	489	75	1000	100	1333	86	350	100	295	96	1052	87	1195	87	606
Hypericum perforatum		78	39	50	25	33	17	29	14	27	14	78	137	74	57	20	9
Poa angustifolia		100	350	75	688	33	167	71	100	-	-	87	1061	78	436	47	241
Vicia sepium		89	333	25	13	17	8	43	21	91	209	13	7	61	26	67	59
Trifolium alpestre		89	144	-	-	17	2	43	86	82	205	83	216	87	439	87	966
Polygonatum odoratum		67	272	-	-	50	25	86	107	73	77	48	81	52	46	80	63
Vicia cassubica		33	17	-	-	17	8	43	21	91	332	22	50	9	45	67	200
Knautia arvensis		56	128	-	-	33	17	14	7	9	5	65	111	83	84	20	9
Astragalus glycyphyllos		44	122	-	-	33	17	43	21	45	19	70	53	83	125	47	19
Silene nutans subsp. nutans		-	-	-	-	17	8	-	-	18	9	30	15	26	10	13	9
Galium album		-	-	25	13	17	8	-	-	-	-	26	72	13	27	-	-
Ch. *Festuco-Brometea* (F-B)																	
Filipendula vulgaris		-	-	50	15	67	108	-	-	-	-	57	161	86	223	6	3
Thalictrum minus		-	-	-	-	-	-	-	-	55	24	13	7	-	-	12	32
Ch. *Calluno-Ulicetea* (C-U)																	
Agrostis capillaris		33	67	75	888	83	267	57	336	36	59	74	583	91	487	60	325
Potentilla erecta		56	78	100	265	83	192	29	79	45	23	61	128	78	164	33	13
Solidago virgaurea s. s.		67	222	25	13	50	25	86	43	27	14	61	70	30	14	40	47
Veronica officinalis		44	22	100	50	33	17	29	14	27	55	78	116	65	30	67	119
Genista tinctoria		56	78	25	13	-	-	-	-	-	-	52	24	26	14	-	-
Luzula multiflora		44	22	-	-	-	-	-	-	-	-	26	11	9	5	13	6
Viola canina		-	-	-	-	-	-	-	-	55	27	13	26	9	3	12	34
Others																	
Quercus robur	a	100	6029	100	5751	83	4541	57	3571	-	-	65	3665	91	5444	47	2594
Quercus robur	b-c	67	206	100	413	83	691	29	150	27	14	61	152	91	405	40	240
Quercus petraea	a	22	111	25	125	50	716	43	2679	91	5681	39	1739	26	920	80	4047
Quercus petraea	b-c	-	-	25	13	33	92	43	86	91	805	35	430	30	79	67	288
Betula pendula	a	22	61	-	-	-	-	-	-	9	10	26	131	9	27	-	-
Betula pendula	c	11	62	-	-	-	-	-	-	9	5	4	2	-	-	13	63
Sorbus aucuparia	a-c	78	94	100	30	33	100	57	29	100	110	96	103	91	63	69	69
Frangula alnus	b-c	67	261	100	625	83	700	86	643	36	18	91	84	91	48	62	144
Prunus spinosa	b-c	44	33	50	15	83	43	-	-	-	-	48	35	41	43	25	41
Rhamnus cathartica	b-c	22	11	25	3	17	8	43	87	9	5	48	17	45	24	38	19
Crataegus rhipidophylla	b-c	-	-	50	38	17	8	-	-	-	-	52	26	36	20	6	1
Convallaria majalis		100	1678	100	588	100	817	86	1429	100	1214	87	1091	83	450	80	944
Maianthemum bifolium		89	811	100	378	100	50	57	514	55	109	43	61	48	84	53	219
Luzula pilosa		67	83	75	150	100	50	71	36	73	477	96	163	96	44	80	238
Anthoxanthum odoratum		78	428	25	13	50	100	43	86	45	64	74	209	87	186	47	53
Oxalis acetosella		44	533	100	1325	50	458	29	79	64	155	52	696	74	428	40	181
Plagiomnium affine		22	11	100	388	50	25	14	7	64	227	87	180	39	61	13	6
Dryopteris carthusiana		11	6	100	30	67	27	-	-	45	64	4	2	4	2	20	9
Campanula rotundifolia		-	-	75	28	67	108	-	-	27	14	70	33	52	27	40	47
Rubus idaeus		-	-	75	38	50	93	29	14	27	209	61	222	61	93	13	113
Fallopia convolvulus		-	-	25	13	33	92	29	14	9	5	52	65	57	28	33	16
Brachythecium rutabulum		-	-	75	38	17	8	14	7	18	9	35	17	26	12	-	-
Deschampsia flexuosa		-	-	75	38	17	8	14	7	-	-	52	65	30	14	7	31
Calamagrostis epigejos		-	-	25	125	50	25	-	-	-	-	22	30	9	5	7	109
Pyrus pyraster	b-c	-	-	50	15	33	25	14	7	-	-	48	29	73	41	-	-
Padus serotina	b-c	-	-	100	50	50	18	-	-	-	-	57	32	48	104	7	3
Sciuro-hypnum oedipodium		-	-	50	138	17	8	-	-	-	-	30	109	13	27	7	3
Rubus x corylifolius		-	-	50	25	17	8	-	-	-	-	30	15	9	25	-	-
Brachytheciastrum velutinum		-	-	-	-	-	-	29	14	9	5	22	11	4	2	13	6
Galium mollugo et dumetorum		-	-	-	-	-	-	29	14	-	-	4	22	-	-	13	6
Hieracium murorum		22	11	-	-	-	-	29	79	82	205	35	37	4	2	33	16
Viscaria vulgaris		44	22	-	-	-	-	14	7	9	5	22	30	-	-	5	3

9		10		11		12		13		14	
50	*25*	26	*84*	29	*146*	20	*10*	5	*2*	10	*190*
25	*3*	-	-	11	*12*	-	-	-	-	15	*8*
25	*3*	5	*3*	26	*33*	-	-	10	*5*	25	*33*
-	-	16	*226*	6	*24*	-	-	-	-	15	*30*
50	*875*	21	*8*	26	*52*	53	*117*	5	*2*	35	*148*
-	-	16	*4*	11	*4*	7	*1*	5	*2*	10	*3*
25	*13*	32	*111*	40	*194*	13	*37*	29	*14*	25	*58*
75	*463*	53	*455*	63	*361*	87	*420*	48	*248*	40	*171*
25	*125*	32	*39*	66	*67*	60	*120*	29	*12*	45	*66*
50	*250*	32	*39*	48	*379*	20	*40*	33	*60*	55	*248*
25	*125*	26	*13*	15	*22*	-	-	-	-	5	*3*
25	*125*	11	*53*	35	*38*	-	-	-	-	15	*30*
25	*125*	47	*71*	54	*120*	27	*13*	57	*129*	65	*74*
-	-	37	*243*	31	*135*	27	*11*	14	*7*	25	*243*
-	-	11	*5*	37	*45*	7	*1*	-	-	30	*15*
-	-	21	*11*	34	*31*	7	*3*	5	*2*		
-	-	5	*3*	17	*22*	-	-	10	*5*	15	*8*
50	*25*	16	*121*	14	*21*	33	*17*	-	-	10	*28*
-	-	-	-	17	*29*	-	-	-	-	10	*5*
-	-	21	*8*	6	*3*	-	-	5	*2*	5	*3*
50	*25*	32	*153*	34	*522*	80	*423*	48	*88*	40	*273*
75	*18*	11	*5*	22	*10*	20	*7*	5	*0*	15	*30*
75	*263*	53	*95*	32	*51*	-	-	19	*29*	20	*10*
50	*25*	53	*48*	45	*122*	67	*61*	38	*17*	30	*38*
25	*3*	11	*5*	3	*2*	-	-	-	-	5	*3*
-	-	11	*5*	12	*6*	-	-	-	-	5	*3*
-	-	21	*58*	14	*14*	-	-	-	-	25	*35*
75	*4188*	21	*644*	44	*2036*	60	*2040*	24	*1634*	20	*888*
25	*26*	26	*135*	25	*131*	60	*217*	43	*157*	180	*313*
-	-	68	*4224*	43	*2197*	67	*1000*	71	*1455*	55	*2738*
-	-	63	*474*	46	*268*	60	*264*	76	*444*	65	*861*
25	*125*	13	*223*	22	*218*	48	*1357*	29	*322*	20	*265*
25	*3*	5	*26*	17	*32*	27	*127*	9	*7*	15	*36*
50	*138*	79	*93*	69	*46*	80	*168*	62	*160*	50	*50*
75	*700*	47	*87*	63	*120*	47	*171*	67	*318*	65	*148*
50	*5*	-	-	32	*75*	53	*55*	19	*6*	10	*90*
-	-	16	*11*	23	*12*	-	-	10	*5*	15	*30*
25	*25*	5	*3*	6	*4*	27	*13*	-	-	10	*1*
75	*263*	79	*1279*	74	*1215*	93	*328*	95	*1198*	55	*1395*
100	*275*	21	*124*	34	*85*	93	*453*	62	*402*	10	*5*
100	*163*	63	*148*	58	*92*	87	*131*	62	*117*	30	*60*
25	*13*	26	*232*	43	*351*	-	-	19	*31*	25	*265*
75	*575*	21	*122*	25	*118*	93	*703*	38	*224*	10	*28*
25	*13*	37	*113*	32	*84*	40	*80*	48	*126*	15	*53*
75	*150*	32	*39*	29	*35*	93	*107*	52	*107*	40	*128*
25	*3*	16	*6*	23	*25*	13	*7*	5	*2*	20	*10*
75	*463*	32	*39*	42	*179*	93	*1340*	52	*472*	25	*368*
75	*28*	21	*100*	32	*57*	67	*58*	29	*117*	35	*125*
-	-	5	*3*	12	*20*	47	*197*	14	*7*	10	*28*
25	*125*	11	*29*	22	*72*	87	*247*	43	*621*	15	*263*
25	*125*	21	*34*	42	*286*	87	*587*	52	*605*	40	*250*
-	-	-	-	12	*6*	53	*49*	5	*0*	10	*1*
75	*28*	21	*35*	35	*117*	87	*306*	48	*306*	30	*248*
25	*13*	32	*87*	20	*17*	47	*363*	24	*312*	10	*5*
25	*3*	5	*26*	11	*12*	20	*40*	5	*2*	20	*55*
-	-	11	*5*	8	*11*	7	*3*	-	-	5	*3*
-	-	5	*3*	5	*2*	-	-	-	-	5	*3*
-	-	42	*45*	32	*30*	-	-	10	*5*	10	*5*
-	-	-	-	5	*2*	-	-	-	-	5	*3*

Table 12. Floristic differentiation of *Querco roboris-Pinetum* reflecting habitat variation and human impact: untransformed communities (col. 1-3) and substitute forest communities (col. 4-5)

Successive number of syntaxon		1		2		3		4		5	
Number of relevés		36		82		47		23		9	
Number of taxa		147		185		179		113		102	
Mean number of taxa in relevé		28		23		30		20		31	
D. *Querco roboris-Pinetum*											
Pinus sylvestris (V-P)	a-c	100	*4733*	100	*4273*	100	*5548*	100	*4339*	100	*5989*
Pleurozium schreberi (V-P)		94	*3274*	94	*2961*	83	*2728*	74	*2076*	89	*1072*
Pseudoscleropodium purum (V-P)		50	*640*	23	*348*	66	*1096*	30	*861*	89	*1294*
Vaccinium vitis-idaea (V-P)		78	*867*	82	*468*	68	*563*	22	*30*	-	-
Dicranum polysetum (V-P)		56	*351*	49	*396*	45	*629*	13	*167*	11	*1*
Hylocomium splendens (V-P)		36	*200*	16	*51*	40	*240*	9	*4*	22	*11*
Calluna vulgaris (C-U)		39	*236*	35	*161*	30	*145*	4	*22*	-	-
Leucobryum glaucum (V-P)		22	*190*	34	*122*	11	*24*	13	*167*	-	-
D. *Querco roboris-Pinetum molinietosum*											
Quercus robur	a-c	86	*2106*	66	*1126*	57	*2281*	65	*1320*	78	*873*
Populus tremula	a-c	42	*326*	11	*89*	11	*39*	9	*4*	-	-
Betula pubescens subsp. *pubescens*	a-c	19	*68*	5	*7*	-	-	-	-	-	-
Frangula alnus	b-c	89	*1172*	46	*232*	43	*110*	74	*548*	67	*94*
Molinia caerulea		92	*1392*	-	-	2	*11*	-	-	-	-
Trientalis europaea (V-P)		67	*369*	37	*179*	15	*17*	43	*120*	44	*22*
Sciuro-hypnum oedipodium		31	*125*	5	*29*	6	*3*	4	*76*	11	*6*
Lysimachia vulgaris		31	*28*	4	*7*	2	*1*	-	-	-	-
Rubus plicatus		25	*222*	4	*23*	9	*4*	4	*76*	-	-
Rubus nessensis		11	*18*	1	*1*	-	-	-	-	-	-
D. *Querco roboris-Pinetum coryletosum*											
Convallaria majalis		11	*90*	17	*61*	70	*474*	13	*26*	22	*11*
Fragaria vesca (T-G)		14	*7*	5	*2*	62	*328*	-	-	67	*79*
Rubus saxatilis (V-P)		11	*18*	2	*1*	55	*251*	4	*2*	22	*61*
Moehringia trinervia		28	*39*	13	*23*	51	*167*	22	*50*	78	*84*
Veronica officinalis (C-U)		6	*3*	6	*9*	47	*136*	4	*2*	44	*72*
Hypericum perforatum (T-G)		-	-	9	*4*	26	*32*	-	-	89	*44*
Carex hirta		-	-	1	*1*	26	*160*	-	-	56	*217*
Campanula rotundifolia		3	*1*	6	*3*	34	*27*	-	-	44	*22*
Mycelis muralis		-	-	6	*3*	21	*68*	9	*4*	44	*72*
Veronica chamaedrys		3	*1*	1	*1*	30	*44*	-	-	22	*11*
Galium borealne		6	*3*	1	*1*	30	*61*	-	-	22	*11*
Hieracium pilosella (C-U)		-	-	9	*25*	28	*90*	9	*24*	22	*7*
Euphorbia cyparissias (F-B)		-	-	1	*1*	28	*23*	-	-	33	*12*
Galium mollugo		3	*1*	-	-	28	*33*	-	-	33	*17*
Melica nutans (Q-F)		-	-	5	*8*	38	*151*	-	-	11	*6*
Viola canina (C-U)		3	*1*	2	*1*	34	*93*	-	-	-	-
Solidago virgaurea s. s.(C-U)		8	*4*	9	*4*	34	*91*	-	-	-	-
Peucedanum oreoselinum (T-G)		-	-	-	-	26	*281*	-	-	-	-
Polygonatum odoratum (T-G)		-	-	4	*2*	23	*31*	9	*4*	11	*6*
Ch. *Vaccinio-Piceetea* (V-P)											
Picea abies	a-c	44	*567*	50	*1091*	26	*150*	52	*491*	-	-
Juniperus communis	b-c	14	*7*	11	*19*	11	*27*	-	-	-	-
Vaccinium myrtillus		97	*4042*	96	*4379*	100	*3209*	91	*1413*	89	*2450*
Dicranum scoparium		36	*115*	43	*155*	28	*60*	30	*215*	11	*6*
Orthilia secunda		11	*18*	5	*8*	30	*70*	-	-	11	*6*
Plagiothecium curvifolium		14	*19*	12	*28*	4	*2*	4	*2*	11	*6*
Dryopteris dilatata		17	*81*	9	*15*	-	-	17	*28*	11	*56*
Ch., ^D. *Quercetea robori-petraeae*											
Polytrichastrum formosum ^		69	*538*	56	*475*	21	*30*	57	*396*	56	28
Pteridium aquilinum ^		78	*2482*	67	*1535*	53	*926*	52	*1326*	11	417
Festuca ovina		61	*1032*	68	*479*	79	*811*	39	*630*	11	56
Melampyrum pratense ^		36	*411*	55	*302*	53	*324*	9	*165*	22	111
Calamagrostis arundinacea		28	*201*	29	*615*	68	*1403*	22	*1415*	22	11
Carex pilulifera		28	*51*	52	*70*	17	*28*	17	*28*	11	6
Ch. *Querco-Fagetea*											
Fagus sylvatica	a-c	8	*19*	39	*757*	9	*4*	22	*248*	22	67
Carpinus betulus	a-c	22	*88*	11	*57*	32	*244*	43	*163*	56	294
Anemone nemorosa		22	*121*	6	*14*	11	*87*	-	-	11	6
Viola reichenbachiana		8	*17*	24	*23*	28	*81*	17	*9*	56	23
Ch. *Calluno-Ulicetea* (C-U)											
Pohlia nutans		39	*129*	49	*112*	19	*91*	35	111	11	6
Agrostis capillaris		25	*75*	23	*23*	36	*85*	26	87	78	278
Others											
Betula pendula	a-c	81	*1051*	46	*205*	47	*376*	61	296	56	101
Quercus petraea	a-c	28	*397*	56	*1498*	49	*1338*	48	553	44	600
Sorbus aucuparia	a-c	86	*792*	61	*155*	79	*374*	70	202	89	528
Luzula pilosa		89	*386*	60	*195*	72	*307*	70	348	44	72
Oxalis acetosella		53	*290*	24	*143*	23	*96*	35	170	67	83

Successive number of syntaxon	1		2		3		4		5	
Dryopteris carthusiana	61	*189*	35	*45*	40	*49*	74	224	89	194
Rubus idaeus	39	*185*	20	*25*	55	*381*	52	233	100	611
Anthoxanthum odoratum	28	*51*	16	*19*	53	*382*	9	4	56	78
Calamagrostis epigejos	25	*97*	34	*112*	17	*380*	35	487	56	1228
Rumex acetosella	11	*43*	16	*19*	38	*131*	17	9	67	33
Maianthemum bifolium	47	*86*	28	*73*	13	*71*	39	39	33	17
Plagiomnium affine	22	*96*	15	*65*	9	*14*	17	170	22	11
Deschampsia flexuosa	3	*1*	35	*234*	-	-	30	626	33	206

Explanations: Shortened table comprises in each column the frequency of species (in %) and cover index (italics).

1. *Querco roboris-Pinetum molinietosum* (36 relevés): Balcerkiewicz *et al.* (1994), tab. 3: 3 (*Qr-P*); Brzeg *et al.* (2000b), tab. 2: 41,42 (*Festuco ovinae-Pinetum*); Brzeg (2004), tab. 1: 1,2,4-9 (*Qr-P*); Jakubowska-Gabara (1994), tab. 2: 6 (*Querco-Pinetum typicum*), 13-15 (*Querco-Pinetum molinietosum*); Kaczyńska (1964), tab. 5: 4,10-14 (*Pino-Quercetum*); Krotoska & Piotrowska 1962, tab. 5, 34 (*Pino-Quercetum*); Macicka 1984, tab. 20: 3 (*Pino-Quercetum typicum*), tab. 29: 13 (Plantation of pine on the habitat of deciduos and mixed forests); Macicka & Wilczyńska (1991), tab. 14: 21 (*Pino-Quercetum typicum*), Macicka & Wilczyńska (1992), tab. 6: 7-8 (*Pino-Quercetum*); Sroka (1982), tab. 2: 9-12,15 (*Pino-Quercetum*); Szwed (1979), tab. 16: 1-4 (*Pino-Quercetum*).

2. *Querco roboris-Pinetum typicum* (82 relevés): Balcerkiewicz *et al.* (1994), tab. 3: 2,5-7,9,11,14 (*Qr-P*); Brzeg (2004), tab. 1: 12 (*Qr-P*); Ferchmin (1980), tab. 21: 3,4 (*Pino-Quercetum*); Jakubowska-Gabara (1994), tab. 2: 3,7 (*Querco-Pinetum*); Kaczyńska (1964), tab. 5: 15 (*Pino-Quercetum*); Macicka 1984, tab. 20: 4,6,7,11,17,19,22,24,29,30 (*Pino-Quercetum typicum*), tab. 29: 14,17 (Plantation of pine on the habitat of deciduos and mixed forests); Macicka & Wilczyńska (1990), tab. 16: 1,4,5,8,9,12-15,17 (*Pino-Quercetum fagetosum*), tab. 17: 1-3,6,8,15-17,22,26-29 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991), tab. 14: 5,14 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1992), tab. 6: 2,3,5 (*Pino-Quercetum*); Macicka-Pawlik & Wilczyńska (1996), tab. 28: 2,4 (*Pino-Quercetum*); Kasprowicz (orig.) tab. A32: 12, 69 (*Qr-P typicum*); Wojterska (2003), tab. 16: 23 (*Calamagrostio-Quercetum typicum*); Wojterska (1976), tab. 11: 1-3 (*Pino-Quercetum*); Pawłow & Czech (1959), tab. 3: 13 (Mixed coniferous forest); Ratyńska (2001), tab. 176: 8 (*Calamagrotio-Quercetum petraeae typicum*); Robińska (1977), tab. 3: 7 (*Pino-Quercetum*); Sroka (1982), tab. 2: 4,6,8 (*Pino-Quercetum*); Szwed (1979), tab. 16: 10,11,17,18,20-22,25-32 (*Pino-Quercetum*).

3. *Querco roboris-Pinetum coryletosum* (47 relevés): Balcerkiewicz *et al.* (1994), tab. 3: 12,13 (*Qr-P*); Berdowski & Kwiatkowski (1992), tab. 7: 2 (*Qr-P*); Brzeg (2004), tab. 1: 10,11,13,14 (*Qr-P*); Ferchmin (1980), tab. 21: 5 (*Pino-Quercetum*); Jakubowska-Gabara (1994), tab. 2: 2,4,5,10 (*Querco-Pinetum typicum*); Kaczyńska (1964), tab. 5: 1-3,5,6,8,9 (*Pino-Quercetum*); Macicka 1984, tab. 20: 12 (*Pino-Quercetum typicum*); Macicka & Wilczyńska (1991), tab. 14: 6 (*Pino-Quercetum typicum*), Nowaczyk (1964), tab. 7: 1-9, 11,12,14-18 (*Pino-Quercetum*); Pawłow & Czech (1959), tab. 3: 16 (Mixed coniferous forest); Robińska (1977), tab. 5: 1 (*Pino-Quercetum* – degenerated forms), tab. 3: 4,6,8,10,12,13 (*Pino-Quercetum*); Szwed (1979), tab. 16: 16,24 (*Pino-Quercetum*).

4. Substitute forest communities on the habitat of *Querco roboris-Pinetum typicum* (23 relevés): Macicka (1984), tab. 20: 5,18 (*Pino-Quercetum*), tab. 29: 2,7,8,12 (Plantation of pine on the habitat of deciduos and mixed forests); Macicka & Wilczyńska (1990), tab. 17: 25 (*Pino-Quercetum*); Macicka-Pawlik & Wilczyńska (1996), tab. 28: 1,6 (*Pino-Quercetum*); Pawłow & Czech (1959), tab. 3: 10,11,17 (Mixed coniferous forest); Sroka (1982), tab. 2: 1 (*Pino-Quercetum*); Szwed (1979), tab. 12: 2 (*Calamagrostio arundinaceae-Quercetum*), tab. 16: 7, 13-15,23 (*Pino-Quercetum*); Wojterska (1976), tab. 11: 4 (*Pino-Quercetum*); Wojterska (2003), tab. 16: 19 (*Calamagrostio arundinaceae-Quercetum typicum*), tab. 17: 7 (Acidophilous oak forests from the *Quercetea robori-petraeae* class); Wojterska *et al.* (2006), tab. 3: 27 (Substitute forest communities).

5. Substitute forest communities on the habitat of *Querco roboris-Pinetum coryletosum* (9 relevés): Gmaj (1997), tab. 9: 14 (*Calamagrostio arundinaceae-Quercetum convallarietosum*); Macicka & Wilczyńska (1990), tab. 17: 19 (*Pino-Quercetum typicum*); Nowaczyk (1964), tab. 7: 10 (*Pino-Quercetum*); Pawłow, Czech (1959), tab. 3: 1-3,12,19 (Mixed coniferous forest); Wojterska *et al.* (2006), tab. 3: 22 (Substitute forest communities).

Table 13. Proposed syntaxonomic structure of the class *Quercetea robori-petraeae* in Central Europe

Quercetea robori-petraeae
Quercetalia roboris

Ch.Cl.,O.: *Carex pilulifera* fo., *Dicranella heteromalla* (opt.), *Festuca ovina* fo., *Hieracium lachenalii, H. Iaevigatum, H. sabaudum, H. umbellatum* fo., *Holcus mollis, Hypnum cupressiforme* fo., *Lathyrus montanus*, *Lonicera periclymenum, Luzula pallescens* (?), *Melampyrum pratense* fo. (?), *Mnium hornum* (opt.), *Plagiothecium denticulatum, P. laetum* (opt.).
D.O.,Cl: *Deschampsia flexuosa, Fagus sylvatica, Galium harcynicum, Hedera helix, Leucobryum glaucum, Quercus petraea*, and others with western distribution

Quercion roboris*

Ch. All.: *Corydalis claviculata, Hypericum pulchrum, llex aquifolium, Sarothamnus scoparius* (?), *Teucrium scorodonia*
D. All. (incl. Ch.,D. Ass.): *Asphodelus albus, Blechnum spicant, Castanea sativa, Erica sp. div. et al.*

Agrostio capillaris-Quercion

Ch. All.: *Calamagrostis arundinacea* (reg.), *Hieracium lachenalii* (reg. opt.), *H. laevigatum* (reg. opt.), *H. sabaudum* (reg. opt.), *Luzula pallescens*, *Melampyrum pratense* fo.
D. All. (geogr.): *Convallaria majalis, Festuca heterophylla*, *F. rubra*, *Hylocomium splendens*, *Luzula pilosa*, *Maianthemum bifolium*, *Moehringia trinervia*, *Orthilia secunda*, *Oxalis acetosella*, *Pinus sylvestris*, *Poa angustifolia var. setacea, Populus tremula, Trientalis europaea, Vaccinium myrtillus*, *V. vitis-idaea*

→ ***Betulo pendulae-Quercetum roboris***
D. Ass.: *Betula pubescens subs. pubescens*, (reg.), *Dryopteris dilatata, Galium saxatile, Lonicera periclymenum* (reg.), *Molinia caerulea* (reg.)

→ ***Molinio caeruleae-Quercetum roboris***
D. Ass.: *Betula pubescens subsp. pubescens*, *Calamagrostis arundinacea, Molinia caerulea* (dom.), *Polytrichum commune*, *R. nessensis, Sphagnum sp. div.*

→ ***Molinio arundinaceae-Quercetum roboris***
Ch. Ass. *Molinia arundinacea;* D. Ass. (geogr.): *Calamagrostis villosa*, *Luzula luzuloides, Rubus bellardii, R. hirtus*, *Senecio ovatus*

→ ***Calamagrostio arundinaceae-Quercetum petraeae***
Ch. Ass.: *Lathyrus montanus* (territ. opt.), *Hieracium lachenalii* (reg. opt.), *H. laevigatum* (reg. opt.), *H. sabaudum* (reg. opt.)
D. Ass. (reg.): *Calamagrostis arundinacea* (reg. opt.), *F. ovina* fo., *Quercus petraea*

Dicrano scoparii-Quercion roboris

Ch. All.: *Aulacomnium androgynum, Cephalozia sp. div . Herzogiella seligerii, Lophocolea heterophylla, Mnium hornum* (opt.), *Plagiothecium sp.*
D. All.: *Cladonia sp. div.*, *Dicranum scoparium, Leucobryum glaucum, Pohlia nutans*, *Thuidium tamarisciunum et al.*

→ ***Aulacomnio androgyni-Quercetum roboris***
Ch. Ass.(reg.): *Aulacomnium androgynum*, *Dicranella heteromalla* (opt.), *Lophocolea heterophylla*, *Mnium hornum*, *Plagiothecium denticulatum*, *P. laetum*, *Herzogiella seligerii*
D. Ass.: *Carpinus betulus* (codom.), *Cladonia coniocraea*, *C. glauca*, *Dicranum scoparium*, *Plagiothecium curvifolium, Pohlia nutans*, *Thuidium tamariscinum*

→ ***Cladonio portentosae-Quercetum petraeae***
D. Ass. *Cladonia sp. div*., *Hypogymnia physodes*

Hieracio lachenalii-Quercion petraeae

Ch. All.: *Hieracium glaucinum, H. lachenalii* (reg.), *H. murorum fo.* (opt.), *H. sabaudum* (reg.), *H. umbellatum* fo. (opt.), *Luzula luzuloides* (reg.)
D. All. (geogr.): *Asplenium septentrionale, A. trichomanes, Campanula persicifolia, C. rotundifolia, Cotoneaster integerrima, Genista germanica, G. pilosa, G. tinctoria, Jasione montana, Lembotropis nigricans, Polytrichum piliferum, Sedum maximum, Silene nutans, Sorbus aria, Tanacetum corymbosum, Viscaria vulgaris* and other xerothermophilous with southern distribution

→ ***Luzulo luzuloidis-Quercetum petraeae****

* associations absent from Poland are not shown

Table A1. *Aulacomnio androgyni-Quercetum roboris*

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	
ID-1		11	11	31	11	11	11	11	11	11	11	11	34	32	32		51	11	11	11	11	11	11	11	26	31	31	51	11	11	11	34	11	11	11	11	11	3	3	
ID-2		1	1	4	1	1	1	1	1	1	1	1	3	2	2		1	1	1	1	1	1	1	1	21	4	4	1	1	1	1	3	1	1	1	1	1	4	4	
ID-3		1	2	15	3	4	5	6	7	8	9	10	1	4	5		3	11	12	13	14	15	16	17	2	2	3	4	18	19	20	2	21	22	23	24	25	3	4	
Date (year)		1994	1990	1980	1983	1983	1990	1983	1982	1989	1989	1984	1997	1989	1989	1-14	1981	1990	1982	1982	1990	1982	1990	1983	1965	1980	1981	1981	1982	1982	1983	1997	1982	1983	1992	1992	1955	1992	1992	15-37
Density of tree layer	a1,a [%]	50	40	45	30	40	40	30	40	30	60	50	50	30	60		70	30	25	40	40	40	35	30	85	60	30	70	35	90	40	35	50	40	40	60	40	40	60	
Density of tree layer	a2 [%]	50	70	60	40	50	50	50	60	70	60	40	50	70	60	%	-	55	50	50	60	60	60	80	-	80	50	20	70	-	60	70	50	70	60	50	75	60	50	%
Density of shrub layer	b [%]	+	3	-	-	+	+	+	5	5	-	5	-	5	-		+	5	+	+	-	+	5	-	-	+	5	20	-	+	+	+	+	5	+	5	-	+	5	
Cover of herb layer	c [%]	10	3	5	10	15	7	30	30	5	5	10	10	5	5		40	20	20	15	10	10	5	5	80	20	15	40	10	10	15	10	5	+	10	5	10	10	5	
Cover of moss layer	d [%]	40	25	10	60	40	20	30	25	30	25	40	10	30	25		40	35	25	30	25	25	25	10	10	30	40	60	25	25	30	15	20	25	10	10	10	10	5	
Area of relevé		150	400	100	100	200	400	200	100	500	400	200	400	500	400		150	150	200	150	400	150	400	200	250	100	200	100	300	200	100	400	300	200	400	400	900	400	400	
Location (ATPOL)		CD36	CD83	CD84	CD82	CD83	CD83	CD73	CD64	CD64	CD64	BE08	CD73	CD64	CD64		CD83	CD35	CD64	CD73	CD84	CD73	CD83	CD64	CD64	CD84	CD83	CD93	CD83	CD73	CD83	CD73	CD83	CD73	CD83	CD83	CD74	CD83	CD83	
Total number of species		26	33	13	28	27	32	25	33	32	32	26	27	31	32		30	32	39	37	37	32	35	27	31	30	22	23	30	33	33	33	29	37	27	33	23	27	33	
Number of mosses, liverworts and lichens species		12	16	6	12	9	14	10	10	13	13	10	13	12	12		7	10	10	9	15	11	13	10	8	9	6	6	8	11	8	14	12	12	12	14	5	12	14	
I. Ch., D*. *Aulacomnio androgyni-Quercetum roboris*																																								
* *Pohlia nutans* (C-U)		2	+	.	1	1	+	+	+	2	1	1	1	2	1	93	+	+	+	+	+	+	2	+	+	.	+	+	+	+	+	1	+	+	1	1	.	1	1	91
Dicranella heteromalla (opt.)		1	+	.	1	1	+	+	+	1	1	1	1	1	1	93	+	1	.	.	1	+	2	+	+	.	.	1	.	+	+	1	+	+	+	+	+	+	+	78
* *Plagiothecium curvifolium* (V-P)		.	+	.	+	+	+	+	+	+	.	.	.	.	.	50	.	.	+	+	+	+	+	+	+	.	.	.	+	+	+	+	+	+	+	+	.	+	+	74
Dicranum scoparium (V-P)		+	1	+	+	.	1	1	.	+	+	+	+	+	+	86	.	+	+	+	+	+	+	.	.	+	+	.	.	.	.	+	+	+	+	+	.	+	+	65
Mnium hornum		2	+	+	+	+	.	.	+	.	+	+	+	.	+	71	.	.	.	.	+	+	.	+	.	+	.	.	+	+	+	+	+	+	+	+	+	+	+	65
Lophocolea heterophylla		+	+	.	+	.	+	.	+	+	+	.	.	+	+	64	.	.	+	.	+	+	+	.	.	.	.	.	+	+	.	.	.	+	+	+	.	+	+	48
Aulacomnium androgynum		+	+	.	.	.	+	+	+	1	+	.	+	1	+	71	.	1	+	.	+	.	1	.	+	.	.	+	+	+	.	+	1	.	+	+	.	+	+	61
Plagiothecium laetum (loc. opt.)		1	+	+	.	.	+	.	+	+	1	.	+	+	1	71	.	+	+	+	+	+	+	.	.	+	+	.	+	+	+	+	.	.	.	+	.	.	+	61
Plagiothecium denticulatum (loc. opt.)		.	+	.	.	.	+	+	.	+	+	.	+	+	+	57	.	.	.	+	+	+	+	+	.	.	.	.	+	+	.	+	+	1	+	.	.	+	.	52
* *Thuidium tamariscinum* (V-P)		+	+	+	.	.	.	+	+	.	+	.	.	.	.	43	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	.	.	17
Herzogiella seligeri		+	.	.	.	+	.	.	.	.	.	.	+	.	.	21	.	.	+	.	.	.	.	+	.	.	.	.	.	+	+	+	+	.	.	+	.	.	+	35
* *Cladonia coniocraea* (C-U)		.	+	.	.	.	+	.	.	.	.	1	+	.	.	29	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	+	.	.	+	.	17
II. D. *Aa-Q anemonetosum nemorosae*																																								
Oxalis acetosella		.	.	.	.	.	.	.	+	r	.	.	.	r	.	21	+	+	+	.	.	.	.	+	+	.	.	+	.	+	+	+	.	.	+	+	+	+	+	61
Agrostis canin+C21a (S-C)		.	+	.	.	.	.	.	.	.	.	.	.	.	.	7	1	+	+	+	+	.	.	.	.	+	+	.	.	+	+	.	.	+	.	+	+	.	+	57
Juncus effusus (M-A)		.	.	.	.	.	+	.	.	.	.	.	.	.	.	7	+	+	+	+	.	+	+	.	.	.	+	+	+	.	+	.	+	+	.	.	.	.	.	52
Anemone nemorosa (Q-F)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	1	+	.	1	.	+	.	+	.	.	.	+	+	.	+	+	.	+	+	.	+	+	57
Milium effusum (Q-F)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	+	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	+	+	.	+	+	30
Stellaria holostea (Q-F)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	1	+	1	1	+	30
Plagiomnium affine		.	.	.	.	.	+	.	.	.	.	.	.	.	.	7	.	+	.	.	+	.	.	.	+	+	.	.	.	.	.	+	.	+	.	.	.	.	.	26
Atrichum undulatum (Q-F)		.	.	+	.	.	.	.	.	.	.	.	.	.	.	7	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	.	+	.	.	22
Poa nemoralis (Q-F)		.	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.	+	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	17
III. Ch., D.* *Quercetea robori-petraeae*																																								
* *Polytrichastrum formosum*		2	2	2	3	3	2	3	2	2	2	2	1	2	2	100	3	3	2	3	2	2	2	2	1	3	3	3	2	2	3	2	2	2	2	1	2	2	1	100
Carex pilulifera		1	1	.	+	2	1	1	1	1	1	1	+	1	1	93	1	1	1	1	1	+	1	+	+	1	2	2	1	+	2	+	1	+	2	1	1	2	1	100
Holcus mollis		.	+	.	+	+	.	+	+	+	+	1	.	+	+	71	2	.	+	+	.	.	+	+	1	1	+	2	+	+	+	+	.	+	1	+	+	1	+	83
* *Melampyrum pratense*		+	+	.	+	+	+	.	1	.	+	1	r	.	+	71	+	1	+	+	+	.	+	.	1	+	.	.	.	.	+	+	.	+	.	+	.	.	+	57
Calamagrostis arundinacea		.	.	.	.	.	+	.	.	.	.	.	1	.	.	14	.	.	+	.	.	+	.	.	.	+	.	.	.	+	.	1	.	.	.	.	.	.	.	22
Festuca ovina		.	.	.	+	.	.	.	+	+	.	.	.	+	.	29	2	.	.	.	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	17
Hieracium sabaudum		r	.	.	.	.	.	.	.	.	.	+	.	.	.	14	.	+	.	.	.	.	+	.	.	.	.	.	.	r	+	.	.	.	.	.	.	.	.	17
IV. Ch. *Vaccinio-Piceetea* (V-P)																																								
Pinus sylvestris	a1/c	.	.	.	/r	.	.	.	.	.	.	/+	.	.	.	14	/+	/r	/+	.	/r	.	/r	.	.	.	.	.	/r	.	.	.	/r	.	.	.	2/r	.	.	35
Picea abies	a,a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	1	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	17
Picea abies	b;bc^/c	.	.	.	.	/+	.	/+	+/+	+/+	/+	+/+	.	1/1	+/+	57	+/+	.	/+	+/+	.	+/+	.	.	+^/	.	.	.	.	.	.	+/	.	/+	.	.	.	.	.	30
Vaccinium myrtillus		.	.	.	+	+	+	+	2	1	1	+	+	1	1	79	1	2	2	2	1	1	1	+	5	1	1	1	+	1	1	1	.	+	.	.	+	.	.	78
Pleurozium schreberi		.	.	.	.	+	+	+	.	+	+	+	+	+	+	64	+	+	.	.	+	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	26
Hylocomium splendens		.	.	.	.	.	.	.	.	+	+	.	.	+	+	29	.	+	+	+	.	+	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	26
Trientalis europaea		.	.	.	.	.	.	+	+	1	+	.	.	1	+	43	.	+	1	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17
V. Ch. *Querco-Fagetea* (Q-F)																																								
Carpinus betulus	a2,a;a1^	3	4	4	3	3	3	3	4	4	4	.	3	4	4	93	.	4	3	3	4	4	4	5	4	5	3	2	4	5	4	4;1^	3	4	4	3	4	4	3	96
Carpinus betulus	b	+	.	.	.	.	+	.	.	.	.	.	.	+	+	29	.	+	.	.	.	.	1	.	+	+	.	.	.	+	.	.	+	+	.	1	.	+	1	43
Carpinus betulus	c	.	+	.	+	+	+	.	+	+	+	.	2	+	+	71	.	.	+	.	+	1	+	+	+	+	.	.	+	+	+	1	+	+	+	+	+	+	+	78
VI. Ch. *Calluno-Ulicetea* (C-U)																																								
Carex pallescens		.	+	.	.	+	+	.	.	.	+	.	+	.	+	43	.	+	+	+	+	+	.	+	.	+	.	.	+	.	+	.	+	+	.	.	+	.	.	52
Carex ovalis		.	.	.	.	+	.	+	+	.	.	.	.	.	.	21	.	.	+	.	+	+	+	.	.	+	.	.	+	.	+	.	+	+	.	.	.	.	.	39
Agrostis capillaris		.	.	.	+	.	.	.	.	.	.	+	.	.	.	14	1	.	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	+	+	.	.	+	.	30
Luzula multiflora		.	.	.	.	+	.	.	.	.	+	+	.	.	+	29	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	17
VII. Ch. *Scheuchzerio-Caricetea fuscae* (S-C), *Molinio-Arrhenatheretea* (M-A)																																								
Deschampsia caespitosa (M-A)		1	+	.	+	+	+	+	+	.	.	.	.	.	.	50	.	+	+	+	+	+	+	+	.	+	.	.	+	+	+	.	+	+	.	1	+	.	1	70
Festuca rubra s. s. (M-A)		.	.	.	.	.	+	+	+	+	.	.	.	+	.	36	.	.	.	+	+	+	+	.	+	1	+	.	+	+	+	.	+	+	.	.	.	.	.	52
Carex nigra (S-C)		.	+	.	.	.	+	.	.	+	+	.	.	+	+	43	.	2	.	+	+	+	+	.	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	35
Lysimachia vulgaris (M-A)		.	.	.	.	.	.	.	+	r	.	.	.	r	.	21	.	.	+	+	.	.	.	.	.	.	+	.	+	.	.	.	.	+	.	+	.	.	+	30
Molinia caerulea (M-A)		.	.	.	.	.	+	.	.	.	.	.	+	.	.	14	.	.	.	+	.	+	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	22
VIII. Others																																								
Quercus robur	a1,a;a2^	3	3	.	3	3	3	3	3	3	4	3	3	3	4	93	4	3	2	4;+^	3	3	3	3	3	4	1	2	3	2	3	3	3	3	3	4	3	3	4	100
Quercus robur	b	.	.	.	.	.	.	.	.	.	.	.	.	+	+	14	+	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	9
Quercus robur	c	.	+	+	+	+	1	3	+	+	.	+	+	+	+	86	.	1	+	+	+	+	+	+	+	+	+	.	+	+	+	+	+	+	+	1	+	+	1	91
Sorbus aucuparia	c	+	+	+	.	+	+	+	+	+	r	.	+	+	r	86	+	.	+	+	.	+	+	+	+	+	+	+	+	+	+	1	+	+	+	+	.	+	+	87
Betula pendula	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	+	7	.	.	2	+	1	.	+	.	.	+	2	.	1	.	.	.	+	+	.	.	.	.	.	39
Betula pendula	c	.	+	.	.	.	+	.	.	+	.	+	.	.	.	29	+	+	+	.	.	+	.	.	.	.	.	.	+	.	.	.	r	.	.	.	.	.	.	26
Frangula alnus	b	.	1	.	.	+	+	.	1	.	.	.	.	+	1	43	+	1	+	+	.	.	.	.	+	+	1	2	.	.	+	.	.	1	+	1	.	+	1	61
Frangula alnus	c	.	+	+	.	+	+	.	+	.	+	.	.	+	+	57	+	1	+	+	+	1	+	+	+	1	+	1	+	+	+	+	+	+	.	+	.	.	+	87
Maianthemum bifolium		2	+	1	2	1	+	+	1	+	+	+	1	+	+	100	.	+	1	+	+	+	+	+	1	1	1	+	2	+	+	+	+	.	1	+	1	1	+	91
Luzula pilosa		1	+	.	1	2	.	+	2	+	+	+	+	+	+	86	+	1	2	+	1	+	+	1	1	1	+	1	.	+	2	+	+	+	2	1	+	2	1	96
Hypnum cupressiforme		1	1	.	+	+	1	1	.	1	1	+	1	1	1	86	+	.	.	.	1	.	1	+	.	+	.	.	.	+	+	1	+	+	1	+	.	1	+	61
Dryopteris carthusiana		.	+	.	.	+	+	+	.	.	.	.	.	.	.	29	+	.	+	+	+	.	.	+	.	+	+	+	+	+	.	.	+	+	+	+	+	+	+	74
Calamagrostis epigejos		+	+	.	+	+	+	+	.	.	.	.	.	.	.	43	2	+	.	+	+	.	+	.	.	.	+	1	+	.	+	.	1	.	.	.	.	.	.	43
Anthoxanthum odoratum		+	.	.	+	.	.	.	+	+	.	+	.	+	.	43	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Convallaria majalis		.	.	.	+	.	.	.	+	.	+	.	.	.	+	29	.	.	+	+	.	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	22

Sporadic species: III.: *Hieracium lachenalii* 4,19; *H. laevigatum* 23,29; *Luzula pallescens* 12,21; *Pteridium aquilinum** 26; **IV.:** *Dicranum polysetum* 18; *Juniperus communis* c 17; *Leucobryum glaucum* 2,11(2),15,34,37; *Pseudoscleropodium purum* 25; *Vaccinium vitis-idaea* 16; **V.:** *Acer pseudoplatanus* c 3,33(r),36(r); *Carex remota* 5,18; *Fagus sylvatica* a2 11(3), b 11, c 11,12,18,28,30(r); *Festuca gigantea* 32; *F. heterophylla* 17,32; *Malus sylvestris* 20,29,30; *Scrophularia nodosa* 34(r),37(r) *Ulmus minor* a 23(1), c 23(1); *Viola riviniana* 35; **VI.:** *Cladonia chlorophaea* 4; *Danthonia decumbens* 8; *Hypericum maculatum* 35; *Luzula campestris* 1; *Polytrichum juniperinum* 4; *Solidago virgaurea* s. s. *30; Veronica officinalis* 23; **VII.:** *Agrostis gigantea* (M-A) 26(1); *Carex canescens* (S-C) 18; *Juncus conglomeratus* (S-C) 24; *Poa palustris* (M-A) 17; *P. trivialis* (M-A) 1,12; *Polytrichum commune* (S-C) 11,17(1),18,26(2); *Ranunculus repens* (M-A) 16; **VIII.:** *Brachytheciastrum velutinum* 6,21,34,37; *Brachythecium salebrosum* 12; *Cladonia digitata* 30; *C. glauca* 1,4,19; *Crataegus laevigata* c 10,14(r); *C. rhipidophylla* var. *rhipidophylla* 8,9,13(r),34(r),37(r); *Crataegus sp.* b 23, c 23; *Dicranodontium denudatum* 9,13,33,36; *Galeopsis tetrahit* 32; *Hieracium murorum* 1; *Kindbergia praelonga* 35; *Moehringia trinervia* 35; *Orthodicranum montanum 2,4,8; Poa angustifolia* 8,15,18; *Polygonum minus* 32; *Pyrus pyraster* 2; *Quercus petraea* a1 3(3),11(1),26(3), a2 26, c 21,26; *Rubus caesius* 26; *R. corylifolius* 29; *R. idaeus* 15; *R. nessensis* 10,14; *Rubus sp.* 23; *Rubus sprengelii* 9,10,13,14; *Sciuro-hypnum oedipodium* 2,5,22,24,31,34,37; *Sedum maximum* 15; *Sphagnum sp.* 15,26.

Table A2. *Molinio caeruleae-Quercetum roboris*

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27		28	29	30	31	32	33	34	35	36		37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	
ID-1		51	51	10	51	10	10	10	10	10	10	10	10	10	10	51	51	10	51	51	10	51	10	51	51	51	51	51		10	10	10	32	10	10	10	10	34		30	10	10	30	30	30	30	30	10	10	10	10	10	30	10	10	51	10	10	10	
ID-2		2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	1	3	2	3	3	2	3	2	3	3	3	3		2	2	2	2	2	2	2	2	3		5	2	2	5	5	5	5	5	2	2	2	2	2	5	2	2	1	2	2	2	
ID-3		13	10	14	14	4	8	5	6	7	9	10	11	12	13	35	9	3	12	4	1	11	2	5	13	7	8	6		27	28	29	1	30	31	32	33	4		40	24	25	25	36	37	38	39	18	26	16	19	22	35	17	23	36	15	21	20	
Date (year)		1981	1981	1984	1980	1983	1982	1982	1982	1981	1985	1984	1983	1983	1984	1981	1980	1982	1981	1981	1985	1981	1982	1981	1981	1980	1980	1980	1-27	1983	1983	1982	1989	1982	1982	1983	1982	1997	28-36	1955	1982	1955	1955	1955	1955	1957	1957	1982	1983	1984	1983	1982	1955	1983	1982	1981	1983	1983	1984	37-56
Density of tree layer	a1,a [%]	60	70	55	55	60	65	40	60	55	70	60	50	55	60	90	40	70	60	70	60	70	60	80	50	70	75	60		60	30	70	70	75	35	50	75	40		60	75	60	50	70	50	80	30	70	60	60	70	70	60	60	60	80	70	60	60	
Density of tree layer	a2 [%]	10	10	-	-	-	-	40	10	-	-	5	-	-	-	-	-	-	5	-	-	-	10	5	-	-	-	-		-	10	20	-	10	40	50	-	35		-	-	10	70	30	40	-	60	-	5	-	-	-	40	-	10	+	-	10	-	
Density of shrub layer	b [%]	20	20	40	50	70	70	30	30	40	30	40	50	30	50	10	15	15	+	50	+	10	5	10	20	10	10	+	%	60	60	40	10	5	5	-	-	+	%	10	20	70	30	30	20	20	25	10	60	20	10	5	20	10	10	20	10	10	10	%
Cover of herb layer	c [%]	90	90	90	55	70	60	60	80	70	70	70	75	80	90	80	90	70	90	60	70	90	70	60	95	70	80	75		50	70	60	80	70	70	80	80	75		90	80	60	50	75	80	70	50	80	60	80	80	80	70	70	80	75	80	80	85	
Cover of moss layer	d [%]	15	+	+	+	+	5	+	10	+	5	-	5	5	-	+	+	+	30	+	+	+	+	+	5	5	+	+		15	20	5	7	+	5	+	5	5		+	+	5	+	+	5	-	+	+	+	-	5	+	5	+	+	10	+	-	+	
Area of relevé		200	100	200	120	200	200	200	200	200	100	200	200	200	250	150	100	200	200	200	150	200	200	200	200	120	100	100		200	200	200	500	200	200	200	200	400		200	200	600	450	400	400	400	400	200	200	200	200	200	600	200	200	200	200	200	200	
Location (ATPOL)		CD83	CD84	CD60	CD84	CD55	CD73	CD83	CD83	CD65	CD73	CD73	CD64	CD32	CD63	CD84	CD84	CD83	CD84	CD83	BC75	CD83	CD83	CD83	CD83	CD83	CD83	CD84		CD73	CD73	CD73	CD64	CD64	CD73	CD73	CD73	CD73		CD73	CD73	CD73	CD73	CD73	CD73	CD73	CD73	CD64	CD73	CD75	CD64	CD64	CD73	CD74	CD73	CD84	CD60	CD64	CD74	
Total number of species		26	28	29	18	30	32	27	22	29	31	25	42	32	24	30	15	27	31	12	18	24	22	23	25	17	14	20		34	27	44	28	29	32	19	22	41		19	33	15	17	25	28	29	19	24	32	26	20	26	24	21	27	31	27	25	26	
Number of mosses, liverworts and lichens species		9	6	3	1	4	5	2	6	3	3	-	10	8	-	5	2	5	13	1	1	2	4	6	5	2	2	5		7	5	11	5	7	8	4	5	9		3	10	1	1	2	7	-	1	4	2	-	5	4	2	2	4	1	2	-	1	
I. D. Ass. *Molinio caeruleae-Quercetum roboris*																																																												
Molinia caerulea (M-A)		3	4	3	4	4	3	3	4	3	2	3	4	4	5	4	5	4	5	3	4	4	4	4	5	4	4	4	100	3	3	4	4	4	4	3	4	4	100	4	3	2	2	3	4	3	3	4	4	4	5	3	4	3	4	3	5	4	4	100
Rubus nessensis		.	.	1	.	.	.	+	.	+	+	+	.	.	1	.	.	.	.	.	.	.	.	.	+	.	.	.	26	+	+	+	+	.	.	.	.	+	56	.	.	.	.	.	.	.	.	+	+	1	.	+	.	.	+	.	.	+	1	35
Polytrichum commune (S-C)		.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	2	.	.	1	.	.	.	.	.	+	19	.	+	.	+	.	.	.	+	+	44	.	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	15
II. Ch., D*. *Quercetea robori-petraeae* (Qrp)																																																												
* *Polytrichastrum formosum*		1	+	+	+	+	1	r	+	+	1	.	1	+	.	+	+	+	2	+	+	.	+	1	1	1	+	.	85	2	2	+	+	+	+	+	1	+	100	+	+	1	+	1	+	.	+	.	+	.	1	.	1	+	+	1	+	.	+	75
Carex pilulifera		+	+	+	+	+	1	+	+	1	+	.	+	+	.	+	1	+	+	.	+	.	+	+	.	+	+	.	78	+	+	+	+	+	+	1	.	+	89	.	1	+	.	1	.	+	+	+	+	.	+	+	1	+	+	1	+	+	+	80
* *Melampyrum pratense*		.	.	+	.	.	1	1	+	.	1	.	+	+	+	.	2	.	.	.	+	+	+	+	.	1	.	.	52	.	+	+	+	+	+	.	+	+	78	.	2	.	1	.	+	1	+	.	.	+	.	+	+	+	1	+	+	+	+	70
Holcus mollis		+	.	+	+	.	+	+	.	+	2	.	+	.	.	1	.	+	.	.	.	+	.	.	.	.	.	.	41	+	+	.	.	.	.	.	.	+	33	.	1	.	+	+	.	+	.	.	.	.	.	+	.	.	.	2	+	+	+	45
* *Pteridium aquilinum*		.	3	4	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	22	+	.	+	1	.	.	.	2	.	44	3	.	.	.	1	+	.	1	1	.	+	+	.	+	2	.	+	1	2	+	65
Dicranella heteromalla		+	+	+	.	+	.	.	.	.	+	.	+	+	.	+	.	.	1	.	.	.	.	.	.	.	.	.	33	.	.	+	.	+	.	+	.	+	44	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	15
Festuca ovina		1	.	.	+	.	.	.	.	1	+	.	+	.	.	.	1	+	1	.	.	.	.	.	.	.	.	+	33	+	.	.	.	.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Plagiothecium laetum		+	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	+	.	.	.	.	.	+	.	.	+	22	.	.	.	.	.	+	+	+	.	33	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	5
Plagiothecium denticulatum		.	.	.	.	.	+	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15	+	+	+	.	+	+	.	.	.	56	.	+	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	15
Lophocolea heterophylla		.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	11	.	.	+	.	+	.	.	.	+	33	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	5
III. Ch. *Vaccinio-Piceetea* (V-P)																																																												
Picea abies	a2,a	1	1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	19	.	1	.	.	2	1	.	.	.	33	.	+	.	.	.	2	.	.	.	1	.	.	.	2	.	.	.	.	+	.	25
Picea abies	b	2	.	+	+	.	.	+	+	.	.	.	.	+	.	.	.	+	+	+	+	+	+	+	+	+	+	.	59	.	.	+	+	+	+	.	.	.	44	+	+	.	+	1	2	1	2	+	.	.	2	.	1	+	+	.	+	+	.	70
Picea abies	c	.	.	.	.	.	+	+	.	+	.	.	.	+	.	+	.	.	+	.	+	.	.	.	.	.	.	.	26	r	+	.	+	.	.	.	.	r	44	.	+	.	.	+	.	.	+	+	.	.	+	.	.	+	.	.	+	.	.	35
Pinus sylvestris	a1,a;a2^	2	.	1	.	1	.	+	+	.	.	.	.	.	.	.	.	1	1	1	.	.	1	3;+^	1	1	1	2	52	.	.	.	.	.	.	.	1	.	11	.	.	.	2	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	15
Pinus sylvestris	c	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	r	.	+	.	.	.	19	.	.	.	.	.	.	.	+	.	11	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	10
Vaccinium myrtillus		3	1	1	2	1	2	2	2	2	2	+	+	+	+	2	2	2	2	3	1	1	2	2	+	1	2	1	100	+	2	2	3	2	1	2	2	2	100	+	3	3	3	2	2	2	2	2	+	+	+	+	2	2	2	1	1	1	.	95
Trientalis europaea		+	.	2	1	+	2	1	1	1	.	+	.	.	2	+	1	2	+	1	.	2	1	2	1	+	1	2	81	1	+	+	3	+	.	.	2	1	78	+	+	.	.	+	+	+	.	3	+	2	2	.	.	1	+	+	1	+	+	75
Pleurozium schreberi		1	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	+	+	+	.	.	26	+	+	.	.	.	.	.	.	.	22	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10
Leucobryum glaucum		+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	.	.	+	+	22	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
IV. Ch. *Querco-Fagetea*																																																												
Carpinus betulus	a,a2	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	+	.	.	.	2	3	.	.	33	.	.	.	4	3	3	2	4	.	.	.	+	+	2	.	.	+	.	.	.	45
Carpinus betulus	b;bc^	.	.	.	.	.	.	.	.	.	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	11	.	.	.	+	.	.	.	.	.	11	.	.	.	+^	.	+^	+^	.	.	.	.	.	.	.	.	.	.	.	.	.	15
Carpinus betulus	c	.	+	+	.	+	+	+	+	+	+	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	41	+	+	+	+	+	+	+	+	+	100	.	+	.	.	.	.	.	.	+	+	+	+	+	.	.	.	.	+	+	.	40
Anemone nemorosa		.	.	.	.	.	.	.	.	.	2	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	15	.	.	+	.	.	.	.	.	+	22	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	r	.	.	.	20
Milium effusum		.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	.	.	.	.	.	.	+	.	.	.	.	.	11	.	.	+	.	.	+	.	.	.	22	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	10
Stellaria holostea		.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	+	11	+	.	.	+	+	+	.	.	.	+	.	.	.	.	+	.	1	.	.	.	35
Poa nemoralis		.	.	.	.	.	+	.	.	1	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	15	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	+	+	.	.	.	+	.	+	+	.	.	r	.	.	+	35
V. Ch. *Scheuchzerio-Caricetea fuscae* (S-C), *Molinio-Arrhenatheretea* (M-A)																																																												
Lysimachia vulgaris (M-A)		.	1	.	+	.	.	.	.	+	1	1	+	+	1	+	.	+	+	.	1	1	.	.	1	.	.	.	52	+	.	+	+	+	+	.	+	1	78	.	.	.	.	+	+	+	+	.	+	2	.	+	+	+	+	1	+	+	2	70
Carex nigra (S-C)		.	.	.	.	+	+	+	1	+	.	1	+	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	37	+	.	+	+	.	+	+	+	+	78	.	+	.	.	.	.	.	.	+	+	+	.	+	.	.	+	1	.	.	.	35
Juncus effusus (M-A)		.	1	.	.	+	.	.	.	+	.	1	+	.	+	.	.	.	.	.	+	.	.	.	+	.	.	+	33	+	+	+	.	.	+	+	.	+	67	.	+	.	.	.	.	.	.	.	+	+	.	.	.	.	+	1	+	.	+	35
Agrostis canina (S-C)		.	.	.	.	+	.	+	.	.	.	.	+	.	.	.	.	+	2	.	.	.	.	.	+	.	.	1	26	+	1	+	.	.	+	.	.	.	44	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	2	.	.	1	20
Deschampsia caespitosa (M-A)		.	.	.	.	1	+	.	.	+	.	1	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	26	+	+	.	.	.	.	.	.	.	22	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	3	.	.	+	20
Festuca rubra s. s. (M-A)		.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	+	+	.	.	+	.	.	.	33	.	1	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	15
VI. D. variant et subvariant																																																												
Betula pubescens subsp. *pubescens* (V-P)	a1,a;a2^	.	.	.	.	.	.	+^	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	.	1^	1^	.	+	1^	.	.	3^	56	+	.	1	1	+	.	1	.	.	.	.	1	.	.	1	+;2^	.	.	+;1^	.	45
Betula pubescens subsp. *pubescens* (V-P)	c	.	.	.	+	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	11	+	+	.	.	+	.	.	.	+	44	1	.	.	+	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	20
Calamagrostis arundinacea (Qrp)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	+	2	1	+	+	1	+	2	89	+	+	+	1	+	1	2	1	1	+	+	+	3	1	1	2	+	+	2	+	100
Sphagnum girgensohnii et fimbriatum (V-P)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	2	1	+	+	1	+	+	1	89	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Carex canescens (S-C)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	+	.	+	.	+	.	1	.	+	56	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
VII. Ch. *Calluno-Ulicetea*																																																												
Pohlia nutans		1	+	+	.	.	+	+	+	.	.	.	.	.	.	+	.	+	+	.	.	.	.	+	+	.	.	.	41	.	.	+	+	+	+	.	+	.	56	.	+	.	.	.	.	.	.	+	.	.	.	+	.	.	+	.	+	.	.	25
Agrostis capillaris		.	.	.	+	+	+	+	.	.	.	.	+	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	30	+	.	+	+	.	.	.	.	.	33	.	.	.	.	+	+	.	.	+	.	+	.	.	.	.	+	.	.	.	+	30
Carex pallescens		.	1	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	19	+	+	.	.	.	+	.	.	+	44	.	+	.	.	.	.	+	.	.	+	+	.	.	+	.	.	+	+	.	.	35
Potentilla erecta		.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	+	+	.	.	+	.	.	.	.	.	.	19	.	.	.	.	.	.	.	.	+	11	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	10
VIII. Others																																																												
Quercus robur	a1,a	3	4	3	4	4	4	3	4	4	4	4	3	4	4	5	3	3	2	.	1	.	+	+	1	2	.	.	85	4	3	4	4	2	3	3	4	3	100	3	3	4	3	4	3	4	3	4	4	4	4	4	4	+	4	5	4	3	4	100
Quercus robur	a2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	11	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	10
Quercus robur	b^;bc	1^	.	.	.	.	.	.	.	.	.	.	.	.	.	+^	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.	+^	.	.	.	.	.	11	+	.	.	+	+	+	+	+	.	.	.	.	.	+	.	.	.	.	.	.	35
Quercus robur	c	1	+	+	+	+	+	+	+	+	+	+	+	+	.	+	+	+	+	.	.	.	+	+	.	1	.	.	74	2	1	+	+	+	+	2	+	1	100	.	+	+	.	.	.	.	.	+	.	.	2	+	.	+	1	+	+	2	.	50
Betula pendula	a1,a	.	.	.	.	.	+	.	.	.	.	.	1	.	.	1	.	2	3	2	+	.	2	+	.	+	2	2	44	.	.	.	+	.	+	.	1	1	44	+	3	.	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	1	+	30
Betula pendula	a2	.	.	.	.	.	.	+	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	1	.	.	1	.	.	1	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	5
Betula pendula	c	+	.	.	+	.	.	.	+	+	.	.	.	+	+	+	.	+	.	.	.	+	.	.	.	+	.	.	37	.	.	.	+	+	+	.	.	.	33	+	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	.	25
Quercus petraea	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	3	4	4	3	3	3	3	3	2	37	.	.	.	.	4	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	5
Quercus petraea	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	7	.	.	.	.	+	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
Quercus petraea	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+/	.	.	.	/1	.	.	/+	+/11	/+	/+	?2	.	26	.	.	.	.	/+	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/2	.	.	.	.	.	5
Sorbus aucuparia	a2	.	1	.	.	.	.	3	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	+	1	.	.	.	.	.	.	22	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	.	15
Sorbus aucuparia	b	+	+	+	.	.	.	+	.	.	.	.	.	.	2	+	.	.	.	.	.	.	.	.	.	.	.	.	22	.	.	+	.	.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	+	.	.	.	1	15
Sorbus aucuparia	c	+	+	+	+	+	+	+	+	+	+	+	+	+	1	+	r	+	+	+	+	+	+	+	+	+	.	.	93	+	+	+	+	+	+	+	+	+	100	+	+	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1	95
Frangula alnus	b	1	1	3	4	4	4	3	3	3	3	3	3	3	3	+	2	2	+	4	+	2	1	2	2	1	1	+	100	4	4	3	2	2	1	.	.	+	78	+	2	4	3	3	.	2	1	2	4	2	+	1	2	2	2	+	2	1	2	95
Frangula alnus	c	+	+	+	1	+	1	+	+	+	+	1	+	+	.	1	1	1	1	1	+	1	+	1	.	1	1	1	93	2	1	+	1	+	+	+	+	+	100	+	+	1	1	1	+	+	.	1	1	1	+	.	+	+	1	+	+	1	1	90
Maianthemum bifolium		+	+	+	+	.	+	+	+	.	2	+	+	+	1	1	1	+	.	+	+	2	+	+	.	+	+	+	85	+	1	1	+	+	+	1	+	+	100	+	+	r	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1	.	95
Dryopteris carthusiana		.	+	.	.	+	+	+	+	+	+	+	+	+	+	1	.	+	.	.	+	1	.	.	+	.	.	+	63	1	.	+	+	r	.	.	.	.	44	.	.	.	.	+	.	.	.	+	+	+	+	+	.	+	+	.	+	.	+	50
Luzula pilosa		+	1	+	+	+	+	.	.	+	1	.	+	.	.	+	+	+	.	.	.	.	.	.	.	+	.	+	52	+	.	+	+	+	.	.	.	.	44	.	+	r	+	+	+	+	+	+	+	.	+	+	+	.	+	+	.	.	.	70
Oxalis acetosella		.	1	+	.	1	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	1	.	.	1	.	.	.	30	.	.	+	+	.	.	.	+	.	33	.	.	.	.	+	.	+	.	+	.	.	.	1	+	.	.	+	+	.	.	35
Anthoxanthum odoratum		.	.	+	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	+	+	.	.	.	.	22	+	.	.	.	.	.	.	.	.	11	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	1	.	.	.	20
Convallaria majalis		.	.	.	.	.	.	.	.	.	1	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	11	.	.	.	.	+	+	+	.	+	44	.	.	.	.	.	.	+	+	.	.	+	.	.	.	+	.	+	.	+	.	30
Galeopsis tetrahit		.	.	.	.	.	+	+	.	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	19	.	.	+	.	.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	+	.	.	+	25
Rubus plicatus		+	.	+	.	.	+	.	+	+	.	1	1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	37	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	+	10
Rubus idaeus		.	1	.	.	+	+	.	.	.	.	+	.	.	.	+	.	+	.	.	.	+	.	.	1	.	.	.	30	.	.	+	.	.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	10
Rubus corylifolius		.	1	+	.	.	.	.	.	+	.	1	2	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	26	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-

Sporadic species: II.: *Aulacomnium androgynum* 36; *Hieracium lachenalii* 11; *H. laevigatum* 6; *H. sabaudum* 21; *Mnium hornum* 30; **III.:** *Dicranum polysetum* 2,19; *Hylocomium splendens* 13,28,36; *Juniperus communis* c 5,21,27; *Lycopodium annotinum* 24; *Plagiothecium curvifolium* 7,18,22,31,33,38,45,52; *Pseudoscleropodium purum* 3(1),10,13,19,23,42,48; *Rubus saxatilis* 11; *Thuidium tamariscinum* 9,13,28,42; *Vaccinium vitis-idaea* 3(1); **IV.:** *Atrichum undulatum* 2,11,13,19,50; *Corylus avellana* b 1,15(1),56, c 1,13,15(1),56; *Eurhynchium angustirete* 42; *Fagus sylvatica* a 31, a2 32,36, b 31(1),36,51, bc 37,42, c 4,22,23,25(r),26,31,35,45(1),51; *Festuca heterophylla* 42; *Hedera helix* 12(1),36,44,50,55; *Malus sylvestris* bc 43, c 6,36,39,54,55; *Polygonatum multiflorum* 36(r),41; *Scrophularia nodosa* 2; *Sorbus torminalis* 36; *Tilia cordata* bc 44; *Viola reichenbachiana* 1,11,47; **V.:** *Agrostis stolonifera* (M-A) 41; *Juncus conglomeratus* (S-C) 13,19(1),54; *Poa pratensis* (M-A) 17,43; *P. trivialis* (M-A) 7,22,26,30,47,52,56; *Veronica chamaedrys* (M-A) 11; **VII.:** *Calluna vulgaris* 3; *Carex ovalis* 10,12,33; *Luzula multiflora* 7,8,11,14,29,38,43; *Nardus stricta* 14,27; *Solidago virgaurea* s. s. 36,37,39,40,41,55; **VIII.:** *Athyrium filix-femina* 6,12; *Aulacomnium palustre* var. *palustre* 14,28,30,32,38; *Betula obscura* a2 8; *Brachytheciastrum velutinum* 42; *Brachythecium rutabulum* 30,33; *Calamagrostis canescens* 12,28; *C. epigejos* 7,11,13,18,52,56(1); *Carex elongata* 12,34,46; *C. panicea* 13; *C. vesicaria* 12(2); *Crataegus laevigata* 46; *C. monogyna* 55; *C. rhipidophylla* var. *rhipidophylla* 6,13; *Deschampsia flexuosa* 10,11; *Fragaria vesca* 1; *Galeopsis pubescens* 1,47; *Hieracium murorum* 11; *Hypericum maculatum* 11; *Hypnum cupressiforme* 3,19,22,23,36; *Impatiens parviflora* 21(1); *Larix decidua* subsp. *decidua* 7; *Lepidozia reptans* 6,31,45,48; *Lophocolea bidentata* 16,19,27,28,38; *Lycopus europaeus* 56; *Moehringia trinervia* 2,6,21,24,30,47,50,53(1); *Mycelis muralis* 24; *Plagiomnium affine* 2,21(1),30,33,42; *Plagiothecium ruthei* 38; *Plagiothecium* sp. 3,17,24,27; *Polygonum hydropiper* 13; *Populus tremula* a 38(1), a1 55(2), a2 8(1),39(1), b 16,55(1), bc 37, c 16,23,32,38,39,46,55; *Prunus* sp. 30,33; *Pyrus communis a2 46, b 46, c 6,10,43,49,55; Rhamnus cathartica b 53, c 53; Rubus gracilis 6,12,15,29,34(r),46(1),54;* *R. hirtus* 14; *R. pallidus* 14,36; *Rubus* sp. 1,18,33,41,43,50; *Salix cinerea* 19; *Sciuro-hypnum oedipodium* 6,10,14,19,30,36,37, 38,42; *S. starkei* 9; *Sphagnum capillifolium* 49; *S. palustre* 19; *S. russowii* 9(2); *Urtica dioica* 2.

Table A3. *Calamagrostio arundinaceae-Quercetum petraeae molinietosum* (untransformed form)

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	
ID-1		48	12	12	12	12	30	12	44	12	30	51	24	12	12		12	51	51	12	12	36	12	3	12	12	12	32	12	51	35	21	12	12	21	12	12	12	12	21	21	21	21	16	30	12	34	24	12	51	37	12	21	12	21	37	30	21	
ID-2		3	1	1	1	1	5	1	4	1	5	2	-	1	1		1	1	1	1	1	13	1	4	1	1	1	2	1	1	10	1	1	1	1	1	1	1	1	1	1	1	1	17	5	1	3	-	1	1	12	1	1	1	1	12	5	1	
ID-3		23	4	2	3	26	22	24	9	8	10	3	-	13	23		40	14	12	15	38	3	17	2	21	22	12	2	11	18	43	2	28	46	25	9	25	30	45	6	12	15	24	14	9	49	3	-	35	5	8	37	23	31	4	15	14	16	
Date (year)		1976	1956	1998	1998	1984	1955	1984	1979	1983	1956	1981	2006	1977	1977	1-14	1982	1980	1981	1982	1983	1977	1965	1992	1984	1983	1989	1989	1982	1981	1976	1957	1983	1955	1957	1983	1984	1990	1985	1957	1957	1957	1957	1971	1955	1997	1997	2006	1983	1981	1986	1982	1957	1983	1957	1986	1957	1957	15-56
Density of tree layer	a1,a [%]	60	80	85	60	70	70	55	60	60	70	70	70	70	60		60	65	80	55	50	75	70	65	70	70	70	70	60	80	65	65	60	20	60	50	70	70	40	65	60	40	60	70	50	65	65	75	70	40	60	75	65	70	60	70	90	50	
Density of tree layer	a2 [%]	-	-	5	50	-	20	60	-	-	-	-	-	30	+	%	30	-	-	-	40	-	-	20	5	-	-	-	+	-	5	-	-	50	30	10	-	10	70	+	+	30	40	60	30	5	5	5	-	-	+	20	20	-	+	-	-	65	%
Density of shrub layer	b [%]	-	30	+	10	25	60	10	20	60	40	30	15	15	15		-	20	+	15	+	-	10	15	25	5	50	50	70	10	10	15	10	-	+	50	15	20	5	30	65	20	30	30	15	20	20	5	15	10	+	25	+	10	65	20	20	15	
Cover of herb layer	c [%]	50	90	75	75	75	60	60	80	40	20	50	50	60	75		80	100	100	95	70	95	80	70	80	70	50	50	90	100	70	90	75	90	70	60	80	60	50	65	40	25	60	70	15	60	65	50	70	100	95	70	70	75	40	90	25	65	
Cover of moss layer	d [%]	10	5	+	5	-	10	30	30	5	15	70	10	20	20		5	+	+	+	+	-	15	5	+	10	5	5	-	-	+	+	+	5	25	5	5	10	5	15	15	50	15	80	30	10	10	-	10	30	-	10	10	+	10	+	+	+	
Area of relevé		150	200	200	300	200	600	200	600	200	500	200	200	200	100		150	100	200	200	150	200	200	400	200	300	400	400	150	200	300	400	200	200	600	150	200	400	100	500	500	400	600	200	400	400	400	200	300	200	800	150	600	200	400	800	200	500	
Location (ATPOL)		BD28	CD83	BD24	CD34	CD65	CD73	CD82	DE50	CD82	CD82	CD84	CE36	CD34	CD35		CD64	CD84	CD83	CD83	CD82	BE28	CD83	CD83	CD82	CD83	CD64	CD64	CD72	CD84	CE01	CD82	CD82	CD73	CD82	CD83	CD65	CD83	CD32	CD82	CD82	CD82	CD82	CD60	CD73	CD73	CD73	BC66	CD83	CD84	BD92	CD34	CD82	CD82	CD82	AD89	CD73	CD82	
Total number of species		22	27	28	31	33	33	37	26	35	42	34	28	31	31		33	29	41	43	35	31	32	33	34	39	32	33	37	39	25	47	35	20	33	39	34	49	28	44	37	32	34	41	45	44	43	40	53	32	38	32	42	40	27	33	28	25	
Number of mosses, liverworts and lichens species		3	7	4	5	-	5	3	2	4	6	7	3	5	3		7	1	4	5	1	-	5	6	1	5	5	6	-	-	1	4	4	1	5	7	2	6	1	5	3	5	5	7	8	11	11	-	5	5	-	5	5	2	4	3	1	1	
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*																																																												
* *Quercus petraea*	a1,a	.	.	5	3	1	.	+	2	+	.	.	.	.	.	43	.	.	4	.	2	.	1	1	1	2	.	.	.	5	.	.	3	.	.	+	.	1	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	4	.	.	.	.	31
* *Quercus petraea*	b/c	.	.	/1	+/1	.	.	+/	/+	.	.	.	.	.	+/	36	.	.	/+	.	/1	.	/+	/+	.	/+	.	.	.	/+	.	.	/2	.	.	/+	.	/+	.	.	.	.	.	.	.	/+	.	.	/1	.	.	/+	.	/2	.	.	.	.	31
* *Calamagrostis arundinacea* (Qrp)		3	5	+	1	.	+	2	2	.	+	.	+	.	2	71	.	.	.	.	+	.	+	.	.	+	+	+	.	.	.	+	+	2	1	+	.	+	+	.	+	1	.	2	+	3	3	.	+	.	.	.	1	+	+	.	1	+	57
Hieracium lachenalii		1	+	1	+	+	+	+	+	+	+	.	+	+	1	93	.	r	+	+	+	+	.	+	+	+	.	.	.	+	1	+	.	+	+	.	+	+	+	1	+	+	+	.	+	+	+	.	.	+	1	+	+	+	+	+	+	+	76
* *Festuca ovina* (Qrp)		1	.	.	+	.	+	+	1	.	+	3	.	+	1	64	+	.	1	+	+	.	.	.	.	.	+	+	.	.	.	+	+	.	1	+	2	1	.	+	+	1	+	+	+	.	.	.	+	2	1	.	+	+	.	.	.	+	57
Hieracium sabaudum		.	.	.	+	+	.	.	.	.	.	+	.	1	1	36	+	r	+	.	.	.	.	+	.	.	.	.	+	+	.	+	.	.	+	.	.	+	.	+	+	+	+	+	.	+	+	+	+	.	1	1	.	+	+	1	.	+	57
Hieracium laevigatum		.	.	+	.	+	+	.	.	+	+	+	.	.	.	43	1	.	.	+	+	+	+	.	+	.	+	+	+	.	1	.	.	.	.	+	+	+	.	.	.	.	.	.	.	+	.	+	+	+	+	.	.	.	.	.	.	.	43
Lathyrus montanus		.	.	.	+	.	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	2
II. Ch., D.* *Quercetea robori-petraeae* (Qrp)																																																												
Carex pilulifera		+	+	+	+	+	2	1	1	+	2	1	2	1	1	100	+	+	+	+	+	.	+	1	+	+	1	1	+	+	.	+	+	.	.	1	+	1	2	+	+	+	.	1	+	1	1	+	+	+	+	+	+	+	+	.	1	+	86
* *Polytrichastrum formosum*		1	1	+	1	.	2	+	+	1	2	4	2	2	2	93	1	+	1	1	+	.	2	1	+	2	1	1	.	.	+	1	+	1	2	1	1	2	1	2	2	1	+	4	3	1	1	.	2	+	.	2	1	+	1	.	+	.	83
Holcus mollis		2	+	1	.	+	.	.	+	1	2	.	3	3	+	71	5	5	4	4	4	4	4	4	3	3	3	3	3	3	3	+	+	.	+	2	2	2	2	+	1	.	+	1	+	1	1	.	2	2	2	2	1	+	+	+	+	.	90
* *Melampyrum pratense*		+	+	1	+	+	+	.	1	.	.	+	+	+	1	79	1	2	2	1	1	.	1	2	1	1	+	+	1	+	2	+	1	.	+	1	2	+	+	1	+	.	+	+	1	2	2	+	+	.	2	.	+	1	+	.	1	+	86
* *Pteridium aquilinum*		1	.	1	2	+	.	2	4	.	.	.	.	.	.	43	.	.	+	+	.	+	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	+	+	1	1	1	.	.	.	2	2	2	.	2	1	+	.	3	+	.	.	.	43
Dicranella heteromalla		+	+	.	.	.	.	.	.	+	+	+	.	+	.	43	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	.	+	+	.	.	.	.	1	.	.	.	+	.	.	19
III. D. *Ca-Q molinietosum*																																																												
Quercus robur	a1,a;a2*	.	4	.	1;2*	4	4	3*	.	4	4	2	4	4;1*	4	79	3	4	2	4	3	4	4	4	4	4	4	4	4	.	4	4	3	1	3	3	4	4	3	3	4	.	4	1;2*	4	4	r	5	3	3	4;+*	4;2*	2;1*	2	4	4	5	1*	95
Quercus robur	b,b/c*;c^	.	+^	.	+*^	+^	+*	+*^	.	+^	+*	2^	+^	+^	+^	79	+^	+^	.	+^	1^	+^	+^	1^	+^	1^	1^	1^	+^	.	+^	+^	1^	+^	+^	2^	+^	+	.	+^	+^	+^	+^	1^	1*	+^	+^	+^	2^	+^	+^	+^	1^	1^	+^	+^	+*	+^	93
Picea abies (V-P)	a1,a;a2*	.	1	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	1*	.	.	.	.	.	.	.	.	.	.	2*	.	2*	.	2;1*	1*	2*	.	1*	.	+*	+*	2*	.	.	.	.	.	.	.	.	.	.	31
Picea abies (V-P)	b/c	.	1/	+/	.	/+	3/	r/	1/	.	/+	+/	.	.	.	57	.	.	.	1/+	.	/+	1/	.	1/	1/+	.	.	.	.	2/+	2/+	.	+/+	+/+	+/	2/+	/+	1/+	/1	2/+	/+	+/+	2/2	+/+	+/+	.	+/+	+/	.	.	.	1/+	1/+	2/+	.	1/	+/+	64
Frangula alnus	b	.	2	+	1	2	2	2	2	4	3	3	2	1	1	93	.	2	.	2	+	.	1	2	2	1	3	3	4	1	1	1	+	.	.	3	2	2	1	.	3	+	2	.	.	2	2	+	2	1	.	2	.	+	1	2	2	.	74
Frangula alnus	c	.	+	1	+	1	2	1	1	1	1	+	1	+	+	93	+	.	1	+	1	+	+	+	1	1	+	1	1	+	.	+	+	+	+	+	+	1	+	+	+	+	.	+	.	+	+	+	1	.	+	+	+	+	+	.	+	+	86
Trientalis europaea (V-P)		.	.	+	+	+	+	+	1	1	.	.	.	.	.	50	.	1	+	1	1	+	1	.	+	+	1	1	.	.	1	1	1	+	+	+	.	1	.	1	1	+	+	.	.	1	1	.	1	+	.	.	+	1	1	.	.	+	69
Carex pallescens (C-U)		+	+	.	.	+	+	.	.	+	1	1	+	.	+	64	.	.	+	+	+	+	.	+	+	+	.	.	+	.	.	+	.	.	+	+	+	.	+	+	+	+	1	+	1	.	.	+	1	.	.	.	1	.	.	.	+	+	55
Molinia caerulea		1	.	1	1	+	+	+	1	+	.	+	+	1	.	79	+	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	+	.	+	+	.	.	.	.	.	.	3	.	1	1	+	+	+	+	+	.	+	.	+	.	.	40
Dryopteris carthusiana		.	.	+	+	1	+	+	.	+	.	.	.	.	.	43	.	.	+	+	.	+	+	+	+	+	+	+	.	.	+	1	+	+	+	+	.	.	+	.	.	+	+	2	.	+	.	.	+	+	+	.	+	1	+	+	.	+	67
Potentilla erecta (C-U)		.	.	.	+	.	.	.	.	.	+	+	.	.	+	29	.	+	+	+	.	.	+	.	.	+	.	.	+	1	.	+	.	.	.	.	.	+	.	.	+	.	.	+	.	+	+	.	+	+	+	.	.	.	.	.	+	+	45
Lysimachia vulgaris		.	+	.	.	.	.	.	.	1	.	.	+	+	.	29	.	1	.	.	+	.	.	+	.	.	.	+	.	.	+	+	.	+	.	.	.	1	+	.	+	.	.	+	.	r	r	+	.	.	.	+	.	+	+	+	.	.	43
Carex nigra		.	+	+	+	+	.	+	.	+	+	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	19
Deschampsia caespitosa		+	.	.	.	.	.	.	.	+	.	.	+	.	.	21	+	1	.	.	+	.	.	.	.	.	.	.	+	+	.	+	.	.	+	+	.	.	+	.	.	+	.	+	.	.	.	.	+	.	+	.	+	.	.	1	.	.	38
Juncus effusus		.	+	.	.	.	.	.	.	+	+	.	+	.	.	29	.	.	.	+	+	.	+	+	+	+	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	.	+	.	.	.	.	+	.	r	.	.	.	.	.	.	.	29
Carex ovalis (C-U)		.	.	.	.	.	+	.	.	.	+	.	+	.	.	21	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	14
Agrostis canina		.	.	.	.	.	.	.	.	+	.	1	.	.	.	14	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	10
IV. D. *Anemone* var.																																																												
Carpinus betulus (Q-F)	a,a2	.	.	.	.	.	1	.	.	.	+	.	.	.	.	14	4	.	.	.	3	.	.	2	.	.	.	.	.	.	1	.	.	3	2	.	.	.	4	.	.	.	3	3	2	1	1	.	.	.	.	.	.	.	1	.	.	4	33
Carpinus betulus (Q-F)	b,(b+c)*/c	.	.	.	.	/+	+*	.	.	/+	.	/+	/+	.	1/	43	/+	/+	.	.	/1	.	+/+	+/+	/+	/+	/+	+/+	/+	+	+	/+	/+	/+	1/+	.	/+	.	/+	1/1	1/+	1/+	/+	2/1	1*/	/+	/+	.	+/+	.	.	.	/+	/+	3/1	.	.	.	71
Oxalis acetosella		.	.	.	.	.	.	+	.	+	.	.	.	.	.	14	1	1	2	1	1	+	+	+	+	+	+	+	2	2	+	1	+	.	+	+	+	+	.	.	+	+	+	1	.	+	+	1	+	+	.	.	+	1	.	.	.	+	79
Anemone nemorosa (Q-F)		.	.	.	.	.	.	.	+	.	+	.	+	1	2	36	+	+	.	+	.	.	+	+	+	+	+	+	.	.	1	.	.	.	.	.	.	1	1	+	+	+	+	+	.	+	+	.	+	.	+	1	.	.	.	.	+	.	55
Poa nemoralis (Q-F)		.	.	.	.	+	.	.	.	.	.	.	.	.	.	7	+	1	.	.	+	1	.	+	.	.	.	.	2	.	.	+	1	.	.	.	1	.	+	1	+	+	+	1	+	.	.	2	+	.	.	.	.	.	.	2	.	.	45
Viola reichenbachiana		.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	1	1	1	+	1	+	.	+	+	.	.	.	+	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+	+	+	.	+	.	.	+	.	43
Stellaria holostea (Q-F)		.	.	.	.	.	.	.	.	.	.	1	.	.	.	7	.	.	.	`	+	.	.	1	1	.	.	.	+	1	.	+	.	.	1	+	.	.	.	1	+	+	.	1	.	+	+	.	.	.	.	.	.	r	+	.	.	.	38
Veronica chamaedrys		.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	1	1	+	+	.	.	+	.	.	.	+	1	+	.	.	.	.	.	+	+	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	1	+	.	36
Fragaria vesca		.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	+	+	.	.	.	.	.	.	.	.	1	1	.	+	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	24
Hypericum perforatum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	1	+	.	.	+	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	+	.	.	+	.	.	.	.	+	.	.	24
Atrichum undulatum (Q-F)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	17
Viola riviniana (Q-F)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	14
V. Ch. *Vaccinio-Piceetea* (V-P)																																																												
Pinus sylvestris	a1,a	3	.	1	2	.	.	4	4	1	.	3	.	.	.	50	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	.	2	.	.	.	.	.	.	.	3	.	3	.	.	.	.	.	.	+	.	3	1	.	.	.	3	21
Pinus sylvestris	c	.	.	r	r	.	.	1	.	.	r	+	.	.	1*	100	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	r	.	.	r	.	.	.	.	.	+	.	.	.	.	.	+*	.	.	.	.	.	.	.	.	100
Vaccinium myrtillus		1	4	4	4	4	3	3	3	3	+	1	+	.	2	93	1	.	1	+	+	+	.	.	2	2	2	2	+	.	.	5	4	4	4	3	3	3	3	3	3	3	3	1	+	2	2	2	2	1	1	.	2	2	2	1	.	2	83
Pleurozium schreberi		.	+	.	1	.	+	+	3	.	1	2	+	.	+	64	.	.	.	.	.	.	+	.	.	1	.	+	.	.	.	.	.	.	.	+	+	1	.	+	.	3	1	2	+	.	.	.	1	1	.	.	1	.	.	.	.	.	33
Pseudoscleropodium purum		.	.	.	+	.	.	3	.	.	.	1	+	.	.	29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	1	+	+	+	.	+	.	.	.	.	.	.	.	.	.	17
Vaccinium vitis-idaea		.	.	.	+	.	.	+	1	.	.	.	.	.	+	29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Hylocomium splendens		.	.	.	.	.	+	.	.	.	+	.	.	.	+	21	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	14
Leucobryum glaucum		.	+	.	+	.	.	.	.	.	.	+	.	.	.	21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	.	.	.	.	+	.	.	.	10
VI. Ch. *Querco-Fagetea* (Q-F)																																																												
Fagus sylvatica	a1*,a2	.	.	+	2	.	.	+	.	.	.	.	.	.	.	21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Fagus sylvatica	b,(b+c)*/c	.	.	+/+	2/+	.	.	+/	.	.	+*/	.	/+	.	.	36	.	.	.	.	.	.	.	.	+/+	.	.	1/+	.	/1	1/+	.	+/+	/+	.	.	.	.	.	2/	.	1/+	/+	/+	.	/+	/+	1/	.	/+	.	.	.	+/+	.	.	.	.	36
VII. Ch. *Calluno-Ulicetea* (C-U)																																																												
Agrostis capillaris		.	.	+	.	.	+	+	.	+	+	1	+	+	+	64	.	1	2	1	+	.	+	+	+	1	.	.	2	2	+	.	+	.	.	+	2	+	+	.	.	.	.	.	+	.	.	.	1	.	.	+	.	+	.	3	.	.	50
Pohlia nutans		+	+	.	.	.	.	.	.	+	+	.	.	+	.	36	+	.	.	+	.	.	+	+	.	.	+	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	+	.	+	+	.	.	1	.	+	.	+	.	+	.	.	36
Solidago virgaurea s. s.		.	+	.	+	.	.	.	.	.	+	.	.	.	.	21	.	.	.	.	+	.	.	.	.	.	+	+	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	+	.	.	.	r	.	.	.	26
Luzula multiflora		.	.	.	.	.	+	.	.	.	+	.	.	+	+	29	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	+	.	+	+	+	+	.	.	+	+	29
Hypericum maculatum		.	.	.	.	.	.	.	.	.	+	.	.	.	.	7	.	.	.	2	+	.	.	.	+	+	.	.	+	.	.	+	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	26
VIII. Others																																																												
Sorbus aucuparia	a2*;b/c	.	+/+	.	.	1/+	/+	+/+	.	+/+	/+	/+	/+	2*;2	+/+	71	/+	.	.	.	/+	/+	/+	/+	/+	/+	/+	/+	+*;2	+/	.	/+	/+	/+	/+	/+	/+	/+	/+	/+	/+	+/+	+/+	/+	/+	+/+	+/+	+/+	/+	.	+/+	1*;2	/+	/+	+/+	1/+	/+	+/1	88
Betula pendula	a2*;a1,a	.	.	1	1	1	+	+*	1	.	.	+	.	1*	+*	64	.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+*	.	.	.	1	.	.	10
Betula pendula	b/c	.	.	.	.	.	/+	+/+	/+	.	.	/1	.	.	+/+	36	/+	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	/+	+/+	.	.	.	.	.	.	.	/r	/r	.	.	/+	+/	+/+	/+	.	.	.	.	.	24
Maianthemum bifolium		1	+	.	.	+	+	+	1	+	+	.	2	3	2	79	2	.	+	+	1	.	1	2	1	2	+	+	+	.	1	1	1	+	1	1	2	1	2	+	+	1	+	2	+	+	+	+	+	+	+	3	+	+	+	+	.	2	90
Luzula pilosa		+	+	+	1	+	.	1	1	+	+	3	+	+	+	93	+	1	+	+	1	1	+	2	+	1	2	+	+	+	.	1	+	.	1	1	+	+	1	1	1	+	1	1	.	1	1	.	1	2	.	+	1	1	+	+	+	+	88
Anthoxanthum odoratum		.	.	+	.	.	+	.	.	.	+	+	+	+	+	50	+	.	.	2	.	1	+	.	+	.	+	+	+	1	.	+	.	.	.	.	+	+	.	+	.	.	+	+	+	.	.	.	+	3	+	1	+	.	.	.	+	.	52
Festuca rubra s. s.		.	.	.	.	.	+	.	.	+	2	1	.	+	.	36	.	1	1	+	+	.	+	+	+	+	.	+	.	2	.	+	.	.	.	+	+	+	+	+	+	.	.	.	+	.	.	.	1	2	2	.	+	+	+	1	.	.	60
Moehringia trinervia		.	.	.	.	+	.	+	.	+	.	.	.	1	.	29	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	14
Calamagrostis epigejos		.	.	+	+	+	.	1	.	.	.	.	.	.	.	29	.	.	+	.	.	.	.	.	.	1	.	.	.	+	.	.	+	.	.	+	1	.	.	+	.	.	1	.	.	.	.	.	2	.	.	.	+	.	.	.	.	+	26
Poa angustifolia		.	.	.	.	+	.	.	.	.	.	+	+	.	.	21	.	1	1	1	.	.	.	.	1	+	.	.	.	+	.	1	.	.	.	.	.	+	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	26
Hypnum cupressiforme		.	.	.	.	.	.	.	.	.	.	+	.	+	.	14	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.	1	.	.	1	.	.	+	.	+	1	+	1	+	+	+	+	.	.	.	.	+	+	.	1	.	.	+	43
Convallaria majalis		1	.	.	.	.	.	.	.	.	.	+	.	.	.	14	.	1	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	+	.	+	.	.	2	.	+	+	2	.	2	.	.	+	+	+	.	.	.	33

Sporadic species: II.: *Aulacomnium androgynum* 22,25,26; *Hieracium umbellatum* 28,43,49,54; *Lonicera periclymenum* b 7(1), c 7(2); *Lophocolea heterophylla* 3; *Luzula pallescens* 29,36; *Mnium hornum* 13(1),15,34,50(1); *Plagiothecium denticulatum* 15,24,25,26,44,45; *P.* laetum 15(r),17,22,34; **V.:** *Betula pubescens* a1,a 41(2),55(1), b 14,32,42, c 6,32(r),42; *Dicranum polysetum* 6; *D. scoparium* 33,38,40; *Dryopteris dilatata* 4,7,17,20,43; *Galium rotundifolium* 20(1); *Juniperus communis* b 8,17,18,51(r), c 9,13,18,36,50; *Lycopodium annotinum* 30; *L. clavatum* 51; *Monotropa hypopitys* s.s. 8,53; *Orthilia secunda* 6,30; *Plagiothecium curvifolium* 15; *Pyrola minor* 20; *Rubus saxatilis* 42(1),46(r); *Sphagnum girgensohnii* 45; *Thuidium tamariscinum* 51; *Viscum album subsp. austriacum* 7; **VI.:** *Acer pseudoplatanus* bc 29; *Ajuga reptans* 16,17,18,20,22(r),27,37,47; *Brachypodium sylvaticum* 54(1); *Campanula persicifolia* 38,43; *Carex digitata* 31,33,51(1); *Corylus avellana* b 35,54,56, c 5(r),35; *Dactylis polygama* 28; *Dryopteris filix-mas* 18,23,30(1),51,52; *Eurhynchium angustirete* 43; *Festuca heterophylla* 26,40,42; *Galeobdolon luteum* 38,39; *Hedera helix* c 19,44(1),45(1); *Malus sylvestris* b 44,45, bc 6,55, c 5,15,18,23,25,26,33,34,35,44,45; *Melampyrum nemorosum* 43,54(1); *Melica nutans* 1(1),46(1); *M. uniflora* 30; *Milium effusum* 15,16,22,39,46,56; *Padus avium* a2 13(1), b 13(1), c 13,50; *Platanthera bifolia* 18,21; *Polygonatum multiflorum* 33; *Ribes uva-crispa* c 46(r); *Scrophularia nodosa* 1,27,28,30; *Tilia cordata* b 27, c 14; *Viburnum opulus* c 17; *Viola reichenbachiana* et *riviniana* 1; **VII.:** *Danthonia decumbens* 10,14,24; *Genista tinctoria* 28,38,49,54; *Nardus stricta* 2,34; *Polytrichum juniperinum* 6; *Potentilla anglica* 23,47; *Scorzonera humilis* 49; *Veronica officinalis* 10,15,31,36(r),52; **VIII.:** *Abies alba* c 21; *Aegopodium podagraria* 46(r); *Agrostis gigantea* 16,43; *Agrostis* sp. 16; *A. stolonifera* 10(1),43; *Alnus glutinosa* a 37(1); *Arrhenatherum elatius* 49(1); *Astragalus glycyphyllos* 38; *Athyrium filix-femina* 18,22,33,40(r),47,51; *Aulacomnium palustre* var. *palustre* 2; *Betonica officinalis* 10,28(1); *Brachythecium rutabulum* 30,39; *Calamagrostis canescens* 50(1); *Campanula patula* s.s. 17,27,28,51,55; *C. rotundifolia* 3; *Carex acutiformis* 46(2); *C. brizoides* 10; *Cladonia* sp. 10; *Clinopodium vulgare* 30; *Crataegus laevigata* c 25(r),26(r),46(r); *C. monogyna* b 17,28,33,42,49,51, c 30,33,38,41,42,46,49; *C. rhipidophylla* var. *rhipidophylla* b 9,24,36,46,47, c 9,19,24,25,26,27,35,52; *Deschampsia flexuosa* 7,20,35(1),42; *Dicranum bonjeanii* 44,45; *Euonymus europaea* c 28; *Euphorbia cyparissias* 20,49; *Fallopia convolvulus* 46; *Festuca pratensis* 49(3); *Galeopsis pubescens* 20,46,49; *G. tetrahit* 7(r),11,15,27,43,48,54; *Galium album* 45; *G. boreale* 54(1); *G. mollugo* 17,28(1),38;*G. palustre* 16; *G. uliginosum* 18,47; *Geum urbanum* 27; *Hieracium barbatum* 43; *H. cymosum* 15,36; *H. murorum* 38,51; *Holcus lanatus* 54; *Impatiens parviflora* 7(1),20,46(1); *Juncus conglomeratus* 11,19,24,34,47; *Kindbergia praelonga* 3,31,34,36,44(1); *Larix decidua* subsp. *polonica* a142(3), b 42(1), c 42(1); *L. decidua* subsp. *decidua* 7(r); *Lepidozia reptans* 9; *Ligustrum vulgare* c 17; *Linaria vulgaris* 49; *Lophocolea bidentata* 17; *Lotus corniculatus* 21,27,47; *L. uliginosus* 43; *Lychnis flos-cuculi* 55; *Mycelis muralis* 5,17,20,31,37,38,40,46,50; *Orthodicranum montanum* 51; *Oxyrrhynchium hians* var. *hians* 45(1); *Padus serotina* b 7, c 7,12,46; *Peucedanum oreoselinum* 54; *Pimpinella saxifraga* 49; *Plagiomnium affine* 18,30,44(1),45(1),47,48; *P. cuspidatum* 38; *Plagiothecium* sp. 11; *Platanthera chlorantha* 55; *Poa compressa* 10,43; *P. pratensis* 10,19,29,43,47,54,55; *P. trivialis* 15; *Polytrichum commune* 21; *Populus tremula* b 8,36,41(1), bc 10,43,55, c 8(1),12,13,14,32(r),36,39(r); *Prunella vulgaris* 11; *Prunus spinosa* c 30,46(r); *Pyrus communis* a 2, b 36, c 2,28,47,49; *Quercus rubra* b 5, c 5,42; *Q. x rosacea* a1,a 30(1),33(2),38(2),1(3), a2 33(1), b 56, c 191),33,56; *Ranunculus sardous* 29; *Rhamnus cathartica* c 28; *Rosa canina* 27; *Rubus caesius* 6,13; *R. corylifolius* 5(1),46; *R. gracilis* 9,23,35,50,52; *R. idaeus* 5,13,17,22,28,30,36,39,46; *R. nessensis* 2,27,36,37,44,45; *R. pallidus* 44,45; *R. plicatus* 4,5,9,25,26,35,47; *R. serpens* 42; *Rubus* sp. 6,8(1),29,30,33,51; *R. sprengelii* 7(1),21,27,32,46; *Rumex acetosella* 13,20; *Salix cinerea* 9,47; *Sciuro-hypnum oedipodium* 3,4,18,24,43,44(1),45(1),53; *Scutellaria galericulata* 46(1); *Selinum carvifolia* 30; *Silene vulgaris* 49; *Sphagnum capillifolium* 2; *S. fimbriatum* 44; *Stellaria graminea* 17,18,43; *Thalictrum aquilegiifolium* 46(1); *Urtica dioica* 3; *Vicia cracca* 28; *V. sepium* 30,38.

Table A4. *Calamagrostio arundinaceae-Quercetum molinietosum* typical variant in stage I of degeneration

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	1-16	17-26
Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
ID-1		30	30	24	33	12	50	12	50	26	12	51	37	30	12	12	12	30	48	48	35	30	48	48	30	48	44		
ID-2		5	5	-	1	1	3	1	3	21	1	1	12	5	1	1	1	5	3	3	20	5	3	3	5	3	4		
ID-3		18	15	-	8	34	12	48	25	1	47	23	22	21	5	27	29	20	19	29	23	26	30	17	13	27	10		
Date (year)		1957	1055	2006	1999	1983	1076	1983	1976	1965	1983	1981	1987	1955	1983	1983	1982	1956	1976	1976	1976	1957	1976	1976	1955	1976	1979	1-16	17-26
Density of tree layer	a1,a [%]	90	50	65	70	65	80	50	85	80	55	60	80	40	60	70	65	50	70	65	60	50	75	85	60	80	60		
Density of tree layer	a2 [%]	-	60	+	5	5	-	30	-	-	10	10	-	-	20	40	5	-	-	-	5	70	-	-	75	-	-	%	%
Density of shrub layer	b [%]	-	10	+	10	+	-	25	-	15	30	50	40	50	50	5	5	30	-	-	20	10	-	-	-	-	10		
Cover of herb layer	c [%]	30	25	40	40	80	40	50	80	70	80	80	95	75	60	75	60	90	90	70	80	50	80	50	25	50	70		
Cover of moss layer	d [%]	5	+	-	10	-	3	10	-	5	5	20	-	5	5	5	10	+	-	+	-	+	+	+	+	-	10		
Area of relevé		900	900	200	300	200	200	200	200	200	200	100	800	400	200	200	100	250	150	200	100	1000	150	200	400	200	400		
Location (ATPOL)		CD73	CD73	BC66	-	CD73	BD28	CD73	BD28	CD64	CD82	CD84	BE03	CD73	CD93	CD83	CD73	CD73	BD39	BD28	CE00	CD73	BD28	BD28	CD73	BD28	DE50		
Total number of species		17	28	30	32	28	15	30	12	29	40	33	21	26	38	34	35	30	24	22	19	19	12	22	20	19	28		
Number of mosses, liverworts and lichens species		1	5	-	7	-	4	3	-	4	7	7	-	1	6	3	5	2	-	7	-	1	3	1	2	-	3		
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*																													
* *Quercus petraea*	a1,a	.	.	.	4	.	5	1	5	.	2	+	1	.	1	3	.	.	.	.	.	.	.	.	.	.	1	56	10
* *Quercus petraea*	a2	.	.	.	+	.	.	+	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	19	—
* *Quercus petraea*	b/c	.	.	/+	+/1	.	/1	/+	/1	.	/1	.	/+	.	/+	/2	.	.	.	.	.	.	.	.	.	.	+/1	56	10
* *Calamagrostis arundinacea* (Qrp)		2	+	2	.	4	3	3	2	+	3	.	.	+	+	+	1	.	.	2	+	+	3	3	+	1	.	81	70
* *Festuca ovina* (Qrp)		.	+	.	.	.	+	.	2	+	+	+	.	.	2	+	1	+	1	1	+	.	+	1	.	.	1	56	70
Hieracium lachenalii		.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	1	.	.	.	.	.	.	1	1	13	30
Hieracium laevigatum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	—	10
Hieracium sabaudum		.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	—
II. D. *Ca-Q molinietosum*																													
Picea abies (V-P)	a1*,a2	.	.	.	.	1	.	1	.	.	.	.	.	.	2	3	.	.	.	.	+	.	.	.	.	.	.	25	10
Picea abies (V-P)	bc*,b	.	+	.	.	.	.	1	.	2*	+	+	.	.	+	+	.	+	.	.	+	+	.	.	.	.	+	44	40
Picea abies (V-P)	c	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	25	10
Quercus robur [Q . x *rosacea* ^]	a1,a	4	3	4	2	4	.	3	.	3	3	4	4	3	4	3	4	3	4^	4^	.	2	3^	3^	2	3^	.	88	80
Quercus robur	a2	.	.	.	+	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	19	—
Quercus robur	b	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	13	10
Quercus robur [Q . x *rosacea* ^]	c	+	.	+	+	1	.	2	.	.	1	+	1	.	1	2	+	.	1^	+^	+	.	1^	1^	+	+^	.	63	60
Frangula alnus	b	+	1	+	1	+	.	2	.	+	3	3	3	3	3	1	1	1	.	.	+	.	.	.	.	.	2	88	30
Frangula alnus	c	+	+	.	1	1	.	1	.	+	1	+	+	1	1	+	+	+	+	.	.	+	.	.	+	+	+	81	60
Molinia caerulea		+	.	1	2	1	1	.	2	.	+	+	3	+	+	+	.	+	2	1	.	.	1	1	.	1	.	75	60
Lysimachia vulgaris		.	+	1	.	1	.	+	.	+	+	.	+	+	+	.	+	.	+	.	.	+	.	.	.	2	.	63	30
Dryopteris carthusiana		.	+	.	.	+	.	+	.	r	.	+	+	+	.	.	+	+	.	.	.	.	.	1	+	+	.	50	40
Trientalis europaea (V-P)		.	.	.	.	+	.	.	.	+	+	+	.	+	+	.	+	1	.	.	1	.	.	.	+	.	1	44	40
Carex pallescens (C-U)		+	+	+	.	+	.	.	.	.	.	+	.	.	+	+	1	+	.	.	.	+	.	.	.	.	.	50	20
Potentilla erecta (C-U)		.	+	.	.	.	.	.	.	+	+	.	.	.	+	+	+	.	.	.	+	.	.	.	.	.	+	38	20
Deschampsia caespitosa		.	.	.	.	+	.	.	.	.	+	.	.	+	+	.	+	.	.	.	.	.	.	+	+	.	.	31	20
Juncus effusus		.	.	.	1	+	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	25	—
Agrostis canina		.	.	.	1	.	.	.	.	.	.	+	.	.	+	+	1	.	.	.	.	.	.	.	.	.	.	31	—
Carex nigra		.	.	.	2	.	.	+	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	31	—
III. Ch., D.* *Quercetea robori-petraeae* (Qrp)																													
Carex pilulifera		+	+	1	1	.	.	+	.	+	+	1	.	1	+	1	+	+	.	+	.	1	.	.	+	.	.	75	40
* *Pteridium aquilinum*		+	.	2	1	.	+	+	2	.	3	.	.	+	.	.	.	1	2	2	3	.	2	+	.	2	2	50	80
Holcus mollis		.	1	.	1	+	.	+	.	1	+	4	.	+	+	+	+	+	.	.	+	+	.	.	1	.	.	69	40
* *Polytrichastrum formosum*		2	1	.	+	.	.	2	.	+	1	2	.	1	1	1	2	+	.	.	.	+	.	.	1	.	1	69	40
* *Melampyrum pratense*		.	+	.	.	+	.	+	.	1	+	.	2	+	+	+	1	+	2	1	.	.	.	.	+	.	.	63	40
Dicranella heteromalla		.	.	.	1	.	+	.	.	+	.	+	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	25	20
IV. Ch. *Vaccinio-Piceetea* (V-P)																													
Pinus sylvestris	a1,a	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.	.	3	4	3	3	3	3	4	3	3	4	13	100
Pinus sylvestris	a2	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	—
Pinus sylvestris	b*,c	.	.	.	1*+	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	19	10
Vaccinium myrtillus		1	2	2	1	1	+	3	4	4	3	3	3	4	4	4	3	4	4	3	3	3	4	2	2	2	2	100	100
Pleurozium schreberi		.	+	.	.	.	.	.	.	+	+	1	.	.	1	+	+	.	.	.	.	.	.	.	.	.	.	44	—
Rubus saxatilis		.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	.	.	.	1	1	.	.	.	13	30
V. Ch. *Querco-Fagetea*																													
Carpinus betulus	a,a2	4	4	.	.	+	.	2	.	3	1	1	.	.	.	.	+	+	.	.	.	3	.	.	4	.	.	50	30
Carpinus betulus	b*,bc	+	+	.	.	.	.	.	.	+*	.	+*	.	1	.	.	.	1	.	.	.	+	.	.	+	.	.	31	30
Carpinus betulus	c	.	.	.	.	+	.	+	.	+	+	r	.	.	+	+	+	.	.	.	+	.	.	.	.	.	.	50	10
Fagus sylvatica	a1,a	.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	2	1	.	.	1	.	.	13	40
Fagus sylvatica	a2	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	6	10
Fagus sylvatica	bc*,b	.	.	.	.	.	.	.	.	.	.	.	.	+*	+	.	.	+*	.	.	2	.	.	.	+*	.	.	13	30
Fagus sylvatica	c	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	.	+	.	.	+	.	.	.	19	20
VI. Ch. *Calluno-Ulicetea* (C-U)																													
Solidago virgaurea s. s.		+	.	.	.	+	.	+	.	.	+	+	.	.	.	.	.	+	1	+	.	.	.	.	.	1	+	31	50
Agrostis capillaris		.	.	.	+	+	.	.	.	.	+	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	2	38	10
Pohlia nutans		.	.	.	+	.	+	.	.	+	+	+	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	31	20
Danthonia decumbens		.	.	.	.	.	.	.	.	+	+	+	.	.	+	+	.	.	.	.	.	.	.	.	.	.	1	31	10
VII. Others																													
Betula pendula	a1,a	.	.	.	.	+	.	1	.	.	.	+	1	.	.	.	1	.	.	.	1	.	.	.	.	.	.	31	10
Betula pendula	a2	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	—
Betula pendula	b/c	.	.	.	2/1	/+	.	/+	.	.	+/+	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	1/+	31	10
Sorbus aucuparia	a2*,b	.	.	+	+	.	.	.	.	.	+*	.	+	.	+	.	.	+*	.	.	.	.	.	.	.	.	+	31	20
Sorbus aucuparia	c	+	+	+	+	+	r	+	+	+	+	+	+	.	+	+	+	+	+	+	.	+	.	+	+	+	+	94	80
Luzula pilosa		+	+	+	.	.	+	+	+	1	+	1	.	+	+	+	1	+	.	1	+	+	.	+	+	1	.	81	70
Maianthemum bifolium		+	+	1	.	+	.	+	.	+	+	1	.	+	+	+	+	1	1	1	+	.	.	.	+	.	.	75	50
Convallaria majalis		+	.	1	.	.	2	1	+	+	.	+	.	.	.	.	+	1	3	1	.	+	2	2	+	1	.	50	80
Rubus sp.		.	+	.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	.	1	19	30
Oxalis acetosella		.	.	+	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	+	.	.	.	.	.	19	20
Rubus idaeus		.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	.	.	.	.	.	.	13	30
Festuca rubra s. s.		.	.	.	.	.	.	.	.	1	+	.	.	.	+	+	.	+	.	.	.	.	.	.	.	.	.	25	10
Rubus plicatus		.	.	.	+	+	.	.	.	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	31	—
Anthoxanthum odoratum		.	.	.	.	.	.	.	.	.	+	+	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	31	—

Sporadic species: III.: *Aulacomnium androgynum* 19; *Herzogiella seligeri* 24; *Lophocolea heterophylla* 16; *Luzula pallescens* 12; *Plagiothecium denticulatum* 7,10; *P. laetum* 6; **IV.:** *Betula pubescens* subsp. *pubescens* a 2(1), b 4(1),14, c 4,13; *Dicranum polysetum* 2; *D. scoparium* 19; *Hylocomium splendens* 7,10,14; *Juniperus communis* b 26; *Leucobryum glaucum* 4(2),10,17,26(1); *Orthilia secunda* 18(1); *Plagiothecium curvifolium* 6,19,22; *Pseudoscleropodium purum* 11(1),15,16; *Thuidium tamariscinum* 2,16; *Vaccinium vitis-idaea* 4,8(1),25,26; **V.:** *Anemone nemorosa* 9(r); *Brachypodium sylvaticum* 3; *Carex montana* 23; *C. sylvatica* 13; *Corylus avellana* c 3; *Equisetum sylvaticum* 26(1); *Fraxinus excelsior* a2 3(1); *Malus sylvestris* c 5,9,10,15,18; *Melica nutans* 6,18(1),23(2); *Milium effusum* 5,13,16,25; *Padus avium* b 3, c 3; *Poa nemoralis* 16; *Sorbus torminalis* 9; *Stellaria holostea* 1,5,7(r),24; *Viburnum opulus* 12; *Viola reichenbachiana* 20; *V. reichenbachiana* et *riviniana* 23(1); *V. riviniana* 3; **VI.:** *Calluna vulgaris* 4,26(1); *Carex ovalis* 5,7,14; *Cladonia coniocraea* 4; *Luzula multiflora* 4,12,13,26; *Nardus stricta* 4,26(1); *Polytrichum juniperinum* 2; *Potentilla anglica* 5; *Scorzonera humilis* 6,18(1),26(2); *Veronica officinalis* 2; **VII.:** *Amblystegium serpens* 4; *Athyrium filix-femina* 12; *Betonica officinalis* 25; *Brachytheciastrum velutinum* 19; *Calamagrostis epigejos* 2,16(1),26; *Campanula rotundifolia* 26; *Carex acutiformis* 3; *C. brizoides* 2,17(1); *C. hirta* 12; *Crataegus laevigata* b 15; *C. rhipidophylla* var. *rhipidophylla* b 10,15, c 15; *Crataegus* sp. b 9, c 9; *Dactylis glomerata* 23(1),25; *Eriophorum angustifolium* 4; *Fragaria vesca* 23; *Galeopsis pubescens* 3; *Galium boreale* 23(1); *G. palustre* 12; *Hypericum maculatum* 15; *Hypnum cupressiforme* 4,19,26(2); *Impatiens parviflora* 3(1); *Kindbergia praelonga* 10; *Lepidozia reptans* 14; *Lophocolea bidentata* 11; *Melampyrum arvense* 1,8,21(1),25; *Osmunda regalis* 4; *Padus serotina* c 3; *Plagiomnium affine* 11,14,23; *Poa angustifolia* 16,18,19; *P. trivialis* 11; *Polygonatum odoratum* 18,23; *Polygonum hydropiper* 4; *Polytrichum commune* 14; *Populus tremula* a 12(1), b 10(1),12(1),16, bc 17, c 3,10,16; *Prunus spinosa* c 3(r); *Pyrus communis* b 5,10, c 7,9,10; *Ranunculus repens* 12; *Rhamnus cathartica* bc 21, c 11; *Rubus caesius* 18; *R. corylifolius* 3(1); *R. gracilis* 5,15; *R. nessensis* 7,10; *Rubus pallidus* 7; *R. sprengelii* 7,14(r); *Serratula tinctoria* 18.

Table A5. *Calamagrostio arundinaceae-Quercetum molinietosum* variant with *Anemone nemorosa* in stage I of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	
ID-1		51	12	12	4	12	4	12	12	12	4	23	51	12	51	51	17	24	12	16	30	12	16	16	12	51	21	21	21	48	17	31	30	23	12	12	31	17	51	
ID-2		1	1	1	50	1	50	1	1	1	50	12	1	1	1	1	11	-	1	21	5	1	17	17	1	1	1	1	1	3	9	2	5	12	1	1	2	9	2	
ID-3		20	6	7	5	18	11	16	19	39	8	11	10	14	8	6	5	-	33	2	12	50	13	12	44	31	7	13	8	20	4	3	11	5	36	41	7	1	2	
Date (year)		1981	1983	1964	1964	1990	1965	1965	1983	1983	1965	1965	1981	1965	1981	1981	1995	2006	1975	1972	1957	1982	1971	1971	1965	1981	1957	1957	1957	1976	1996	1981	1956	1965	1983	1957	1981	1995	1981	1-38
Density of tree layer	a1,a [%]	50	60	70	75	50	85	60	70	55	70	65	60	75	40	30	30	65	60	90	90	40	80	70	80	50	45	20	45	70	50	30	65	60	60	80	70	10	60	
Density of tree layer	a2 [%]	10	-	-	-	-	-	-	-	5	-	-	5	-	-	-	-	-	-	20	-	20	40	10	-	-	20	45	+	-	-	30	-	-	-	-	70	70	-	%
Density of shrub layer	b [%]	40	70	50	5	10	5	+	15	5	30	-	5	10	10	20	35	5	15	40	10	+	20	20	15	20	40	35	15	-	10	-	15	10	15	40	+	+	10	
Cover of herb layer	c [%]	90	30	30	95	60	95	95	80	80	95	90	100	80	100	100	75	60	60	70	30	60	40	100	70	90	85	75	75	90	40	20	60	80	80	30	10	40	70	
Cover of moss layer	d [%]	10	5	20	5	5	-	5	+	+	-	+	+	10	-	20	55	+	+	60	+	+	60	95	5	+	5	15	20	-	+	10	5	25	+	5	10	-	30	
Area of relevé		200	200	300	400	400	400	150	200	200	400	500	200	200	300	200	150	150	200	100	400	200	300	300	200	200	750	700	450	200	150	100	400	500	200	400	100	150	150	
Location (ATPOL)		CD84	CD64	CD62	CC22	CD83	CC22	CD84	CD82	CD83	CB94	CD52	CD83	CD83	CD84	CD84	BC66	BC66	CD74	CE14	CD73	CD64	CD60	CD60	CD63	CD83	CD82	CD82	CD82	BD38	BC66	CD84	CD82	CD53	CD82	CD72	CD84	BC66	CD83	
Total number of species		42	36	26	34	40	24	40	40	38	37	33	41	30	34	35	28	39	27	33	34	29	45	40	30	19	33	34	29	21	24	25	50	41	46	26	23	35	38	
Number of mosses, liverworts and lichens species		6	7	4	1	4	-	2	2	4	-	1	4	3	-	2	1	1	3	10	1	6	8	7	5	2	2	2	3	-	1	1	6	6	4	3	5	-	9	
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*																																								
* *Quercus petraea*	a1,a	.	.	.	.	.	.	.	+	2	.	.	4	2	.	1	.	.	1	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	1	21
* *Quercus petraea*	b/c	.	.	.	.	.	.	.	/+	/+	.	.	.	/+	.	.	.	.	/+	.	.	.	.	.	.	+/1	.	.	.	.	.	.	.	.	.	.	.	.	.	13
* *Festuca ovina* (Qrp)		1	+	+	.	+	.	+	+	+	.	+	+	.	**3**	2	.	.	.	1	.	+	.	.	+	2	2	+	+	1	.	+	.	2	+	+	+	.	**3**	66
* *Calamagrostis arundinacea* (Qrp)		.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	2	2	**3**	**3**	**3**	**3**	2	1	+	.	.	.	+	1	2	.	.	.	.	.	.	+	.	37
Hieracium lachenalii		+	.	+	.	+	+	+	.	+	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	+	.	.	.	1	34
Hieracium laevigatum		.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	11
Hieracium sabaudum		.	+	.	.	.	.	.	.	.	1	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	+	.	.	21
Lathyrus montanus		.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
II. D. *Ca-Q molinietosum*																																								
Picea abies (V-P)	a1*,a2	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	3*2	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Picea abies (V-P)	bc*,b	.	.	.	2	+	.	+	.	+	.	.	1	1	1	2	+	.	+	3	+	.	+	.	2	2	.	.	.	.	.	.	.	.	1	.	.	+	2	47
Picea abies (V-P)	c	.	.	.	+	.	.	+	.	+	.	.	+	.	.	.	.	.	1	.	.	+	1	+	.	.	r	+	r	.	.	.	.	.	.	.	.	.	.	29
Quercus robur [Q . x *rosacea* ^]	a1,a	3	4	4	4	4	5	4	4	3	4	4	.	3	3	2	.	4	3	.	4	3	1	2	3	.	3	2	3^	4^	2^	2	4	4	4	5	4	4	3	89
Quercus robur	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Quercus robur [Q . x *rosacea* ^]	b*,bc	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+^	.	.	.	2^	.	.	.	2^	.	+	.	.	.	.	.	.	13
Quercus robur [Q . x *rosacea* ^]	c	+	1	+	+	+	.	+	+	+	+	+	+	+	1	+	.	+	+	+	.	+	1	1	.	.	1	1	+^	1^	.	+	.	+	+	.	+	+	+	79
Frangula alnus	b	**3**	**4**	**3**	1	2	.	.	2	1	2	.	1	.	+	.	.	1	2	.	2	+	.	1	.	.	+	+	1	.	.	.	2	+	2	1	.	.	.	58
Frangula alnus	c	.	+	2	.	+	.	.	+	+	+	+	+	+	+	+	.	.	+	.	1	+	+	1	+	.	+	+	+	.	.	1	+	+	.	+	+	.	+	68
Carex pallescens (C-U)		+	1	1	2	1	1	+	+	+	+	+	.	+	.	.	.	.	.	.	+	.	+	.	.	.	+	+	.	.	1	+	+	+	+	1	+	+	+	66
Lysimachia vulgaris		1	1	.	+	1	+	+	+	.	+	.	+	+	.	.	+	1	+	1	+	+	+	+	+	.	.	.	+	.	+	1	+	.	.	+	.	.	.	63
Trientalis europaea (V-P)		+	.	.	.	1	.	+	2	1	.	.	+	.	2	1	+	2	+	+	+	1	.	.	+	.	1	1	+	.	1	.	.	2	2	.	.	+	+	61
Dryopteris carthusiana		+	+	.	.	.	+	.	+	+	.	.	.	.	.	.	+	+	+	.	+	+	1	+	r	.	.	+	.	.	+	.	+	.	+	.	.	+	.	47
Deschampsia caespitosa		+	1	+	+	.	.	+	+	+	+	+	.	.	.	.	.	+	.	.	+	.	.	.	.	.	+	+	.	.	.	1	1	.	+	+	.	+	.	47
Potentilla erecta (C-U)		+	.	.	+	+	.	.	+	+	+	.	+	.	.	+	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	+	+	+	.	.	.	.	37
Juncus effusus		+	.	+	.	+	.	+	+	.	.	+	.	.	.	.	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	+	.	34
Molinia caerulea		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	1	.	2	+	.	1	.	.	.	1	1	.	.	.	+	.	.	+	.	26
Agrostis canina		+	1	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	1	+	.	.	21
III. D. *Anemone* var.																																								
Carpinus betulus (Q-F)	a,a2	2	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	2	2	2	1	3	.	2	4	1	.	.	3	.	.	.	.	4	.	.	32
Carpinus betulus (Q-F)	b*,bc	.	.	.	.	.	.	.	.	.	1*	.	.	+*	.	.	.	.	.	.	.	.	2*	2*	+*	.	2*	3*	2*	.	.	.	+	+*	.	3*	+*	.	.	32
Carpinus betulus (Q-F)	c	+	+	+	.	.	.	.	.	+	+	.	.	+	2	+	.	.	+	.	.	1	2	1	+	.	1	.	1	.	.	.	.	.	+	+	.	.	.	45
Oxalis acetosella		1	2	.	.	+	.	1	2	2	1	+	2	2	.	1	1	2	.	3	.	1	1	1	.	1	.	1	+	.	+	.	+	+	2	.	.	1	+	68
Anemone nemorosa (Q-F)		.	.	+	.	1	.	.	+	.	2	1	+	+	1	.	1	+	+	.	+	.	+	1	+	.	+	+	.	+	+	.	+	1	+	.	.	1	.	61
Viola reichenbachiana (Q-F)		+	+	+	1	+	1	+	.	+	+	+	+	+	1	1	.	.	.	2	.	.	+	.	.	+	.	.	.	.	.	.	+	2	+	+	.	+	+	61
Moehringia trinervia		.	+	.	+	.	.	+	+	+	.	+	.	.	.	.	.	r	.	+	.	.	+	.	.	.	.	+	.	.	.	+	.	.	+	+	.	+	.	37
Atrichum undulatum (Q-F)		.	+	+	.	.	.	+	.	.	.	.	+	+	.	.	.	.	+	1	.	+	+	.	+	.	.	.	.	.	.	.	.	+	.	.	1	.	+	34
Hypericum maculatum (C-U)		.	+	.	1	1	2	+	+	+	**3**	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	32
Veronica chamaedrys		.	.	.	2	1	1	+	+	.	2	+	+	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	32
Ajuga reptans (Q-F)		+	.	.	.	+	.	+	+	.	+	+	+	+	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	32
Fragaria vesca		.	.	.	1	.	2	+	+	.	2	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.	.	.	26
Poa nemoralis (Q-F)		.	+	.	.	.	.	+	.	.	.	+	.	.	1	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	+	.	.	.	.	+	+	1	.	26
Stellaria holostea (Q-F)		+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	1	1	2	.	.	1	.	+	.	.	1	.	.	.	.	1	.	.	26
Veronica officinalis (C-U)		.	.	.	.	r	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	+	21
Hypericum perforatum		1	.	.	.	.	.	.	.	.	.	.	1	.	1	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	18
Viola riviniana (Q-F)		.	.	.	2	.	2	.	.	.	1	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	18
IV. Ch., D.* *Quercetea robori-petraeae* (Qrp)																																								
* *Polytrichastrum formosum*		2	1	2	.	+	.	1	+	+	.	.	1	2	.	.	.	+	+	2	+	+	3	3	+	+	1	2	1	.	+	2	+	+	+	+	1	.	1	76
Carex pilulifera		1	+	1	.	+	.	.	.	+	.	+	+	+	1	+	.	2	+	+	+	+	1	2	+	2	+	+	.	.	.	1	+	1	+	+	1	.	1	74
Holcus mollis		2	1	1	**3**	**3**	**3**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**3**	+	.	.	.	.	+	+	2	.	1	2	.	.	.	.	.	1	+	1	2	+	+	.	.	68
* *Melampyrum pratense*		1	+	1	1	1	2	1	+	+	.	.	1	1	1	.	.	.	.	.	+	1	.	.	1	**3**	1	1	+	.	.	+	+	.	+	1	.	.	+	63
* *Pteridium aquilinum*		.	.	.	1	2	1	.	.	.	2	.	2	.	**4**	**4**	**3**	**3**	**3**	**3**	.	+	.	.	.	.	.	.	2	1	1	1	+	2	.	+	.	+	+	55
Dicranella heteromalla		.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	+	+	+	.	.	.	.	.	.	.	+	.	.	.	+	.	+	21
V. Ch. *Vaccinio-Piceetea* (V-P)																																								
Pinus sylvestris	a1,a	.	.	.	.	.	.	.	1	.	.	.	+	.	.	.	2	.	.	**3**	.	.	1	2	.	1	.	.	1	**3**	**3**	.	.	.	.	.	.	2	1	32
Pinus sylvestris	b*,c	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	+	r	r	.	.	.	.	.	.	.	.	.	+	21
Vaccinium myrtillus		1	+	+	.	+	.	.	1	+	.	+	+	+	1	1	2	2	**3**	+	+	2	2	2	**4**	**4**	**4**	**3**	**3**	**5**	1	.	+	+	+	+	+	2	1	87
Pleurozium schreberi		1	.	+	1	+	.	.	.	+	.	.	+	+	.	2	.	.	.	2	.	.	2	4	+	.	.	.	.	.	.	.	+	2	+	+	.	.	1	45
Pseudoscleropodium purum		+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	**4**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	1	16
VI. Ch. *Querco-Fagetea* (Q-F)																																								
Fagus sylvatica	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	5
Fagus sylvatica	bc*,b	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	+	.	.	.	+*	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Fagus sylvatica	c	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	+	.	.	+	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	+	21
VII. Ch. *Calluno-Ulicetea* (C-U)																																								
Agrostis capillaris		3	1	1	1	1	+	1	1	.	.	+	2	+	.	2	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	1	.	.	2	.	.	.	.	42
Pohlia nutans		+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	+	26
Luzula multiflora		.	.	.	.	+	.	+	.	.	.	1	+	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	+	.	.	+	.	.	.	24
Solidago virgaurea s. s.		.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	r	.	.	+	.	.	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	18
VIII. Others																																								
Betula pendula	a1,a	+	.	.	.	.	1	.	.	.	.	.	.	.	.	.	2	2	3	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	16
Betula pendula	b/c	/+	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/+	.	.	11
Sorbus aucuparia	a2*,b	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	+	+	+	.	.	.	.	1	.	.	.	.	.	21
Sorbus aucuparia	c	+	+	.	+	+	+	+	+	+	+	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	1	+	+	+	+	+	.	+	.	+	.	+	.	84
Maianthemum bifolium		1	+	.	+	1	2	+	.	1	2	3	+	+	1	1	1	1	+	1	+	+	1	2	+	+	+	+	1	.	+	+	+	3	1	.	+	+	+	89
Luzula pilosa		1	+	.	1	1	.	+	+	+	+	1	+	+	1	1	.	.	+	+	+	+	+	.	1	2	+	1	+	+	+	1	.	1	+	.	1	+	1	82
Anthoxanthum odoratum		1	+	+	.	1	.	2	+	.	.	+	1	+	2	1	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	+	1	+	+	2	.	.	1	53
Festuca rubra s. s.		1	.	+	.	+	.	.	1	.	.	.	1	+	.	**4**	.	.	.	.	+	.	.	.	1	.	+	.	.	1	.	+	2	.	2	.	.	.	+	39
Convallaria majalis		.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	1	1	1	.	+	+	2	2	r	.	.	.	+	1	.	+	.	.	.	.	1	1	.	37
Calamagrostis epigejos		.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.	1	+	.	+	1	1	.	.	.	+	.	.	1	.	+	+	.	32
Poa angustifolia		1	.	.	.	+	.	.	.	.	.	.	1	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	21

Sporadic species: IV.: *Aulacomnium androgynum* 21; *Lophocolea heterophylla* 2,21; *Luzula pallescens* 5; *Mnium hornum* 19(2); *Plagiothecium denticulatum* 2(1); *P. laetum* 1,12,21,22,36; **V.:** *Betula pubescens subsp. pubescens* a 20(1), a2 22(1),23(1), c 19(1),22,23(1),35; *Dicranum polysetum* 9,22(1),23(1),32; *D. scoparium* 23(2); *Galium rotundifolium* 7; *Hylocomium splendens* 32; *Juniperus communis* c 1,8,12,14,34,38; *Leucobryum glaucum* 9,19,25,28,34,38(2); *Rubus saxatilis* 17,22,23(1),29(1),33(1); *Thuidium tamariscinum* 19(1),35; *Vaccinium vitis-idaea* 28; **VI.:** *Brachypodium sylvaticum* 16; *Campanula persicifolia* 4,33; *Carex digitata* 18,19(1); *Corylus avellana* b 16(3),17(1),33(1), bc 16, c 17(1),33; *Dactylis polygama* 23(1); *Dryopteris filix-mas* 27; *Festuca gigantea* 37; *F. heterophylla* 4,22,23(2),33; *Fraxinus excelsior* b 6, c 6; *Galium odoratum 7; Hedera helix* c 20; *Lilium martagon* 17,29(1); *Malus sylvestris* a 3, bc 23,32, c 9,24,26,27,28,29,34; *Melampyrum nemorosum* 33(1); *Melica nutans* 17,19(2),29(1),37(1); *Milium effusum* 8,17,18(1),20,27; *Padus avium* b 16(1),37; *Platanthera bifolia* 5,14,15(1); *Polygonatum multiflorum* 3,20,21; *Pulmonaria obscura* 33(r); *Ranunculus auricomus* 4; *Scrophularia nodosa* 3,8,10; *Sorbus torminalis* c 24; *Viburnum opulus* c 5,10; **VII.:** *Carex ovalis* (CU) 8,9,11,23(1),32,34; *Genista germanica* 10; *G. tinctoria* 33; *Hieracium pilosella* 15,38(1); *Nardus stricta* 3; *Viola canina* 15; *Danthonia decumbens* 32; **VIII.:** *Abies alba* c 1; *Achillea millefolium* 14; *Agrostis gigantea* 20,32,38; *A. stolonifera* 32; *Alnus glutinosa* 18; *Anthriscus sylvestris* 10; *Athyrium filix-femina* 10,30; *Brachythecium rutabulum* 33; *Campanula patula* s.s. 7,12,14,32,35; *C. rapunculoides* 15; *C. rotundifolia* 4(1),6; *Carex acutiformis* 17(1); *C. brizoides.* 32; *C. canescens* 2; *C. divulsa* 19; *C. hirta* 23; *C. nigra* 2,8,9,34,37; *Chamaenerion angustifolium* 2(r); *Clinopodium vulgare* 7,33; *Crataegus laevigata* b 17; *C. monogyna* b 1(1),2,12,24,26,27, bc 20(r),32, c 1,2,23,24,27; *C. rhipidophylla* var. *rhipidophylla* b 9, c 9,34; *Dactylis glomerata* 16; *Deschampsia flexuosa* 16(2),19(1),23(4),30(2),37; *Euonymus europaea* c 7; *Fallopia convolvulus* 37(1); *Galeopsis pubescens* 6,10,22; *G. tetrahit* 7,8,9,34,37(r),38; *Galium boreale* 4,6(1),29(1); *G. mollugo* 4,6(1),10,12,14(2),15; *G. uliginosum* 32,34; *G. verum* 11,14(1); *Geranium robertianum* 10; *Geum urbanum* 15; *Hepaticae* indet. 38; *Hieracium murorum* 2,11(1),26,28,33(1); *Holcus lanatus* 27; *Hypnum cupressiforme* 5,17,19(2),23,26,27,28(1); *Impatiens parviflora* 17,37(2); *Juncus conglomeratus* 12,34; *Kindbergia praelonga* 3,8; *Lapsana communis* s.s. 10; *Larix decidua* ssp. *polonica* a1 22(4),23(3), c 22(1); *Lathyrus pratensis* 4(2); *Lepidozia reptans* 2; *Lophocolea bidentata* 22; *Lotus corniculatus* 7,13; *L. uliginosus* 32; *Lysimachia nummularia* 17(r),32; *Melampyrum arvense* 23(1); *Mycelis muralis* 7,10(1),26,28,37; *Padus serotina* b 37, c 17; *Peucedanum oreoselinum* 29; *Phleum pratense* 7; *Pimpinella saxifraga* 14; *Plagiomnium affine* 2,3,19(2),33(r); *P. elatum* 19(1); *Plagiothecium* sp. 38(1); *Poa compressa* 3; *P. palustris* 32; *P. pratensis* 7,11,13,26,27,32,34; *P. trivialis* 33,37(1); *Polygonatum odoratum* 33; *Populus tremula* a 4(1), c 1,4,27; *Prunus spinosa* c 20,37; *Pyrus communis* c 5,8,9,24; *Quercus rubra* c 22; *Ranunculus acris* s.s. 7,32; *R. repens* 17(r); *Rosa canina* c 8,34; *Rubus caesius* 16(3),29(1),30; *R. corylifolius* 17(1); *R. gracilis* 1,9,12,34; *R. idaeus* 10(1),16(2),17(2),30,34,37(2),38; *R. nessensis* 18; *Rubus plicatus* 2,9; *R. serpens* 22(1),23; *Rubus* sp. 20,27; *R. sprengelii* 5,16,17,24,35; *Rumex acetosa* 7,11; *R. acetosella* 7,14(1),19,38; *Salix caprea* c 26,27; *Sambucus nigra* c 30; *Sanguisorba officinalis* 16; *Sciuro-hypnum oedipodium* 5(1),33; *Scutellaria galericulata* 17; *Sedum maximum* 14(1),15; *Stellaria graminea* 4,10(1),11,13,32; *Thuja gigantea* c 22; *Torilis japonica* 4,6,10; *Trifolium alpestre* 4; *Urtica dioica* 10; *Vicia cracca* 15.

Table A6. *Calamagrostio arundinaceae-Quercetum molinietosum* in stage II of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
ID-1		51	30	51	51	31	21	21	51	21	51	51	51	37	51	51	51	51	51	23		12	39	19	12	51	12	51	51	51	51	12	21	31	51	51	30	30	37	51	35	51	51	12	5	51	44	39	55	
ID-2		1	5	2	2	2	1	1	3	1	1	1	1	12	1	1	1	1	2	12		1	31	2	1	1	1	1	1	2	1	1	1	4	1	2	5	5	12	1	29	1	3	1	2	3	4	31	17	
ID-3		22	2	19	17	4	21	28	1	29	24	27	30	3	15	16	17	2	20	2		32	12	18	10	21	20	25	26	14	29	43	30	7	32	16	33	29	23	34	11	33	3	1	9	2	8	13	5	
Date (year)		1981	1956	1981	1981	1981	1957	1957	1981	1957	1980	1980	1981	1986	1981	1981	1981	1981	1981	1965	1-19	1984	1991	1985	1983	1980	1964	1980	1980	1980	1981	1983	1957	1980	1980	1981	1955	1956	1987	1981	1976	1981	1980	1957	1994	1980	1979	1991	1994	20-47
Density of tree layer	a1,a [%]	60	60	50	60	40	30	50	60	70	70	50	70	70	60	70	70	70	70	70		75	50	40	60	45	60	60	55	60	70	60	40	40	65	70	50	70	70	40	50	70	70	80	70	40	40	65	80	
Density of tree layer	a2 [%]	-	-	30	40	60	20	15	30	20	15	-	-	50	15	20	-	20	10	-		-	5	30	-	-	-	40	-	10	-	10	40	40	15	50	20	-	20	-	-	5	-	-	-	15	-	5	-	
Density of shrub layer	b [%]	60	+	10	+	20	40	40	20	+	5	-	30	10	5	+	20	10	10	40		+	5	70	55	80	+	40	+	20	30	15	+	15	25	20	10	70	30	35	30	10	10	30	15	20	+	+	5	
Cover of herb layer	c [%]	70	70	60	90	80	90	70	95	50	90	90	70	100	40	90	90	90	80	80	%	75	80	60	30	60	60	90	60	70	60	80	70	80	75	60	80	60	60	65	100	90	30	60	50	90	90	20	30	%
Cover of moss layer	d [%]	10	10	10	+	10	10	20	20	15	-	+	10	+	25	20	-	20	+	5		+	+	5	10	20	+	+	+	50	30	+	+	5	+	+	+	5	-	10	10	10	-	10	+	+	5	5	5	
Area of relevé		200	800	100	200	100	900	1000	200	450	100	100	100	900	100	100	100	200	200	200		200	700	400	200	100	400	200	100	200	200	200	600	100	100	100	400	500	800	120	200	100	100	600	80	100	600	200	200	
Location (ATPOL)		CD84	CD73	CD84	CD83	CD84	CD82	CD82	CD84	CD82	CD84	CD84	CD83	BD80	CD83	CD83	CD93	CD84	CD83	CD53		BD66	BE15	DD81	CD64	CD84	BD66	CD83	CD84	CD84	CD83	CD83	CD82	CD84	CD84	CD83	CD73	CD73	BE03	CD84	CE01	CD84	CD83	CD72	BC98	CD84	DE50	BE15	BC73	
Total number of species		36	41	29	31	35	48	37	30	24	27	20	23	26	27	37	20	34	25	32		27	25	21	32	22	29	26	18	32	25	30	29	18	15	21	18	26	18	18	26	31	14	15	21	14	37	31	15	
Number of mosses, liverworts and lichens species		5	7	4	3	4	9	4	7	2	-	1	1	4	2	5	-	5	1	4		3	3	2	4	2	1	7	1	11	1	3	2	3	1	2	1	6	-	2	3	6	-	2	3	1	2	8	3	
I. Ch., D.* *Quercetea robori-petraeae*																																																		
Carex pilulifera		+	+	+	.	1	1	1	+	1	1	r	2	+	1	+	+	+	+	.	89	+	+	.	1	.	.	1	1	+	1	1	+	2	2	+	.	+	.	.	+	2	2	+	+	+	+	+	+	79
* *Polytrichastrum formosum*		1	2	r	+	+	2	2	2	2	.	+	2	+	2	1	.	1	+	+	89	.	.	1	2	2	+	+	+	2	3	+	1	1	+	.	+	1	.	1	+	2	.	2	.	+	1	1	+	79
Holcus mollis		2	+	.	+	2	1	1	.	+	2	1	2	3	3	3	3	2	+	2	89	+	+	+	3	3	4	3	1	.	+	+	1	.	1	.	.	.	+	1	+	4	.	+	.	.	.	.	.	61
Festuca ovina		1	.	+	.	+	.	.	+	+	2	.	2	1	2	.	.	+	+	+	63	2	.	.	+	2	1	+	1	2	2	+	+	.	2	+	.	.	+	+	+	+	+	2	.	.	.	.	.	64
* *Melampyrum pratense*		+	2	.	.	+	1	1	+	1	1	1	2	3	1	1	.	.	.	1	74	.	.	+	+	.	+	.	+	+	2	+	1	1	2	.	.	+	+	.	.	+	+	3	.	.	1	.	.	57
* *Pteridium aquilinum*		.	.	3	3	+	.	.	2	.	+	2	.	.	.	1	.	+	2	2	53	4	.	+	.	.	+	2	2	.	.	.	+	.	.	+	2	.	.	.	1	+	.	.	3	5	2	+	+	54
Dicranella heteromalla		.	+	.	.	+	.	.	+	.	.	.	.	+	.	.	.	.	.	.	21	.	+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	+	1	25
Plagiothecium laetum		.	.	.	+	+	.	.	+	.	.	.	.	.	.	+	.	+	.	.	26	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	14
II. D. *Ca-Q molinietosum*																																																		
Quercus robur	a1,a	4	4	.	.	2	3	3	.	4	.	.	.	.	.	2	3	.	.	4	47	.	.	.	4	3	.	2	.	2	4	4	3	3	4	.	1	4	4	3	.	1	.	5	4	2	1	.	.	64
Quercus robur	a2	.	.	1	.	.	.	.	.	1	.	.	.	.	.	1	.	1	.	.	21	.	.	2	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	+	.	.	.	.	.	.	.	14
Quercus robur	b,bc^	.	+^	.	.	.	1	1	+	+	.	.	.	.	.	.	.	.	.	.	26	.	+	2	.	.	.	.	.	.	.	.	.	.	.	.	.	+^	+	.	2	.	.	.	.	.	.	.	.	18
Quercus robur	c	+	.	+	.	.	1	1	.	1	.	.	.	.	.	.	1	.	.	+	37	.	+	+	1	+	.	+	.	+	+	+	1	+	.	+	.	.	+	+	+	+	.	+	.	.	.	+	.	61
Frangula alnus	b	4	+	1	+	2	+	r	2	1	.	.	1	+	1	1	2	1	.	+	84	+	1	4	4	4	.	.	+	2	2	2	+	.	2	+	+	4	3	3	1	2	2	2	2	2	2	+	+	89
Frangula alnus	c	+	+	.	+	+	.	+	+	+	+	r	.	+	+	1	1	+	+	+	84	.	.	.	1	2	+	+	+	+	1	+	+	+	2	+	+	1	+	1	.	+	1	1	.	2	+	+	1	82
Molinia caerulea		.	.	1	1	+	.	.	2	+	1	.	2	.	.	.	.	+	2	.	47	.	+	2	+	.	.	.	.	2	1	.	.	.	+	1	1	+	2	2	.	1	2	+	.	1	.	+	+	61
Trientalis europaea (V-P)		.	.	.	.	.	+	1	2	+	1	+	2	.	.	+	.	.	.	1	47	.	.	+	1	+	.	+	2	1	.	+	+	+	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	46
Carex pallescens (C-U)		.	+	.	+	+	+	+	.	.	.	.	1	1	1	.	.	.	.	+	47	+	.	.	+	1	+	.	.	.	.	+	1	+	.	.	.	+	.	1	+	.	.	.	.	.	+	.	.	39
Lysimachia vulgaris		+	+	+	+	1	+	+	.	r	.	r	.	.	.	.	.	.	.	+	53	.	.	.	.	1	.	.	.	.	+	+	.	1	.	.	.	.	+	.	.	.	.	.	+	+	+	.	.	29
Deschampsia caespitosa		+	+	.	.	1	1	1	.	.	.	.	.	.	+	2	1	+	.	.	47	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	14
Potentilla erecta (C-U)		+	+	.	+	+	.	.	.	.	.	.	.	.	+	1	.	.	.	+	37	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	7
Juncus effusus		+	.	.	.	+	.	.	.	.	.	.	1	+	+	+	.	+	.	.	37	.	.	.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	14
Carex nigra		2	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	+	.	.	16	+	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	21
III. D. *Anemone* var. (rich var.)																																																		
Oxalis acetosella		1	+	2	.	1	+	1	.	+	2	+	1	.	2	.	3	2	2	1	79	.	1	+	+	.	.	+	1	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29
Anemone nemorosa (Q-F)		+	+	.	1	+	+	+	+	+	.	+	.	.	+	r	1	+	r	1	79	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Viola reichenbachiana (Q-F)		+	.	+	+	+	.	.	.	.	2	.	.	.	.	1	.	+	+	1	47	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Poa nemoralis (Q-F)		.	1	+	.	.	1	.	.	.	1	.	1	+	+	.	.	.	.	1	42	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Stellaria holostea (Q-F)		.	+	.	.	2	+	1	.	1	.	.	.	.	.	.	.	.	.	1	32	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Atrichum undulatum (Q-F)		.	+	.	.	1	.	.	1	.	.	.	.	+	.	.	.	+	.	.	26	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
IV. *Vaccinio-Piceetea* (V-P)																																																		
Pinus sylvestris	a1,a	+	.	3	3	.	.	.	1	.	2	.	1	.	.	.	.	1	2	.	42	.	2	2	.	.	.	2	.	+	.	.	.	.	.	3	3	.	.	.	3	.	2	.	.	.	3	.	.	32
Pinus sylvestris	c	.	.	.	+	.	+	+	r	.	.	.	+	.	.	+	.	.	.	.	32	.	.	.	.	.	.	+	.	.	+	.	r	.	.	+	.	.	.	.	+	.	r	.	.	.	.	.	.	21
Picea abies	a1,a	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	2	.	.	.	1	.	.	.	1	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	4	.	21
Picea abies	a2	.	.	2	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	16	.	1	.	.	.	.	.	.	2	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	1	.	14
Picea abies	b	+	+	+	+	.	+	.	.	.	1	.	2	1	.	+	.	+	1	.	58	.	.	.	.	.	.	3	.	1	2	+	.	.	+	2	.	+	.	1	.	.	+	2	.	.	.	.	.	36
Picea abies	c	+	+	.	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	26	+	+	.	.	.	.	.	.	+	+	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	+	r	32
Vaccinium myrtillus		1	+	1	3	3	3	5	5	4	4	3	4	3	1	+	.	2	+	2	95	2	1	2	2	+	2	4	3	4	3	5	3	3	4	3	4	4	3	2	+	2	2	2	.	1	1	+	+	96
Pleurozium schreberi		.	2	.	+	.	+	.	+	.	.	.	.	.	+	.	.	1	.	1	37	.	+	.	.	.	.	.	.	1	.	.	.	.	.	.	.	+	.	.	1	+	.	+	.	.	1	1	.	29
Pseudoscleropodium purum		+	+	1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	21	+	.	.	.	.	.	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14
V. Ch. *Calluno-Ulicetea* (C-U)																																																		
Agrostis capillaris		+	+	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	26	.	.	+	.	+	.	.	.	+	1	+	.	.	.	.	.	+	.	.	+	.	.	.	+	.	4	.	.	32
Pohlia nutans		.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	11	.	+	.	.	.	.	+	.	+	.	+	.	.	.	+	.	+	.	.	.	.	.	.	+	.	.	1	1	32
VI. Others																																																		
Quercus petraea	a1,a	.	.	.	2	1	.	.	3	.	3	3	4	3	4	3	2	4	3	.	63	4	.	.	.	.	4	1	3	3	1	1	.	.	.	2	.	.	.	.	.	4	3	.	.	.	.	.	.	36
Quercus petraea [*Q.* x *rosacea*^]	a2	.	.	.	3	.	1^	1^	2	.	1	.	.	2	2	1	.	1	2	.	53	.	.	.	.	.	.	3	.	+	+	+	.	.	.	2	.	.	.	.	.	1	.	.	.	.	.	.	.	21
Quercus petraea [*Q.* x *rosacea*^]	b	.	.	.	.	.	+^	1^	+	.	1	.	.	1	.	.	.	.	1	.	32	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	7
Quercus petraea [*Q.* x *rosacea*^]	c	.	.	.	+	.	+^	+^	+	.	.	r	3	.	+	r	.	1	+	.	53	+	.	.	.	.	1	+	+	1	.	+	.	.	.	1	.	.	.	.	.	1	.	.	+	.	.	.	.	32
Carpinus betulus (Q-F)	a1,a	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	.	.	.	.	.	.	.	.	.	.	.	7
Carpinus betulus (Q-F)	a2	.	.	.	.	3	2	2	2	2	.	.	.	.	.	.	.	.	.	.	26	.	.	.	.	.	.	.	.	.	.	2	3	3	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	14
Carpinus betulus (Q-F)	b,bc^	.	+^	.	.	1	3	3	.	1	.	.	.	.	.	.	.	.	.	.	26	.	.	.	.	.	.	+	.	.	.	+	2	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	+	18
Carpinus betulus (Q-F)	c	+	.	.	.	+	1	1	+	.	+	r	.	.	.	+	.	.	.	.	42	+	.	.	+	.	2	.	r	+	.	+	1	+	.	.	.	.	.	r	.	+	.	.	.	+	1	.	+	46
Fagus sylvatica (Q-F)	a1,a	.	.	.	.	+	.	.	1	2	+	.	.	.	.	.	.	.	.	.	21	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.	14
Fagus sylvatica (Q-F)	a2	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	7
Fagus sylvatica (Q-F)	b/c	.	.	.	.	.	+/+	1/+	/1	/+	.	.	.	.	/r	.	.	.	.	.	26	.	.	.	/+	.	/+	.	.	/+	.	+/+	+/1	.	.	.	1/	.	.	.	.	+/	/+	.	.	.	.	.	.	29
Betula pendula	a1,a	.	+	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	16	2	1	2	.	.	.	.	.	.	.	.	.	.	1	1	.	+	1	.	.	.	+	.	.	1	.	1	.	36
Betula pendula	a2	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	.	.	7
Betula pendula	b/c	.	/+	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	+/	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	/+	.	.	.	.	+/+	+/	.	18
Sorbus aucuparia	a2	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	1	.	.	.	.	.	.	.	.	.	.	11
Sorbus aucuparia	b	.	.	+	.	.	+	+	1	1	.	.	.	1	.	.	1	.	.	1	42	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	+	.	.	+	.	.	.	1	+	+	.	25
Sorbus aucuparia	c	+	+	+	+	+	+	+	+	+	+	r	+	+	+	+	1	+	+	1	100	+	.	+	+	+	+	.	+	+	.	.	1	+	.	+	+	+	1	r	+	+	.	.	.	+	+	.	+	68
Luzula pilosa		1	+	+	+	2	+	+	1	+	1	+	2	.	1	1	2	1	+	.	89	+	1	+	+	1	+	1	1	1	+	+	+	2	1	+	+	+	.	+	+	+	+	.	.	.	+	+	r	86
Maianthemum bifolium		1	+	1	2	+	1	1	1	+	+	1	1	.	1	+	2	.	+	2	89	.	.	1	1	.	.	.	2	+	+	+	+	2	.	.	.	+	.	+	.	2	+	+	.	1	.	.	.	50
Dryopteris carthusiana		+	.	.	1	.	1	1	+	1	+	.	+	.	.	+	1	.	+	.	58	+	1	+	+	+	+	.	.	+	.	+	+	+	.	.	+	.	.	.	1	+	.	.	.	.	.	+	2	54
Calamagrostis epigejos		1	+	.	+	.	1	.	+	.	+	1	1	.	1	+	1	1	.	.	63	+	2	.	.	.	+	.	2	.	+	.	1	.	.	.	.	.	.	.	2	.	.	.	.	.	2	+	.	32
Anthoxanthum odoratum		.	+	.	+	.	+	+	.	.	.	.	.	+	.	.	2	.	+	+	42	.	.	+	+	+	+	.	.	+	.	+	+	.	.	.	.	.	.	+	.	.	.	1	.	.	.	.	.	32
Rubus idaeus		+	.	1	3	.	.	.	+	.	1	r	.	.	r	r	+	+	+	.	58	.	2	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	+	.	.	.	+	.	.	.	.	14
Festuca rubra s. s.		1	+	.	.	2	1	1	.	.	.	.	1	.	.	1	.	1	.	.	42	.	.	.	.	1	+	.	.	.	2	.	.	.	.	.	.	+	.	.	.	+	.	.	1	.	.	.	.	21
Moehringia trinervia		.	.	+	2	.	.	+	.	.	.	.	.	.	.	.	.	1	1	.	26	+	.	.	+	.	+	.	.	.	.	.	.	.	.	+	.	.	+	.	+	.	.	.	+	.	.	.	.	25

Explantion: Q-F - *Querco-Fagetea*

Sporadic species: I.: *Aulacomnium androgynum* 36; *Calamagrostis arundinacea* 35(1); *Hieracium lachenalii* 45(1); *H. sabaudum* 46; *Lophocolea heterophylla* 23; *Plagiothecium denticulatum* 23,30; **IV.:** *Betula pubescens* subsp. *pubescens* a,a2 22(1),23,36(1),46(1), b 21,37,46(1), c 21,22,23,25,29,35,46; *Dicranum polysetum* 8,28,46; *D. scoparium* 6,26,36,46; *Dryopteris dilatata* 21; *Hylocomium splendens* 1,28; *Juniperus communis* b 33, c 10,24,26,34; *Leucobryum glaucum* 6,28(1),36,46; *Monotropa hypopitys* s.s. 45(1); *Rubus saxatilis* 19(1); *Thuidium tamariscinum* 1,6,7; *Vaccinium vitis-idaea* 45; **V.:** *Calluna vulgaris* 45; *Carex ovalis* 7,13,15,20,24; *Danthonia decumbens* 45(1); *Genista tinctoria* 37; *Hieracium pilosella* 45(1); *Hypericum maculatum* 2,6,19,25; *Luzula multiflora* 2,6,7,31,42; *Nardus stricta* 41; *Polytrichum juniperinum* 19; *Solidago virgaurea* s.s. 2,6,17,19(1),23,27(r),37,44,45; *Veronica officinalis* 2,6,13,17,45(1); *Viola canina* 45; **VI.:** *Abies alba* c 39; *Acer pseudoplatanus* (QF) b 39; *Agrostis canina* 1(2),15(1),25,29(3),30,38; *A.* cfr. *canina* 36; *A. gigantea* 2,7,10,15(1),24(1),38(1); *Agrostis* sp. 24; *A. stolonifera* 2; *Ajuga reptans* (QF) 4,5,19; *Alnus glutinosa* b 37; *Arrhenatherum elatius* 13; *Athyrium filix-femina* 6(1),45; *Aulacomnium palustre* var. *palustre* 24; *Brachypodium sylvaticum* (QF) 43(1); *Brachytheciastrum velutinum* 2,6; *Brachythecium rutabulum* 2; *Campanula persicifolia* (QF) 19; *C. rotundifolia* 45; *Carex brizoides* 2(4); *C. hirta* 15,16(1); *Carex* sp. 32; *Chamaenerion angustifolium* 21,46; *Convallaria majalis* 4(1),5(1),6,7,8,9(r),30,31,32(1),35,44(1); *Corylus avellana* (QF) b 19(3), c 19,21; *Crataegus laevigata* b 9(r); *C. monogyna* b 6,7,15(1), c 1,5,6,7,15; *C. rhipidophylla* var. *rhipidophylla* c 14,23(r); *Crepis paludosa* 4,34; *Dactylis polygama* (QF) 43; *Deschampsia flexuosa* 21(3),23,39,45,46(2); *Dryopteris filix-mas* (QF) 6(r),9,25,26,39; *Epilobium montanum* 3; *Equisetum sylvaticum* 45(1); *Festuca gigantea* (QF) 10(1),17,43; *F. heterophylla* (QF) 19(1); *Fragaria vesca* 1,3,30,25,29; *Galeopsis tetrahit* 1,3(2),4,5,8,16(1),17,34; *Galium aparine* 13; *Geranium robertianum* 4; *Hieracium murorum* 3; *Holcus lanatus* 31,46; *Hypericum perforatum* 14,15,16(1),26,45; *Hypnum cupressiforme* 6(1),7,9,23,26,31,40,46(1); *Impatiens noli-tangere* (QF) 10; *I. parviflora* 3(2),17,18(2),21,39,43; *Juncus conglomeratus* 2; *Kindbergia praelonga* 20; *Larix decidua* subsp. *decidua* a,a2 20(1),46, b 21, c 46; *Lophocolea bidentata* 40; *Lysimachia thyrsiflora* 43(r); *Malus sylvestris* (QF) a 6(1), b 6(r),7, c 6,7,20,30; *Melica nutans* (QF) 25; *Milium effusum* (QF) 1,7,11(1),30,33(1),35,40; *Mycelis muralis* 4,19,20,45(1),46; *Orthodicranum montanum* 6; *Padus serotina* b 43(1); *Peucedanum oreoselinum* 45; *Plagiomnium affine* 3(1),13,15(1),17,20,22,38; *Plagiomnium rostratum* 39(1); *Plagiothecium* sp. 1,26; *Poa angustifolia* 6(5),14,15,16(1),23; *P. pratensis* 2,25; *P. trivialis* 13,16(1); *Polygonatum multiflorum* (QF) 6;*Polygonum hydropiper* 31; *Polytrichum commune* 6; *Populus tremula* a1 13(3), a2 13(3),37(2), b 13, bc 2, c 37,40; *Prunus spinosa* c 30; *Pyrus communis* a 36, b 37, c 1,18; *Quercus cerris* b 30; *Q. rubra* a 47(4), b 13, c 13,20,45(1),47(2); *Rhamnus cathartica* c 40; *Ribes spicatum* (QF) 43; *Robinia pseudacacia* a1 37(1), b 37, c 37; *Rubus caesius* 5; *R. corylifolius* 26; *R. gracilis* 3(1); *R. nessensis* 23,30(r); *R. plicatus* 40; *Rubus* sp. 6,7,22,31,39(4),45(2),46; *R. sprengelii* 25; *Rumex acetosella* 21,45(1),46; *Sambucus nigra* c 3; *S. racemosa* b 39(1); *Scirpus sylvaticus* 14,15; *Sciuro-hypnum oedipodium* 8,19,28,43; *Senecio vulgaris* 46; *Sorbus torminalis* (QF) c 23; *Sphagnum capillifolium* 7; *Stellaria media* 46; *Ulmus minor* (QF)i c 6; *Urtica dioica* 18; *Veronica chamaedrys* 17,19(1); *Viola riviniana* (QF) 7.

Table A7. *Calamagrostio arundinaceae-Quercetum petraeae molinietosum* (relevés 1-15) and *Ca-Qp typicum* (relevés 16-39) in stage III of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	
ID-1		37	30	51	51	12	19	30	37	48	48	17	19	39	31	31		17	5	35	35	55	12	18	23	37	35	37	24	47	35	39	44	39	31	31	38	39	27	29	29	
ID-2		14	5	1	1	1	2	5	14	3	3	9	2	31	4	4		9	2	20	29	16	2	1	12	14	20	14	-	176	29	28	4	31	4	4	6	31	1	10	10	
ID-3		3	28	13	11	42	16	31	2	26	31	3	12	9	4	5		7	8	2	5	4	32	36	14	8	15	18	-	9	6	5	13	8	9	12	6	4	28	1	2	
Date (year)		1986	1955	1981	1981	1955	1983	1956	1986	1976	1976	1995	1985	1991	1981	1981	1-15	1995	1994	1975	1976	1993	1965	1989	1965	1984	1977	1987	1995	1983	1976	1992	1977	1991	1980	1980	1984	1991	1975	1980	1980	16-39
Density of tree layer	a1,a [%]	50	70	50	70	80	30	70	40	50	40	70	50	45	40	50		20	80	45	70	70	50	80	70	80	80	50	40	55	50	40	50	25	40	40	60	40	60	70	70	
Density of tree layer	a2 [%]	5	20	10	-	20	40	-	40	60	-	-	70	15	70	50	%	70	-	-	-	-	75	-	-	25	5	30	-	-	-	40	5	60	60	60	-	20	-	-	-	%
Density of shrub layer	b [%]	65	20	20	20	30	80	50	35	-	-	10	90	-	+	+		+	10	40	+	20	10	-	5	5	+	30	+	20	40	15	10	10	5	-	5	20	1	1	5	
Cover of herb layer	c [%]	95	80	100	100	60	60	90	95	80	60	50	30	60	10	10		35	15	80	70	30	70	100	95	70	90	45	80	90	95	65	80	90	30	5	85	100	30	40	40	
Cover of moss layer	d [%]	10	20	10	-	5	3	+	-	-	-	10	15	5	10	20		+	+	20	90	70	+	-	+	+	+	5	40	50	60	70	60	5	60	10	+	+	40	35	30	
Area of relevé		900	400	150	150	400	400	300	800	200	200	120	400	400	200	200		150	80	100	300	100	200	150	200	300	100	600	200	200	150	600	400	600	100	200	200	500	150	200	100	
Location (ATPOL)		BD92	CD73	CD84	CD83	CD73	CD93	CD73	BD80	BD28	BD28	BC66	DD92	BE15	CD83	CD83		BC66	BC98	CE00	CE00	BC64	CD83	BD44	CD53	BD81	CE01	BD81	CC80	BD08	CE01	BE15	DE31	BE15	CD84	CD83	AD76	BE15	BD54	CD17	CD17	
Total number of species		26	34	26	25	32	24	20	16	15	11	23	18	24	17	21		27	25	28	25	36	16	8	13	23	20	17	21	13	27	21	33	29	17	12	16	22	12	16	19	
Number of mosses, liverworts and lichens species		5	4	1	-	5	2	4	-	-	-	1	3	4	1	4		2	2	1	3	4	1	-	5	5	1	1	2	3	4	3	6	7	4	1	1	3	4	8	8	
I. Ch., D.* *Quercetea robori-petraeae*																																										
* Polytrichastrum formosum		+	2	.	.	1	.	+	.	.	.	.	1	.	2	2	47	.	.	.	+	.	+	.	+	.	.	.	.	.	+	1	+	1	[3]	2	+	.	+	.	.	46
* Pteridium aquilinum		[3]	.	.	2	.	1	.	.	.	2	.	+	.	.	.	33	.	2	.	.	1	+	+	+	1	2	.	+	.	+	.	.	.	.	.	[4]	[4]	.	.	.	46
Festuca ovina		.	+	1	.	1	.	.	.	.	.	.	.	.	+	.	27	.	.	.	+	.	.	.	+	.	1	+	.	1	+	.	.	.	.	.	1	.	[3]	[3]	[3]	42
* Melampyrum pratense		+	+	+	2	+	+	+	.	.	2	.	.	.	.	+	60	.	.	+	.	1	.	2	.	.	1	.	.	.	.	1	.	.	2	.	.	.	.	2	1	33
Carex pilulifera		.	.	.	.	.	.	+	+	.	.	.	+	.	2	1	33	.	1	.	.	.	.	.	.	1	.	1	.	.	+	+	.	.	2	+	.	.	+	.	r	38
Calamagrostis arundinacea		.	.	.	.	.	.	.	[3]	2	1	.	.	.	.	.	20	.	.	.	.	.	1	.	.	.	.	.	[3]	[3]	.	+	1	.	.	.	.	.	.	.	.	21
Hieracium lachenalii		.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	7	+	.	1	.	+	.	+	.	.	1	.	.	.	.	.	+	.	.	.	.	+	.	.	.	29
Holcus mollis		2	.	[5]	[4]	.	.	.	.	.	.	1	.	.	.	.	27	1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	[3]	.	.	.	+	.	.	.	17
Dicranella heteromalla		.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	7	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	13
Hieracium sabaudum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	13
II. D. *Ca-Q molinietosum*																																										
Quercus robur	a1,a	2	4	.	.	5	.	4	.	.	.	.	3	.	+	3	47	4	4	1	.	3	3	.	.	.	2	.	.	.	.	.	.	1	.	3	3	.	.	.	.	38
Quercus robur	a2	1	.	.	.	+	2	.	1	.	.	.	1	.	.	.	33	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	4	.	.	.	.	.	.	.	13
Quercus robur	bc^;b	1	+^	.	.	.	3	+^	+	.	.	.	.	.	.	.	33	.	2	3	+	+	.	.	.	.	.	.	.	.	3	.	.	.	.	.	+	+	.	.	.	29
Quercus robur	c	+	.	.	.	+	1	.	.	.	.	.	+	.	+	+	40	.	+	+	+	.	+	+	.	.	1	.	.	.	+	+	.	.	.	+	+	+	.	.	.	46
Lysimachia vulgaris		1	.	.	.	+	1	+	+	2	1	1	+	+	1	.	[73]	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Molinia caerulea		1	+	.	.	+	1	+	3	+	2	2	.	2	.	.	[67]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Potentilla erecta (C-U)		+	+	1	+	1	+	.	1	.	.	.	.	.	.	.	[47]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Trientalis europaea (V-P)		.	+	1	2	.	1	.	.	.	.	1	+	.	.	.	[40]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Carex pallescens (C-U)		.	+	+	.	1	.	.	.	.	.	.	.	.	+	.	[27]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Deschampsia caespitosa		.	.	.	.	1	.	.	.	.	.	.	.	1	+	.	[20]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	4
Juncus effusus		.	.	.	.	+	.	.	.	.	.	1	.	.	+	+	[27]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Carex nigra		.	.	.	.	+	.	.	.	2	.	.	.	.	.	+	[20]	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
III. D. *Anemone* var. (rich var.)																																										
Oxalis acetosella		.	+	3	3	+	.	.	.	.	.	.	.	1	.	.	33	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	.	.	.	21
Viola reichenbachiana		+	+	1	1	.	.	.	.	.	.	.	.	.	.	.	27	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Poa nemoralis		+	.	.	1	.	.	.	.	.	.	.	.	.	+	.	20	.	.	.	.	1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Anemone nemorosa		.	.	.	2	.	+	.	.	.	.	.	.	.	.	.	13	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Veronica chamaedrys		.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	7	.	.	+	.	1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	13
Hypericum perforatum		.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	13	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Fragaria vesca		.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
IV. Ch. *Vaccinio-Piceetea* (V-P)																																										
Pinus sylvestris	a1,a	2	.	2	2	1	3	.	3	3	3	2	1	1	.	.	73	2	.	3	4	.	.	2	.	2	3	3	3	4	3	3	3	1	.	.	2	2	.	2	2	71
Pinus sylvestris	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	1	.	.	.	13
Pinus sylvestris	c	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	7	.	.	+	.	.	.	.	.	.	.	+	r	.	+	.	.	.	.	+	+	.	.	+	+	33
Picea abies	a1,a	+	.	1	.	.	.	.	.	.	.	.	1	3	.	.	27	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
Picea abies	a2	.	.	1	.	.	.	.	.	.	.	.	2	2	.	.	20	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	8
Picea abies	b/c	.	/+	1/	1/	.	.	.	.	.	.	.	4/+	.	.	.	27	.	.	.	+/	.	/+	.	.	.	+/	+/+	+/	.	.	2/	.	1/	.	.	.	.	.	.	.	29
Vaccinium myrtillus		[3]	[4]	[4]	1	+	2	[5]	[3]	[4]	2	1	2	.	1	1	93	2	.	2	.	.	[4]	[5]	[5]	[3]	[4]	[3]	[4]	[4]	+	2	+	+	1	.	.	.	+	+	+	75
Pleurozium schreberi		+	1	.	.	.	1	+	.	.	.	.	.	.	.	+	33	+	.	2	[5]	[3]	.	.	+	.	.	.	1	[3]	[3]	[4]	[4]	+	.	.	.	+	.	2	+	58
Pseudoscleropodium purum		.	.	.	.	+	+	.	.	.	.	2	+	.	.	.	27	+	.	.	.	2	.	.	1	.	.	.	[3]	.	.	.	.	.	.	.	.	.	.	.	.	17
Dicranum scoparium		.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	7	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	+	+	1	.	.	.	+	1	2	33
V. Ch. *Querco-Fagetea*																																										
Carpinus betulus	a,a2	.	2	.	.	2	1	.	.	.	.	.	.	.	4	3	33	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	[4]	[4]	.	.	.	.	.	13
Carpinus betulus	bc^;b	.	+^	.	.	+	+	+^	.	.	.	.	.	.	.	+	33	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	13
Carpinus betulus	c	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	13	.	.	+	+	.	+	.	.	1	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	21
Fagus sylvatica	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	2	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Fagus sylvatica	a2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	1	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Fagus sylvatica	bc^;b	.	+^	.	.	.	1	+^	.	.	.	+	.	.	.	.	27	.	.	.	+	.	+	.	.	1	+	3	.	.	.	.	.	.	.	.	.	.	.	.	.	21
Fagus sylvatica	c	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.	+	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17
VI. Ch. *Calluno-Ulicetea* (C-U)																																										
Agrostis capillaris		.	+	2	.	1	.	.	.	.	.	.	.	.	.	.	20	1	1	.	1	.	.	.	.	.	.	.	1	.	1	.	+	.	.	.	.	.	.	.	.	25
Pohlia nutans		+	.	.	.	.	.	.	.	.	.	.	.	1	.	.	13	.	.	.	+	.	.	.	+	+	.	1	.	+	.	.	.	+	1	.	.	.	+	+	.	38
Luzula multiflora		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	+	.	.	.	.	.	.	+	1	.	+	.	.	.	+	.	.	.	.	+	.	.	25
VII. Others																																										
Quercus petraea [Q. x rosacea^]	a1,a	1	.	4	2	.	.	.	.	.	3^	2^	.	.	.	.	20	.	.	.	.	2	.	4	4	3	.	.	.	.	.	.	.	.	3	.	.	.	4	4	3	33
Quercus petraea [Q. x rosacea^]	a2	.	.	.	.	.	.	.	3	4^	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	2	.	2	.	.	.	3	.	.	.	.	.	.	.	.	.	13
Quercus petraea [Q. x rosacea^]	b	1	.	.	.	.	.	.	2	.	.	1^	.	.	.	.	13	.	.	.	.	.	.	.	1	.	.	+	.	2	.	+	.	.	.	.	.	.	+	+	1	29
Quercus petraea [Q. x rosacea^]	c	+	.	+	+	.	.	.	+	1^	1^	+^	.	.	.	.	27	.	.	.	.	.	.	.	1	1	.	+	+	.	.	+	.	.	.	.	.	+	+	+	+	38
Betula pendula	a1,a	1	.	.	.	.	1	.	.	.	.	2	1	1	+	1	47	.	2	.	.	2	.	.	.	.	.	.	.	+	.	.	.	2	.	.	+	2	.	.	.	25
Betula pendula	a2	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	1	2	.	.	.	17
Betula pendula	b;bc^	.	.	.	.	.	.	.	1	.	.	+	.	.	+^	+^	13	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	8
Betula pendula	c	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	13	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	.	.	.	.	17
Frangula alnus	b	+	2	2	1	[3]	[4]	[3]	2	.	.	.	.	.	1	1	67	.	+	+	+	+	1	.	.	.	.	.	.	.	1	+	.	1	.	.	.	2	.	.	.	38
Frangula alnus	c	+	+	+	1	.	+	1	+	.	.	+	.	.	+	+	67	.	+	.	+	+	.	.	.	.	+	.	.	.	.	+	+	+	+	+	.	+	.	.	+	46
Sorbus aucuparia	a2^;b	.	+^	.	.	+^	1	1^	.	.	.	.	1^1	.	.	.	13	.	2	.	.	2	+	.	+	.	.	.	.	.	+	.	.	1	.	.	1	+	.	+	+	42
Sorbus aucuparia	c	.	+	+	.	+	1	+	.	+	.	+	+	+	.	+	67	+	1	.	.	+	+	.	+	+	+	.	+	.	+	+	.	+	+	+	+	+	.	+	+	71
Luzula pilosa		.	+	1	.	+	.	.	.	1	1	+	+	.	1	+	60	+	.	.	.	1	+	.	+	.	+	.	.	.	+	1	.	2	2	+	.	1	+	.	+	54
Dryopteris carthusiana		.	.	.	.	+	+	.	+	1	.	+	.	+	+	+	53	+	+	.	+	+	+	.	.	+	.	.	+	.	+	+	.	+	.	.	.	.	.	.	.	42
Maianthemum bifolium		+	+	1	1	+	.	+	.	1	1	1	2	.	1	+	80	.	.	.	.	.	+	.	.	.	+	.	.	.	.	1	.	2	1	1	.	+	.	.	.	29
Calamagrostis epigejos		.	.	.	.	.	.	.	+	.	.	+	.	[3]	+	1	33	.	.	.	[4]	.	.	.	.	1	+	+	2	.	1	.	.	+	.	+	.	[3]	.	.	.	38
Deschampsia flexuosa		.	.	.	.	.	.	.	.	.	.	2	.	+	.	.	13	2	.	3	1	+	.	.	.	.	+	.	.	.	+	[3]	[4]	[3]	.	.	+	1	.	.	.	46
Rubus idaeus		1	.	+	.	+	.	.	.	.	.	.	.	.	.	+	27	+	.	+	1	r	.	.	.	+	.	.	1	.	2	+	.	.	.	.	.	+	.	.	.	38
Festuca rubra s. s.		.	.	.	1	.	.	+	.	.	.	.	.	.	.	1	20	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	+	.	.	.	.	.	21
Moehringia trinervia		.	.	.	1	+	+	.	.	1	.	.	.	.	.	.	27	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	1	.	.	.	+	25
Mycelis muralis		.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	7	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	+	.	.	.	25
Rumex acetosella		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	+	+	.	.	.	.	.	.	+	r	.	.	.	+	.	.	.	.	.	.	.	.	21
Hypnum cupressiforme		+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	13	.	.	.	.	1	.	.	.	.	+	.	.	1	.	.	1	.	.	.	.	.	.	+	.	21

Sporadic species: I.: *Hieracium laevigatum* 11; *Mnium hornum* 13(1); *Plagiothecium denticulatum* 32; *P. laetum* 15,24; **IV.:** *Betula pubescens* subsp. *pubescens* a2 36(1), c 2,7; *Dicranum polysetum* 31,37,38; *Dryopteris dilatata* 2,19(1); *Hylocomium splendens* 2; *Juniperus communis* b 31(2), c 3,4,31; *Leucobryum glaucum* 33,37(3); *Lycopodium annotinum* 2; *Plagiothecium curvifolium* 32,39; *Rubus saxatilis* 9(1),16; *Thuidium tamariscinum* 5(1); *Vaccinium vitis-idaea* 23,28; **V.:** *Acer platanoides* c 18,28; *A. pseudoplatanus* b 29, c 24; *Ajuga reptans* 3; *Atrichum undulatum* 5; *Brachypodium sylvaticum* 17(1); *Carex digitata* 18; *Corylus avellana* b 1,11,28, c 11; *Dactylis polygama* 17(1),20(1); *Dryopteris filix-mas* 20,24(2),29(1); *Festuca heterophylla* 2; *Fraxinus excelsior* c 38,39(r); *Gymnocarpium dryopteris* 13; *Impatiens noli-tangere* 30; *Lathyrus niger* 20; *Malus sylvestris* bc 2; *Melica nutans* (QF) 1(1),9(1); *Milium effusum* 2,5,35(1); *Stellaria holostea* 21; *Tilia cordata* c 19; *Viola riviniana* 6,20(1),31; **VI.:** *Calluna vulgaris* 18(2),26(1); *Carex ovalis* 11,31; *Danthonia decumbens* 31; *Hieracium pilosella* 31; *Hypnum jutlandicum* 7; *Polytrichum juniperinum* 31; *Scorzonera humilis* 6; *Solidago virgaurea* s.s. 2,17,20,25; *Veronica officinalis* 17,18,20(1),31; **VII.:** *Abies alba* a1 12(2), a2 12(2), b 12(3), c 12,29; *Agrostis canina* 5(2); *Alnus glutinosa* c 17; *Anthoxanthum odoratum* 2,6(1),16,18,26,37; *Arrhenatherum elatius* 18,35; *Astragalus glycyphyllos* 18,20(1); *Athyrium filix-femina* 8,13,18,24,30; *Brachypodium pinnatum* 16; *Brachythecium rutabulum* 36; *B. albicans* 39; *Campanula rotundifolia* 1,20; *Cardaminopsis arenosa* 31; *Carex brizoides* 5,7; *C. echinata* 11(1); *C. hirta* 4,16,27; *Chamaenerion angustifolium* 26,29; *Cladonia furcata* 39, *Cladonia sp.* 38; *Convallaria majalis* 10,22(1),23(1),37; *Crataegus laevigata* b 16, c 16; *C. rhipidophylla* var. *rhipidophylla* 4; *Crataegus* sp. c 17; *Dactylis glomerata* 18; *Dianthus deltoides* 31; *Galeopsis pubescens* 1,35; *G. tetrahit* 9,13,15,19,32,38; *Galium mollugo* 3,4(1),18,20(1),27,31; *G. verum* 20(1); *Geranium robertianum* 31; *Geum urbanum* 31; *Hieracium murorum* 24,25,35; *Holcus lanatus* 17,29; *Impatiens parviflora* 25,29,35(2),36; *Larix decidua* subsp. *decidua* a1 32(1), bc 26, c 27(r); *Leontodon autumnalis* 31; *Padus serotina* b 26, c 17,20(r),27; *Phragmites australis* 17(r); *Pimpinella saxifraga* 20; *Plagiomnium affine* 12,17(1),36,38,39(1); *P. rostratum* 1(1),29(2); *Plagiothecium nemorale* 29; *Poa angustifolia* 3,4,20(2),31; *P. compressa* 2; *P. pratensis* 2,18(1); *Pogonatum aloides* 24; *Polypodium vulgare* 20(1); *Polytrichum commune* 3(1),5; *Populus tremula* a1,a 2,7,12(1), a2 12(1), b 12,17,20(1), bc 2,7, c 12,17(2),21; *Pseudotaxiphyllum elegans* 24; *Pyrus communis* c 2,7; *Quercus rubra* a2 32(1); *Robinia pseudacacia* a1 24(1), b 19,24, c 24; *Rosa canina* c 3; *Rubus plicatus* 16(2); *Rubus* sp. 6(3),8,12,19,27,29(4),31,32; *R. sprengelii* 5,11,16(1); *Salix caprea* b 8; *Sciuro-hypnum oedipodium* 2,23,38(2); *Senecio vulgaris* 13; *Stellaria media* 13(1),32,35; *S. uliginosa* 13; *Trifolium alpestre* 18; *T. pratense* 18; *Urtica dioica* 13; *Veronica spicata* 31; *Viscum album* subsp. *album* 13.

Table A8. *Calamagrostio arundinaceae-Quercetum petraeae typicum* typical variant (untransformed form)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	1-36
Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
ID-1		42	50	12	42	48	35	42	52	12	36	12	36	12	50	21	37	38	48	12	21	12	55	42	36	42	42	42	42	24	31	35	42	55	55	55	55	
ID-2		1	3	2	1	3	20	3	12	2	13	2	17	2	3	1	12	6	3	2	1	2	16	2	13	2	2	2	4	-	4	18	3	16	16	16	16	
ID-3		5	9	1	4	5	27	9	3	4	2	6	18	7	23	1	18	1	33	5	17	9	15	2	10	11	12	1	1	-	1	7	4	5	11	18	20	
Date (year)		1981	1976	1993	1981	1976	1976	1980	1973	1992	1977	1998	1985	1998	1976	1957	1986	1984	1976	1998	1957	1981	1991	1981	1985	1980	1980	1981	1981	2006	1980	1975	1981	1992	1989	1992	1978	1-36
Density of tree layer	a1,a [%]	60	80	60	75	70	60	70	75	60	75	85	70	80	80	70	75	75	70	80	55	80	60	70	45	50	65	55	55	80	30	65	60	70	80	80	70	
Density of tree layer	a2 [%]	-	-	10	-	-	15	-	-	20	-	10	-	5	-	+	5	5	-	+	-	-	-	-	+	-	-	-	-	-	60	-	-	-	-	-	-	%
Density of shrub layer	b [%]	-	-	5	+	-	+	-	+	10	-	+	5	-	-	+	5	25	-	5	65	5	+	-	5	-	-	-	-	+	+	30	-	5	10	-	5	
Cover of herb layer	c [%]	80	50	50	85	70	90	95	10	60	70	70	95	70	70	65	90	85	70	60	30	40	40	45	75	50	50	40	40	30	35	60	45	10	20	20	30	
Cover of moss layer	d [%]	-	10	5	+	10	+	+	80	5	5	+	+	5	-	20	-	+	+	5	35	15	30	+	5	+	+	+	+	10	5	20	+	-	10	15	40	
Area of relevé		100	200	150	100	150	300	100	130	200	200	200	800	200	200	350	700	200	250	200	350	100	100	100	800	100	120	100	100	200	100	100	100	200	100	100	100	
Location (ATPOL)		BD49	BD28	BD29	BD49	BD28	CE11	BD49	CD64	CC70	BE28	BD24	CE22	BD24	BD28	CD82	BD80	AD74	BD28	CC95	CD82	CD35	BC63	BD49	BE27	BD49	BD49	BD49	BD49	CE36	CD84	CE01	BD49	BC73	BC82	BC73	BC72	
Total number of species		12	19	23	20	20	17	20	27	33	24	23	29	21	15	30	17	22	16	28	21	24	26	21	33	13	19	20	19	33	19	20	19	13	25	22	24	
Number of mosses, liverworts and lichens species		-	9	5	2	2	1	2	5	8	4	3	3	4	-	5	-	1	2	5	6	5	3	2	7	1	2	2	2	4	1	4	3	-	3	6	8	
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*																																						
* *Quercus petraea*	a1,a	4	5	3	4	.	.	4	4	3	.	5	4	4	4	.	4	2	.	4	.	1	.	4	.	3	4	4	4	5	.	.	4	4	3	5	2	72
* *Quercus petraea*	a2	.	.	1	.	.	.	.	.	2	.	2	.	+	.	.	1	1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19
* *Quercus petraea*	b	.	.	.	+	.	.	.	.	2	.	.	+	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	17
* *Quercus petraea*	c	+	.	+	1	.	.	+	+	1	.	1	+	1	+	.	+	1	.	2	.	+	.	+	.	+	+	+	.	2	.	.	+	+	+	+	.	64
Hieracium lachenalii		.	.	+	+	+	+	+	+	+	+	+	.	.	r	1	1	+	+	+	+	+	1	+	+	+	+	+	+	.	+	+	+	.	.	r	+	81
* *Festuca ovina* (Qrp)		.	1	1	1	1	+	2	.	+	+	+	.	1	.	2	2	.	+	2	+	+	1	3	3	3	3	2	2	.	.	.	2	2	.	2	2	75
Hieracium sabaudum		+	.	.	+	.	.	.	+	.	.	.	.	+	.	+	+	+	.	+	.	1	r	+	1	+	+	+	+	.	+	.	+	+	1	.	1	58
* *Calamagrostis arundinacea* (Qrp)		5	3	3	4	3	.	+	+	1	.	+	+	2	1	.	.	.	2	+	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	44
Hieracium laevigatum		.	1	.	.	.	+	.	.	.	+	+	+	+	.	.	.	+	.	.	.	.	+	.	1	.	.	.	.	+	+	+	.	+	+	+	.	42
Lathyrus montanus		.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
II. Ch., D.* *Quercetea robori-petraeae* (Qrp)																																						
* *Melampyrum pratense*		+	.	+	+	2	.	+	.	1	1	.	.	+	+	1	2	1	1	1	1	1	2	1	1	1	1	+	1	.	+	1	2	.	+	r	.	78
* *Pteridium aquilinum*		2	+	1	2	1	3	5	.	1	+	2	2	1	1	+	.	.	1	1	+	2	2	1	+	.	+	+	2	+	.	.	+	r	+	.	.	78
* *Polytrichastrum formosum*		.	2	1	+	.	.	+	4	+	+	+	+	1	.	1	.	.	.	+	2	2	2	+	1	.	+	+	+	2	1	2	+	.	1	1	.	72
Carex pilulifera		+	+	.	.	1	+	+	.	.	.	+	.	+	+	+	+	.	.	1	1	1	+	+	+	+	+	+	+	2	1	.	+	.	+	2	.	69
Dicranella heteromalla		.	.	.	+	+	.	+	1	+	+	.	.	+	.	+	.	.	+	.	.	+	.	+	+	.	+	+	+	+	.	+	+	.	2	1	+	58
Holcus mollis		.	.	+	.	.	.	.	.	3	4	+	1	.	+	+	.	.	.	.	.	.	.	.	2	.	.	.	.	+	2	2	.	.	.	1	.	33
III. Ch. *Vaccinio-Piceetea*																																						
Pinus sylvestris	a1,a	.	.	2	.	3	3	.	.	1	.	+	1	1	.	.	.	3	3	+	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	33
Pinus sylvestris	b*,c	.	.	.	.	.	+	.	+	r	+	.	.	r	.	.	.	.	.	r	.	.	.	.	1*	.	.	.	.	r	.	.	.	.	.	.	.	22
Picea abies	a1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Picea abies	b/c	.	.	.	/+	.	.	.	/+	.	.	+/	1/	.	.	1/+	.	.	.	.	4/2	.	/+	/+	/+	.	.	/+	.	/+	.	.	.	.	.	.	.	31
Pleurozium schreberi		.	+	1	.	.	.	.	.	+	.	.	+	+	.	1	.	+	.	+	2	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	31
Vaccinium myrtillus		.	.	1	3	3	3	.	+	2	+	4	4	4	4	4	4	4	3	3	3	3	3	+	1	.	.	+	+	2	1	1	.	.	.	.	.	72
IV. Ch. *Querco-Fagetea*																																						
Fagus sylvatica	a1,a	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3	.	.	11
Fagus sylvatica	a2	.	.	+	.	.	.	.	.	+	.	.	.	1	.	1	.	1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	19
Fagus sylvatica	b	.	.	1	.	.	+	.	.	+	.	.	1	.	.	1	.	1	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	1	1	.	.	28
Fagus sylvatica	c	.	.	.	.	.	+	.	.	+	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	r	+	.	.	25
Poa nemoralis		+	.	+	.	.	.	+	1	.	+	.	.	.	.	+	1	+	.	+	.	.	.	.	+	.	+	+	.	.	.	.	+	+	1	+	1	47
V. Ch. *Calluno-Ulicetea*																																						
Luzula multiflora		.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	+	.	.	.	+	.	.	+	.	.	.	+	+	+	.	.	.	.	.	1	.	28
Pohlia nutans		.	r	.	.	1	+	.	2	.	+	.	+	.	.	.	.	.	+	.	.	1	.	.	+	.	.	.	.	+	.	.	.	.	.	1	1	33
Solidago virgaurea s. s.		.	.	.	+	1	.	.	.	.	.	.	.	.	.	r	+	.	1	.	.	.	.	+	.	.	.	.	+	.	+	+	+	.	.	.	.	28
VI. Others																																						
Quercus robur	a1,a	.	.	1	.	.	+	.	.	.	4	.	.	.	.	4	.	.	.	2	3	4	3	.	3	.	.	.	.	.	2	4	+	.	.	.	.	33
Quercus robur	a2	.	.	1	.	.	2	.	.	1	.	.	.	.	.	.	.	1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14
Quercus robur	b/c	.	.	+/+	.	.	/+	.	.	/+	/+	.	.	.	.	/+	.	1/1	.	1	/+	+	.	.	/+	.	.	.	.	.	/+	/+	.	.	.	.	.	33
Sorbus aucuparia	a2/b	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	.	/2	.	.	+/	/+	.	.	+/2	.	.	.	.	.	.	.	.	.	.	.	.	14
Sorbus aucuparia	c	.	.	1	+	+	.	.	+	+	+	.	+	.	.	+	.	+	+	+	+	+	.	.	.	.	+	+	.	+	+	.	.	r	.	r	.	53
Frangula alnus	b	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	1	1	1	.	.	.	.	.	.	.	+	+	3	.	.	.	.	.	22
Frangula alnus	c	.	.	.	.	.	.	+	.	r	+	.	.	.	.	.	.	+	.	+	+	+	+	.	.	.	+	+	.	+	1	.	.	+	.	+	.	39
Luzula pilosa		.	2	+	+	1	1	+	1	1	1	1	+	+	1	1	.	+	.	+	+	.	1	+	.	.	+	.	+	+	1	.	.	.	+	.	+	69
Maianthemum bifolium		+	.	+	.	1	.	.	+	+	+	+	+	.	+	+	.	.	1	.	+	1	1	.	1	.	+	.	.	+	2	+	.	.	2	.	.	56
Anthoxanthum odoratum		.	.	.	+	.	.	+	+	.	.	+	.	.	.	+	.	.	.	.	.	+	+	+	1	+	+	+	.	.	.	+	+	.	.	.	.	39

Sporadic species: II.: *Aulacomnium androgynum* 2; *Hieracium umbellatum* 9; *Lophocolea heterophylla* 9,36; *Mnium hornum* 34(1); **III.:** *Dicranum scoparium* 2,20,24,35(2),36(2); *Diphasiastrum complanatum* 15; *Dryopteris dilatata* 12; *Galium rotundifolium* 12; *Juniperus communis* b 11,22(r), c 4,25,26,28,34; *Leucobryum glaucum* 9,20(1),25,31(1),35(1); *Monotropa hypopitys* s. s. 15; *Orthilia secunda* 36; *Plagiothecium curvifolium* 22(1),35(2),36(2); *Pseudoscleropodium purum* 3,9,19; *Rubus saxatilis* 18,34; *Thuidium tamariscinum* 20; *Trientalis europaea* 6(1),15,20(r); *Vaccinium vitis-idaea* 5(1),6(1),9,13,17,19; **IV.:** *Acer platanoides* c 33(r); *A. pseudoplatanus* c 19,34; *Ajuga reptans* 19; *Anemone nemorosa* 21; *Atrichum undulatum* 2,10; *Brachypodium sylvaticum* 34; *Campanula persicifolia* 15,36(r); *Carex digitata* 15; *C. montana* 2; *Carpinus betulus* a,a2 14(1),30(4) c 14(2),15,29(r); *Cerasus avium* b 24; *Corylus avellana* b 34(1),36, bc 32, c 4,8,23,25,26,27; *Dactylis polygama* 16(r),34; *Festuca gigantea* 12(1),19; *F. heterophylla* 14(1); *Galium odoratum* 34(1); *Hypericum montanum* 7; *Malus sylvestris* c 35(r); *Melica nutans* 17,19,28,33; *Milium effusum* 30; *Scrophularia nodosa* 7,14,28,36; *Stellaria holostea* 31; *Tilia cordata* 16; *Viola reichenbachiana* 7,12(1); *V. riviniana* 29(r),34; **V.:** *Agrostis capillaris* 9,11,13,22,24,31(1); *Calluna vulgaris* 25; *Carex pallescens* 17; *Cladonia coniocraea* 21; *Genista tinctoria* 24; *Hypnum jutlandicum* 22(2),36(1); *Polytrichum juniperinum* 8,24(1); *Veronica officinalis* 8,24,26; **VI.:** *Aesculus hippocastanum* c 17; *Astragalus glycyphyllos* 35; *Betula pendula* a 4,21,22(1), a1 6,9(1),13,16(2),17(1),19,24(1), a2 11, b 4,17,24,29, c 9,11,14(2),23,29; *Brachytheciastrum velutinum* 2,24; *Brachythecium rutabulum* 29; *Calamagrostis epigejos* 3,6,11(1),12,13,29(2),31; *Campanula rotundifolia* 3,19; *Carex caryophyllea* 8(1); *Cerastium semidecandrum* 8; *Cladonia glauca* 8; *Crataegus laevigata* 6; *C. rhipidophylla* var. *rhipidophylla* 34; *Dactylis glomerata* 17; *Deschampsia caespitosa* 29,32; *D. flexuosa* 3(1),6,8,9,10,17(2),22(2),29(2),31(3); *Dryopteris carthusiana* 9(r),11,12,22,29; *Euonymus europaea* c 34; *Fallopia convolvulus* 1,7,27; *Festuca rubra* s. s. 9,24,26,30; *Galeopsis pubescens* 7,29; *G. tetrahit* 1,12(1),32; *Geranium robertianum* 9(r); *Geum urbanum* 24; *Hieracium murorum* 10,16,23,36; *Hieracium* sp. 5; *Holcus lanatus* 8; *Hypericum perforatum* 24; *Hypnum cupressiforme* 2,3,9,13,15,20(1),21,24,29,31; *Impatiens parviflora* 29; *Juncus effusus* 29,31; *Knautia arvensis* 25; *Moehringia trinervia* 9,10,12,29,35; *Molinia caerulea* 18,30; *Mycelis muralis* 7,12(1),15,29,33,34(1),35; *Orthodicranum montanum* 2; *Oxalis acetosella* 12(1); *Padus serotina* c 1,22,29; *Plagiomnium affine* 3,11,15(1),19,36(1); *Plagiothecium* sp. 32; *Poa angustifolia* 5,23; *P. pratensis* 8,10,23,28; *Polygonatum odoratum* 5(1),15,32; *Polypodium vulgare* 22(1),36(3); *Populus tremula* b 36(1), c 8,16,27,33(r),36(1); *Pseudotsuga taxifolia* a 22(2), b 22(r), c 22; *Pyrus communis* c 27; *Quercus rubra* a 22(1), c 21(1),22; *Q. x rosacea* a 5(3),18(3), 5(1),18(1); *Rhamnus cathartica* c 21; *Rubus caesius* 34; *R.* cfr. *hirtus* 12; *R. idaeus* 9(r),11,12; *R. plicatus* 21; *Rubus* sp. 7,12(1),17; *Rumex acetosella* 8; *Sambucus nigra* c 35(r); *Sarothamnus scoparius* c 24; *Sciuro-hypnum oedipodium* 9,11,19(1); *Silene nutans* subsp. *nutans* 36(r); *S. vulgaris* 16; *Veronica chamaedrys* 36; *Vicia cassubica* 2,28; *V. cracca* 23.

Table A9. *Calamagrostio arundinaceae-Quercetum petraeae typicum* variant with *Anemone nemorosa* (untransformed form)

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	
ID-1		12	12	47	12	50	36	52	12	42	12	37	4	37	36	36	12	59	12	12	31	12	21	12	36	36	12	12	4	19	36	36	4	42	12	35	36	59	12	4	31	4	35	36	
ID-2		2	2	176	2	3	13	12	2	5	2	12	50	12	13	13	2	6	2	2	4	3	1	2	16	17	2	2	50	2	13	13	50	4	2	18	13	6	2	50	2	50	18	13	
ID-3		24	11	6	25	20	18	5	16	6	20	11	17	2	16	21	21	6	18	22	10	1	5	26	2	21	29	28	23	8	15	5	19	5	23	6	8	5	13	13	6	9	3	13	
Date (year)		1965	1993	1983	1983	1976	1986	1973	1985	1980	1985	1987	1967	1986	1985	1985	1989	1993	1985	1983	1981	1983	1957	1999	1984	1985	1977	1995	1968	1983	1985	1985	1965	1980	1977	1975	1985	1993	1993	1967	1981	1965	1976	1985	1-43
Density of tree layer	a1,a [%]	75	60	70	70	80	70	60	75	40	60	70	80	60	45	70	50	80	70	60	40	30	45	75	60	25	70	60	65	40	60	75	65	65	70	65	60	60	75	70	60	80	65	70	
Density of tree layer	a2 [%]	-	5	-	10	-	-	-	-	-	20	5	-	20	5	20	40	-	-	40	60	50	30	5	15	35	-	10	-	-	-	5	-	-	30	-	5	-	-	-	70	-	-	-	%
Density of shrub layer	b [%]	-	+	+	15	-	5	-	-	+	+	35	20	30	20	20	15	-	-	+	10	10	35	10	15	20	10	5	10	10	+	+	5	-	10	+	35	-	5	-	20	-	+	40	
Cover of herb layer	c [%]	80	60	70	75	60	80	80	60	80	75	95	95	95	100	95	75	80	80	50	30	80	80	80	90	85	80	50	90	80	75	60	90	60	50	60	65	60	70	100	30	85	60	90	
Cover of moss layer	d [%]	+	+	-	-	+	10	-	+	+	5	-	30	-	10	5	5	+	10	-	50	+	+	5	5	5	5	10	5	50	20	5	+	+	15	-	5	5	+	-	10	-	5	+	
Area of relevé		250	200	200	200	200	900	100	200	100	200	900	400	800	600	800	400	100	200	200	100	200	900	200	800	600	150	150	400	500	900	600	400	110	100	100	400	150	150	400	150	500	200	800	
Location (ATPOL)		CD64	BD29	BC99	CD73	BD28	-	CD02	BC75	BD49	CD32	AD79	CC02	BD80	BE06	BE28	CD64	BC99	CD32	CD73	CD84	CD82	CD82	CD43	CE11	-	CD35	CD35	CC02	DE02	BE18	BE28	CC02	BD49	CD35	CD90	BE27	BC99	CD02	CC02	CD84	CC22	CE00	BE29	
Total number of species		26	31	25	29	25	25	30	20	28	25	34	39	27	33	35	31	15	25	17	19	29	35	36	34	30	29	42	31	28	27	32	35	30	33	20	28	24	34	35	28	33	26	39	
Number of mosses, liverworts and lichens species		2	3	-	-	1	7	-	2	3	5	-	2	-	4	5	7	2	2	-	5	3	5	7	7	7	2	11	1	2	6	5	2	3	5	-	4	4	3	-	4	-	3	5	
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*																																													
* *Quercus petraea*	a1,a	.	4	4	+	5	.	.	4	3	2	.	5	3	3	4	.	.	2	1	.	2	.	4	.	.	1	.	.	.	.	4	.	4	2	.	.	.	2	.	.	.	.	.	47
* *Quercus petraea*	a2	.	1	.	.	.	.	.	.	.	.	.	.	2	1	2	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	16
* *Quercus petraea*	b/c	.	/+	.	.	/+	.	.	/+	/+	/+	.	1/	/2	/1	+/1	.	+/	/+	/+	.	/1	.	/1	.	+/+	/+	/+	.	.	.	/+	.	/+	/+	.	.	.	/+	.	/+	.	.	.	51
* *Festuca ovina* (Qrp)		+	1	+	.	+	1	.	+	1	+	.	.	1	.	+	1	.	1	.	.	+	1	1	.	+	2	+	.	1	3	1	.	+	+	+	2	1	1	.	.	.	.	1	65
Hieracium lachenalii		.	+	+	1	+	1	.	+	+	+	.	.	+	1	.	.	.	+	.	+	+	+	+	+	+	2	1	+	.	.	1	+	+	+	+	+	.	+	+	+	+	1	+	74
Hieracium sabaudum		+	.	.	.	.	.	+	.	+	+	1	.	1	1	+	.	.	.	+	+	.	+	+	+	+	+	1	+	+	1	+	1	+	+	.	.	.	1	.	.	.	+	1	60
* *Calamagrostis arundinacea* (Qrp)		4	3	3	3	3	.	+	+	.	.	.	+	+	.	.	+	2	2	2	.	+	.	2	.	.	2	1	.	+	.	.	.	.	2	.	.	2	2	.	+	.	.	.	51
Hieracium laevigatum		.	+	.	.	.	+	.	.	.	.	1	+	.	.	+	+	+	.	.	.	+	.	+	.	.	.	+	1	.	+	.	.	.	.	1	1	+	.	+	+	+	.	1	44
Lathyrus montanus		.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	.	.	.	1	.	.	.	.	.	.	1	.	1	.	.	14
II. D. *Anemone* var. (rich var.)																																													
Carpinus betulus (Q-F)	a,a2	3	.	.	2	.	.	.	.	.	2	.	.	.	.	.	3	.	.	3	4	3	3	+	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	4	.	.	.	28
Carpinus betulus (Q-F)	b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	3	.	.	.	+	+	.	.	.	.	.	.	1	.	.	.	.	.	2	.	.	.	16
Carpinus betulus (Q-F)	c	+	.	.	+	1	.	+	.	+	.	.	.	.	.	.	1	.	.	.	.	+	1	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	1	+	.	+	.	33
Veronica chamaedrys		.	+	.	.	r	+	+	.	+	.	+	2	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	1	1	1	+	.	.	.	.	+	1	.	1	.	.	42
Anemone nemorosa (Q-F)		+	.	r	.	.	.	+	+	.	1	.	2	.	.	.	+	2	1	.	.	.	+	+	.	.	1	1	2	.	.	.	3	.	1	.	.	+	1	2	+	2	.	+	51
Atrichum undulatum (Q-F)		.	+	.	.	.	.	.	+	+	.	.	.	.	1	1	.	.	.	.	.	+	.	.	1	+	.	+	.	.	1	+	.	+	+	.	+	+	+	.	.	.	.	+	40
Stellaria holostea (Q-F)		+	.	.	+	.	.	.	+	.	+	+	.	.	.	.	1	.	.	+	.	+	1	+	.	.	.	.	.	.	.	.	1	.	.	+	.	.	.	.	1	2	+	.	35
Viola reichenbachiana (Q-F)		.	.	+	.	.	.	+	.	.	.	.	.	+	1	1	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	1	.	.	+	.	+	.	+	.	.	.	+	+	33
Viola riviniana (Q-F)		.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	+	.	.	.	.	.	.	2	.	1	.	.	16
Fragaria vesca		.	.	.	.	.	.	.	.	.	.	+	1	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	.	1	.	+	.	.	.	.	2	.	2	.	.	23
Hypericum perforatum		.	.	.	.	+	+	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	+	.	.	.	+	+	.	.	.	.	.	.	+	28
Oxalis acetosella		1	+	.	+	.	.	+	.	.	.	.	2	.	.	.	1	.	.	1	.	+	.	+	.	.	.	+	1	.	.	.	1	.	.	.	1	.	+	2	.	+	1	.	40
III. Ch., D.* *Quercetea robori-petraeae* (Qrp)																																													
* *Melampyrum pratense*		1	r	+	2	+	1	.	1	+	1	1	2	3	.	+	1	+	1	.	1	1	1	2	1	1	1	1	.	1	+	.	1	2	1	.	1	1	+	+	+	1	1	1	86
Holcus mollis		.	+	+	1	+	3	4	4	4	4	4	3	3	3	3	3	.	2	+	+	+	.	2	2	.	2	2	2	1	2	1	2	.	+	2	2	.	2	2	1	2	2	2	86
Carex pilulifera		+	.	.	+	.	+	.	1	+	.	.	.	+	.	+	1	.	1	.	2	+	+	1	1	+	+	1	+	+	1	+	+	+	+	.	.	.	2	+	1	+	+	+	70
* *Pteridium aquilinum*		+	2	.	+	.	1	.	2	1	2	.	1	.	4	3	3	4	3	3	.	+	2	2	1	.	2	+	1	2	.	.	+	2	2	.	1	.	.	+	.	.	+	2	67
* *Polytrichastrum formosum*		+	+	.	.	+	1	.	+	+	1	.	1	.	1	1	1	.	1	.	3	+	1	1	+	1	1	1	.	.	2	1	+	+	2	.	+	.	.	.	1	.	1	.	65
Dicranella heteromalla		+	.	.	.	.	+	.	.	.	+	.	.	.	1	.	+	.	.	.	+	+	.	+	.	.	.	1	.	.	.	+	.	+	.	.	+	+	+	.	+	.	.	.	35
IV. Ch. *Vaccinio-Piceetea*																																													
Picea abies	a,a2	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	7
Picea abies	b/c	.	.	.	+/	.	.	.	.	.	.	.	2/	1/	/+	/+	/+	.	.	+/	.	/+	/+	+/	+/	+/	.	.	.	/+	.	.	.	/+	.	1/	2/	.	1/	.	.	/+	/+	2/	47
Pinus sylvestris	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	2	+	2	2	.	1	.	3	.	.	.	.	.	.	.	.	+	.	.	.	.	.	19
Pinus sylvestris	b/c	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	/r	.	.	.	/+	.	.	.	/1	.	.	.	.	.	.	.	.	1/	+/	/+	.	.	.	.	.	.	16
Vaccinium myrtillus		2	2	+	3	3	3	.	+	+	+	+	+	2	+	2	2	+	2	+	+	4	4	4	4	4	3	3	3	3	.	.	1	.	2	2	2	2	1	1	1	.	.	.	84
Trientalis europaea		1	.	.	+	.	.	.	.	.	.	.	+	.	.	.	1	.	.	.	.	+	1	.	+	.	+	.	1	1	.	.	.	.	+	.	.	.	.	1	.	.	+	.	30
Pleurozium schreberi		.	.	.	.	.	+	.	.	+	.	.	2	.	.	.	+	.	.	.	+	.	+	1	+	1	.	.	.	3	+	.	.	.	.	.	1	.	.	.	.	.	.	.	28
Leucobryum glaucum		.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	.	1	.	.	.	+	+	.	.	.	+	1	.	+	.	+	.	.	.	.	.	.	.	+	.	.	.	26
V. Ch. *Querco-Fagetea* (Q-F)																																													
Poa nemoralis		.	1	.	.	.	.	+	.	.	.	1	.	.	2	+	.	.	.	.	+	.	+	.	+	.	.	.	.	.	1	3	.	.	.	.	.	1	1	.	+	+	+	+	37
VI. Ch. *Calluno-Ulicetea*		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
Agrostis capillaris		.	1	.	.	+	.	.	.	.	.	.	.	1	+	+	.	.	.	.	.	+	.	.	.	.	1	+	.	+	1	2	1	+	.	+	1	.	2	.	+	1	1	1	47
Luzula multiflora		.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	+	23
Pohlia nutans		.	.	.	.	.	+	.	.	.	+	.	.	.	+	+	+	+	.	.	+	.	+	+	+	+	.	.	.	.	.	+	.	.	+	.	.	+	.	.	.	.	+	+	37
Solidago virgaurea s. s.		.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	+	+	.	.	.	+	+	+	.	.	.	+	+	.	.	+	.	.	1	.	.	1	30
VII. Others																																													
Quercus robur	a1,a	4	2	.	4	.	4	4	.	.	3	4	.	2	.	1	3	.	3	3	3	2	3	1	3	.	4	4	4	.	4	1	4	.	3	4	4	.	4	4	4	5	4	4	74
Quercus robur	a2	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	2	2	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	9
Quercus robur	c	/+	/+	.	1	.	1/+	/+	.	.	.	+/	.	.	.	.	1	.	/+	2	/+	1	/+	/+	/+	/+	1/+	1/+	.	2/+	+/	+/	1/1	.	+/+	.	1/+	.	+/1	+/+	/+	/+	.	1/+	65
Sorbus aucuparia	a2	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	12
Sorbus aucuparia	b	.	+	+	1	.	.	.	.	.	.	3	.	1	.	1	.	.	.	.	.	.	.	1	1	.	1	+	.	.	+	+	.	.	.	.	+	.	.	.	+	.	.	+	35
Sorbus aucuparia	c	+	+	.	+	.	.	+	.	+	+	+	+	+	.	+	+	.	.	+	+	+	+	+	+	+	+	+	.	+	+	.	+	.	+	.	+	+	.	+	+	+	+	+	72
Frangula alnus	b	.	+	.	2	.	+	.	.	+	+	1	.	3	2	2	2	.	.	.	.	.	1	1	1	+	+	.	.	+	.	.	.	.	.	.	2	.	.	.	.	.	.	2	42
Frangula alnus	c	+	r	.	1	.	.	+	+	.	+	+	.	+	.	+	1	.	.	.	+	r	+	+	+	+	+	+	+	+	.	.	.	+	.	.	+	.	.	.	+	+	+	.	58
Luzula pilosa		+	+	+	+	+	.	+	.	+	+	.	1	.	.	+	2	.	+	.	2	+	+	1	1	1	+	1	+	+	.	.	+	+	+	+	.	.	1	.	2	.	1	.	67
Maianthemum bifolium		+	+	.	+	+	.	+	1	.	1	.	+	.	.	.	2	+	+	1	+	2	1	2	+	.	1	1	1	.	.	.	3	.	+	.	+	.	1	1	1	1	2	.	65
Anthoxanthum odoratum		.	.	.	+	.	+	.	.	+	.	+	3	.	.	.	+	.	.	.	.	.	+	1	.	+	+	+	1	+	+	.	1	1	+	1	1	.	1	+	.	+	+	2	56
Festuca rubra s. s.		.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	+	.	+	+	+	.	.	.	.	.	.	.	.	+	.	3	+	.	.	.	1	.	+	.	.	2	28
Moehringia trinervia		r	+	.	.	.	+	.	.	.	.	1	.	.	1	+	.	.	+	.	.	.	.	.	.	.	.	+	.	1	.	+	.	+	.	.	.	.	+	.	.	.	.	.	28
Hypnum cupressiforme		.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	+	.	+	+	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	+	28
Campanula rotundifolia		.	+	.	.	.	.	.	.	+	.	.	+	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	+	.	.	.	+	.	.	.	+	.	.	23

Sporadic species: III.: *Aulacomnium androgynum* 16; *Hieracium umbellatum* 2,27,30(1),37,43; *Lophocolea heterophylla* 24,27; *Mnium hornum* 27; *Plagiothecium denticulatum* 27; *P. laetum* 15,20,40; **IV.:** *Dicranum scoparium* 6(1),15,24(1),43; *Hylocomium splendens* 27; *Juniperus communis* b 12(1),24,28, c 4,8,12,28,32,39; *Orthilia secunda* 12,28,32; *Plagiothecium curvifolium* 24(1); *Pseudoscleropodium purum* 27(1),29(1); *Pyrola rotundifolia* 6; *Rubus saxatilis* 3,9; *Vaccinium vitis-idaea* 26,29(1),34; **V.:** *Acer platanoides* c 15,24; *A. pseudoplatanus* b 24(1),c 24; *Ajuga reptans* 1,5; *Brachypodium sylvaticum* 14; *Campanula persicifolia* 9,12,32,37,39,41; *Carex digitata* 8,12(1),39(1); *C. montana* 5; *C. sylvatica* 30,39; *Corylus avellana* b 3,11,15,17,43(1), c 7,9,15,33,43; *Epipactis helleborine* 7; *Fagus sylvatica* a1,a 4,19(1),24(1), a2 2,19(1),23, b 23(1),24,26, c 1,19,21,22,23,42; *Festuca heterophylla* 8,13; *Hedera helix c* 4; *Hepatica nobilis* 3,17; *Lathyrus niger* 3,5,14; *Malus sylvestris* b 2,4, c 1,2,4,16; *Melampyrum nemorosum* 11(2),33,43; *Melica nutans* 3,5,34; *Milium effusum* 2,4,10,18,21,28,40; *Phyteuma spicatum* 5; *Polygonatum multiflorum* 4,11(r),15,22; *Primula veris* 12; *Sanicula europaea* 5; *Scrophularia nodosa* 9,27(r),31,43; *Tilia cordata* b 15,26, c 18; *Viburnum opulus* 12,42; *Viola reichenbachiana* et *riviniana* 5; **VI.:** *Calluna vulgaris* 6; *Carex pallescens* 5,14,18,28,43; *Danthonia decumbens* 36; *Hieracium pilosella* 22,35,43; *Hypericum maculatum* 41(2); *Luzula campestris* 23; *Polytrichum juniperinum* 25; *Potentilla erecta* 9; *Scorzonera humilis* 34,37; *Veronica officinalis* 11,12,13,25,28,29,30,36; **VII.:** *Agrostis stolonifera* 7(1); *Angelica sylvestris* 11,30; *Arrhenatherum elatius* 11,13,31,43; *Astragalus glycyphyllos* 12,28,32,39(1); *Athyrium filix-femina* 1,10; *Betula pendula* a 8,26(2),38,41(1), a1 4,15(1),16(2),19(1),24(1),25(1),31(1),36(1), a2 4,10,23,25,27(1),34(2), b 27,34(2),36, c 12,18,23,33,35,36,38,43; *Brachytheciastrum velutinum* 30; *Calamagrostis epigejos* 15,25,27,31,38; *Carex hirta* 38(r); *Ceratodon purpureus* 17; *Chaerophyllum temulum* 14; *Clinopodium vulgare* 3,9,11(1),14(1),32,33,39(1); *Cornus sanguinea* b 14, c 11,14,15; *Crataegus laevigata* c 7; *C. monogyna* c 4,30; *C. rhipidophylla* var. *rhipidophylla* c 19(r),40; *Dactylis glomerata* 30; *Deschampsia caespitosa* 5,39; *D. flexuosa* 24(1),25(2),35,38; *Dryopteris carthusiana* 1,7,27,38,41; *Euphorbia cyparissias* 14,31; *Festuca pratensis* 12,39; *Galeopsis pubescens* 11,15; *G. tetrahit* 2,29,31,33,43; *Galium aparine* 14; *G. boreale* 3,12(3),32(1),39(3); *G. mollugo* 5,11,14,32(1),39(1),41,43; *G. verum* 9,33; *Geranium sanguineum* 3; *Geum urbanum* 41; *Glechoma hederacea* 31; *Hieracium murorum* 6,22(1),36,39,43; *Holcus lanatus* 35; *Impatiens parviflora* 4,15,24,31,37; *Juncus effusus* 7; *Kindbergia praelonga* 23; *Knautia arvensis* 3; *Lathyrus pratensis* 12(1),39(2); *L. sylvestris* 32(1),41; *Linaria vulgaris* 11; *Lysimachia vulgaris* 13; *Molinia caerulea* 36; *Mycelis muralis* 7,41; *Padus serotina* b 14(1), c 23(r),25; *Peucedanum oreoselinum* 11,29,43; *Pimpinella saxifraga* 3; *Plagiomnium affine* 16,31,37,38; *Poa angustifolia* 3,22; *P. pratensis* 7,11(1),12(2),28(1),32,39,43(2); *P. trivialis* 4; *Polygonatum odoratum* 21,22,37; *Populus tremula* a 29(1), a2 34, b 13,24,25,34(1), c 2,5,25,29,34,35,38(r); *Potentilla reptans* 35; *Prunella vulgaris* 15,30,35; *Pyrus communis* bc 9, c 26,27,37; *Quercus rubra* b 13, c 13; *Q. x rosacea* a 17(5),37(4), b 37; *Ranunculus acris* s. s. 7; *Rhamnus cathartica* b 11, c 11; *Rosa* sp. bc 11; *Rubus caesius* 34; *R.* cfr. *hirtus* 24; *R. idaeus* 7,11,40; *R. pallidus* 4; *R. plicatus* 15,36; *Rubus* sp. 24,25,33; *R. sprengelii* 2,38; *R. acetosa* 11; *R. acetosella* 7; *Sarothamnus scoparius* 31(1); *Sciuro-hypnum oedipodium* 10,25,27,34,43; *Sedum maximum* 22,37,41;*Stellaria graminea* 12,39(1),41; *S. media* 31; *Taraxacum officinale* 31; *Thalictrum minus* 17; *Torilis japonica* 41; *Trifolium alpestre* 12(2),32(1); *T. medium* 3; *Vicia cassubica* 12(1),14,32(1),33,37,39(3),41; *V. cracca* 7,9; *V. dumetorum* 12(2),39; *V. sativa* 14; *V. sepium* 7,14,28.

Table A10. *Calamagrostio arundinaceae-Quercetum petraeae typicum* typical variant in stage I of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52		53	54	55	56	57	58	59	
ID-1		50	48	47	27	27	27	27	27	48	52	27	27	27	20	51	27	27	27	27	27	27	27	27	27	50	48	12	37	12	36	23	48	27	27	12	12	42	12	27	37	55	27	27	42	42	18	48	55	52	5	31	55		35	18	2	55	24	18	39	
ID-2		3	3	176	1	1	1	1	1	3	16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	2	12	2	17	12	3	1	1	2	2	5	2	1	12	16	1	1	2	3	1	3	16	12	2	4	16		20	2	7	16	-	3	28	
ID-3		7	24	3	15	16	17	18	19	1	19	12	13	14	11	28	4	5	6	7	8	9	10	11	3	24	3	10	19	27	12	15	32	2	1	8	19	1	3	22	17	22	21	26	13	2	1	25	1	1	11	14	8		10	2	1	24	-	9	3	
Date (year)		1976	1976	1983	1975	1975	1975	1975	1975	1976	1973	1975	1975	1975	2007	1981	1975	1975	1975	1975	1975	1975	1975	1975	1975	1976	1976	1982	1987	1984	1985	1965	1976	1975	1975	1985	1984	1980	1988	1975	1987	1994	1975	1975	1980	1980	1990	1976	1979	1973	1994	1980	1975	1-52	1976	1989	1988	1992	2006	1989	1992	1-59
Density of tree layer	a1,a [%]	80	75	70	60	60	65	65	70	70	80	65	60	60	70	80	65	60	70	70	70	70	60	60	60	85	70	50	90	60	20	75	80	60	70	70	70	60	60	60	70	40	60	60	70	70	85	70	70	60	70	50	95		50	60	60	40	80	70	70	
Density of tree layer	a2 [%]	-	-	-	-	-	-	-	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	40	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	75	-		25	-	-	-	-	-	-	
Density of shrub layer	b [%]	-	-	1	+	-	10	-	10	-	-	20	+	+	10	60	-	+	-	20	5	20	-	-	-	-	-	+	20	-	20	30	-	5	20	-	20	+	-	-	+	+	-	-	-	+	-	-	-	-	-	-	-	%	20	-	+	30	10	-	35	%
Cover of herb layer	c [%]	50	75	60	50	70	60	50	40	60	70	60	60	60	85	60	60	70	80	70	75	70	70	80	70	60	70	75	100	60	75	95	50	70	90	60	90	60	40	60	95	40	60	40	35	60	75	50	10	20	30	15	10		75	30	50	90	30	90	80	
Cover of moss layer	d [%]	15	+	-	+	+	+	-	+	-	-	-	+	+	5	10	+	+	+	+	-	-	15	+	-	3	10	15	+	+	25	+	-	+	-	-	-	+	+	-	-	30	+	5	+	+	+	+	-	30	30	5	+		+	10	10	70	60	-	20	
Area of relevé		200	200	200	bd	70	200	150	350	150	180	bd	200	200	200	100	200	250	150	200	150	200	200	250	200	200	200	200	600	200	900	200	200	200	200	200	200	100	170	70	900	100	200	bd	110	110	110	200	100	220	200	100	100		100	170	150	100	200	200	200	
Location (ATPOL)		BD28	BD28	BC99	BD54	BD54	BD54	BD54	BD54	BD28	CD02	BD54	BD54	BD54	CD39	CD93	BD54	BD54	BD54	BD54	BD54	BD54	BD54	BD54	BD54	BD28	BD38	CD73	BE03	BD66	BD96	CD53	BD28	BD54	BD54	CD32	BD66	BD49	BD57	BD54	CE11	BC72	BD54	BD54	BD49	BD49	BD44	BD28	BC73	CD73	BC98	CD84	BC84		CE00	BD44	BD81	BC72	CC80	BD44	BE15	
Total number of species		16	19	10	11	11	7	9	13	14	11	7	8	12	21	23	12	13	9	10	8	9	9	10	10	15	19	22	15	19	36	15	11	11	12	14	27	20	20	12	18	28	15	13	11	19	11	20	12	24	26	11	9		23	13	22	18	26	12	29	
Number of mosses, liverworts and lichens species		4	2	-	2	3	1	-	3	-	-	-	1	3	1	4	2	2	1	1	-	-	1	1	-	2	5	4	-	4	4	3	-	4	-	-	-	2	2	-	-	5	5	3	2	5	2	2	-	8	9	2	2		2	3	3	2	8	-	3	
I. Ch., D* *Calamagrostio arundinaceae-Quercetum petraeae*																																																															
* *Quercus petraea* [*Q . x rosacea* ^]	a1,a	5	3^	4	4	4	4	4	4	3^	4	4	4	4	3	.	4	4	4	4	4	4^	4	4	4	5	4^	.	1	4	.	4	4^	4	4^	4	4	4	3	4	.	.	4	4	4	4	4	4^	4	.	3	3	3	88	.	.	.	.	.	.	.	78
* *Quercus petraea*	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	3
* *Quercus petraea*	b	.	.	1	+	.	1	.	1	.	+	2	+	+	2	.	.	+	.	2	+	1	.	.	.	.	.	.	.	.	2	3	.	.	1	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	35	.	.	.	.	.	.	.	31
* *Quercus petraea* [*Q . x rosacea* ^]	c	+	1^	.	+	1	1	1	2	2^	2	2	1	1	1	.	+	2	2	1	+	2	2	1	1	1	2^	.	+	1	+	+	1^	+	1	+	1	+	+	+	.	.	.	+	+	+	3	+^	r	.	.	.	.	81	.	+	.	1	+	+	.	78
* *Festuca ovina* (Qrp)		+	+	.	+	+	+	+	+	1	1	+	+	1	1	1	+	+	+	1	+	1	1	+	+	.	1	1	.	2	1	+	.	+	+	+	+	+	+	+	1	1	+	3	3	3	.	+	1	2	2	.	+	88	1	2	+	+	.	1	+	88
* *Calamagrostis arundinacea* (Qrp)		3	4	3	3	3	3	3	3	3	3	3	3	3	.	1	2	1	+	2	1	+	+	2	1	1	2	1	.	.	.	1	1	2	1	1	.	.	.	+	.	.	3	+	.	.	.	2	.	.	.	.	.	67	.	1	1	1	3	2	.	68
Hieracium lachenalii		.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	1	+	1	.	+	21	.	.	.	.	.	.	+	20
Hieracium sabaudum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	.	.	.	+	+	+	.	+	.	.	+	.	13	.	.	.	.	.	.	.	12
Hieracium laevigatum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		+	.	.	.	.	.	.	2
III. Ch., D* *Quercetea robori-petraeae* (Qrp)																																																														
* *Pteridium aquilinum*		1	2	+	.	.	1	+	+	2	2	.	1	1	.	.	1	1	.	.	.	.	.	.	2	+	+	.	.	2	1	1	+	3	4	3	4	.	.	.	.	.	+	.	.	.	3	2	.	.	+	.	.	52	4	+	.	+	+	2	2	56
Carex pilulifera		1	1	.	.	+	.	+	.	.	.	.	.	+	+	+	.	+	+	+	.	+	+	+	+	+	.	2	.	1	1	.	+	.	+	.	+	+	+	+	.	+	+	1	+	.	.	+	.	.	+	1	.	60	+	.	.	.	.	.	+	56
* *Melampyrum pratense*		.	2	+	+	+	.	.	+	.	+	+	.	.	+	.	.	.	.	+	+	+	.	.	.	.	1	3	3	1	.	+	2	.	.	1	+	+	1	.	1	+	.	.	+	3	.	+	.	+	.	+	.	54	+	+	.	+	.	.	+	54
* *Polytrichastrum formosum*		2	.	.	.	+	.	.	+	.	.	.	+	.	.	2	+	.	.	+	.	.	.	.	.	+	+	2	.	+	1	.	.	.	.	.	.	+	+	.	.	.	+	.	+	+	.	.	.	2	+	1	.	38	.	.	1	.	1	.	+	39
Dicranella heteromalla		+	+	.	.	.	+	.	+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	+	1	.	+	+	2	.	+	1	.	+	35	+	.	+	.	.	.	.	34
Holcus mollis		.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	3	4	3	4	5	3	3	.	.	.	.	.	.	+	.	.	.	23	.	.	.	.	.	.	.	20
IV. Ch. *Vaccinio-Piceetea*																																																														
Pinus sylvestris	a1,a	.	.	.	.	.	+	.	+	3	2	.	.	.	.	1	1	+	1	1	2	.	.	+	.	.	.	.	1	.	2	.	3	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	29	3	4	4	3	5	4	4	37
Pinus sylvestris	b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	+	.	.	.	.	3
Pinus sylvestris	c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.	1	+	.	.	.	.	3
Vaccinium myrtillus		.	2	+	2	2	1	2	2	2	4	4	3	3	5	3	3	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	3	3	3	1	.	+	+	.	2	2	+	.	+	+	1	.	+	.	.	.	85	1	.	+	5	1	+	3	85
Leucobryum glaucum		.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	2	+	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	+	.	1	.	.	.	21	.	+	.	.	.	.	.	20
Pleurozium schreberi		.	.	.	.	+	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	2	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	12	.	.	.	1	1	.	.	14
V. Ch. *Calluno-Ulicetea*																																																														
Pohlia nutans		+	.	.	+	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.	r	+	+	.	+	+	+	.	+	.	.	.	.	.	.	.	1	+	+	.	+	+	.	.	+	.	+	+	38	.	.	+	.	2	.	.	37
Luzula multiflora		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	+	.	+	.	.	r	15	.	.	.	.	.	.	+	15
VI. Others																																																														
Quercus robur	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	4	5	.	.	.	.	.	.	1	.	.	3	.	4	3	.	.	.	.	.	.	.	4	3	.	.	17	.	.	+	.	.	.	.	17
Quercus robur	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	3
Quercus robur	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2/1	.	.	.	.	.	.	.	.	.	.	.	/+	1/+	.	/+	.	.	+/	.	/+	.	.	/+	.	+/	.	.	.	.	.	.	.	.	.	.	.	.	15	2/+	.	.	/+	.	.	/+	19
Sorbus aucuparia	a^;b	.	.	.	.	.	.	.	.	.	.	.	.	.	+^+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	3
Sorbus aucuparia	c	.	.	r	+	.	.	+	+	1	+	.	.	+	.	1	+	+	.	.	.	+	.	.	.	.	+	+	+	.	+	+	+	.	.	+	+	+	.	+	+	+	+	.	.	+	1	+	.	+	+	.	.	56	+	+	.	+	.	+	.	56
Frangula alnus	b	.	.	.	.	.	.	.	.	.	.	.	.	.	+	2	.	.	.	.	.	.	.	.	.	.	.	+	2	.	1	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12	.	.	.	3	.	.	+	14
Frangula alnus	c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	1	+	.	.	+	+	.	.	+	+	+	.	.	.	.	+	.	23	.	.	.	+	.	.	+	24
Luzula pilosa		r	1	+	+	+	.	+	+	+	1	+	+	+	+	3	+	+	1	1	2	+	+	+	+	1	+	2	.	1	.	.	.	+	+	+	+	+	.	+	.	1	+	+	+	+	.	+	.	+	.	2	1	81	.	.	+	.	1	.	.	75
Convallaria majalis		r	.	1	1	+	.	+	+	1	1	+	+	+	2	2	.	+	.	+	+	.	+	+	+	+	1	.	.	.	.	r	1	.	+	+	.	.	.	+	.	.	+	+	.	.	+	1	.	.	.	.	.	58	.	+	.	.	+	3	.	56
Maianthemum bifolium		1	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	+	.	+	1	.	.	21	.	.	1	.	.	.	+	22

Sporadic species: III.: *Aulacomnium androgynum* 33; *Hieracium umbellatum* 58; *Lophocolea heterophylla* 4,57; *Mnium hornum* 50(3); *Plagiothecium denticulatum* 49; **IV.:** *Cladonia furcata* 31; *Dicranum majus* 50; *D. polysetum* 54; *D. scoparium* 5,33,49(1),50,57(1); *Juniperus communis* b 41, bc 37, c 14,34,48(r); *Lycopodium clavatum* 53; *Monotropa hypopitys* s.s. 31,34,48(r); *Orthilia secunda* 32,41,48(r); *Picea abies* a2 30, b 27,30,59 c 24,27,37,45,59; *Plagiothecium curvifolium* 13,16,26,30(1),42,50(1); *Pleurozium schreberi* 14(1),26,59; *Pseudoscleropodium purum* 41(3),56(4),57(3); *Rubus saxatilis* 9(1),36; *Trientalis europaea* 15(1); *Vaccinium vitis-idaea* 4,14(1),16,22,31,41,47,55,58; **V.:** *Agrostis capillaris* 30,36(1),40(1),41(2),47,50(1); *Calluna vulgaris* 53,54; *Carex ovalis* 30; *Cladonia coniocraea* 31; *C. deformis* 53; *Danthonia decumbens* 1,49; *Hypericum maculatum* 38; *Nardus stricta* 49; *Polytrichum juniperinum* 41,49,50; *Scorzonera humilis* 26; *Solidago virgaurea* s.s. 1,37,45,54(r); **VI.:** *Acer platanoides* c 29; *A. pseudoplatanus* c 53; *Agrostis stolonifera* 49; *Anemone nemorosa* (QF) 15; *Anthericum ramosum* 14,45; *Anthoxanthum odoratum* 28,30,36,40(1),43,45,50(2),53,56(1); *Arrhenatherum alatius* 40(1); *Astragalus glycyphyllos* 36,48; *Athyrium filix-femina* 36; *Atrichum undulatum* (QF) 17,45; *Betula pendula* a 28(1),31,41(2),51(2),55,56(1),59(1), a1 53(2), a2 40(1), b 15(1),30,40,53,57(2),59(2), c 27,38(r),57,59; *Brachypodium pinnatum* 9(1); *B. sylvaticum* 30; *Calamagrostis epigejos* 14,30,38,53(1),55,58(3),59; *Campanula persicifolia* 48; *C. rotundifolia* 37,40; *Carex caryophyllea* 49; *C. hirta* 57; *C. nigra* 49; *Carpinus betulus* a2 29(2),51(4), b 10(2), c 15(1),27,29(1),53; *Cerasus avium* c 30,38; *Chamaenerion angustifolium* 3,30; *Corylus avellana* b 3,15(1). c 15,44,46; *Crataegus monogyna* c 25; *C. rhipidophylla* var. *rhipidophylla* c 36,57(r); *Dactylis polygama* 50; *Deschampsia flexuosa* 14,30,40(1),55(2),56,57,59; *Dryopteris carthusiana* 15(1),28,30(1),36,41,55,56(r),57; *D. filix-mas* 41(r); *Fagus sylvatica* a1 52(4), a2 29(1), b 27,56, c 2,25,27,35,52; *Fallopia convolvulus* 37; *Festuca heterophylla* 48; *F. rubra* s.s. 18,23,34,39,40,50,51; *Fragaria vesca* 41; *Galeopsis pubescens* 30,37,40; *G. tetrahit* 30,36,46,55(1),59; *Galium mollugo* 41(r),57; *G. verum* 56(r); *Geranium robertianum* 55; *Hedera helix* 53; *Hieracium murorum* 14,30(1),50,53; *Hypericum perforatum* 40,53; *Hypnum cupressiforme* 1(r),29,33,49,50,54(2),57; *Impatiens parviflora* 30(1); *Juncus effusus* 30; *Koeleria macrantha* 17; *Larix decidua* subsp. *decidua* a 57; *Lathyrus niger* 37; *Lysimachia vulgaris* 28,36; *Malus* sp. c 16; *M. sylvestris* c 9,26,36; *Melica nutans* 2(2),36,47; *Milium effusum* 27; *Moehringia trinervia* 28,30,38,59; *Molinia caerulea* 2(1),27,32(1),47,59; *Oxalis acetosella* 36(1); *Padus serotina* c 30,50(1); *Peucedanum oreoselinum* 26,45; *Plagiomnium affine* 2,41,57(2),59(1); *Plagiothecium ruthei* 50; *Poa angustifolia* 1(1),2,14,24,25(1),26,29,36; *P. annua* 50; *P. compressa* 38; *P. nemoralis* (QF) 1,38,44,52(2),55(1); *P. pratensis* 39,40(1),48(r); *Polypodium vulgare* 41(1); *Polytrichum commune* 15; *Populus tremula* c 41(r),58(1); *Pyrus communis* bc 37; *P. communis* c 31,38,57(r); *P. pyraster* c 14; *Quercus palustris* a 55; *Q. rubra* a 27, c 27; *Quercus* sp. 50; *Rhamnus cathartica* b 24; *Rubus* cfr. *hirtus* 30(1); *R. corylifolius* 36(1); *R. idaeus* 15,30,53,59; *Rubus* sp. 30(2),53,57; *Rumex acetosella* 30,38(r),50,59; *Salix caprea* b 57; *Sarothamnus scoparius* 40; *Stellaria graminea* 36,55; *Tilia cordata* 29; *Veronica officinalis* 2,25,37,40,45,49; *Vicia cassubica* 48(r); *V. sepium* 57(r); *Viola reichenbachiana* (QF) 55(1),59; *V. reichenbachiana* et *riviniana* 9.

Table A11. *Calamagrostio arundinaceae-Quercetum petraeae typicum* variant with *Anemone nemorosa* in stage I of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		31	32
ID-1		42	42	42	42	51	12	12	4	49	4	55	4	42	37	59	36	12	4	36	23	12	59	36	42	36	55	32	31	12	31		33	42
ID-2		5	5	5	5	1	2	2	50	5	50	17	50	4	12	6	17	2	50	13	12	2	5	13	4	16	16	2	2	2	4		29	4
ID-3		11	3	8	12	9	14	17	16	1	20	4	14	15	1	3	24	30	22	6	17	12	6	1	4	6	10	3	5	31	8		10	11
Date (year)		1981	1981	1980	1980	1981	1961	1985	1965	1976	1964	1984	1967	1981	1986	1993	1986	1983	1968	1985	1965	1985	1993	1976	1980	1985	1975	1989	1981	1965	1981	1-30	1975	1977
Density of tree layer	a1,a [%]	65	65	55	45	60	65	80	70	60	80	60	70	65	85	80	50	70	75	40	70	90	80	60	75	45	80	50	50	85	30		40	60
Density of tree layer	a2 [%]	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	+	10	-	10	-	-	-	+	-	20	-	40	35	-	50		10	20
Density of shrub layer	b [%]	+	-	+	15	+	+	-	5	-	-	5	20	-	20	20	5	-	10	5	+	-	-	+	-	5	-	15	10	-	-		20	10
Cover of herb layer	c [%]	85	80	95	85	100	80	80	90	70	90	70	85	100	70	80	100	75	80	85	80	90	50	60	35	55	30	75	70	80	90	%	80	80
Cover of moss layer	d [%]	-	+	+	+	10	5	+	-	-	-	5	25	+	5	+	5	5	-	5	+	+	-	-	+	15	10	5	10	10	60		5	20
Area of relevé		100	150	100	100	150	400	200	400	100	500	100	300	100	900	120	800	200	400	500	300	200	150	200	110	800	100	400	100	250	200		150	300
Location (ATPOL)		BD49	BD49	BD49	BD49	CD83	-	BC75	CC02	-	CC02	BC72	CC02	BD49	-	BC99	CE20	CD82	CC02	-	CD53	BD14	BC88	BE27	BD49	CE22	BC84	CD64	CD84	CD63	CD84		CE01	DE50
Total number of species		31	17	23	28	27	31	28	34	26	29	27	35	25	37	15	34	25	20	37	24	20	23	24	20	32	16	30	24	31	21		24	35
Number of mosses, liverworts and lichens species		-	1	1	1	2	6	4	-	-	-	2	3	2	4	3	3	2	-	5	3	1	-	-	2	6	4	7	2	8	5		1	5
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*																																		
* *Quercus petraea* [Q . x *rosacea*^]	a1,a	4	4	4	3	4	.	4	.	.	.	.	4	4	2	4^	3	3	.	2	4	5	3	.	4	1	4	.	1	.	2	70	.	.
* *Quercus petraea*	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	.	.	1	.	.	.	.	.	1	.	.	.	.	.	13	.	.
* *Quercus petraea*	b/c	/+	/+	/+	/+	/+	.	/+	.	.	.	.	1/	/+	/+	.	/+	/1	.	+/+	/+	/+	.	.	/+	+/+	.	.	.	.	.	53	.	.
* *Festuca ovina* (Qrp)		+	+	+	+	2	.	.	.	+	.	.	.	3	1	.	+	+	.	+	+	+	.	1	2	.	+	1	1	+	2	67	1	+
Hieracium lachenalii		.	.	.	.	+	+	+	+	+	1	+	+	.	+	.	+	.	.	+	.	.	.	.	+	+	+	.	.	.	+	50	.	+
Hieracium sabaudum		+	+	+	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	+	.	.	.	27	.	.
* *Calamagrostis arundinacea* (Qrp)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	+	.	.	.	5	2	.	.	.	.	.	.	.	.	13	+	.
Hieracium laevigatum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	+	.	+	.	13	.	.
Lathyrus montanus		.	.	.	.	.	.	.	1	.	1	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.
II. D. *Anemone* var. (rich var.)																																		
Anemone nemorosa (Q-F)		.	.	.	+	1	.	1	.	+	1	.	1	.	.	2	1	+	1	.	r	+	.	.	.	.	+	+	.	+	+	53	.	.
Poa nemoralis (Q-F)		.	+	.	+	1	1	.	.	+	.	.	+	.	1	+	.	.	.	+	.	.	+	1	+	+	1	.	.	.	+	50	.	1
Oxalis acetosella		.	.	.	.	2	.	+	2	.	1	2	.	.	+	.	1	1	+	.	+	.	.	.	.	2	.	1	1	+	.	47	1	.
Veronica chamaedrys		+	.	+	+	1	.	+	1	.	1	1	1	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	40	.	.
Fragaria vesca		+	.	+	+	.	.	.	2	.	1	1	1	.	.	.	+	.	+	+	+	.	.	+	.	.	.	.	.	.	.	40	.	.
Viola reichenbachiana (Q-F)		+	.	.	.	.	+	1	.	.	+	2	.	+	.	.	+	.	.	+	.	+	+	+	.	.	.	.	.	.	.	37	.	.
Atrichum undulatum (Q-F)		.	+	.	+	.	+	.	.	.	.	1	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.	.	+	+	.	30	.	.
Hypericum perforatum		+	+	+	.	1	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	27	+	+
Melica nutans (Q-F)		+	.	.	.	.	.	+	.	1	.	+	.	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.	.	23	.	.
Stellaria holostea (Q-F)		.	.	.	.	.	.	.	1	.	.	.	+	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	1	+	.	20	.	.
III. Ch., D.* *Quercetea robori-petraeae* (Qrp)																																		
Holcus mollis		5	5	5	5	4	4	4	4	3	3	3	3	.	+	.	1	2	1	1	+	+	.	2	.	+	.	3	2	+	1	83	.	1
* *Melampyrum pratense*		+	2	+	+	1	.	.	.	1	1	+	3	3	1	1	.	+	.	1	2	.	+	1	+	.	.	1	2	1	3	73	.	.
* *Pteridium aquilinum*		.	1	.	+	4	.	2	1	2	1	.	+	.	3	4	3	+	1	.	.	+	1	.	1	2	.	3	+	.	.	63	2	3
Carex pilulifera		.	+	.	.	+	+	+	+	.	.	+	.	+	1	.	.	2	+	+	+	+	.	.	+	1	.	1	.	+	.	57	+	+
* *Polytrichastrum formosum*		.	.	.	.	1	1	+	.	.	.	.	.	.	1	.	.	1	.	1	+	+	.	.	+	1	+	1	1	1	3	50	.	+
Dicranella heteromalla		.	.	.	.	.	1	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	1	+	+	.	+	+	27	.	.
IV. Ch. *Vaccinio-Piceetea* (V-P)																																		
Pinus sylvestris	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	+	.	+	.	.	.	2	.	.	.	.	.	13	3	4
Pinus sylvestris	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	2
Picea abies	a1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	7	.	.
Picea abies	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	+	.
Picea abies	b	.	.	.	.	+	.	.	.	.	.	1	.	.	2	.	2	.	.	+	.	.	.	+	.	+	.	+	.	.	.	27	+	.
Picea abies	c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	.	+	+	17	.	.
Vaccinium myrtillus		.	.	.	.	.	.	.	.	.	1	3	.	.	2	+	4	3	5	4	3	1	2	2	.	2	.	2	2	5	3	57	3	.
Pleurozium schreberi		.	.	.	.	+	.	.	.	.	.	.	2	.	.	.	1	.	.	+	+	.	.	.	+	.	.	+	.	+	.	27	.	2
Trientalis europaea		.	.	.	.	2	.	.	+	.	1	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	.	.	+	20	1	.
Carex pallescens		.	.	.	.	.	.	+	.	.	+	.	.	.	+	.	+	+	.	.	+	.	.	+	.	.	.	.	.	.	.	23	.	.
V. Ch. *Querco-Fagetea* (Q-F)																																		
Carpinus betulus	a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	4	.	7	.	.
Carpinus betulus	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	3	.	4	10	.	.
Carpinus betulus	b	.	.	.	.	.	.	.	1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	13	.	.
Carpinus betulus	c	.	.	+	.	.	+	.	+	.	1	.	.	.	+	.	.	+	.	.	r	.	.	.	.	.	.	1	+	+	+	37	.	.
Fagus sylvatica	a1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	3	.	1	.	.	10	.	.
Fagus sylvatica	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	2	.	.	.	.	.	7	1	.
Fagus sylvatica	b/c	.	.	.	.	.	+/+	.	+/+	.	/+	1/	/+	.	.	.	.	/+	.	.	.	.	.	.	.	+/+	/+	.	.	.	.	27	2/	.
VI. Ch. *Calluno-Ulicetea*																																		
Pohlia nutans		.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	+	.	.	.	.	.	1	2	+	.	+	1	30	.	+
Luzula multiflora		+	+	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	23	.	+
Agrostis capillaris		.	.	.	.	.	+	+	+	.	1	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	1	+	.	27	.	+
Solidago virgaurea s. s.		.	+	+	+	.	.	.	.	.	.	.	.	+	.	.	+	.	.	+	.	.	.	.	.	.	.	+	.	.	+	27	.	.
Carex pallescens		.	.	.	.	.	.	+	.	.	+	.	.	.	+	.	+	+	.	.	+	.	.	+	.	.	.	.	.	.	.	23	.	.
VII. Others																																		
Quercus robur	a1,a	+	.	.	.	.	4	.	4	4	4	4	.	.	4	.	.	3	4	2	.	.	.	4	.	+	.	3	2	3	1	53	.	+
Quercus robur	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	10	.	.
Quercus robur	b/c	.	.	.	.	.	+/+	.	/1	/1	/+	/+	.	.	.	.	.	/1	.	.	.	.	.	+/1	.	.	.	/1	.	/+	.	30	+/	/+
Sorbus aucuparia	a^;b	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+^+	+	.	.	.	+	.	.	1	.	+	.	+^	.	.	.	23	.	.
Sorbus aucuparia	c	+	.	.	.	.	.	.	.	+	+	+	+	.	+	+	+	+	.	+	+	+	.	+	.	+	r	+	1	+	+	63	.	+
Frangula alnus	b	+	.	+	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	1	+	.	+	.	.	.	.	2	.	.	.	27	1	+
Frangula alnus	c	+	.	+	+	+	+	.	+	+	.	.	+	.	.	.	.	.	.	1	+	.	.	.	+	.	r	1	+	+	.	50	.	.
Luzula pilosa		+	+	+	+	1	2	.	.	+	.	+	+	+	.	.	1	1	+	+	+	.	+	+	+	+	1	2	2	1	2	80	+	.
Maianthemum bifolium		+	.	+	+	.	+	.	+	+	2	.	1	+	.	.	+	1	+	.	+	.	+	+	.	1	2	2	1	1	2	70	+	.
Dryopteris carthusiana		.	.	.	.	.	.	.	+	+	.	+	.	.	+	.	+	+	.	.	.	+	+	+	.	1	.	.	+	.	.	37	+	.
Galium boreale		+	.	+	.	2	.	.	+	.	1	.	+	.	.	.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	30	.	.
Anthoxanthum odoratum		+	.	.	.	1	.	.	.	.	.	.	.	2	.	.	+	.	+	.	+	.	.	.	+	.	.	+	.	.	.	27	1	.
Convallaria majalis		.	.	.	+	1	.	.	.	.	.	.	.	+	.	2	.	.	.	.	.	+	.	.	2	.	.	2	3	.	.	27	.	.
Festuca rubra s. s.		.	.	.	.	.	+	+	.	.	.	.	.	+	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	+	.	23	.	.
Galeopsis tetrahit		.	+	+	+	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	23	.	.
Rubus idaeus		.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	1	.	.	.	.	.	+	.	.	+	.	.	+	.	.	20	+	.
Moehringia trinervia		.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	.	17	+	+

Sporadic species: III.: *Aulacomnium androgynum* 27,29; *Hieracium umbellatum* 1,11,13; *Luzula pallescens* 19; *Mnium hornum* 25(1),26; **IV.:** *Betula pubescens* subsp. *pubescens* a 27(2); *Chimaphila umbellata* 32; *Dicranum scoparium* 13,16,25(1),30(1),32 *Dryopteris dilatata* 25; *Galium rotundifolium* 5(1),19; *Hylocomium splendens* 12(1); *Juniperus communis* b 11,12(2),18(1),32(2), c 5(1),10,12,18,26(r),32; *Leucobryum glaucum* 11(1),25; *Monotropa hypopitys* s.s. 20; *Orthilia secunda* 19; *Plagiothecium curvifolium* 29; *Pleurozium schreberi* 12(2),24; *Pseudoscleropodium purum* 7; *Ptilium crista-castrensis* 12; *Pyrola chlorantha* 8,12(1),19; *Rubus saxatilis* 1,20; **V.:** Acer pseudoplatanus b 25(1), c 14,25(1); *Ajuga reptans* 5(1),7,15,16; *Anemone ranunculoides* 11; *Anthriscus sylvestris* 12; *Brachypodium sylvaticum* 9,16; *Campanula persicifolia* 5,8,13; *Carex digitata* 6,16(1),21,26; *Corylus avellana* b 3,4(2),14,15(2),22, c 1,2,3,4,24; *Dactylis polygama* 22(1); *Dryopteris filix-mas* 7; *Festuca gigantea* 16; *F. heterophylla* 12(3),14; *Fraxinus excelsior* 1,9; *Galeobdolon luteum* 6; *Galium odoratum* 6; *Hepatica nobilis* 8; *Hypericum montanum* 3,13; *Impatiens noli-tangere* 14(r); *Lilium martagon* 21; *Melampyrum nemorosum* 1,4; *Melica uniflora* 6; *Milium effusum* 6(2),31; *Padus avium* b 23, c 9; *Platanthera bifolia* 1,13; *Potentilla alba* 1,4; *Pulmonaria obscura* 8; *Scrophularia nodosa* 3,4,8,10,12,24; *Stachys sylvatica* 14(r); *Ulmus minor* c 29; *Viburnum opulus* c 4,14,19; *Viola riviniana* 8(1),9,10,18(1),32; **VI.:** *Chamaecytisus ratisbonensis* 32(1); *Danthonia decumbens* 32; *Genista germanica* 8; *Hieracium pilosella* 13,32; *Polytrichum juniperinum* 6,19; *Potentilla erecta* 1,3,4; **VII.:** *Achillea millefolium* 5,13; *Aegopodium podagraria* 8(1); *Agrimonia eupatoria* 9; *Agrostis gigantea* 9(1); *Alnus glutinosa* a2 19(1); *Astragalus glycyphyllos* 8,10(2); *Athyrium filix-femina* 17; *Betula pendula* a 7,21, a1 19,32, a2 14,25,31; *Bromus hordaceus* 32; *Calamagrostis epigejos* 14(1),16(1),24,25(1),32(3); *Campanula patula* s.s. 4; *C. rotundifolia* 8; *Carex hirta* 7; *Chaerophyllum temulum* 1; *Clinopodium vulgare* 1,3,4; *Crataegus laevigata* c 29; *C. monogyna* c 28; *Deschampsia caespitosa* 6,16(r); *D. flexuosa* 6,14,19(2),23(1),25,31; *Euphorbia cyparissias* 32; *E. serrulata* 32; *Festuca pratensis* 12; *Galeopsis pubescens* 2,11(r),14,23; *Galium mollugo* 8(1),10,12(1),17; *G. palustre* 9; *Hieracium barbatum* 9; *H. murorum* 19(1),20; *Hypnum cupressiforme* 6,14,27,32(1); *Impatiens parviflora* 16(1),22,23; *Juncus effusus* 7; *Knautia arvensis* 1; *Lapsana communis* s.s. 6(r); *Larix decidua* subsp. *decidua* a 7(1), a1 19, a2 31, c 25; *Lathyrus sylvestris* 8; *Linaria vulgaris* 11(1); *Lophocolea bidentata* 6; *Lysimachia vulgaris* 9(1); *Mycelis muralis* 3,6,25; *Peucedanum oreoselinum* 1,13; *Pimpinella saxifraga* 9; *Plagiomnium affine* 3,7,14,27,29; *P. rostratum* 19; *Poa angustifolia* 5(1),6,21,32; *P. pratensis* 1,9,12(2),13,18(1); *Populus tremula* b 19, c 19; *Pyrus communis* b 28, c 7,15,27; *Ranunculus acris* s.s. 11; *Robinia pseudacacia* a1 32; *Rubus* cfr. *hirtus* 16; *R. corylifolius* 29; *Rubus* sp. 8,23,31; *Rumex acetosa* 23; *R. acetosella* 13,25,32; *Sarothamnus scoparius* 32; *Sciuro-hypnum oedipodium* 7,15,19; *Scutellaria galericulata* 11(1); *Sedum maximum* 9; *Sphagnum* sp. 30; *Stellaria graminea* 8,10,12(1),18; *Thymus serpyllum* 32; *Trifolium alpestre* 8(1),10; *Urtica dioica* 11(r),16; *Veronica officinalis* 4,6,29; *Vicia cassubica* 8(3),10(1),24; *V. cracca* 2,10.

Table A12. *Calamagrostio arundinaceae-Quercetum petraeae typicum* in stage II of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12		13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
ID-1		23	42	36	35	37	36	36	36	37	36	35	35		37	46	35	37	55	51	37	36	37	36	27	27	52	44	52	55	
ID-2		12	3	17	20	14	17	17	16	14	13	18	20		14	3	20	16	16	2	12	17	14	17	1	1	16	4	14	16	
ID-3		13	10	5	26	16	10	11	16	17	9	4	21		15	14	16	6	14	5	21	14	20	4	27	23	12	12	4	21	
Date (year)		1965	1981	1976	1977	1987	1985	1985	1976	1987	1985	1976	1976	1-12	1986	1954	1976	1973	1984	1981	1986	1985	1986	1976	1975	1975	1973	1979	1984	1994	13-28
Density of tree layer	a1,a [%]	75	80	50	60	60	25	25	50	60	75	95	60		70	55	50	60	55	80	75	30	40	70	60	50	60	60	55	60	
Density of tree layer	a2 [%]	-	-	15	5	20	50	25	5	10	-	10	20		10	40	5	-	-	-	5	35	45	10	-	-	-	-	5	-	
Density of shrub layer	b [%]	-	-	20	5	35	10	25	30	35	35	20	+		5	5	30	50	30	10	15	5	45	+	+	-	+	10	5	-	
Cover of herb layer	c [%]	65	85	80	70	85	90	90	60	90	40	30	45	%	65	40	60	40	30	90	90	90	95	90	40	30	75	100	50	40	%
Cover of moss layer	d [%]	+	+	20	+	+	10	5	35	5	5	20	+		+	15	35	40	15	80	+	5	5	20	5	5	50	10	+	20	
Area of relevé		200	100	200	200	600	900	800	200	900	800	100	100		700	1200	200	100	100	150	800	800	900	200	100	80	200	400	500	100	
Location (ATPOL)		CD43	BD59	BE27	CE00	BD80	BE06	BD96	CE11	BD80	BE27	CD91	CE00		BE02	CC92	CE11	CD02	BC84	CD83	BE02	CE22	AD89	BE27	BD54	BD54	CD02	DE50	BE05	BC63	
Total number of species		19	23	24	20	29	33	30	23	24	21	23	21		24	21	24	17	18	21	15	18	22	28	18	14	14	30	28	17	
Number of mosses, liverworts and lichens species		2	2	3	2	3	4	5	3	6	1	5	5		6	3	3	2	3	5	3	5	4	6	6	5	2	1	2	4	
I. Ch., D.* *Quercetea robori-petraeae*																															
Festuca ovina		+	1	.	1	1	+	1	.	.	+	+	.	67	1	1	.	.	1	1	+	+	.	3	3	2	+	.	1	2	75
Carex pilulifera		+	+	1	+	.	+	+	.	1	+	1	+	83	1	.	.	.	1	+	+	+	+	+	1	1	.	+	.	+	69
Holcus mollis		4	.	1	+	1	.	1	+	+	2	2	+	83	2	.	+	.	1	1	1	.	1	2	.	3	.	1	.	.	56
* *Pteridium aquilinum*		.	5	3	+	.	.	2	2	2	.	.	.	50	1	.	2	3	2	+	.	.	.	+	.	+	2	2	3	.	63
Dicranella heteromalla		+	+	.	.	+	+	.	.	.	.	+	+	50	+	.	.	.	+	1	+	.	.	+	+	+	.	.	.	.	44
* *Melampyrum pratense*		1	+	.	1	1	.	.	.	.	.	+	+	50	.	.	.	.	.	+	.	1	.	+	.	.	.	.	+	+	31
* *Polytrichastrum formosum*		+	.	+	.	.	1	.	+	+	1	2	+	67	+	+	+	1	2	2	.	1	+	.	2	.	+	.	+	.	69
Calamagrostis arundinacea		.	.	.	.	.	.	.	+	.	.	.	.	8	.	+	+	3	.	.	.	.	.	.	+	.	5	.	.	.	31
II. D. *Anemone* var. (rich var.)																															
Viola reichenbachiana (Q-F)		.	.	+	.	+	+	+	+	.	+	+	+	67	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Atrichum undulatum (Q-F)		.	+	.	+	.	+	1	.	+	.	+	.	50	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	13
Oxalis acetosella (Q-F)		+	.	1	+	.	.	.	+	.	+	.	2	50	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	13
Poa nemoralis (Q-F)		+	+	.	.	2	+	+	.	.	+	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Anemone nemorosa (Q-F)		+	+	.	.	.	.	.	.	+	.	.	.	25	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	6
III. Ch. *Vaccinio-Piceetea*																															
Picea abies	a1,a	.	.	.	.	.	.	.	1	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Picea abies	a2	.	.	.	+	.	.	1	.	.	.	1	.	25	.	.	1	.	.	.	1	1	.	.	.	.	.	.	.	.	19
Picea abies	b	.	.	2	1	.	.	1	3	.	.	2	+	50	1	.	3	.	.	2	2	+	.	.	.	.	.	.	.	.	31
Picea abies	c	.	.	+	+	.	.	.	.	.	3	+	.	33	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	19
Pinus sylvestris	a1,a;a2^	.	.	3;+^	2	3	2	2	3	3	.	.	2	67	2	4	3	4	.	2	.	3	2	2;+^	.	.	4	4	3	+	75
Pinus sylvestris	b/c	.	.	.	.	.	.	.	/+	/+	.	.	.	17	.	.	/+	.	.	/+	.	.	.	+/	.	.	.	.	.	.	19
Pleurozium schreberi		.	.	2	+	.	1	1	3	1	.	.	.	50	.	.	3	3	.	+	.	+	1	+	1	.	3	2	+	2	69
Vaccinium myrtillus		+	+	3	4	4	4	3	3	4	.	1	2	92	2	3	3	+	1	5	5	5	5	3	+	+	1	+	2	+	100
Dicranum scoparium		.	.	.	.	.	.	1	.	.	.	.	+	17	.	.	.	.	.	.	.	+	+	.	+	+	.	.	.	2	31
IV. Ch. *Querco-Fagetea* (Q-F)																															
Fagus sylvatica	a1,a	.	.	.	1	.	.	.	.	.	.	.	3	17	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Fagus sylvatica	a2	.	.	.	1	.	.	.	1	1	.	1	2	42	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Fagus sylvatica	b/c	.	/+	.	+/+	.	.	.	+/	1/	.	.	+/+	42	.	.	+/	.	2/+	.	.	.	.	+/	.	.	.	.	.	.	19
V. Ch. *Calluno-Ulicetea*																															
Pohlia nutans		.	.	+	.	+	.	+	+	1	.	.	+	50	+	.	+	.	1	.	+	+	+	2	.	+	.	.	.	2	56
Agrostis capillaris		.	.	+	.	+	+	.	1	.	1	+	+	58	.	+	1	.	.	+	+	+	+	.	.	.	.	3	.	1	50
VI. Others																															
Quercus petraea [*Q* . x *rosacea* ^]	a1,a	4	5	.	.	2	.	1	.	2	.	.	.	42	3	o	.	.	3	3	4	.	1	.	4	3^	.	.	1	3	63
Quercus petraea	a2	.	.	.	.	2	2	2	.	1	.	.	.	33	1	+	.	.	.	.	.	3	2	.	.	.	.	.	1	.	31
Quercus petraea	b/c	/1	/+	.	.	2/+	1/+	2/+	.	2/1	.	.	.	50	+/2	+/	.	.	/+	.	+/2	1/1	2/1	.	/+	/+	/+	.	1/+	/1	69
Quercus robur	a1,a	.	.	1	3	.	.	.	.	.	4	5	.	33	.	.	.	.	.	2	.	.	1	3	.	.	.	.	.	2	25
Quercus robur	a2	.	.	2	1	.	3	.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	1	2	.	.	.	.	.	.	13
Quercus robur	b/c	.	.	+/	+/+	.	1/	.	+/+	.	.	/+	.	42	.	+/+	+/+	1/+	.	/1	.	.	2/+	+/+	+/	.	.	/+	+/+	.	56
Betula pendula	a1,a	.	.	.	+	.	.	.	.	.	+	.	.	17	.	+	.	.	2	.	+	.	2	2	.	.	.	.	1	3	44
Betula pendula	a2	.	.	.	.	+	+	.	.	.	.	.	.	17	.	.	.	.	.	.	.	.	2	+	.	.	.	.	.	.	13
Betula pendula	b/c	.	.	.	.	2/	.	.	.	.	.	.	.	8	+/	+/	/+	/+	.	.	+/+	/+	1/	+/	.	.	.	/+	/+	.	63
Sorbus aucuparia	a	.	.	.	.	.	.	.	.	1	.	.	.	8	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	6
Sorbus aucuparia	b/c	/+	.	.	.	+/+	+/+	.	.	2/+	.	/+	.	42	/+	+/+	.	+/+	+/+	.	.	/+	1/	/+	.	.	/+	/+	/+	/+	69
Frangula alnus	b/c	.	/+	.	.	.	1/	1/	.	.	.	/+	+/	42	.	+/	.	4/	1/+	/+	.	.	.	+/+	.	.	+/1	/+	/+	.	50
Luzula pilosa		+	+	+	1	+	.	.	.	1	.	+	1	67	+	.	.	.	1	+	.	1	+	+	+	1	.	.	.	.	50
Calamagrostis epigejos		.	.	+	+	+	+	1	1	.	+	.	.	58	+	.	1	.	.	+	.	+	.	+	.	.	.	3	+	.	44
Moehringia trinervia		.	1	+	+	+	+	1	+	.	.	.	.	58	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	19
Deschampsia flexuosa		.	.	.	+	+	+	.	.	.	+	+	2	50	1	.	.	.	.	.	+	1	+	.	.	.	.	.	+	.	31
Rubus idaeus		+	+	.	.	+	.	1	+	.	.	.	.	42	.	.	+	2	.	.	.	.	+	.	.	.	2	+	.	.	31
Anthoxanthum odoratum		.	+	.	.	.	+	+	.	+	.	.	.	33	+	.	.	.	.	.	.	.	+	.	+	.	.	1	+	+	38
Dryopteris carthusiana		.	.	+	.	.	+	+	+	.	.	.	.	33	+	+	+	+	.	.	.	.	.	+	.	.	+	.	.	.	38
Maianthemum bifolium		+	.	.	.	+	.	.	+	.	.	+	1	42	.	.	+	+	1	1	.	.	.	.	.	.	.	.	.	.	25
Rumex acetosella		.	.	.	.	+	.	.	+	+	.	.	.	25	.	+	+	.	.	.	.	.	.	.	.	.	.	1	+	.	25
Hypnum cupressiforme		.	.	.	.	+	.	.	.	.	.	+	.	17	.	.	.	.	.	.	+	.	.	+	+	.	.	.	+	.	25
Hypericum perforatum		.	.	.	.	.	.	.	.	.	+	.	.	8	+	.	.	.	.	.	.	.	.	+	.	.	.	+	+	.	25

Sporadic species: I.: *Hieracium sabaudum* 25; *Plagiothecium laetum* 11,22; **III.:** *Betula pubescens* subsp. *pubescens* a2 5, c 9; *Dicranum polysetum* 12; *Dryopteris dilatata* 3,6(1),8,13,15; *Galium rotundifolium* 4,10; *Hylocomium splendens* 14(1); *Juniperus communis* b 26(2), c 23,26(1); *Leucobryum glaucum* 23; *Plagiothecium curvifolium* 7,24,27; *Pseudoscleropodium purumi* 14(2),18(2),28(2); *Trientalis europaea* 8,11,15; *Vaccinium vitis-idaea* 22; **IV.:** *Acer pseudoplatanus* c 7; *Ajuga reptans* 1; *Brachypodium sylvaticum* 3,6,7; *Carpinus betulus* a2 14(2), b 14,17(2), c 5,17(1); *Cerasus avium* c 7; *Dryopteris filix-mas* 3,6; *Festuca giganteai* 3; *Melica nutans* 2; *Milium effusum* 8,11,15; *Padus avium* c 3; *Scrophularia nodosa* 3,5,10; *Stellaria holostea* 16; *Tilia cordata* b 5,6; *Viola riviniana* 1; **V.:** *Calluna vulgaris* 5,9,19; *Carex ovalis* 14(1); *C. pallescens* 2,6(1),21; *Cladonia coniocraea* 24; *Danthonia decumbensi* 26; *Genista tinctoria* 10; *Hieracium pilosella* 26(1); *Luzula multiflora* 4,12,22,23,27; *Potentilla erecta* 22; *Veronica officinalis* 10(1),14,26(2),28; *Viola canina* 14,26; **VI.:** *Abies alba* b 21(1), c 21; *Achillea millefolium* 26; *Agrostis gigantea* 25(1); *A. stolonifera* x *capillaris 23*; *Anthericum ramosum* 2; *Brachythecium rutabulum* 22; *Campanula rotundifolia* 5,10,11,22; *Carex hirta* 26; *Cephalozia bicuspidata* 13; *Cerastium holosteoides* 26; *Chamaenerion angustifolium* 6,27; *Convallaria majalis* 9(1),23; *Fallopia convolvulus* 2; *Festuca rubra* s.s. 6,26(1); *Fraxinus excelsior* c 16; *Galeopsis tetrahit* 2; *Geranium robertianum* 2,7; *Hieracium murorum* 1,12; *Hieracium* sp. 24; *Impatiens parviflora* 6(1),7(2); *Larix decidua* subsp. *decidua* a1 6(1), bc 9; *Leontodon autumnalis* 22,26; *Mycelis muralis* 2(1),7; *Padus serotina* b 7(1), c 7; *Plagiomnium affine* 9 ,20; *P. cuspidatum* 9; *P. rostratum* 13; *Poa pratensis* 26(3); *P. pratensis* 28; *P. trivialis* 1; *Polygonatum odoratum* 18; *Populus tremula* c 21; *Pyrus communis* a1 6; *Quercus rubra* a1 13(1), a2 13(1), b 19, bc 9,13,27; *Robinia pseudacacia* b 5; *Rubus* cfr. *hirtus* 3,6(2),22; *R. plicatus* 16(2),21(1); *Rubus* sp. 5,7(2),15,26(2),27; *Salix caprea* b 21; *Sarothamnus scoparius* b 26(1), c 9,10,19; *Stellaria media* 6,7,10; *Thymus pulegioides* 26; *Viscum album* subsp. *album* a 27.

Table A13. *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* typical variant (untransformed form)

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	1-78
ID-1		50	18	24	14	14	50	50	50	59	14	59	42	42	18	50	50	50	50	59	18	18	18	14	14	14	18	18	18	18	18	18	18	18	59	48	42	12	42	42	27	42	42	12	35	8	59	42	14	18	59	42	42	47	14	20	19	20	36	24	24	20	20	20	18	18	42	50	59	59	59	12	59	28	18	42	42	42	55	
ID-2		3	1	-	9	9	3	3	3	6	9	6	1	1	1	3	3	3	3	5	1	1	1	9	9	9	1	1	1	1	1	1	1	1	5	5	2	3	3	4	1	2	2	3	18	-	6	5	9	1	5	2	2	176	9	1	2	1	17	-	-	1	1	1	1	1	2	3	5	5	5	3	5	3	1	2	4	5	16	
ID-3		8	10	-	1	7	11	14	19	4	6	3	3	6	29	10	16	17	18	5	9	33	8	8	9	10	22	30	7	20	35	2	14	15	8	5	6	38	12	13	29	3	4	12	1	-	10	4	11	34	12	7	8	5	5	4	1	1	13	-	-	6	7	5	5	18	10	27	7	10	13	39	4	4	6	5	6	14	7	
Date (year)		1976	1990	2005	1964	1964	1976	1976	1976	1993	1964	1993	1981	1981	1990	1976	1976	1976	1976	1993	1990	1990	1989	1964	1964	1964	1990	1990	1989	1990	1990	1990	1990	1990	1993	1976	1981	1984	1980	1980	1976	1981	1981	1988	1976	2006	1993	1981	1964	1990	1993	1981	1981	1993	1964	2007	1983	2006	1985	2005	2005	2007	2007	2007	1990	1990	1981	1976	1993	1993	1993	1977	1993	1974	1990	1981	1980	1980	1990	
Density of tree layer	a1,a [%]	85	80	70	80	80	80	70	70	60	100	80	60	65	80	75	85	80	85	80	95	75	90	80	90	100	90	80	90	80	80	85	80	80	60	60	79	70	75	50	75	65	60	65	50	70	70	90	90	70	80	55	60	60	90	70	50	75	30	70	30	60	70	60	80	85	65	75	70	70	70	60	50	80	90	80	60	60	70	
Density of tree layer	a2 [%]	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	10	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	5	50	5	60	10	60	-	5	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	%
Density of shrub layer	b [%]	-	20	-	10	30	-	-	-	-	20	-	+	+	10	-	-	-	-	-	40	-	5	20	20	+	5	-	50	10	-	-	5	5	-	-	10	+	5	5	-	-	-	-	+	5	-	25	+	-	-	-	+	+	+	10	20	8	5	-	-	10	10	5	20	30	-	-	5	-	-	15	5	-	30	-	-	+	30	
Cover of herb layer	c [%]	50	60	60	100	90	60	50	70	70	90	70	85	90	80	75	60	60	80	70	80	80	75	90	90	90	70	60	50	70	50	60	60	85	70	80	60	80	50	95	40	40	45	40	50	60	80	100	80	85	70	60	70	60	100	70	80	70	80	70	50	65	70	70	75	60	35	65	70	50	40	60	70	10	40	45	45	50	20	
Cover of moss layer	d [%]	+	-	+	-	+	3	3	3	+	10	-	+	+	-	3	+	-	3	+	-	5	-	-	+	-	-	-	-	-	-	-	-	-	5	-	10	+	-	-	5	+	+	10	30	10	5	+	+	-	5	+	+	-	+	10	5	10	5	+	+	10	10	10	-	-	+	3	10	+	+	15	+	40	-	+	+	+	+	
Area of relevé		200	150	200	200	220	200	150	200	250	200	150	100	100	200	150	200	150	200	200	150	200	200	220	180	150	150	150	200	200	150	150	150	200	100	200	100	300	120	100	200	100	100	150	200	400	100	100	150	200	200	100	100	200	150	150	400	150	700	200	150	200	200	200	200	120	100	200	150	200	150	150	150	200	150	150	120	100	100	
Location (ATPOL)		BD28	BD44	CC80	BD44	BD44	BD28	BD28	BD28	BC99	BD44	BC99	BD49	BD49	BD44	BD28	BD28	BD28	BD28	BC88	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BC88	BD39	BD49	BD66	BD49	BD49	BD54	BD49	BD49	BD57	CD90	BC98	BC88	BD49	BD44	BD44	BC88	BD49	BD49	BC99	BD44	CD39	DD92	CD39	BE16	CC80	CC80	CD39	CD39	CD39	BD44	BD44	BD49	BD28	BC88	BC88	BC88	CD34	BC88	CC91	BD44	BD49	BD49	BD49	BC84	
Total number of species		16	19	36	25	17	22	19	32	24	24	14	20	16	22	28	24	20	36	24	16	25	19	19	16	16	23	16	23	21	14	14	17	17	27	28	19	30	31	29	20	21	21	27	24	44	28	21	20	23	30	19	21	14	28	33	23	33	31	26	30	35	35	34	16	15	22	24	22	29	24	37	24	28	17	21	27	15	20	
Number of mosses, liverworts and lichens species		1	-	2	-	1	3	4	1	3	2	-	3	3	-	1	1	-	4	1	-	3	-	-	1	-	-	-	-	-	-	-	-	-	2	-	2	2	-	-	4	3	2	6	5	9	5	2	1	-	2	4	1	-	1	4	1	4	7	4	2	5	4	5	-	-	2	5	3	4	1	4	3	6	-	4	3	1	2	
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*																																																																																				
* *Quercus petraea*	a1,a	5	4	4	5	5	5	4	4	.	5	5	5	4	2	4	5	5	4	5	4	3	5	5	5	5	3	3	3	4	3	4	4	4	3	.	4	4	4	4	4	4	4	4	.	1	2	5	3	3	2	4	4	4	5	4	.	4	.	4	.	3	4	4	5	4	4	4	3	+	4	3	3	4	5	5	4	4	4	92
* *Quercus petraea*	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	+	.	1	4	1	4	.	+	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	10
* *Quercus petraea*	b,bc*	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	2	.	2	1	.	.	1	2	+	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	19
* *Quercus petraea*	c	1	2	1	+	.	.	+	+	+	+	.	+	1	1	.	+	.	.	.	2	2	1	.	+	+	2	1	.	2	+	2	1	1	.	.	+	2	+	+	+	+	+	1	.	r	+	+	.	r	+	+	+	+	.	2	.	2	1	+	+	1	1	2	3	3	+	1	+	.	+	+	.	+	1	+	+	+	1	78
* *Calamagrostis arundinacea* (Qrp)		3	3	3	4	4	3	3	3	3	3	3	5	5	4	3	3	3	3	3	3	3	4	4	4	4	3	3	3	3	3	2	2	2	2	+	.	.	+	.	+	.	.	.	.	.	1	.	2	2	2	.	.	2	2	+	+	+	.	2	2	2	1	1	2	2	.	2	1	2	2	.	2	.	1	.	.	.	.	76
* *Festuca ovina* (Qrp)		+	.	+	.	+	2	2	2	1	+	+	+	1	1	+	.	.	2	.	.	+	.	+	+	+	1	.	.	.	.	.	.	.	+	1	2	2	1	1	3	3	3	3	3	3	+	+	+	.	+	+	2	1	+	+	1	+	1	2	.	2	1	1	.	.	2	2	.	.	.	1	.	2	.	+	2	1	1	71
Hieracium lachenalii		r	.	+	.	.	1	1	+	.	.	.	+	+	+	.	1	1	1	.	+	+	.	.	.	.	.	+	.	.	.	.	.	+	.	1	+	1	+	+	.	+	+	+	1	2	.	+	+	.	.	+	+	+	.	+	+	1	+	+	+	+	+	+	.	.	+	+	.	.	+	+	+	.	+	+	+	+	+	62
Hieracium laevigatum		.	.	+	.	.	.	.	.	.	.	+	.	.	+	1	.	.	.	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	+	.	+	.	.	+	.	.	.	1	+	+	.	.	+	+	.	.	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	2	+	.	.	.	.	.	.	.	+	28
Hieracium sabaudum		.	+	+	+	+	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	+	.	.	+	+	+	+	+	.	.	.	+	1	.	+	.	1	+	2	1	+	.	+	+	+	.	+	+	.	+	.	.	.	.	+	.	.	.	.	+	.	+	.	+	.	.	+	+	+	+	+	+	+	.	53
II. D. *Ca-Q polygonatetosum odorati*																																																																																									
Corylus avellana (Q-F)	b,bc*	.	2	.	1	3	.	.	.	+	2	+	+	.	.	.	.	.	.	+	1	.	1	2	2	+	1	.	3	2	.	.	1	1	.	.	.	.	1*	.	.	.	.	.	.	.	.	2	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	2	2	.	.	1	+	+	1	.	.	2	.	.	.	.	37
Corylus avellana (Q-F)	c	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	.	+	.	.	+	.	.	.	+	.	.	.	+	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	+	+	.	23
Convallaria majalis		+	+	+	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	4	4	3	3	3	3	3	3	1	+	2	1	+	1	2	3	2	.	1	+	.	+	+	2	.	.	1	+	4	4	3	3	3	3	3	1	1	.	.	+	+	2	2	2	+	+	+	2	2	2	2	+	2	.	+	2	2	.	.	88
Moehringia trinervia		.	+	2	+	.	.	.	.	.	.	.	+	+	+	1	+	1	1	.	2	+	1	+	.	.	1	1	1	+	2	+	+	.	+	.	.	+	.	+	.	+	+	+	.	+	.	+	+	r	+	1	.	.	.	.	.	.	+	1	+	.	.	.	1	+	+	.	+	1	+	.	+	+	+	+	+	.	.	60
Hieracium murorum		.	.	.	+	.	.	.	.	+	.	+	.	.	.	.	.	1	.	+	.	.	+	.	+	+	.	+	.	.	.	.	.	.	.	.	+	.	.	.	1	.	.	1	+	+	+	.	.	.	.	.	.	.	1	1	.	+	+	+	.	+	1	+	.	.	.	.	.	.	.	+	.	+	.	.	.	.	+	33
Veronica officinalis (C-U)		+	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	.	+	+	+	+	+	+	1	1	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	1	.	+	.	.	+	+	+	+	31
Mycelis muralis		.	+	+	+	+	.	.	.	.	.	.	+	.	.	2	+	1	.	.	1	r	+	+	.	.	1	.	1	.	.	1	.	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	+	.	+	+	.	+	+	+	+	.	.	+	.	.	+	+	.	.	.	+	.	.	.	.	41
Polygonatum odoratum		1	.	+	.	.	+	+	+	+	+	+	.	.	.	1	+	+	.	.	.	+	+	.	.	.	+	.	.	.	.	.	+	+	+	1	.	.	+	.	.	+	.	+	.	.	1	.	+	1	+	.	.	+	+	+	+	+	.	.	+	+	+	1	.	.	.	+	.	+	.	+	.	+	.	.	.	+	.	50
Melica nutans (Q-F)		+	.	.	.	+	2	.	+	.	+	.	.	.	.	2	1	2	2	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	+	1	.	+	+	+	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	1	+	+	.	.	.	1	1	1	.	.	.	1	+	.	.	.	.	.	.	.	.	.	+	37
Galeopsis tetrahit		.	+	.	+	.	.	.	.	+	.	.	.	+	1	.	.	.	.	+	2	+	+	.	.	.	2	2	.	+	.	2	+	1	+	.	.	+	.	+	.	.	+	.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	+	.	.	+	.	+	.	.	.	.	35
Festuca heterophylla (Q-F)		.	+	.	1	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	2	+	+	.	.	1	r	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	21
III. Ch., D.* *Quercetea robori-petraeae* (Qrp)																																																																																				
* *Pteridium aquilinum*		+	1	+	1	2	2	.	.	+	2	2	+	2	1	2	2	2	+	+	2	1	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	.	.	.	+	2	2	.	.	.	.	.	+	1	.	.	.	+	+	.	2	.	.	.	+	1	+	1	2	.	+	.	2	.	.	2	2	.	2	2	2	.	.	69
* *Melampyrum pratense*		1	.	r	.	.	.	1	+	1	+	.	.	.	.	.	.	.	1	+	.	r	.	.	.	+	+	1	.	+	+	.	.	.	+	1	3	3	3	3	+	+	1	2	+	.	+	1	.	.	+	1	1	1	+	.	.	.	.	+	.	+	.	1	.	.	+	1	.	+	.	+	1	1	.	+	+	1	2	58
Carex pilulifera		1	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	1	+	2	.	.	.	.	.	+	+	.	.	+	+	+	+	+	+	+	+	1	.	.	+	.	.	.	+	1	.	2	.	+	+	.	.	41
* *Polytrichastrum formosum*		.	.	.	.	+	+	+	.	.	1	.	+	+	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	1	+	.	2	2	2	.	+	+	.	+	+	.	.	+	.	.	.	.	+	+	.	.	.	.	.	+	+	.	+	.	2	+	1	.	+	+	+	+	41
Dicranella heteromalla		+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	+	+	1	+	+	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	.	.	.	.	+	3	.	+	+	.	.	22
Holcus mollis		.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	1	.	1	4	5	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	+	.	.	.	.	1	.	19
IV. Ch. *Vaccinio-Piceetea*																																																																																					
Pinus sylvestris	a1,a	.	.	1	1	.	.	.	.	.	1	.	.	.	3	.	.	.	.	.	.	2	.	.	.	.	2	1	.	1	1	.	.	.	2	3	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	.	.	.	1	.	3	.	3	1	3	2	.	1	.	.	.	1	3	2	3	.	1	1	.	.	+	.	.	35
Pinus sylvestris	c	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	9
Vaccinium myrtillus		.	+	1	1	.	.	1	2	.	3	2	.	.	1	.	2	2	2	+	+	1	1	1	.	+	1	2	.	1	2	.	1	+	2	3	3	+	2	.	.	.	+	1	.	.	+	.	.	1	+	1	.	+	4	4	4	4	4	3	3	3	3	3	.	1	+	2	2	2	2	1	1	.	.	.	.	.	.	68
Pleurozium schreberi		.	.	.	.	.	+	.	+	.	.	.	+	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	.	+	.	.	.	.	.	.	.	+	1	+	.	.	.	1	+	1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	21
Rubus saxatilis		.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	.	.	.	.	1	.	+	.	.	1	.	+	.	.	.	.	.	1	+	+	.	.	.	.	.	.	.	.	19
V. Ch. *Querco-Fagetea* (Q-F)																																																																																			
Poa nemoralis		.	2	+	.	+	.	.	.	+	.	.	+	.	1	.	.	.	.	+	2	.	+	.	.	.	1	.	r	+	.	1	+	.	+	.	.	.	.	+	+	.	.	.	.	.	1	+	1	1	+	+	+	.	+	2	.	1	+	.	.	1	2	1	+	.	+	.	+	+	+	.	.	+	+	+	+	+	1	54
VI. Ch. *Calluno-Ulicetea* (C-U)																																																																																		
Solidago virgaurea s. s.		.	.	.	.	.	+	+	1	+	.	.	+	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	+	.	+	+	.	.	.	.	.	+	+	.	+	.	.	.	+	.	+	+	+	+	.	+	.	+	+	+	.	.	.	+	.	.	.	+	.	+	+	.	.	.	.	36
Luzula multiflora		.	.	+	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	+	+	+	+	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	+	1	.	.	.	+	.	+	.	.	.	.	.	22
Pohlia nutans		.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	+	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	r	+	+	.	+	+	2	.	.	.	.	1	21
VII. Others																																																																																			
Sorbus aucuparia	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Sorbus aucuparia	b	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	10
Sorbus aucuparia	c	.	+	+	+	.	.	.	.	.	+	.	+	.	+	+	r	.	.	.	+	r	.	+	.	.	1	.	r	1	.	.	+	.	.	+	.	+	+	.	.	.	.	.	+	+	+	.	+	+	+	+	+	.	+	+	4	+	.	+	+	r	.	+	+	.	+	.	.	.	+	+	.	+	.	+	.	.	+	53
Frangula alnus	b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	+	+	.	.	r	+	+	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	14
Frangula alnus	c	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	.	.	r	.	.	.	.	+	.	1	.	+	.	.	.	.	+	+	+	+	+	.	+	+	.	.	.	.	+	.	.	.	+	+	.	.	.	+	.	+	.	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	+	+	.	.	31
Luzula pilosa		1	+	+	.	+	1	+	1	.	+	+	+	.	+	+	+	+	2	.	.	+	.	+	.	+	.	.	r	.	+	+	+	+	+	+	.	+	+	+	1	.	+	.	.	.	+	+	.	1	1	.	+	.	.	1	+	+	.	+	1	1	1	2	.	1	+	r	+	+	1	.	.	+	.	+	.	+	+	68
Maianthemum bifolium		+	.	.	+	+	+	.	+	+	+	.	+	.	.	1	1	1	+	+	.	r	2	+	.	+	.	.	r	+	1	+	.	+	+	2	.	.	+	+	.	.	1	.	1	.	+	.	+	1	.	+	.	+	+	.	1	.	.	.	.	.	.	.	+	+	.	.	.	+	+	2	+	.	r	.	.	+	+	56
Anthoxanthum odoratum		.	.	.	.	.	.	.	1	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	+	+	+	.	+	+	1	.	.	.	.	.	.	+	.	.	+	.	+	+	+	+	+	+	+	.	.	+	.	.	.	.	+	.	1	.	+	+	.	.	32
Poa angustifolia		+	.	+	.	.	2	.	2	.	.	.	.	.	.	.	+	.	1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	.	2	.	+	.	.	.	+	.	2	.	.	.	.	.	.	.	.	.	1	.	+	.	.	.	.	1	.	.	.	.	+	.	.	.	1	.	.	.	.	.	.	.	22
Hypnum cupressiforme		.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	1	.	+	+	.	+	.	.	.	+	.	+	+	+	.	+	.	.	.	.	.	22
Galium boreale		.	.	.	+	.	.	.	1	+	.	.	.	.	.	1	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	+	.	.	+	.	.	.	+	.	+	+	.	.	.	.	.	+	.	.	21
Festuca rubra s. s.		.	.	+	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	+	.	.	.	1	.	2	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	1	.	.	+	.	.	.	.	.	+	.	.	19
Plagiomnium affine		.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	.	+	+	+	.	1	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19

Sporadic species: III.: *Herzogiella seligeri* 68; *Hieracium umbellatum* 4,8(r),10,11,21,28,29,45,49,54,73; *Lophocolea heterophylla* 46; *Mnium hornum* 71; **IV.:** *Dicranum polysetum* 61,63; *D. scoparium* 41,43,44(1),58,59; *Galium rotundifolium* 37; *Juniperus communis* b 39,55,57,62, c 21,24,25,36,52,54,55,57,62,71,75,76; *Leucobryum glaucum* 10,40,42,43(1),44,51; *Lycopodium clavatum* 75; *Orthilia secunda* 6,15(1),35,37,58; *Picea abies* a 16, b 48, c 26,3858,60(r),76,78; *Plagiothecium curvifolium* 9,40,73; *Pseudoscleropodium purum* 21,45,50(1),55,57,62; *Trientalis europaea* 56(1); *Vaccinium vitis-idaea* 10,24,35,50,54,59(r),70; **V.:** *Acer platanoides* c 4,38; *A. pseudoplatanus* c 4,38,60; *Ajuga reptans* 8,26,28,61,63; *Anemone nemorosa* 9,38(2),53,55,71; *Atrichum undulatum* 12,58,67,75; *Brachypodium sylvaticum* 17,22(1),31,50,74; *Campanula persicifolia* 39,40,43; *Carex digitata* 78(r); *C. montana* 8(1),16(1),18(1),23,35; *Carpinus betulus* c 3,15,42,51,56; *Cerasus avium* b 55,57; c 13,43(r),45(r),55,57(r); *Dactylis polygama* 19,34,46,50(1),68(2); *Dryopteris filix-mas* 69; *Fagus sylvatica* a 48(3), b 78(3), c 4,6,10,38,49(r); *Festuca gigantea* 2(1),14,26(1),64(1); *Fraxinus excelsior* 22,37,38; *Galeobdolon luteum* 50(1); *Hepatica nobilis* 34,69; *Lathyrus niger* 5(1),24(1); *Lilium martagon* 16,34,54; *Malus sylvestris* c 28; *Melampyrum nemorosum* 39; *Padus avium* b 44, c 38; *Platanthera bifolia* 18; *Scrophularia nodosa* 2,4,5,14,28,33,74; *Tilia cordata* a 5(1),23(2),24(1),25,29(1),65(1) c 4,49; *Ulmus minor* c 22; *Viola mirabilis* 15(1); *V. reichenbachiana* 19,34,47,50,68,69,78; *V. reichenbachiana* et *riviniana* 8,15,17(1); **VI.:** *Agrostis capillaris* 3,8(1),16(1),41,44,45(1),56,58,59,60,71(1); *Calluna vulgaris* 36; *Cladonia coniocraea* 73; *Danthonia decumbens* 45,73; *Genista tinctoria* 54; *Hieracium pilosella* 8,44,45,61(1),63,71; *Luzula campestris* 45(1), *Potentilla erecta* 18; *Scorzonera humilis 8(1),11(1),19,34,35,46,53,67(r),69;* **VII.:** *Achillea millefolium 39,45(r),62;* *Aesculus hippocastanum* c 32,74; *Anthericum ramosum* 9,10,35(1),45,54,71; *Arrhenatherum elatius* 45; *Betonica officinalis* 8,15,69; *Betula pendula* a 14,21(r)64(1), a2 71, b 57,62(r), c 18(3),43(r); *Brachypodium pinnatum* 16(1),18(1),65(1); *Calamagrostis epigejos* 35(2),38,55,57,58,61,62,70,76; *Campanula patula* s.s.. 47; *C. rotundifolia* 3,4,6,7,8,10,40,45(2),49,67(r),72,73,76; *Ceratodon purpureus* 46,69; *Chamaenerion angustifolium* 58; *Clinopodium vulgare* 15(2),18(2),39,47(1); *Cornus sanguinea* c 72; *Crataegus laevigata* b 19; *C. monogyna* b 56, c 56; *Dactylis glomerata* 16(1),39,48; *Deschampsia caespitosa* 7,29; *D. flexuosa* 44,45,58; *Dianthus superbus* s.s. 33; *Dryopteris carthusiana* 3,14,50,55(1),57,58,59,60(1),62(1),68,69,70; *Equisetum hyemale* 2; *Euonymus europaea* 23,49; *Euphorbia cyparissias* 3,71; *Fallopia convolvulus* 1,13,15(2),17,18,19,21,42,48,68,72(1); *F. dumetorum* 2,3,20,22(1),27(1),28(r),29,31,60,64; *Fragaria vesca* 17,55,57,59,61,62,63; *Galeopsis pubescens* 3,12,15(1),16,17,38,41,51,55,57(r),59,62,73; *Galium album* 55,61(1),63; *G. album* fo. *dumetorum* 71; *G. aparine* 61; *G. mollugo* 35,77; *G. verum* 7,8,78(r); *Geranium robertianum* 39,47,68; *Geum urbanum* 38; *Hypericum perforatum* 3,39,45,60,76; *Impatiens parviflora* 3,9,19(1),34(1),45,50,58,68(1), 69(1),70,72; *Kindbergia praelonga* 45; *Leontodon hispidus* 36; *Lysimachia vulgaris* 72; *Mnium* sp. 75; *Molinia caerulea* 6,15(1),16,71; *Padus serotina* b 45(1),55,57,62(r),78, c 2,3(1),20,25,32,38,45,55,57(r),59,60,62,64(1),65,74(r); *Peucedanum oreoselinum* 6,7,18,39,47,54,61(1),62,63,67,73,77; *Pimpinella saxifraga* 8(r),35, *Plagiomnium rostratum* 58; *Plagiothecium* sp. 51; *Populus alba* c 18; *P. tremula* c 44,71; *Prunus spinosa* 15,19; *Pyrus communis* b 71, c 38,71; *Quercus robur* a 37(1),40,44(3),50(2),52(1), a1 3(2),45(4),56(2),71(3), a2 56(3), b 45,56(2), c 43,44,45,56(1),71; *Q. x rosacea* a 9(4),35(4),45(2),46(4),50(3),61,63,69(3), c 35,63(1); *Ribes nigrum* c 27; *Robinia pseudacacia* a 20(2),65(2) b 20(2),c 20(1),27(1); *Rubus caesius* 30,42,66,72,76; *R. idaeus* 38,55,57,58(1),60,61; *Rubus* sp. 58,60,66; *R. sprengelii* 26; *R. x corylifolius* 37,55,57,62,63; *Rumex acetosella* 35,44,45; *Sciuro-hypnum oedipodium* 6,7,45(1),55(1),57(1),59,61, 62,63(1),68(1); *Selinum carvifolia* 47; *Serratula tinctoria* 8,18; *Seseli annuum* 18; *Silene nutans* subsp. *nutans* 8,46,71; *Symphoricarpos albus* 37; *Taraxacum officinale* 37,45(r),62; *Urtica dioica* 3,14,26,28,29,31(1),33,60(r),64; *Veronica chamaedrys* 6(1),8,15(1),18(2),37; *Vicia cassubica* 4,6,9,11,14,24(1),25,39,54,76; *Vicia sepium* 49; *Vincetoxicum hirundinaria* 21,26; *Viscaria vulgaris* 18.

Table A14. *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* variant with *Anemone nemorosa* (untransformed form)

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	1-91
ID-1		24	4	12	12	42	12	4	12	24	24	24	4	4	37	12	12	12	29	12	37	42	36	42	42	12	24	36	4	12	17	4	42	42	12	36	36	12	28	12	24	35	42	42	37	29	12	12	12	12	21	12	12	12	24	38	16	16	12	20	12	12	24	21	24	20	20	12	35	29	42	12	3	37	12	12	12	24	59	36	12	55	38	59	36	50	24	12	12	37	55	37	
ID-2		-	50	3	3	1	3	50	3	-	-	-	50	50	13	3	3	3	10	3	12	3	13	3	4	3	-	13	50	3	9	50	5	5	3	13	13	3	3	3	-	18	4	4	12	10	3	3	3	3	1	3	3	3	-	6	17	17	3	1	3	3	-	1	-	1	1	3	18	10	4	3	4	12	3	3	3	-	5	13	3	16	4	5	13	3	-	3	3	12	16	12	
ID-3		-	25	17	15	14	16	26	21	-	-	-	24	27	5	6	19	18	20	13	13	3	7	8	9	14	-	23	21	36	15	2	9	10	34	20	14	35	3	33	-	5	21	22	4	15	24	23	31	30	9	26	32	28	-	4	10	11	25	2	27	29	-	10	-	8	3	2	2	16	14	22	1	9	41	8	9	-	2	4	4	2	27	9	11	28	-	40	5	12	16	16	
Date (year)		2006	1966	1984	1985	1981	1993	1965	1975	2006	2006	2006	1966	1966	1987	1993	1993	1993	1980	1984	1987	1980	1985	1980	1980	1985	2006	1985	1968	1985	1995	1965	1981	1981	1990	1985	1986	1984	1974	1994	2006	1976	1981	1981	1986	1980	1998	1998	1985	1985	1957	1999	1985	1993	2006	1987	1971	1971	1998	2006	1999	1993	2006	1957	2006	2007	2006	1981	1976	1980	1981	1990	1992	1986	1973	1988	1988	2006	1993	1985	1993	1992	1987	1993	1986	1976	2006	1993	1993	1987	1990	1986	
Density of tree layer	a1,a [%]	40	85	60	60	100	60	75	80	70	70	70	60	75	60	70	70	70	65	80	20	75	75	80	55	70	70	70	75	75	50	60	70	75	70	75	80	70	70	60	70	65	60	65	65	60	75	75	80	80	45	70	75	60	60	65	60	80	70	70	60	70	30	60	40	60	55	70	65	75	85	60	70	70	60	60	70	80	80	20	60	50	85	70	70	80	70	70	70	70	50	70	
Density of tree layer	a2 [%]	-	-	-	5	-	15	-	-	-	-	-	-	-	5	-	-	10	-	-	70	-	5	-	-	-	-	-	-	-	-	-	-	-	-	25	-	-	-	10	-	-	-	-	20	-	10	5	-	-	20	10	-	-	-	40	40	30	20	-	10	-	70	+	60	-	-	-	-	-	-	-	-	+	-	-	-	-	-	40	5	-	5	-	-	-	10	-	-	5	-	5	
Density of shrub layer	b [%]	-	10	20	15	+	15	40	-	-	-	+	70	5	20	10	+	10	-	10	5	-	20	7	5	+	-	5	10	+	-	5	+	+	-	5	20	15	+	5	+	+	+	+	20	15	5	5	+	-	15	15	-	5	+	20	80	60	10	+	5	5	+	25	-	15	15	+	-	+	+	5	50	15	-	-	-	-	5	5	5	10	+	-	10	-	+	20	5	40	40	5	%
Cover of herb layer	c [%]	90	90	90	70	100	75	90	40	80	70	75	85	90	95	50	60	70	70	60	85	45	95	95	70	60	70	90	90	80	45	100	90	95	70	80	80	60	60	60	70	80	70	75	95	70	80	80	80	80	50	50	60	60	50	85	80	90	80	70	80	75	70	80	50	70	60	60	85	40	95	60	60	95	75	65	60	30	30	75	40	50	90	50	85	60	50	30	80	80	15	80	
Cover of moss layer	d [%]	50	20	-	+	+	5	25	+	+	+	10	20	30	-	5	+	+	5	+	15	+	5	+	+	5	+	+	-	-	+	-	-	+	5	5	5	+	5	5	5	+	+	+	+	5	+	5	-	+	+	5	+	+	+	+	5	5	+	10	5	5	10	+	5	10	10	20	+	+	+	+	+	-	+	10	+	+	+	+	5	+	+	5	5	3	+	5	+	-	5	+	
Area of relevé		150	400	200	200	100	200	400	200	150	200	200	300	500	900	150	200	200	150	200	500	110	700	100	150	100	200	900	400	200	150	400	150	100	200	800	900	200	80	200	200	200	100	100	600	150	300	200	200	200	900	200	200	150	200	700	300	200	200	200	200	200	250	450	250	200	200	200	300	200	120	200	400	500	200	100	100	250	150	800	150	150	600	200	600	200	150	200	200	900	100	900	
Location (ATPOL)		CC80	BC29	CD75	BD14	BD59	CD52	CC02	BD28	CC80	CC80	CE36	BC29	BC29	BD80	CD02	CD02	CD52	CD17	BD19	AD89	BD49	BE27	BD49	BD49	CD32	CC80	BE29	CC02	BD14	BC66	CB94	BD49	BD49	CD77	BE28	-	BD66	CC91	CD35	CE36	CE01	BD49	BD49	BD80	CD28	CC95	CC95	BD14	BD14	CD82	CD43	BC75	BD29	CC80	AD75	BD97	BD97	CC95	CD39	CD43	BC66	CC80	CD82	CC80	CD39	CD39	CD28	CE01	CD28	BD49	CD77	CD83	BD92	BD41	BD57	BD57	CC80	BC88	BE28	CD02	BC72	AD75	BC88	BE28	BD28	CC80	CD02	CD27	BD80	BC84	-	
Total number of species		33	23	39	31	24	49	35	26	38	34	28	31	27	30	43	39	45	31	36	44	28	43	27	35	29	34	43	30	20	37	32	29	34	47	42	42	35	32	44	41	28	29	24	28	40	45	46	30	35	30	41	34	37	35	32	40	37	36	36	47	45	31	37	34	36	35	52	28	39	37	46	32	28	28	31	32	35	31	44	43	37	30	28	48	35	33	47	42	35	33	38	
Number of mosses, liverworts and lichens species		2	3	-	1	3	6	4	3	5	4	7	4	4	-	7	4	4	4	4	4	2	3	2	3	5	2	3	-	-	1	-	-	2	5	9	5	2	3	7	2	1	3	3	3	7	4	7	-	2	4	4	4	3	4	4	3	2	3	5	6	7	6	6	5	4	5	12	2	9	1	3	5	-	2	6	3	3	4	6	10	2	4	3	2	8	3	10	4	-	2	3	
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*																																																																																																
* *Quercus petraea*	a1,a	3	5	1	4	5	2	3	5	4	4	4	4	.	4	2	2	.	4	4	.	4	.	5	4	1	4	.	.	4	3	.	4	4	1	3	.	4	4	1	.	.	4	4	4	4	4	4	4	4	.	3	4	4	4	.	.	.	3	4	3	.	.	.	.	3	3	4	.	.	5	2	1	4	.	2	3	5	4	.	2	3	.	3	4	5	4	1	4	4	.	.	73
* *Quercus petraea*	a2	.	.	.	+	.	2	.	.	.	.	.	.	.	1	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	2	.	2	.	.	.	.	.	.	.	.	.	1	1	2	.	+	.	4	.	4	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	1	.	.	.	.	.	2	.	.	1	.	.	20
* *Quercus petraea*	b,bc*	.	+,1*	.	.	.	1	1,2*	.	.	.	.	3,+*	.	1	+	+	+	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	+	.	.	.	+	+	1	2	.	+	+	.	.	+	.	1	.	.	.	.	1	+	.	.	+	.	.	2	2	.	.	+	.	.	.	1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	31
* *Quercus petraea*	c	+	.	.	+	+	1	.	+	+	1	+	.	.	+	+	1	+	+	1	.	+	.	+	+	+	+	.	.	+	r	.	+	+	+	1	.	1	+	.	.	.	+	1	+	+	1	+	2	1	.	+	+	+	1	.	+	.	1	2	+	.	+	.	+	2	1	+	.	+	+	.	+	+	.	+	+	+	.	.	.	1	.	.	1	+	+	.	+	1	.	.	67
Hieracium lachenalii		+	.	+	.	+	1	.	+	.	.	+	+	.	+	1	+	1	+	+	+	+	1	.	.	.	+	+	+	+	+	1	+	+	1	+	+	+	1	1	+	+	+	+	1	+	+	+	+	1	+	+	+	+	+	.	+	.	1	1	1	+	+	+	+	+	+	+	1	+	+	+	+	+	.	1	+	+	+	1	2	.	1	.	1	1	+	1	.	1	.	1	82
* *Festuca ovina* (Qrp)		+	.	.	+	.	1	.	1	+	+	.	.	.	.	1	1	1	2	3	3	3	3	3	3	3	.	1	.	.	+	.	+	+	1	1	1	2	+	1	.	.	2	2	2	1	.	+	1	+	2	+	1	+	.	2	1	.	1	2	1	+	+	1	+	2	1	+	.	+	1	1	.	1	2	2	2	+	.	1	1	.	.	.	1	+	+	+	+	2	.	1	74
* *Calamagrostis arundinacea* (Qrp)		5	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	2	.	.	.	.	+	1	2	.	+	1	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	1	1	2	+	+	1	+	2	2	.	2	+	2	1	2	2	2	+	2	2	1	.	.	+	1	.	1	.	.	.	.	2	1	.	+	1	.	2	.	2	2	1	1	.	.	.	65
Hieracium sabaudum		.	1	+	+	.	.	.	+	+	+	.	+	+	.	.	.	+	.	.	2	+	1	+	+	+	.	1	.	+	.	1	+	+	+	+	+	.	1	1	.	.	+	+	1	.	.	+	+	+	.	.	.	.	.	1	.	1	.	.	+	+	.	.	.	.	.	+	+	.	.	+	+	1	1	2	+	+	.	.	+	r	+	.	1	.	+	r	1	+	1	1	59
Hieracium laevigatum		.	.	.	.	.	+	+	.	+	.	+	+	.	+	+	.	.	.	.	2	.	+	+	.	+	+	+	+	.	+	.	.	.	+	.	1	+	.	+	+	1	.	.	1	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	+	+	.	.	.	+	+	+	.	.	+	1	.	.	+	.	1	+	1	40
Lathyrus montanus		.	+	.	.	.	.	1	.	.	.	+	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
II. D. *Ca-Q polygonatetosum odorati*																																																																																																
Corylus avellana (Q-F)	b,bc*	.	.	2	.	.	+	.	.	.	.	.	.	.	.	+	.	2	.	+	.	+*	.	+*	1	+	.	1	.	.	.	.	+	+	.	.	+	.	.	+	.	.	.	.	.	.	1	+	.	.	.	+	.	.	.	.	.	+	.	.	1	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	.	1	.	+	+	30
Corylus avellana (Q-F)	c	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	+	+	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	16
Moehringia trinervia		.	.	+	+	.	+	.	.	2	2	.	.	.	.	+	r	.	+	+	1	+	+	+	.	.	2	1	+	.	+	.	+	+	.	+	+	1	.	+	+	.	+	+	+	1	+	.	.	+	+	+	.	.	+	1	2	2	+	.	.	.	+	.	.	+	1	+	.	+	+	+	.	+	+	+	+	+	+	+	.	.	+	+	1	.	1	+	+	+	.	+	65
Veronica officinalis (C-U)		.	.	.	.	.	1	+	+	+	.	.	.	+	+	1	.	1	+	.	1	+	+	.	+	+	+	+	.	.	.	+	+	.	+	+	.	.	+	+	.	+	+	+	1	+	+	+	+	+	.	1	.	1	.	.	.	+	.	.	1	1	.	+	.	1	+	+	1	+	+	+	+	+	+	+	1	.	+	+	+	.	.	.	.	.	.	+	+	+	+	+	63
Hieracium murorum		+	+	.	.	+	+	+	+	.	+	+	.	+	+	1	1	+	+	.	.	.	1	.	.	+	+	+	.	+	.	.	.	.	+	.	+	+	+	+	+	+	.	.	1	+	+	+	+	+	+	+	+	1	+	+	+	+	.	+	.	1	.	+	.	.	.	.	1	.	.	+	+	1	.	+	.	+	.	.	+	.	+	.	+	.	.	1	1	+	.	+	62
Convallaria majalis		+	2	2	.	+	1	3	3	.	+	2	2	2	1	2	2	2	1	1	.	+	.	+	+	.	+	+	.	.	+	.	.	.	+	.	.	1	.	1	.	.	+	+	.	.	3	3	1	2	.	2	+	1	.	.	.	.	2	2	1	1	1	.	+	2	2	.	.	.	4	3	3	.	.	.	.	+	2	.	+	.	.	.	2	2	+	1	2	.	.	.	59
Mycelis muralis		.	.	+	+	+	.	+	.	2	+	.	.	.	.	+	+	+	.	.	.	+	+	.	.	.	.	.	+	+	1	+	+	.	.	1	+	+	.	.	.	.	.	.	.	+	+	+	.	+	+	.	.	+	+	1	1	1	.	r	.	+	.	+	+	1	1	.	.	+	+	.	.	.	.	.	.	1	.	1	.	+	1	+	.	+	.	r	+	.	+	1	52
Melica nutans (Q-F)		.	.	.	+	.	1	.	1	+	+	.	.	.	.	.	+	+	1	+	.	.	.	+	.	.	+	.	.	1	2	.	+	.	.	+	.	.	+	+	+	.	.	.	.	.	+	+	.	.	.	+	+	+	+	.	.	.	1	+	+	+	.	1	.	1	1	.	.	.	+	+	.	+	.	.	.	1	.	.	.	3	.	1	+	1	1	.	.	.	.	.	44
Polygonatum odoratum		+	.	.	.	.	.	.	+	.	+	.	.	.	.	+	+	1	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	+	+	+	.	+	+	+	.	.	.	.	.	+	1	+	1	.	.	+	2	1	.	.	.	+	+	.	.	.	.	r	.	.	.	.	+	.	.	.	+	.	+	+	.	.	.	34
Festuca heterophylla (Q-F)		.	+	.	+	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	+	2	.	.	+	+	1	.	.	.	1	.	1	2	.	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	+	+	.	.	.	.	.	+	1	.	1	+	30
Galeopsis tetrahit		.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	.	.	.	.	1	.	.	.	.	+	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	.	+	+	r	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	+	+	.	r	+	+	.	.	.	.	.	.	.	1	26
III. D. *Anemone* var. (rich var.)																																																																																																	
Carpinus betulus (Q-F)	a2	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	2	.	.	.	.	2	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Carpinus betulus (Q-F)	b	.	1	+	.	.	.	.	.	.	.	.	3	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	2	2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	13
Carpinus betulus (Q-F)	c	.	1	+	+	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	1	1	.	.	+	+	.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	r	.	23
Hypericum perforatum		+	.	+	.	.	+	.	+	.	+	+	.	.	.	.	.	+	+	+	+	+	+	.	+	.	.	.	.	.	+	.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	.	+	.	+	.	+	+	+	.	.	.	.	.	.	.	+	.	.	+	.	.	+	+	+	+	+	.	+	+	+	+	.	.	+	+	.	.	.	.	.	.	.	+	.	r	+	54
Veronica chamaedrys		.	.	+	+	.	+	+	+	.	+	.	.	.	.	.	.	+	+	+	+	+	+	+	.	.	+	.	+	.	r	1	+	+	1	.	+	.	.	.	.	1	.	.	1	+	.	.	.	+	.	+	.	1	.	.	.	.	+	1	.	+	+	+	+	+	.	1	.	+	.	+	.	.	+	+	.	+	.	.	+	.	1	.	.	1	+	+	.	.	.	1	51
Anemone nemorosa (Q-F)		.	+	.	1	2	1	1	.	+	.	2	.	1	3	.	1	+	.	.	.	.	.	.	.	1	.	.	+	1	2	2	.	.	2	.	.	.	.	2	2	.	.	.	.	.	+	.	+	+	+	1	+	.	.	.	2	1	+	.	1	2	.	+	.	.	.	.	.	.	+	2	2	.	+	.	.	+	.	.	.	r	.	.	.	.	+	r	.	+	+	.	45
Viola riviniana (Q-F)		.	1	+	+	.	1	+	.	+	+	.	+	1	.	+	.	1	.	+	.	.	.	.	.	.	+	+	+	+	+	1	.	.	+	.	.	+	.	1	+	.	.	.	.	.	.	1	+	+	+	+	+	+	+	.	.	.	+	.	1	.	+	+	+	.	.	.	.	.	.	+	.	.	.	.	.	1	.	.	.	+	.	.	.	.	+	.	+	.	+	.	45
Fragaria vesca		+	.	+	.	.	+	+	.	+	.	.	.	.	.	+	1	+	.	.	.	+	+	+	.	.	.	.	+	.	.	1	+	+	+	.	+	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	+	+	.	1	.	.	.	2	2	.	.	.	.	+	.	.	.	.	.	+	.	+	r	+	.	.	+	+	.	+	.	+	.	.	41
Atrichum undulatum (Q-F)		.	.	.	.	+	.	1	.	+	+	.	+	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	+	+	1	.	.	.	.	.	+	+	.	.	.	+	.	+	+	+	.	+	+	+	.	.	.	.	+	+	.	.	+	.	+	1	.	+	.	.	.	.	.	1	+	.	+	.	.	+	.	.	.	+	+	.	+	.	1	.	37
Viola reichenbachiana (Q-F)		.	.	.	+	+	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	+	+	.	.	1	.	.	.	+	+	+	.	+	+	.	+	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	+	+	.	+	.	.	+	+	.	.	.	+	1	.	.	2	+	+	.	.	.	+	1	.	+	33
Oxalis acetosella		.	.	1	.	3	+	+	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	+	.	+	.	1	1	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	1	1	+	.	.	1	+	+	+	.	.	.	.	.	.	+	+	.	.	.	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.	+	30
Stellaria holostea (Q-F)		.	1	.	.	.	.	.	.	.	.	+	2	1	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	12
IV. Ch., D.* *Quercetea robori-petraeae* (Qrp)																																																																																																
* *Melampyrum pratense*		.	.	+	+	.	2	.	.	+	+	.	.	.	1	1	+	1	.	2	.	+	1	+	1	1	+	+	1	.	+	.	+	+	1	1	+	1	1	1	+	1	3	3	3	3	1	1	+	+	1	+	+	+	+	2	1	1	1	1	1	1	.	.	.	.	.	.	1	.	+	+	1	2	.	1	1	+	+	1	.	+	1	.	.	+	+	+	2	.	+	1	74
Polytrichastrum formosum		.	2	.	+	.	+	2	.	+	+	2	2	3	.	1	+	.	1	.	.	.	1	.	+	1	.	+	.	.	.	.	.	+	+	1	1	.	+	1	2	+	+	+	.	.	+	+	.	+	+	1	+	+	+	.	1	1	+	.	+	1	2	+	+	.	.	+	+	.	+	+	+	.	+	+	+	.	.	+	+	1	.	.	+	+	.	+	+	.	1	+	65
Carex pilulifera		+	+	.	+	+	+	+	+	+	1	+	+	+	.	+	1	1	1	.	1	.	+	.	+	.	+	+	.	+	.	.	.	+	+	+	+	+	.	1	2	.	+	+	.	+	+	+	.	+	1	1	1	.	+	.	+	+	.	1	+	1	+	1	+	.	.	1	.	+	.	+	+	.	+	+	2	+	1	+	1	.	.	.	.	.	+	1	.	.	.	+	67
* *Pteridium aquilinum*		+	.	2	1	.	1	.	1	+	.	2	2	.	+	1	+	2	.	.	.	.	+	4	3	3	4	3	3	3	3	3	.	.	+	1	1	+	.	.	.	.	2	2	.	.	2	1	+	.	1	2	2	1	.	.	+	+	+	+	1	1	+	2	2	.	.	.	.	.	.	2	.	.	.	.	.	+	1	2	.	2	.	+	.	+	2	.	.	.	.	2	58
Holcus mollis		+	.	1	+	.	+	+	.	2	+	.	+	1	2	1	.	+	+	+	2	.	1	.	.	+	+	2	1	1	.	4	5	5	4	3	3	3	3	3	3	3	.	.	.	.	+	.	.	.	.	1	.	1	+	.	1	1	1	.	2	1	.	1	.	.	.	+	+	1	.	2	1	1	2	.	.	.	2	2	.	.	.	.	2	.	.	1	2	2	.	.	60
Dicranella heteromalla		.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	+	+	.	.	1	.	+	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	+	.	.	+	+	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	1	.	.	.	+	.	.	.	+	+	.	+	.	1	.	.	.	.	.	.	1	.	.	.	.	26
V. Ch. *Vaccinio-Piceetea* (V-P)																																																																																																	
Pinus sylvestris	a1,a	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	.	1	.	+	.	.	.	.	.	.	1	.	.	.	2	.	.	.	.	.	.	.	1	.	.	.	.	.	+	.	1	1	1	+	.	1	2	1	.	2	4	4	2	1	.	.	3	.	3	1	1	.	.	+	.	.	.	+	.	.	.	.	2	+	.	1	.	2	.	.	1	+	.	.	.	.	35
Pinus sylvestris	b*,c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	r	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+*	.	.	r	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	1*	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	+	.	.	.	.	11
Vaccinium myrtillus		2	2	+	2	+	2	1	+	+	+	3	3	3	1	1	.	1	.	+	1	.	+	+	.	2	+	2	5	2	2	+	.	.	1	+	3	+	.	2	+	.	2	+	1	.	4	3	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	.	.	.	+	1	.	1	.	.	.	+	+	+	+	2	2	2	2	1	1	1	1	1	.	.	80
Pleurozium schreberi		3	.	.	.	.	+	.	.	+	.	.	.	.	.	+	.	+	+	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	2	+	.	+	+	.	+	+	+	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	+	27
VI. Ch. *Querco-Fagetea* (Q-F)																																																																																																
Fagus sylvatica	l,a)*,a2	.	.	.	.	.	+	2*	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1*	.	.	8
Fagus sylvatica	b/c	.	1/+	.	/+	.	+/	3/+	/+	.	.	.	/+	.	+/	.	.	.	.	.	.	.	1/	.	.	.	.	.	.	.	.	+/+	.	.	.	.	.	/+	.	.	/+	.	.	.	.	.	.	.	/+	.	2	/+	.	.	/r	+/	/+	/+	.	.	+/+	/+	/r	2/2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/+	.	.	.	1/+	1/	.	28
Poa nemoralis		.	.	+	.	3	+	+	.	2	1	.	1	+	1	+	.	1	.	+	+	.	1	.	+	.	1	+	.	2	1	.	.	.	.	2	.	+	2	.	+	+	1	.	+	+	+	+	.	1	.	1	.	+	.	.	.	.	1	2	+	.	.	.	.	.	.	.	.	2	1	.	.	3	.	.	.	2	.	+	1	1	.	+	+	.	.	2	+	.	+	+	53
VII. Ch. *Calluno-Ulicetea* (C-U)																																																																																																
Solidago virgaurea s. s.		.	.	+	.	.	1	.	.	+	+	.	.	.	+	+	+	+	+	+	.	+	+	+	+	.	.	1	.	.	+	.	+	+	.	.	1	.	+	1	+	.	+	+	.	+	.	.	+	.	.	.	.	+	+	.	.	.	+	+	+	+	.	+	.	+	+	.	+	2	+	.	1	.	.	1	+	.	+	.	.	.	1	+	1	.	+	.	.	.	.	.	52
Agrostis capillaris		1	.	2	.	.	.	.	.	2	.	.	.	.	1	.	.	+	.	.	.	.	3	.	.	.	+	1	.	.	.	1	.	.	+	1	.	2	.	+	2	.	.	.	+	2	.	.	+	.	.	+	1	1	1	.	.	.	+	.	+	1	.	.	1	+	+	1	4	3	.	+	.	1	.	.	+	+	+	1	1	.	1	.	.	.	2	+	2	.	.	1	46
Pohlia nutans		.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	2	.	.	.	.	+	.	+	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	+	+	+	+	.	.	.	.	.	.	+	.	.	1	.	.	.	+	+	.	.	.	.	+	+	+	+	.	+	.	+	+	.	.	.	.	.	+	29
Luzula multiflora		.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	+	.	.	.	.	.	.	+	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	+	+	+	.	.	+	.	.	.	+	.	.	+	.	+	.	.	25
VIII. Others																																																																																																
Quercus robur	a1,a	.	.	3	.	.	3	.	.	.	.	.	.	4	.	3	3	4	.	.	2	.	4	.	.	4	.	4	4	.	.	4	.	+	4	3	5	.	.	4	4	4	.	.	.	.	1	1	.	.	.	2	.	.	.	2	1	.	1	.	2	4	.	.	.	.	.	.	4	1	.	3	4	.	4	3	3	.	.	2	3	2	5	.	1	.	.	4	1	.	4	4	47
Quercus robur	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	+	.	.	.	3	2	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	1	.	.	.	.	.	.	.	.	1	14
Quercus robur	b	.	.	.	.	.	+	.	.	.	.	.	.	1	.	+	.	.	.	.	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	.	+	1	.	.	.	2	.	.	.	2	1	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	+	.	.	.	+	21
Quercus robur	c	.	.	.	.	.	+	.	.	.	.	.	.	1	.	+	1	+	.	.	+	.	.	.	.	+	.	.	+	.	.	+	.	.	+	+	+	.	.	+	2	+	.	.	.	.	+	+	.	.	.	+	.	.	.	+	+	+	1	.	+	1	.	.	.	.	.	.	+	.	.	+	+	.	+	+	+	.	.	+	+	+	+	.	.	.	.	+	.	.	+	.	40
Frangula alnus	b	.	.	1	.	.	.	.	.	.	.	+	.	.	+	.	.	+	.	.	+	+	.	+	+	+	.	1	.	.	r	.	+	+	.	.	+	+	.	1	+	+	.	.	.	.	+	.	.	.	.	.	.	+	.	.	3	+	.	+	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	2	+	.	1	.	.	1	.	.	.	+	+	3	1	40
Frangula alnus	c	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	r	.	.	+	+	+	+	+	.	+	.	.	.	.	+	+	+	+	+	.	+	+	.	+	+	+	.	.	.	+	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	+	r	.	.	.	+	.	1	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	r	.	.	.	31
Sorbus aucuparia	a2*,b	.	.	+	.	.	.	.	.	.	.	+	.	.	2	.	.	.	.	.	+*,1	.	1*,2	.	.	.	.	+	.	.	.	.	.	.	.	+	1	2	.	.	.	.	.	.	.	+	.	.	.	.	+	2	.	+	.	+	2	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	2	2	.	.	.	.	+	1	+	+	.	+	+	.	.	+	.	3	.	.	30
Sorbus aucuparia	c	+	+	+	+	.	.	.	.	.	+	+	+	+	+	.	.	.	+	+	.	+	+	.	.	+	+	.	.	+	+	+	.	+	+	+	+	+	.	+	+	.	.	.	.	+	+	.	+	+	.	+	.	1	+	+	1	+	+	+	r	+	+	+	+	.	.	.	.	+	+	.	+	+	+	.	.	+	.	+	+	+	.	.	.	+	.	+	.	+	+	+	63
Padus serotina	b/c	/1	.	.	.	.	.	.	.	/+	/+	.	.	.	.	.	+/r	.	.	.	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	+/+	.	.	/+	.	.	.	.	.	.	/+	.	.	.	.	.	.	/+	.	.	.	1/+	.	.	.	+/+	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	/+	.	+/	r	r	/+	.	.	.	+/	+/	.	.	+/+	.	21
Luzula pilosa		.	.	.	+	+	.	+	+	+	+	+	+	+	+	.	1	1	+	+	.	+	.	+	+	+	2	.	+	+	+	.	+	+	1	+	.	.	+	1	+	.	1	+	.	+	+	1	+	+	1	+	+	1	2	+	+	+	1	1	1	1	+	1	+	1	1	+	+	.	+	+	1	.	.	.	.	+	+	.	+	1	.	+	.	1	.	1	.	+	1	.	74
Anthoxanthum odoratum		+	.	+	.	.	.	+	+	2	+	.	.	.	+	+	+	.	+	.	+	1	1	.	1	.	.	1	+	.	.	.	.	+	1	.	+	1	.	+	.	1	1	.	.	+	.	.	.	.	+	.	.	1	.	.	.	.	+	+	2	1	.	1	1	1	1	.	1	1	+	1	.	+	1	3	3	.	.	1	+	.	.	.	.	1	+	1	1	1	.	2	55
Maianthemum bifolium		.	1	.	1	.	.	1	+	.	+	1	1	1	.	.	+	.	+	.	.	+	.	.	+	1	.	+	2	.	1	+	2	2	1	.	+	.	+	2	2	.	.	.	.	.	+	1	.	.	+	+	+	1	+	.	3	3	.	.	1	.	.	+	.	.	.	.	.	.	1	+	2	.	.	.	.	.	+	.	.	.	.	+	+	1	.	.	.	.	1	1	48
Festuca rubra s. s.		.	.	+	+	.	+	.	.	+	+	.	.	.	.	.	1	1	.	.	1	.	.	.	+	+	+	2	.	.	.	.	.	+	+	.	.	+	.	+	+	.	+	+	3	1	.	.	.	.	.	.	+	1	+	.	.	.	.	.	.	+	.	.	.	.	.	1	.	.	.	+	.	3	3	.	.	.	+	.	+	.	+	.	1	.	+	+	1	.	.	2	41
Poa angustifolia		.	.	+	+	.	+	.	.	+	.	.	.	.	.	+	.	2	.	2	.	.	1	.	.	+	.	.	.	.	.	.	.	.	2	.	.	+	.	+	.	.	.	+	.	2	+	1	+	+	1	.	.	+	.	.	.	.	.	.	2	+	.	1	.	2	3	3	.	2	.	1	.	.	1	.	+	.	.	.	1	.	.	.	.	1	+	+	+	.	.	.	38
Dryopteris carthusiana		2	.	+	.	+	.	.	.	+	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	+	.	.	+	.	.	.	.	.	+	+	.	+	.	+	.	.	+	.	2	+	.	.	.	+	1	.	+	+	1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	.	.	31
Hypnum cupressiforme		.	.	.	.	.	+	.	+	+	.	+	.	.	.	.	+	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	+	.	.	+	.	.	.	.	+	+	.	.	.	.	+	.	+	.	.	+	.	.	.	+	.	.	+	+	.	.	.	+	.	.	.	.	+	.	.	.	.	+	.	+	1	.	+	.	.	+	.	+	+	.	.	.	31
Calamagrostis epigejos		.	.	.	.	.	1	.	.	+	+	.	.	.	.	.	.	+	.	+	r	.	.	.	.	.	+	.	.	.	1	.	.	.	.	+	.	.	.	.	+	.	.	+	.	+	.	+	+	.	1	.	.	.	+	1	.	.	+	.	+	.	.	.	.	.	.	.	.	.	+	+	.	+	+	.	.	.	.	2	.	.	.	.	1	.	.	.	.	1	.	2	30
Plagiomnium affine		.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	+	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	.	+	.	+	.	.	.	.	.	+	+	+	.	.	.	+	.	.	.	.	.	.	+	1	1	+	.	+	.	+	1	2	.	+	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	29
Campanula rotundifolia		+	.	.	.	.	+	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	.	.	.	.	+	.	.	+	.	.	+	.	.	.	.	.	+	+	+	+	.	.	.	25
Sciuro-hypnum oedipodium		.	.	.	.	.	+	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	+	.	.	.	.	.	.	+	+	+	.	+	.	.	1	+	+	.	+	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	+	+	.	.	.	24
Deschampsia flexuosa		.	.	.	.	.	1	.	.	.	.	.	.	.	1	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	1	+	.	.	.	+	3	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	+	.	+	2	.	21
Rubus idaeus		1	.	+	.	.	.	.	.	.	.	.	.	.	.	r	.	+	.	.	+	.	.	.	.	.	.	.	2	.	.	1	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	+	+	+	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.	+	.	21

Sporadic species: IV.: *Aulacomnium androgynum* 61,72,80,85, *Herzogiella seligeri* 83; *Hieracium umbellatum* 6,27(1),33,39,55(1),73,84,91; *Lophocolea heterophylla* 61,83; *Luzula pallescens* 80; *Mnium hornum* 2(1),7(1),12,13; *Plagiothecium denticulatum* 10,38,64; *P. laetum* 35,55,67; **V.:** *Cladonia furcata* 15,80; *Dicranum polysetum* 59; *D. scoparium* 11,20,25,52,54,62,67,68(1),79,80,87; *Dryopteris dilatata* 11; *Galium rotundifolium* 79,82; *Hylocomium splendens* 45; *Juniperus communis* b 28(1),60,67, c 4,24,28,30(r),43,47,48,52,67(r); *Leucobryum glaucum* 2,7(1),11,12,13,35,39,50, 75(1),87; *Lycopodium clavatum* 21; *Monotropa hypopitys* s.s. 18; *Orthilia secunda* 15,79,85(1),88; *Picea abies* b 4(2),15(1),22,23,27,28,29,36,40(r),41,61,80,87(2),90,91, c 6(r),8,21,42,43,45,48,49,52,70,85,87; *Pseudoscleropodium purum* 1(2),6(1),8,15(1),17,39,45,47(1),60(1),62(2),64(1),65,66(1),85,87; *Ptilium crista-castrensis* 13; *Pyrola minor* 55(1); *P. rotundifolia* 36; *Rubus saxatilis* 60,62(1),64(1),83; *Thuidium tamariscinum* 34,39; *Trientalis europaea* 3,7,17,28,50,63(1); *Vaccinium vitis-idaea* 15,45,46,47,51,56(1),82,85; *Viscum album* subsp. *austriacum* a 46; **VI.:** *Acer platanoides* b 35,44(2),89, c 2,12,20,22,44,58(r); *A. pseudoplatanus* c 35,46,74,85,90; *Ajuga reptans* 6,14,34(r),46,59,84,85,89; *Alnus incana* a2 55, c 55; *Brachypodium sylvaticum* 26,77,81(1); *Campanula persicifolia* 5,6,7,8,12,15,18,33,34,37,48,63,67,81(r), 88(1); *Carex digitata* 13,18,28,38,46,63,67,81(1),90(1); *C. montana* 18,24,51(1),60; *Cerasus avium* c 27,45,67,75(r),76,80,84; *Dactylis polygama* 83(2),90; *Dryopteris filix-mas* 1,5,36,40,64,83; *Festuca gigantea* 28,30,49,65,66(1),81(r); *Fraxinus excelsior* c 74,90; *Galeobdolon luteum* 67; *Galium odoratum* 13,90; *Hepatica nobilis* 18,83; *Hypericum montanum* 18,42,49,71; *Hypochoeris maculata* 67(r); *Impatiens noli-tangere* 5,27; *Lathyrus niger* 22,36,40,82; *Malus sylvestris* b 17,89, c 6,17(r),19, 47,54,61,63,74; *Melampyrum nemorosum* 21,24,27(1),32,33,41(1),88,89(2); *Milium effusum* 7(1),14,36,54,72(1),84,89,90,91; *Padus avium* c 56,84; *Phyteuma spicatum* 41; *Platanthera bifolia* 12,19(r),21,24,71(r); *Polygonatum multiflorum* 14,35,50; *Potentilla alba* 32,33,61; *Primula veris* 28; *Ribes uva-crispa* b 89, c 1; *Sanicula europaea* 41,84; *Scrophularia nodosa* 2,4,23,28,29,31,42,46(r),49; *Stachys sylvatica* 41; *Tilia cordata* a2 82(1), b 35,57,82, c 22,41,68,72,88; *Viburnum opulus* 27,37,56,57; *Viola reichenbachiana* et *riviniana* 18,45,69; **VII.:** *Carex ovalis 30,62; C. pallescens* 21,23,24,27,34, 47,51,63,68,82,84(1); *Cladonia pyxidata* 80; *Genista germanica* 7,12,13; *G. tinctoria* 36,48,79,84; *Hieracium pilosella* 24,30, 59,67,69,75,76,80,84; *Hypericum maculatum* 23,31(1); *Luzula campestris* 39,60; *Polytrichum juniperinum* 8,18,44,67,69; *Potentilla erecta* 31(1),32,33,34,71; *Scorzonera humilis* 6,26,47,84(1); *Viola canina* 71,76; **VIII.:** *Achillea millefolium* 14,19,41,44,59(1),65(1),67,69,74,75,76; *Aegopodium podagraria* 2; *Alopecurus pratensis* 84; *Angelica sylvestris* 89(1); *Anthericum ramosum* 19,25,38,52,53; *Arrhenatherum elatius* 20,22,41(1),44(1),49,68,89(1),91(1); *Astragalus glycyphyllos* 16,24,34,51,64,66(1),75; *Berberis vulgaris* b 81; *Betonica officinalis* 32,68; *Betula pendula* a 3,15,16(1),19(2), 48,52,71,72,81(2),84,87,88(1), a1 4,6,22(1),35(1),44(1), 51(1)55(2),60,79(1),86(1),89(1),91(1), a2 17(1),20(1),39(1),51(1), 56(2),57(1),60(1),73, b 6(2),7,12,15(1),16,55(1),56(1),70, 71,82, c 1(1),2,6,15,16,17,21,23, 34,39,62,71,72,76,77,86; *Brachypodium pinnatum* 75; *Brachytheciastrum velutinum* 35,46,67,69,79,83(1); *Brachythecium rutabulum* 11,19,37,61,78(2); *B. salebrosum* 69; *Brachythecium* sp. 18(1),21; *Bryum* sp. 45,69; *Campanula patula* s.s. 32,33,68,69; *Carex hirta* 1,56; *Cephalozia* sp. 80,87(r); *Cerastium holosteoides* 68; *Ceratodon purpureus* 82; *Chamaenerion angustifolium* 20,37,47,55,89; *Cladonia glauca* 15,80,87; *Clinopodium vulgare* 18,22(1),23,24,31(1),32,33,61,85; *Conyza canadensis* 9,10,26,86; *Cornus sanguinea* b 1, c 14,89; *Crataegus laevigata* b 39(1),61(1),86; *C. monogyna* b 14,47,58,84, c 70; *C. rhipidophylla var. rhipidophylla* b 81, c 1,64,76(r),88(r); *Cruciata glabra* 40(2); *Dactylis glomerata* 7,14,20,41,47,49,67,84(1); *Deschampsia caespitosa* 9,39,67,69; *Epilobium montanum* 67(r); *Euonymus europaea* c 57; *Euphorbia cyparissias* 41,45,64,75,76,86; *Fallopia convolvulus* 5,19,38,70,78,81,83; *F. dumetorum* 10,26,77,86; *Galeopsis pubescens* 21,22,31,32,35,38,40,55,67,73; *Galium album* 18,45,59,65,66; *G. album* fo. *dumetorum* 8,15,17,46,48,53,60,67,71; *G. aparine* 15(r),20,44,56,57,65(1),66(1),69; *G. boreale* 1,8,10,19,26,28,33,34,46, 59(r),64,70,85,86; *G. mollugo* 30,31,70; *G. verum* 1,24,30,31,71,76,84; *Geranium robertianum* 20,56(1),57,69,82,84; *Geum rivale* 90(r); *G. urbanum* 31; *Gnaphalium sylvaticum* 67; *Heracleum sphondylium* 89; *Holcus lanatus* 36,45,67; *Impatiens parviflora* 30(2),62,78,79(1),81,82(1),84(1),86,91; *Juncus effusus* 40,49; *Knautia arvensis* 30(r),33; *Lapsana communis* s. s. 31; *Larix decidua* subsp. *decidua* a 29(1),49, a1 79, c 49; *Leontodon autumnalis* 67; *Leucanthemum vulgare* 41; *Linaria vulgaris* 20; *Lysimachia nummularia* 67(r); *Lysimachia vulgaris* 3,54,56,57,78; *Malus* sp. c 38; *Melandrium rubrum* 68; *Mnium* sp. 21,23; *Molinia caerulea* 39,55; *Peucedanum oreoselinum* 6,16,24,33,38,59,64,65,66,70(2); *Pimpinella saxifraga* 45,75,76(r); *Plagiomnium cuspidatum* 36,63,75; *Plagiomnium rostratum* 47; *Plagiothecium* sp. 5; *Poa compressa* 67(1),76; *P. pratensis* 20,27(1),28(2),36(1),39,40,42,67,75,80(r),89(1); *P. trivialis* 69; *Polypodium vulgare* 6(1); *Populus tremula* a1 55(1),89(1) a2 17, b 20,32,33,78,88, c 17,20,32,33,55,88,89; *Prunella vulgaris* 35; *Prunus* sp. c 62,86(r); *P. spinosa* b 81,84(1), c 26,37;*Pyrus communis* a2 14,39, b 27,46,60, c 16(r),19,24,34,44,46,54(r),60,69,71,75; *Quercus rubra* a1 40(2), b 55(1), c 17(r),40; *Q. x rosacea* a 30(1),59(1),69(4), a1 50(3),63(4), a2 50(1), c 50,59(1),63,66; *Ranunculus sardous* 41; *Rhytidiadelphus squarrosus* 63; *Robinia pseudacacia* a 82(1), b 36,82, c 71,74; *Rosa canina* b 84; *Rubus caesius* 5,21,23,24,56(r); *R.* cfr. *hirtus* 79; *R. hirtus* 40; *R. nessensis* 3; *R. pallidus* 3(1); *R. plicatus* 6(1),17,30(1),56(1),57,71,73; *R. radula* 3; *R. schleicheri* 34,71; *Rubus* sp. 1,54,55,62,64,77,82, *R. sprengelii* 3(1),6,16,46,74,87,90; *R. x corylifolius* 3(1),37,40; *Rumex acetosa* 20,36,47,76(r),89; *R. acetosella* 20,56(1),57,60,67,70,74,79,80(r),91; *Sagina procumbens* 67; *Sambucus nigra* b 55, c 5,35,84; *S. racemosa* c 56; *Sarothamnus scoparius* c 22,44,46,58,79; *Sedum maximum* 19,20,27,34,38,63,67,70,71; *Selinum carvifolia* 68; *Senecio ovatus* 84; *S. sylvaticus* 9; *S. vulgaris* 20; *Silene nutans* subsp. *nutans* 42; *Stellaria graminea* 7,31,34; *S. media* 20,27,35,65(2),66(3),79,82,91; *Taraxacum officinale* 20,22,27, 45,59,65,69,75(r),76(r),88(r); *Torilis japonica* 31,45; *Trichodon cylindricus* 69;*Trifolium alpestre* 13,84,88; *T. arvense* 22; *Urtica dioica* 7,9,10,26,65(2),66(1),77; *Vicia cassubica* 7(1),12,27,46,67,79; *V. sepium* 1,40,62; *Viscaria vulgaris* 34,52,67.

Table A15. *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* typical variant in stage I of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	1-62	63	64	65	66	67	68	69	70	71	72	73	63-73
ID-1		42	42	27	50	18	18	18	14	18	18	37	50	50	50	18	47	48	18	18	42	18	18	14	14	18	18	18	18	42	42	42	18	18	37	42	59	18	42	50	27	42	42	59	20	59	59	12	44	50	50	23	48	36	37	36	44	37	48	18	37	48	54		18	18	18	18	18	18	18	18	18	2	18	
ID-2		1	1	1	3	1	1	1	9	1	5	13	3	3	3	1	176	3	1	5	1	1	1	9	9	1	1	5	1	2	4	4	5	1	14	4	6	1	2	3	1	4	4	6	1	5	5	3	4	3	3	12	3	16	12	17	4	14	3	1	14	3	11		2	2	2	2	2	2	2	2	2	7	2	
ID-3		7	2	20	3	4	25	28	2	32	8	3	4	5	6	24	2	9	26	6	8	19	31	3	4	3	13	7	21	9	2	18	9	12	11	20	7	11	14	1	25	12	16	9	10	1	11	3	1	22	26	16	21	7	20	7	7	12	18	23	13	2	5		6	7	8	3	11	5	9	10	1	9	4	
Date (year)		1981	1981	1975	1976	1989	1989	1990	1964	1990	1990	1987	1976	1976	1976	1989	1983	1976	1990	1990	1981	1990	1990	1964	1964	1989	1989	1989	1990	1981	1981	1981	1989	1990	1986	1980	1993	1990	1980	1976	1975	1981	1981	1993	2007	1993	1993	1984	1979	1976	1976	1965	1976	1985	1986	1986	1977	1987	1976	1989	1987	1976	1975	1-62	1990	1990	1990	1990	1989	1990	1990	1989	1989	1988	1989	63-73
Density of tree layer	a1,a [%]	70	60	70	85	80	75	80	80	80	80	50	85	75	85	85	70	80	75	75	85	90	75	80	90	80	90	80	85	60	65	80	70	80	25	65	70	75	60	75	50	85	70	70	75	70	70	60	70	90	85	75	40	25	50	60	60	60	75	90	70	80	70		60	65	70	75	60	65	70	60	60	70	60	
Density of tree layer	a2 [%]	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55	-	-	-	-	-	-	-	-	-	5	-	-	-	20	-	-	-	60	55	40	+	10	20	-	-	40	-	-		-	-	-	-	-	-	-	-	-	-	-	
Density of shrub layer	b [%]	-	+	+	-	10	-	-	10	-	-	+	-	-	-	30	+	-	-	-	-	15	-	10	10	-	10	20	5	+	7	+	-	5	20	-	-	5	+	-	-	-	-	15	5	70	-	-	10	-	-	15	-	20	5	35	5	5	-	20	5	-	10	%	5	5	-	-	-	-	-	-	-	5	5	%
Cover of herb layer	c [%]	85	70	50	50	80	90	75	90	75	75	90	50	40	60	80	60	50	85	80	85	85	75	90	90	80	60	75	85	35	40	45	95	70	80	80	90	70	50	75	40	95	45	60	60	70	60	75	60	85	65	75	75	85	95	75	80	85	80	50	100	50	40		90	75	95	60	90	75	80	50	70	60	40	
Cover of moss layer	d [%]	+	+	5	10	-	-	+	+	-	-	5	10	+	+	-	+	5	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	-	+	-	-	-	+	5	5	-	10	+	60	-	+	5	+	+	3	+	+	+	+	5	30	5	10	-	+	-	5		5	15	5	25	10	+	+	20	40	+	30	
Area of relevé		100	100	300	200	200	130	200	200	200	200	600	200	200	200	150	200	150	150	250	100	150	150	220	150	150	150	200	200	100	100	100	120	150	500	140	100	120	100	150	150	100	100	70	300	90	250	200	600	200	200	200	150	800	800	900	400	700	200	200	800	200	100		200	200	250	200	170	200	250	130	125	200	150	
Location (ATPOL)		BD49	BD49	BD54	BD28	BD44	BD44	BD44	BD44	BD44	BD44	BD80	BD28	BD28	BD28	BD44	BC99	BD28	BD44	BD44	BD59	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD49	BD49	BD49	BD44	BD44	BD81	BD49	BC99	BD44	BD49	BD39	BD54	BD49	BD49	BC38	CD39	BC98	BC88	BD66	DE40	BD28	BD28	CD53	BD28	CE22	BE02	-	DE51	AD78	BD28	BD44	BD80	BD28	BC82		BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD44	BD81	BD44	
Total number of species		15	13	15	13	22	15	21	17	16	20	16	17	12	16	23	18	16	20	25	18	16	20	21	21	14	16	24	20	14	17	20	20	13	21	19	12	16	13	17	18	24	28	24	31	19	22	39	21	20	19	21	22	33	18	32	37	23	27	19	30	13	16		21	27	22	26	12	25	22	16	19	27	30	
Number of mosses, liverworts and lichens species		2	2	4	1	-	-	2	2	-	-	3	6	3	1	-	1	3	-	-	-	-	-	1	-	-	-	-	-	2	2	-	-	-	1	-	-	-	1	1	2	-	6	3	6	-	2	4	2	2	3	4	1	4	2	7	5	2	6	-	3	-	2		2	6	4	5	2	2	1	3	5	2	6	
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*																																																																												
* *Quercus petraea* [*Q. x rosacea*^]	a1,a	4	4	4	5	3	3	4	5	4	4	3	5	4	5	4	4;1^	4^	2	2	3	4	3	5	5	4	5	3	4	4	4	5	3	4	.	4	4	4	4	4	3	5	4	4^	4	.	4^	4	4	5	5	4	.	1	3	1	.	.	4^	3	3	4^	4	92	.	.	.	.	1	.	.	.	.	1	+	27
* *Quercus petraea* [*Q. x rosacea*^]	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	1	.	.	.	1	.	.	.	4^	3	3	.	.	.	.	.	2	.	.	11	.	.	.	.	.	.	.	.	.	.	.	-
* *Quercus petraea* [*Q. x rosacea*^]	b;bc'	.	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	+	1	.	.	.	2	.	.	.	.	.	.	.	.	2^	1	.	.	.	+	.	.	2	.	2	+	.	.	.	.	.	+	.	1'	24	.	.	.	.	.	.	.	.	.	+	.	9
* *Quercus petraea* [*Q. x rosacea*^]	c	+	+	1	+	1	+	3	+	3	1	+	.	+	.	+	1	1^	+	1	+	2	1	.	+	+	r	+	4	+	+	+	.	2	+	+	.	3	+	.	1	.	+	.	2	.	.	2	2	1	.	.	2^	+	2	+	.	.	1^	+	1	+^	.	76	1	+	+	1	+	1	1	r	+	.	+	91
* *Calamagrostis arundinacea* (Qrp)		5	4	3	3	4	4	4	4	3	3	4	3	3	3	3	3	3	4	3	5	4	4	4	4	3	3	3	2	.	.	.	2	2	.	.	2	2	.	+	+	.	.	.	.	2	2	.	1	2	1	1	1	+	.	.	.	.	+	2	1	1	.	74	2	2	2	3	4	3	3	3	1	2	2	100
* *Festuca ovina* (Qrp)		+	+	2	1	.	.	.	+	+	.	+	2	1	3	.	1	1	.	1	+	+	.	+	+	1	.	.	.	2	2	.	.	.	1	1	.	+	.	1	3	+	3	3	3	.	+	2	1	+	+	+	+	.	.	2	1	+	1	.	.	+	2	68	1	2	1	2	2	+	1	3	2	+	2	100
Hieracium lachenalii		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	+	.	+	.	.	1	.	.	.	.	.	.	+	1	+	+	.	.	.	.	1	18	.	.	.	+	.	.	.	.	+	.	+	27
Hieracium laevigatum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	+	.	.	.	.	.	9
Hieracium sabaudum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	+	.	1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	10	.	.	.	.	r	.	.	1	.	.	.	18
II. D. *Ca-Q polygonatetosum odorati*																																																																													
Corylus avellana	b;bc'	.	.	.	.	1	.	.	1	.	.	.	.	.	.	2	+	.	.	.	.	1	.	1	1	.	1	1	1	.	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	23	.	1	.	.	.	.	.	.	.	.	+	18
Corylus avellana	c	+	.	.	.	r	.	.	+	.	.	.	.	.	.	r	.	.	.	.	.	.	+	+	+	.	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19	.	.	+	+	.	.	.	r	.	.	+	36
Convallaria majalis		2	+	+	+	2	2	2	2	2	2	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	+	.	1	2	1	.	2	+	+	+	2	1	.	1	.	1	2	2	2	1	.	.	.	1	.	2	1	1	1	.	85	3	3	4	1	4	4	2	2	2	+	2	100
Moehringia trinervia		+	+	.	.	1	.	1	.	1	+	+	+	1	.	r	.	+	+	1	.	.	.	+	+	+	+	.	1	.	.	.	1	+	2	+	.	+	+	.	.	.	+	.	.	.	+	+	.	.	.	.	1	+	+	+	.	+	.	+	+	+	+	58	+	.	.	.	.	1	.	.	.	.	.	18
Mycelis muralis		.	.	.	.	1	.	r	.	+	1	.	.	.	.	+	.	.	+	+	.	.	+	+	+	.	.	1	+	.	.	+	2	.	.	.	.	1	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	+	.	+	.	.	.	r	.	.	+	37	.	.	.	.	.	.	+	.	.	.	.	9
Polygonatum odoratum		.	.	+	+	.	.	.	.	+	+	.	+	.	r	.	r	1	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	+	+	.	.	+	.	+	+	1	+	.	+	.	.	r	.	r	.	.	.	.	1	.	+	.	.	.	.	35	.	+	.	.	.	.	.	.	.	.	.	9
Melica nutans		.	.	.	r	.	.	.	.	.	.	.	1	2	.	.	.	2	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	+	.	+	.	.	.	.	1	.	1	+	.	.	.	.	1	.	.	.	.	21	.	.	.	.	.	.	.	.	.	.	.	-
Hieracium murorum		.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	1	+	+	.	1	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	21	.	.	.	.	.	.	.	.	.	.	.	-
III. Ch., D.* *Quercetea robori-petraeae* (Qrp)																																																																												
* *Melampyrum pratense*		.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	1	+	+	.	.	.	+	.	.	+	+	.	3	1	.	1	.	.	1	1	1	1	+	.	+	.	.	2	.	.	.	+	.	.	32	+	+	.	+	1	+	+	1	.	+	+	82
* *Pteridium aquilinum*		2	.	.	+	3	+	2	+	1	1	1	1	+	.	1	1	1	1	1	+	1	1	+	1	3	1	2	2	.	+	.	3	4	3	4	5	3	3	1	.	.	2	.	.	1	.	.	2	+	1	+	+	+	2	+	2	.	1	2	2	+	.	79	1	+	1	2	1	1	1	2	+	.	2	91
Holcus mollis		.	.	.	.	.	+	.	+	.	.	.	.	.	.	r	.	.	.	.	.	1	.	2	+	.	+	1	+	.	.	.	.	+	.	.	.	.	.	4	1	.	.	.	.	.	.	.	1	.	.	.	.	+	1	1	+	.	.	+	1	.	.	31	.	.	.	.	.	.	.	.	.	.	.	-
* *Polytrichastrum formosum*		+	+	+	2	.	.	.	+	.	.	+	2	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	2	.	.	+	.	.	.	.	.	+	+	+	.	.	.	+	1	+	.	+	.	.	.	.	31	.	.	.	+	.	.	.	+	1	.	+	36
Carex pilulifera		.	.	+	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	.	.	.	+	+	.	+	.	1	.	+	2	+	.	+	+	+	r	.	.	.	+	+	+	.	+	.	.	1	.	.	37	.	.	.	.	.	.	.	.	.	.	.	-
Dicranella heteromalla		+	+	+	.	.	.	.	.	.	.	1	+	r	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	+	.	1	.	+	.	.	.	.	.	.	.	r	.	+	.	.	.	.	1	.	.	.	.	+	27	.	.	.	1	.	.	.	.	.	+	.	18
Hieracium umbellatum		.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	+	+	2	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	16	1	2	1	.	.	.	.	.	+	.	+	45
IV. *Vaccinio-Piceetea*																																																																												
Pinus sylvestris	a1,a	.	+	.	.	.	2	1	.	1	1	1	.	.	.	2	.	4	3	3	2	2	2	.	.	.	.	2	1	.	.	.	1	.	2	.	.	.	.	.	.	.	.	.	2	.	2	.	1	1	.	.	2	2	.	2	3	3	4	3	3	3	4	50	4	4	4	4	4	4	4	4	4	4	4	100
Pinus sylvestris	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	-
Pinus sylvestris	c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	5	.	.	+	+	.	.	.	2	+	+	2	55
Vaccinium myrtillus		.	.	+	.	.	.	1	.	.	+	2	.	.	.	2	.	1	+	.	1	.	+	.	1	1	+	1	1	.	.	1	2	.	1	+	.	.	.	.	+	+	.	1	1	2	2	.	3	4	4	4	4	4	4	3	3	5	4	3	5	3	.	61	+	+	+	.	2	2	1	1	.	2	.	73
Pleurozium schreberi		.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	1	+	.	.	+	.	+	.	+	1	.	1	.	+	.	.	19	2	1	.	.	.	+	.	.	.	.	.	27
V. Ch. *Querco-Fagetea*																																																																												
Fagus sylvatica	a2	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	2	.	.	5	.	.	.	.	.	.	.	.	.	.	.	-
Fagus sylvatica	b/c	.	.	.	.	.	.	.	/+	.	.	+/+	.	.	.	.	/+	.	.	.	.	.	.	/+	/+	/+	.	.	.	.	.	/+	.	.	+/+	.	.	.	.	.	.	.	.	.	.	.	.	/+	.	.	/+	.	.	.	.	/+	.	.	.	.	+/+	/+	/+	23	.	.	.	.	.	.	.	.	.	.	.	-
Festuca heterophylla		.	.	.	.	2	1	.	1	.	1	.	.	.	.	2	.	.	1	1	.	1	+	+	+	2	1	.	.	.	.	.	2	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	.	.	.	27	.	.	.	.	.	+	.	.	.	.	.	9
Poa nemoralis		+	+	.	+	2	.	.	+	.	.	.	1	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	1	+	+	.	1	.	.	+	1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	24	.	.	.	+	.	1	.	.	.	.	.	18
VI. Ch. *Calluno-Ulicetea*																																																																												
Solidago virgaurea s. s.		+	.	.	.	.	.	.	+	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	+	.	+	.	+	+	.	+	.	.	.	.	.	.	.	+	.	+	.	.	.	+	.	.	21	.	.	.	+	1	.	.	1	.	.	+	36
Pohlia nutans		.	.	.	.	.	.	+	.	.	.	1	r	r	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	+	+	+	+	.	.	.	+	23	+	1	1	2	1	+	+	1	1	.	1	91
Calluna vulgaris	c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	2	+	+	+	+	.	+	+	.	.	.	+	64
VII. Others																																																																												
Quercus robur	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	3	3	2	.	.	.	.	.	6	.	.	.	.	.	.	.	.	.	.	.	-
Quercus robur	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	2	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	-
Quercus robur	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/r	.	.	.	.	+/	.	.	.	.	.	+/+	.	1/	.	3/+	1/+	+/+	.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	-
Sorbus aucuparia	a';a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	+	.	9
Sorbus aucuparia	b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	+	.	+	.	.	+	.	.	+	.	+	.	+	+	.	.	.	1	.	.	15	.	.	.	.	.	.	.	.	.	.	.	-
Sorbus aucuparia	c	.	+	.	r	r	.	+	.	+	.	+	.	.	.	r	+	+	.	.	+	.	+	.	.	+	.	+	+	+	.	+	+	.	+	.	.	+	.	.	+	+	.	.	.	.	.	+	+	1	+	+	.	+	.	+	+	+	1	+	.	.	+	53	+	+	+	+	.	+	+	1	+	.	+	82
Frangula alnus	b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	+	+	1	.	.	+	.	.	.	.	+	.	+	+	.	.	.	.	.	.	15	.	.	.	.	.	.	.	.	.	.	.	-
Frangula alnus	c	.	.	.	.	r	.	+	.	.	+	.	.	.	.	r	.	.	+	.	.	.	.	+	.	.	+	.	+	.	.	+	.	.	.	+	.	.	+	.	.	1	+	.	.	.	.	+	+	+	.	+	.	.	.	.	+	+	1	+	.	+	.	35	+	.	.	+	.	.	.	.	+	.	+	36
Luzula pilosa		.	.	+	r	1	.	.	.	.	+	.	2	+	+	.	.	1	.	+	+	.	+	+	+	.	+	.	+	.	+	.	.	.	.	+	.	+	+	.	1	.	+	+	1	+	1	1	1	1	+	+	1	1	.	.	1	.	1	.	+	.	2	58	+	+	+	.	.	+	.	+	+	+	+	73
Galeopsis tetrahit		+	.	.	.	1	.	1	.	1	1	.	.	.	.	2	.	.	1	2	+	1	+	.	.	+	2	1	1	+	.	+	4	+	.	.	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	37	+	.	+	.	.	1	+	.	.	.	.	36
Vincetoxicum hirundinaria		.	.	.	.	.	1	+	.	1	+	.	.	.	.	1	.	.	1	+	.	+	1	+	+	.	2	2	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	24	.	.	+	.	.	.	+	.	.	.	.	18
Maianthemum bifolium		.	.	.	+	1	.	1	+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	1	.	1	+	+	.	2	.	.	.	.	.	.	.	.	+	.	26	.	.	.	.	.	.	.	.	+	.	.	9
Fallopia dumetorum		.	.	.	.	r	+	+	.	1	+	.	.	.	.	2	.	.	+	.	.	.	+	.	.	2	2	1	.	.	.	.	1	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23	.	.	.	.	.	.	+	.	.	.	.	9
Vicia cassubica		.	.	.	.	.	.	+	.	+	.	.	.	.	.	r	.	.	r	.	.	.	.	+	.	.	.	+	.	.	.	.	1	.	.	+	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	18	.	.	+	.	.	+	1	.	.	.	.	27
Dryopteris carthusiana		.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	.	+	+	+	.	.	+	+	.	.	+	.	16	.	.	.	.	.	.	+	.	.	+	.	18
Anthoxanthum odoratum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	+	1	+	.	1	.	.	+	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	18	.	.	.	.	.	.	.	.	.	1	+	18

Sporadic species: III.: *Lophocolea heterophylla* 43,49; *Plagiothecium laetum* 12,58; **IV.:** *Chimaphila umbellata* 44; *Dicranum polysetum* 64,71,73(1); *D. scoparium* 42,44,53,55,70(1),72; *Galium rotundifolium* 47,53,54; *Hylocomium splendens* 44; *Juniperus communis* b 30,44, c 7,24,35,40,41,42,56,64,65,66,69; *Leucobryum glaucum* 3,8,44(2),60,66(1),71(2),73; *Monotropa hypopitys* s.s. 56; *Orthilia secunda* 62(1); *Picea abies* a1 60(1), a2 48(2), b 48(1), 54(1), 60(1), 63(1), c 10,18,19,32,35,41,42,47,48(1),63,64,69; *Plagiothecium curvifolium* 42,58; *Pseudoscleropodium purum* 51,64,65; *Pyrola minor* 62(2); *Rubus saxatilis* 10,39,45,46(1),52(1),58(1),61; *Thuidium tamariscinum* 55; *Trientalis europaea* 53(1),56; *Vaccinium vitis-idaea* 48,51,54,56,64,65,69,72; *Viscum album* subsp. *austriacum* 22,66,73; **V.:** *Acer platanoides* c 53,62(r); *A. pseudoplatanus* b 53, c 20,53; *Ajuga reptans* 5(1),56; *Anemone nemorosa* 11(1),20,31(1),43(2),45(2),48(1),60; *Atrichum undulatum* 51,55; *Brachypodium sylvaticum* 6(1),59(1),72; *Campanula persicifolia* 41,42,64; *Carex montana* 3,31,48; *Carpinus betulus* b 51,56, c 20,30,51,56,57; *Dactylis polygama* 16,55(r); *Dryopteris filix-mas* 46; *Festuca gigantea* 5,7(1),18,21(1),28(1); *Hypericum montanum* 27; *Lathyrus niger* 10,27,32(1),69; *Lilium martagon* 10(r),19,20,24,31,32(1),52,68; *Luzula luzuloides* 72; *Malus sylvestris* 52,58; *Milium effusum* 36,60,72; *Platanthera bifolia* 47; *Ribes spicatum* c 7; *Scrophularia nodosa* 5,6(r),18(1),28; *Tilia cordata* b 43, c 6(r),47,68; *Ulmus glabra* a 59(1), c 59(r); *U. minor* c 19,52; *Viburnum opulus* c 59; *Viola reichenbachiana* 46,53,62; **VI.:** *Agrostis capillaris* 38,39(1),47,53,54,56,57,72; *Carex ericetorum* 56; *C. ovalis* 47; *C. pallescens* 1,41,42,51; *Cladonia coniocraea* 40; *Danthonia decumbens* 56; *Hieracium pilosella* 14,47,56; *Luzula multiflora* 1,3(1),30,38(2),40,42,44,55; *Polytrichum juniperinum* 60,73(1); *Ptilidium ciliare* 43; *Scorzonera humilis* 14(1),16(r),36,58;V*eronica officinalis* 16,17,39,43,44,47,54,56,72; **VII.:** *Agrostis stolonifera* 40; *A. vinealis* 66,73; *Alliaria petiolata* 5; *Anthericum ramosum* 6,14(1),21,23,41,68; *Astragalus glycyphyllos* 15; *Betonica officinalis* 58; *Betula pendula* a 2,27(1),66(1),73, a1 34(1),55(1),56(1),57(1),60(1), a2 34(2), b 34(1),35,54,55, c 2,23,24,54,57,68; *Brachypodium pinnatum* 10(1),18(1),19,31,37,63(1); *Brachythecium rutabulum* 65,67; *Calamagrostis canescens* 71(1); *C. epigejos* 29,34(2),44,47,53(1), 55(2),60, 63(1),65(1),69(1),73; *C. patula* s.s. 43; *C. rotundifolia* 14,50(1),72; *Carex acutiformis* 33(2); *Chamaenerion angustifolium* 57(1),60(1); *Cladonia* sp. 42; *Clinopodium vulgare* 41,47; *Crataegus laevigata* b 45; *C. monogyna* b 27,34,60, c 20; *Dactylis glomerata* 52; *Deschampsia flexuosa* 34,43,44,46,53,60,72(2); *Dianthus superbus* s.s. 9,59; *Euonymus europaea* c 59(1); *Fallopia convolvulus* 1,2,12,21,35,63,68; *Festuca rubra* s.s. 3,34,39,40,45,47(1),50,55,57; *Fragaria vesca* 56,58; *Galeopsis pubescens* 14,31,41,53; *Galium album* fo. *dumetorum* 47; *G. boreale* 5(2),8,14(r),19(1),24,27(1),41,42,43,58(1); *G. verum* 27,47; *Geranium robertianum* 19(r),52; *Hieracium* sp. 58; *Holcus lanatus* 57; *Hypericum perforatum* 41; *Hypnum cupressiforme* 13,42,43,44(1),47,53,56(1),58,66,71,73; *Impatiens parviflora* 36,53,55(1); *Juncus effusus* 60; *Koeleria* sp. 73; *Lamium maculatum* 72; *Larix decidua* subsp. *decidua* a2 60(1); *Leontodon hispidus* 47; *Lysimachia vulgaris* 21,26(1),27(2),45,49(1),66; *Molinia caerulea* 52(1),58; *Orthodicranum montanum* 53; *Padus serotina* c 22,28,47; *Peucedanum oreoselinum* 14,19(r),24,30,31,39,41,42,44,51,64,73; *Phragmites australis* 66,73; *Pimpinella saxifraga* 72; *Plagiomnium affine* 7,12,44(1),46,47(1),51,55,56(2),64,65; *Poa angustifolia* 19,27(1),40,41,44,47(4),48,50(1); *P. pratensis* 15; *Polypodium vulgare* 62; *Populus tremula* b 19,55,57(1), c 16,19,55,57(1),71; *Prunus spinosa* b 34, c 46,52; *Pyrus communis* b 45(1),72, c 47,56; *Ranunculus acris* s.s. 56; *Rhamnus cathartica* c 49; *Robinia pseudacacia* c 22,28,64; *Rosa canina* c 7,19,59; *Rubus caesius* 9,15,19; *R. idaeus* 6,11,20,34,45,53,60,72; *Rubus* sp. 2,34(1),38,53(2),55,56,57,60; *Rumex acetosa* 47; *R. acetosella* 44,64,66(1),73; *Sambucus nigra* c 5; *S. racemosa* b 60; *Sciuro-hypnum oedipodium* 12,47,64(1); *Sedum maximum* 31,39; *Selinum carvifolia* 47; *Silene nutans* subsp. *nutans* 16; *Stellaria graminea* 72; *S. media* 34,55; *Urtica dioica* 5(1),6(r),15(1),19,21,22,25,26(1),27(1),33,37(1),33,37(1),68,72; *Veronica chamaedrys* 39,44; *Viscum album* subsp. *album* 55.

Table A16. *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* variant with *Anemone nemorosa* in stage I of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	
ID-1		42	42	12	37	59	41	37	47	29	42	42	42	50	50	42	42	42	20	29	36	29	12	42	17	17	42	42	29	42	42	29	36	55	49	37	29	12	37	12	31	23	50	29	49	12	20	23	36	23	49	59	29	18	17	16	36	37	44	48	48	36	55	55	
ID-2		1	1	3	13	6	1	13	176	10	6	4	3	3	3	4	4	4	1	10	13	10	3	3	9	9	5	5	10	5	5	10	13	14	5	12	10	3	13	3	2	12	3	10	5	3	4	12	17	12	5	5	10	3	9	17	13	12	4	3	3	16	16	16	
ID-3		10	1	20	4	1	13	1	1	21	4	7	5	2	30	17	8	10	9	6	12	11	37	7	13	9	13	7	19	2	5	18	22	35	4	7	17	7	2	10	8	4	29	14	3	11	6	9	9	6	2	3	7	1	11	7	17	6	6	16	14	10	9	6	
Date (year)		1981	1981	1964	1987	1993	1997	1987	1983	1980	1981	1981	1981	1976	1976	1981	1980	1980	2007	1980	1985	1977	1984	1980	1995	1995	1980	1981	1980	1981	1980	1980	1985	1994	1975	1986	1980	1988	1987	1988	1981	1965	1976	1980	1975	1990	2007	1965	1965	1965	1976	1993	1980	1989	1995	1972	1984	1987	1976	1976	1976	1986	1989	1990	1-63
Density of tree layer	a1,a [%]	85	60	70	70	60	80	70	70	70	80	80	75	75	75	60	50	75	70	75	60	70	80	80	30	80	30	55	70	65	50	75	65	90	60	70	75	70	70	60	50	60	80	60	60	70	60	70	45	60	60	70	60	80	50	100	65	70	60	80	60	40	80	70	
Density of tree layer	a2 [%]	-	-	-	20	-	-	20	-	-	-	-	-	-	-	-	-	-	5	-	15	-	-	-	5	-	-	-	-	-	-	-	20	-	-	20	-	-	5	-	60	-	-	-	-	15	10	-	20	-	-	-	-	-	-	5	-	5	-	-	-	60	-	-	
Density of shrub layer	b [%]	-	+	-	20	-	5	+	+	+	20	-	-	-	-	40	20	+	5	+	5	20	5	-	+	-	5	-	5	+	5	+	40	10	+	-	-	-	5	+	10	20	-	15	-	10	10	10	10	30	+	10	5	+	-	+	5	20	20	-	-	25	10	30	%
Cover of herb layer	c [%]	95	80	60	95	80	100	80	70	60	70	75	45	50	50	60	85	95	50	40	90	40	100	75	70	40	95	95	60	60	80	60	60	30	90	70	60	45	95	40	50	75	60	50	75	50	70	95	80	90	60	70	50	85	80	60	70	100	100	80	80	80	20	30	
Cover of moss layer	d [%]	-	+	+	+	5	+	5	-	+	-	+	5	3 +	+	+	+	+	25	10	5	30	-	-	+	-	+	+	+	-	+	+	5	10	-	+	+	5	5	20	10	15	-	+	+	+	+	+	+	30	-	5	15	-	-	80	10	+	-	+	10	-	-	+	
Area of relevé		100	100	300	900	150	400	800	200	200	100	100	100	200	200	100	100	130	200	200	600	150	200	150	100	120	100	100	150	100	100	150	800	200	150	800	120	100	800	150	200	200	200	200	200	300	200	300	700	200	100	120	200	350	150	400	800	900	200	200	150	800	100	150	
Location (ATPOL)		BD59	BD49	CC95	BD80	BC98	CC25	BD80	BC39	CD17	BD59	BD49	BD49	BD39	BD39	BD49	BD49	BD49	CD39	CD17	BE28	CD17	BD66	BD49	BC66	BC66	BD49	BD49	CD28	BD49	BD49	CD28	BE28	BC83	-	-	CD28	BD57	BD80	BD57	CD84	CD53	BD28	CD17	-	CE15	CD39	CD52	BE06	CD53	-	BC88	CD17	BD44	BC66	CC91	CE05	BD80	DE50	BD28	BD28	CE20	BC83	BC84	
Total number of species		18	16	30	23	20	27	23	12	31	17	26	26	27	27	24	31	36	41	36	42	37	26	18	26	34	32	31	44	18	31	51	37	31	30	33	35	31	21	33	28	40	36	39	26	39	37	47	36	39	31	24	41	42	29	56	33	33	28	31	26	29	19	22	
Number of mosses, liverworts and lichens species		1	3	5	2	4	3	5	-	4	-	2	4	2	2	3	1	3	5	16	5	7	-	-	1	-	3	2	6	-	1	7	4	4	-	3	9	3	5	6	1	4	-	8	1	5	-	5	2	4	-	4	15	-	-	3	8	3	-	4	6	-	-	4	
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*																																																																		
* *Quercus petraea* [Q. x *rosacea* ^]	a1,a	4	4	4	4	4^	3^	4	4	4	4	5	5	4	4	4	4	5	3	4^	1	4	5	5	1	3;3^	3	4	4	4	4	4	4	.	.	.	4	2	4	3	1	.	5	4	.	2	3	.	2	.	.	3	4	4	2;2^	5	4	4	2	4^	3^	+	3	4	87
* *Quercus petraea*	a2	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	2	.	.	.	.	.	.	.	.	1	.	.	.	1	.	.	14
* *Quercus petraea* [Q. x *rosacea* ^]	b	+	+	.	+	.	+^	.	.	.	2	.	.	.	.	.	.	+	1	+	.	.	.	+	+	.	+	.	1	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	.	.	+	+	.	.	.	.	+	.	.	.	+	.	.	33
* *Quercus petraea* [Q. x *rosacea* ^]	c	+	+	1	+	.	+^	+	+	.	+	+	+	+	.	.	+	+	2	+	+	+	1	+	.	+;+^	+	+	+	+	.	+	+	.	.	.	+	1	+	1	.	.	1	+	.	+	+	.	1	.	.	+	2	+	+	2	2	+	1^	1^	.	.	.	1	71
* *Festuca ovina* (Qrp)		.	.	1	.	.	.	.	+	1	+	1	2	1	1	3	4	4	3	3	3	3	.	2	.	.	+	+	+	+	1	+	.	.	+	1	+	1	.	2	1	+	1	+	2	+	1	+	1	2	.	.	2	.	.	3	+	.	.	1	2	1	+	1	71
* *Calamagrostis arundinacea* (Qrp)		5	4	3	3	3	3	3	3	3	+	.	.	1	1	.	.	.	+	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	+	.	.	.	1	.	.	.	.	1	.	2	+	.	.	.	2	1	1	.	+	.	40
Hieracium lachenalii		.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	+	+	+	+	.	.	.	.	.	+	.	.	+	+	.	.	+	+	2	.	2	.	.	.	+	+	.	.	.	+	.	+	.	+	1	.	+	.	.	.	.	.	1	.	.	35
Hieracium sabaudum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+	.	+	+	.	.	+	.	.	.	.	.	.	+	2	.	.	.	.	+	.	.	+	.	.	.	+	.	1	.	.	.	.	.	.	.	.	21
Hieracium laevigatum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	8
Lathyrus montanus		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
II. D. *Ca-Q polygonatetosum odorati*																																																																		
Corylus avellana (Q-F)	b;bc'	.	.	.	.	+	.	.	+	.	.	.	+'	.	.	3	2	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	1	.	.	.	.	.	+	.	1	.	.	.	+	.	+	.	2	.	+	.	+	.	+	.	.	.	.	.	.	.	.	25
Corylus avellana (Q-F)	c	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	.	+	.	2	.	.	.	.	.	.	.	.	.	.	19
Moehringia trinervia		+	1	.	+	.	.	+	+	+	.	+	.	.	+	+	.	+	.	+	+	+	2	.	+	+	+	+	+	+	.	+	1	.	1	1	+	+	.	+	.	.	.	+	+	+	.	+	.	.	+	+	+	2	.	.	.	+	1	+	.	+	+	+	65
Convallaria majalis		1	+	1	2	2	2	+	2	2	4	4	3	3	3	3	1	.	1	.	.	.	.	.	+	+	.	+	.	.	+	.	.	.	.	.	.	1	+	1	+	+	+	.	.	+	2	2	.	.	2	2	.	1	.	1	.	2	+	2	1	.	.	+	62
Mycelis muralis		+	.	.	.	1	.	+	.	.	.	.	+	.	+	.	+	.	+	.	.	.	+	+	.	+	.	.	+	+	.	1	+	+	.	+	.	1	+	+	+	+	.	.	.	.	+	.	+	.	.	2	.	2	1	.	.	1	.	.	.	.	+	.	44
Melica nutans (Q-F)		+	.	1	.	.	2	.	+	1	1	+	+	.	.	.	.	+	.	.	.	+	+	.	1	+	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	1	.	.	.	2	.	.	.	2	.	.	.	1	+	.	.	.	1	+	+	+	+	43
Hieracium murorum		.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	+	.	1	+	.	.	+	.	.	.	.	.	+	+	.	+	1	.	.	+	+	+	.	.	+	+	1	.	+	.	2	+	1	1	.	.	.	.	.	+	1	+	.	.	.	.	+	+	41
Veronica officinalis (C-U)		.	.	.	.	.	.	.	.	1	.	+	+	.	.	.	.	.	+	+	+	+	1	+	.	.	.	.	+	.	+	+	.	+	+	1	.	.	.	.	.	+	.	+	.	+	.	+	.	1	.	.	+	.	.	1	+	.	.	.	.	.	.	+	38
III. D. *Anemone* var. (rich var.)																																																																		
Poa nemoralis (Q-F)		+	+	.	1	.	.	+	+	+	+	1	1	.	.	.	1	+	.	+	.	.	+	+	+	+	.	.	+	+	.	.	+	.	.	+	.	+	+	+	1	2	.	+	.	.	2	2	+	1	.	.	+	4	3	3	3	+	.	.	+	.	1	1	60
Veronica chamaedrys		.	.	+	.	+	+	.	.	+	.	.	.	+	+	+	+	.	+	.	+	+	.	+	.	+	+	+	+	.	+	1	+	1	+	+	+	+	.	+	.	2	+	+	+	+	.	2	.	2	+	.	.	+	.	+	+	.	.	+	.	.	.	.	57
Fragaria vesca		.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	+	1	+	+	.	+	.	+	+	+	+	.	+	1	+	+	1	.	+	.	.	.	2	+	.	.	+	+	+	+	+	.	+	.	1	+	+	.	.	.	+	1	.	.	.	48
Hypericum perforatum		.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	+	+	+	+	.	+	.	.	+	.	.	+	+	.	.	.	+	+	.	.	.	+	.	.	+	+	r	+	.	+	.	.	.	.	+	.	.	.	.	.	.	1	.	.	.	.	38
Atrichum undulatum (Q-F)		.	+	.	.	+	.	.	.	.	.	+	+	.	.	.	.	+	.	+	+	+	.	.	.	.	+	.	.	.	.	+	+	2	.	+	+	.	.	.	.	+	.	+	.	.	.	+	.	+	.	.	+	.	.	.	1	.	.	.	+	.	.	+	35
Anemone nemorosa (Q-F)		1	.	1	3	2	.	+	3	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	2	.	.	.	+	.	.	.	1	.	+	.	.	+	.	1	+	.	.	+	.	.	.	+	1	.	.	1	.	.	30
Viola reichenbachiana (Q-F)		.	.	.	1	.	+	.	.	.	+	.	.	.	.	.	+	+	.	.	+	.	.	.	+	.	+	.	.	.	.	.	1	+	+	.	.	.	.	.	+	+	.	.	.	.	.	1	.	+	.	+	.	.	.	+	.	.	.	.	.	1	.	.	29
Viola riviniana (Q-F)		.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	+	.	1	1	.	+	.	.	.	.	.	.	.	.	+	.	.	.	1	.	17
IV. Ch., D.* *Quercetea robori-petraeae* (Qrp)																																																																		
* *Melampyrum pratense*		.	.	.	1	+	+	+	r	+	.	+	1	+	+	1	+	.	2	2	+	1	+	+	.	+	+	+	+	1	1	1	1	+	.	.	+	2	+	2	.	.	1	2	.	.	.	+	.	.	1	.	2	1	+	1	1	+	.	.	.	.	.	2	67
* *Pteridium aquilinum*		+	.	.	.	3	.	+	.	.	+	.	1	+	2	.	.	.	+	.	1	+	5	4	4	3	+	1	+	+	.	+	+	1	.	.	.	.	1	+	.	2	2	.	.	2	1	1	.	.	2	2	.	1	.	+	+	.	3	+	.	1	1	+	60
Holcus mollis		.	.	.	.	.	.	1	.	.	.	.	.	2	.	.	.	.	.	+	1	.	+	.	.	.	5	5	4	4	4	3	3	3	3	3	3	3	+	2	2	1	.	.	2	+	.	+	+	2	1	.	.	.	+	3	.	1	1	.	.	1	+	.	52
* *Polytrichastrum formosum*		.	+	+	.	.	+	+	.	.	.	.	1	+	+	+	.	.	.	+	1	.	.	.	.	.	+	.	+	.	+	.	1	+	.	.	.	1	1	2	2	1	.	.	+	+	.	+	1	+	+	.	.	.	.	2	1	+	.	.	.	.	.	+	46
Carex pilulifera		.	.	.	.	.	.	.	.	+	.	+	+	.	.	+	.	.	.	1	+	+	.	+	+	+	.	.	+	.	.	+	+	.	.	+	+	1	.	1	1	.	.	+	+	+	.	.	+	+	.	.	1	.	+	1	+	1	.	.	.	.	.	.	44
Dicranella heteromalla		+	+	.	+	+	.	1	.	.	.	+	+	.	.	+	.	+	.	.	+	.	.	.	.	.	+	.	.	.	.	.	+	1	.	.	.	+	1	+	.	.	.	.	.	.	.	+	.	.	+	.	.	+	.	.	+	+	.	+	+	.	.	.	35
V. *Vaccinio-Piceetea*																																																																	
Pinus sylvestris	a1,a	1	.	.	.	.	1	.	.	.	2	.	.	.	.	.	.	.	2	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	+	.	.	+	.	2	2	.	2	.	.	.	+	.	.	.	.	+	3	4	3	3	.	.	27
Pinus sylvestris	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+/+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	+	+	.	.	r	.	r	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	14
Vaccinium myrtillus		1	1	1	1	.	+	5	.	+	+	.	.	.	2	.	.	.	2	.	.	+	+	.	1	2	.	+	2	.	.	.	1	.	.	+	.	1	4	+	+	+	+	+	.	2	2	1	1	1	.	.	.	.	1	.	2	4	2	4	4	3	.	+	60
Pleurozium schreberi		.	.	+	.	.	.	.	.	+	.	.	.	+	.	+	+	+	2	1	+	3	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	.	.	.	.	2	.	+	.	.	.	.	.	3	.	.	1	.	.	.	1	.	.	.	+	.	.	.	30
Rubus saxatilis		.	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	.	.	.	.	.	.	.	1	+	.	.	.	1	+	.	1	.	.	.	.	.	+	.	.	.	1	1	.	.	.	22
VI. Ch. *Querco-Fagetea* (Q-F)																																																																	
Fagus sylvatica	a1	.	.	.	+	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	3	1	11
Fagus sylvatica	a2	.	.	.	2	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	6
Fagus sylvatica	b	.	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	2	2	3	17
Fagus sylvatica	c	+	.	+	+	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	+	.	+	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	+	.	1	24
Ajuga reptans		.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	+	.	.	+	.	.	+	.	+	.	.	.	+	+	.	.	.	.	1	+	.	1	+	.	+	2	.	.	.	.	.	.	.	.	.	.	25
VII. Ch. *Calluno-Ulicetea* (C-U)																																																																	
Solidago virgaurea s. s.		.	.	.	+	.	.	.	.	+	.	+	+	.	.	+	+	+	1	+	+	.	.	+	.	.	.	+	+	+	+	.	.	.	.	.	+	.	.	.	+	.	+	.	+	r	+	.	.	.	.	.	+	.	.	1	.	.	+	.	+	.	.	.	40
Agrostis capillaris		.	.	+	.	.	+	.	.	.	.	.	.	2	2	.	.	+	+	+	3	.	.	.	1	.	.	.	+	.	.	+	.	.	.	1	+	+	.	.	.	.	2	2	.	.	.	.	+	.	2	.	+	.	.	.	+	.	.	.	+	.	+	.	35
Pohlia nutans		.	.	.	+	+	.	+	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.	.	.	+	.	.	+	.	.	+	+	.	.	4	.	+	.	+	+	.	.	1	29
Luzula multiflora		.	.	.	.	.	.	.	.	+	.	+	+	+	+	.	.	+	+	.	+	+	.	.	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	25
VIII. Others																																																																	
Quercus robur	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	1	4	4	4	.	4	.	3	2	4	.	1	4	2	.	4	.	4	4	.	.	1	.	.	.	.	+	.	.	.	.	.	29
Quercus robur	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	2	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Quercus robur	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1/1	.	.	.	.	.	.	.	.	.	.	.	.	/+	/+	/+	.	/1	.	/1	/+	/+	.	/+	/+	/+	.	/+	+/+	/+	/1	.	.	.	.	.	/r	+/	.	.	.	.	.	.	27
Sorbus aucuparia	a2';b	.	.	.	1	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+'	1	.	2	.	.	+	.	1	1	.	+	1	.	.	.	.	1	.	.	.	+	.	.	27
Sorbus aucuparia	c	3	+	+	+	.	+	+	.	+	+	+	.	r	.	+	+	.	.	.	+	+	+	.	.	+	.	.	+	.	.	+	+	+	+	+	.	+	+	+	+	+	r	+	+	+	+	+	+	+	+	.	+	+	+	+	.	.	.	.	.	+	.	.	65
Frangula alnus	b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	+	.	.	.	+	.	.	.	+	.	+	1	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	+	2	.	.	.	.	.	21
Frangula alnus	c	.	+	.	.	.	.	.	.	+	.	+	+	+	.	.	+	+	.	.	.	.	.	+	.	+	+	.	.	.	+	.	.	1	+	.	.	.	.	+	+	+	+	.	+	+	.	+	+	+	+	.	.	1	.	+	.	.	+	.	.	+	+	.	44
Luzula pilosa		+	.	+	.	.	+	+	.	+	+	+	+	+	+	.	+	+	+	+	+	2	+	+	.	+	+	+	+	+	+	+	+	+	.	.	+	.	+	.	2	1	+	.	.	+	1	+	.	1	+	.	1	r	+	+	1	.	+	1	2	1	.	1	75
Anthoxanthum odoratum		.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	+	+	.	+	+	1	+	.	.	.	+	+	.	+	+	+	.	.	.	+	+	.	.	+	.	+	+	+	1	.	+	+	+	.	.	+	.	+	+	+	+	.	.	.	.	.	.	.	44
Maianthemum bifolium		.	.	.	.	.	+	1	+	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	+	+	+	.	.	.	+	+	+	1	.	.	.	2	2	.	+	2	.	.	.	.	1	.	2	+	1	.	1	+	+	.	1	+	.	.	1	.	.	.	43
Festuca rubra s. s.		.	.	+	.	.	.	.	.	.	.	.	.	1	+	.	.	.	.	1	1	+	.	.	.	.	+	.	1	2	.	+	.	.	4	3	2	.	.	+	+	.	.	3	3	+	+	.	.	.	.	1	+	.	.	.	+	.	.	+	.	.	.	.	37
Clinopodium vulgare		.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	1	1	.	.	.	.	+	.	.	.	1	+	.	.	+	.	.	+	.	.	.	+	.	.	.	+	1	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	25
Poa angustifolia		.	.	.	.	.	.	.	.	+	.	.	.	1	1	+	.	.	1	.	.	2	+	.	.	.	.	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	2	+	.	.	2	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	+	24
Galeopsis tetrahit		+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	r	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	+	+	.	2	+	.	.	.	.	.	.	.	.	.	22
Galium boreale		.	.	+	.	+	.	.	.	+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	r	.	.	+	.	.	+	.	.	.	.	+	.	.	.	.	.	1	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	22
Plagiomnium affine		.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	.	.	+	.	+	.	.	+	.	+	.	.	.	2	.	.	+	.	.	.	.	+	.	.	.	22
Dryopteris carthusiana		.	+	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	r	.	.	.	+	.	.	+	.	.	.	.	.	+	.	+	.	+	.	.	r	.	.	.	.	.	.	.	+	.	.	21

Sporadic species: IV.: *Aulacomnium androgynum* 51; *Hieracium umbellatum* 17,30,33,35; *Hypericum pulchrum* 21; *Plagiothecium laetum* 7,38,45; **V.:** *Betula pubescens* subsp. *pubescens c 55; Dicranum polysetum* 18,52; *D. scoparium* 19,39(1),52,55(3),56; *Dryopteris dilatata* 7,38,48,61(1); *Galium rotundifolium* 32(1); *Hylocomium splendens* 19,21,52; *Juniperus communis* b 18, bc 9,21(2),26,30, c 3,6,11,15,17; *Leucobryum glaucum* 19,39(1),56; *Monotropa hypopitys* s.s. 21; *Orthilia secunda* 45,52(1); *Picea abies* a 33(2),58, a1 61, a2 45(1),57(1), b 32,45(2),48(1),58(2),61, c 3,11,12,55,56,57,58,63; *Plagiothecium curvifolium* 63; *Pseudoscleropodium purum* 19,24,31,43,51(1),52; *Pyrola minor* 45(1); *Trientalis europaea* 25(1),31,41(2),58(1),61(1); *Vaccinium vitis-idaea* 28,59,60(1); *Viscum album* subsp. *austriacum* 45; **VI.:** *Acer platanoides* b 32, c 1,8(r),32; *A. pseudoplatanus* b 32(1), c 10,32,34,44; *Adoxa moschatellina* 43,52; *Brachypodium sylvaticum* 15,50,55,62(2); *Campanula persicifolia* 5,27,28; *Carex digitata* 9,47; *C. montana* 3,28,31,59,60(1); *Carpinus betulus* a 58(1), a2 33(1),40(4),55(1), b 40(2),46,47(1),55(1),57,58, c 27,28,31,33(1),40,46(r),47,52,55,56,57,58; *Cerasus avium* c 17,37(r),39(r); *Dactylis polygama* 24(1),33,55; *Daphne mezereum* 4(r); *Dryopteris filix-mas* 24(1),25,33,61; *Epipactis helleborine* 32; *Eurhynchium angustirete* 31; *Festuca gigantea* 6,26,62,63; *F. heterophylla* 9,31,36(1),41,49,62,63; *Fraxinus excelsior* b 45,50, c 19(r),22,26,34,43,44,45(1),50,52,57; *Galeobdolon luteum* 9(1),55; *Galium sylvaticum* 55; *Hepatica nobilis* 47(1); *Hypericum montanum* 3,15,21,27,31,53(r); *Lathyrus niger* 4(1),9,11,21,26,32,33,55; *Lonicera xylosteum* b 47, c 47(1),55; *Malus sylvestris* b 58, c 21,59; *Melampyrum nemorosum* 16,17,26, 30,41(1),47,49(1); *Milium effusum* 47,57(1); *Padus avium* b 50, c 25,34,43; *Phyteuma spicatum* 47; *Poa remota* 25; *Polygonatum multiflorum* 48; *Potentilla alba* 16; *Pulmonaria obscura* 47,49; *Scrophularia nodosa* 3,5,17,22,23,27,29,33,47,53; *Stellaria holostea* 40; *Tilia cordata* b 32(3), c 6,32,49(1),53; *Ulmus minor* b 55(2), c 55; *Viburnum opulus* c 17,26,31; *Viola reichenbachiana* et *riviniana* 9,13,21,28,31,36,42,43,52,59,60(1); **VII.:** *Carex ovalis* 53; *C. pallescens* 2,17,34,37,41,49; *Hieracium pilosella* 18,21,28,31,42,49,52; *Hypericum maculatum* 54; *Polytrichum juniperinum* 19,21,35; *Potentilla erecta* 16,26,27,30; *Scorzonera humilis* 59,60; *Viola canina* 20,53(r); **VIII.:** *Abies alba* 45(r); *Achillea millefolium* 16,17,18,20,21,27,34,42,44,46,49; *Agrimonia eupatoria* 46,50; *Agrostis gigantea* 54(1); *Ajuga genevensis* 37; *Alliaria petiolata* 25; *Anthericum ramosum* 15,47,55; *Arrhenatherum elatius* 35(1),45(1); *Astragalus glycyphyllos* 26,28,30,31,36,37,42,43,45,53; *Athyrium filix-femina* 31; *Avenula pubescens* 30; *Betonica officinalis* 15,41,42(2); *Betula pendula* a 24(1),54(1),56(r),58(1), a1 4,20(2),35(1),57(1), c 39,40,58; *Brachypodium pinnatum* 24,58(1); *Brachytheciastrum velutinum* 9,19,28, 31,32,36,43,45,47,52,59; *Brachythecium albicans* 52; *B. rutabulum* 19,20(1),21,31,33(1),43,52; *B. salebrosum* 28,36; *Bryum* sp. 36; *B. subapiculatum* 36,43; *Calamagrostis canescens* 53(r); *C. epigejos* 18,20(1),23,25(1),40,44(1),48,54(2),57,58,61(1); *Campanula rotundifolia* 4,11,13,17,27,30,32,42,59,60(1),61; *Carex hirta* 14,20,25(r),54; *C. panicea* 34; *Carex* sp. 25; *Ceratodon purpureus* 18,19,36; *Chaerophyllum temulum* 55; *Chamaenerion angustifolium* 57(1); *Cladonia* sp. 52; *Colutea arborescens* 42; *Cornus sanguinea* b 4(2),20,51(1), c 20; *C. stolonifera* c51(1); *Coronilla varia* 16,36; *Crataegus laevigata* b 58, c 55; *C. monogyna* b 4(1),35, c 4,34,35; *C. monogyna* et *laevigata* b 49, c 40; *Dactylis glomerata* 17,41,42,48,54; *Deschampsia caespitosa* 6,25,51,52; *D. flexuosa* 4,6,7,24(1),25(2),32,38,45,48,54,56(1),61; *Epilobium parviflorum* 53; *Euonymus europaea* c 55; *Euphorbia cyparissias* 6,20,34,42,52,55; *Euphorbia esula* 20; *Fallopia convolvulus* 2(1),10,12,14(1),17(1),24,43,50(1),51(1),54(1); *F. dumetorum* 48,53(2); *Galeopsis pubescens* 11,20,23,27,32(1),35,39(r),48(1),55; *Galium album* 18,21,28,31,36,43,46; *G. album* fo. *dumetorum* 45; *G. aparine* 46(1),48,53,57(1); *G. mollugo* 13,20,49; *G. palustre* 50; *G. verum* 17,27,34,41,49,53(1); *Geranium robertianum* 16,22,28,31,43,46,48(1),53; *G. sanguineum* 13; *Geum urbanum* 18(r),31,34,35,46(1); *Glechoma hederacea* 31,53(1); *Hieracium barbatum* 50; *Hypnum cupressiforme* 6,7,18,19,21, 35,38,39,45,52,56,60; *Hypochoeris radicata* 31; *Impatiens parviflora* 5(2),20,24(2),25,32,42,48(4),51(1),54; *Juncus effusus* 54,57(r); *Knautia arvensis* 16,35; *Larix decidua subsp. decidua* a 24(2), a1 57, c 57; *Leontodon autumnalis* 19; *Linaria vulgaris* 14,53,55; *Lophocolea bidentata* 19,52; *Lycopus europaeus* 53; *Lysimachia nummularia* 34; *L. vulgaris* 50; *Mnium* sp. 12; *Molinia caerulea* 59,60(1); *Oxalis acetosella* 25(1),31(2),40,41,45(2),47(3),49,58(3); *Padus serotina* b 20,22(1),33(1), c 18(r),22,30,33(1),46(r),54; *Peucedanum oreoselinum* 11,13,14,16,17,18(1)42(1),55; *Pimpinella saxifraga* 3,13,28,36,42,44,49(1),50; *Plagiomnium cuspidatum* 3; *P. rostratum* 20; *Plagiothecium* sp. 27; *Plantago major* 46; *Poa pratensis* 3,30,34(1),35,44(1),47,50,52,56; *P. trivialis* 31,41,49; *Polygonatum odoratum* 9,13(1),15,17,18(1),46(1),47,55,58,59,60; *Populus tremula* a 58, a1 4(1), b 17, c 4,58; *Potentilla reptans* 34; *Prunus spinosa* b 55,57,58; c 55; *Pyrus communis* b 45,55, bc 27,30, c 16,21,23,28,34,36,43,44,62; *P. pyraster* b 18,46; *Ranunculus acris* s.s. 31; *Rhamnus cathartica* c 24,55; *Ribes nigrum* c 53(r); *Robinia pseudacacia* c 44; *Rosa canina* c 26; *Rosulabryum capillare* 59; *Rubus caesius* 1,10(1), 12,23(1),27,44,50,53(2),59; *R.* cfr. *hirtus* 48(1),61(2); *R. idaeus* 24,32,35,41,43,46(2),48,51,55,57(1),61; *R. plicatus* 32(1); *Rubus* sp. 2,17,36,56,58(4); *R. sprengelii* 25(1),37(r); *R. x corylifolius* 22(1),46; *Rumex acetosa* 43,47; *R. acetosella* 18,48,55,61(r); *Salix* sp. c 31; *Sambucus nigra* c 7,53(r),55; *S. racemosa* b 57(2), c 57; *Sarothamnus scoparius* c 35; *Sciuro-hypnum oedipodium* 3,5,6,9(1), 19,21,28,31,36,43,52; *Sedum maximum* 35,50,55; *Silene nutans* subsp. *nutans* 45; *Stellaria graminea* 56; *S. media* 20,46,48; *Taraxacum officinale* 28,31,36,42,43,46; *Torilis japonica* 28; *Trifolium alpestre* 31; *Urtica dioica* 24,53(1),62; *Vicia cassubica* 5,19,30,39,51; *V. cracca* 11,27; *V. sepium* 47,53; *Viola* sp. 25; *Viscaria vulgaris* 42,55.

Table A17. *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* in stage II of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	1-20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	21-35
ID-1		37	51	42	29	12	23	42	29	42	5	55	37	23	23	55	16	36	36	29	2		29	42	23	37	44	44	48	42	42	35	24	27	29	29	35	
ID-2		12	1	4	10	2	12	4	10	3	2	16	12	12	12	16	19	17	17	16	7		10	3	12	14	4	4	3	6	6	29	-	1	10	10	20	
ID-3		14	7	19	8	15	10	3	13	6	10	13	10	3	7	12	12	20	23	7	4		9	1	12	7	3	2	11	3	5	18	-	24	3	4	14	
Date (year)		1984	1981	1981	1980	1964	1965	1981	1979	1981	1994	1975	1986	1965	1965	1991	1972	1985	1986	1977	1988		1977	1981	1965	1986	1976	1976	1976	1981	1981	1976	2006	1975	1977	1977	1976	
Density of tree layer	a1,a [%]	75	80	70	70	60	60	60	60	60	70	70	70	60	75	70	20	35	40	70	60		70	75	80	20	60	70	80	70	85	60	20	60	70	75	50	
Density of tree layer	a2 [%]	-	10	-	-	-	-	-	-	-	-	-	5	-	-	-	90	20	35	-	-		-	-	-	50	15	10	-	-	-	5	70	-	-	-	30	
Density of shrub layer	b [%]	+	+	-	5	-	-	-	+	+	30	-	+	75	20	+	60	5	15	+	+	%	-	+	-	5	20	20	-	25	20	+	+	+	+	5	20	%
Cover of herb layer	c [%]	45	90	75	70	80	90	45	65	45	30	70	100	80	90	50	90	50	95	80	55		50	45	85	55	60	30	50	35	75	70	60	30	20	30	90	
Cover of moss layer	d [%]	+	+	+	20	+	5	+	10	5	+	10	+	15	15	-	20	5	+	10	5		5	+	+	5	10	5	20	+	-	30	20	5	10	30	+	
Area of relevé		600	150	100	150	400	200	100	200	100	200	100	500	300	300	100	200	900	900	200	200		150	100	200	600	400	400	200	100	100	150	200	150	100	200	100	
Location (ATPOL)		BE05	CD83	BD49	CD17	BD66	CD52	BD49	CD17	BD49	BC98	BC82	AD88	CD53	CD53	BC63	BD31	BE28	CE20	CD17	BD81		CD17	BD49	CD43	BD92	DE41	DE41	BD28	BD59	BD59	CE00	CE36	BD54	CD17	CD17	CE01	
Total number of species		34	32	27	34	24	25	17	35	27	25	28	29	32	33	29	50	25	27	45	25		28	19	15	27	34	24	22	19	15	28	24	13	21	20	23	
Number of mosses, liverworts and lichens species		3	2	2	10	3	3	2	3	3	4	4	2	5	4	-	7	5	3	2	3		3	1	1	3	3	1	4	1	-	3	3	3	7	6	2	
I. Ch., D.* *Quercetea robori-petraeae*																																						
Festuca ovina		3	.	2	2	+	+	2	1	2	1	2	+	1	+	1	.	.	.	1	+	80	3	3	+	1	+	+	1	+	2	2	2	2	2	2	+	100
Carex pilulifera		+	.	+	+	+	+	+	.	1	+	+	.	.	.	1	.	1	1	.	.	60	+	+	+	1	+	+	.	+	+	+	+	+	+	+	+	93
* *Polytrichastrum formosum*		.	+	+	1	+	1	+	.	+	.	1	+	1	1	.	1	1	+	.	1	75	.	+	.	1	1	.	.	+	.	.	2	+	+	.	+	53
* *Pteridium aquilinum*		+	3	3	.	.	.	.	+	2	.	2	1	1	.	2	.	+	1	+	1	65	.	.	.	.	+	1	2	.	+	1	+	+	.	.	.	47
* *Melampyrum pratense*		+	+	+	3	+	.	.	2	.	.	2	1	.	.	.	.	.	.	1	.	45	2	1	+	.	1	+	1	+	+	3	+	.	+	1	.	80
Holcus mollis		.	1	.	.	4	5	.	.	.	.	2	+	1	1	2	.	1	+	.	.	50	.	.	5	.	2	2	.	.	.	.	+	.	.	.	+	33
Dicranella heteromalla		+	.	.	.	.	+	+	.	+	1	.	.	.	.	.	+	.	.	.	+	35	.	.	.	+	.	.	.	.	.	+	.	1	.	.	.	20
II. D. *Ca-Q polygonatetosum odorati*																																						
Corylus avellana (Q-F)		.	.	/+	/1	.	.	/+	.	.	.	.	.	4/+	2/+	.	+/	.	.	.	.	30	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	7
Veronica officinalis (C-U)		1	.	.	.	.	+	.	+	+	1	+	.	.	.	+	.	+	+	+	.	50	+	+	.	.	+	+	.	.	.	+	.	.	+	+	.	47
Moehringia trinervia		+	2	+	+	.	.	.	+	+	+	+	+	.	.	+	2	.	.	.	+	60	+	.	+	+	.	.	.	+	.	.	.	.	.	.	+	33
Convallaria majalis		+	.	.	.	.	.	3	.	+	.	.	.	.	.	.	2	.	1	+	+	35	+	.	.	.	.	+	2	3	4	.	+	.	.	+	+	53
Melica nutans (Q-F)		.	.	+	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	+	.	25	+	.	.	.	+	.	1	+	+	.	+	+	.	.	.	47
Hieracium murorum		.	.	.	+	.	1	.	.	+	.	1	.	+	1	.	.	+	.	+	1	45	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.	20
Mycelis muralis		.	+	.	.	+	.	.	.	.	.	+	.	.	+	+	1	+	.	.	.	35	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	13
Polygonatum odoratum		.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	15	.	.	.	.	.	.	1	.	.	.	.	+	+	.	.	20
III. D. *Anemone* var. (rich var.)																																						
Veronica chamaedrys		+	1	+	+	+	+	.	+	.	.	2	.	1	2	1	.	.	.	+	.	60	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	7
Viola reichenbachiana (Q-F)		1	1	.	.	+	+	.	.	+	+	.	+	1	+	+	.	.	+	.	.	55	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Hypericum perforatum		+	+	+	.	.	.	+	+	.	+	.	+	.	.	+	+	+	.	+	.	55	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Oxalis acetosella		.	1	.	.	.	.	.	.	.	.	2	.	+	1	.	.	1	1	.	.	30	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	7
Atrichum undulatum (Q-F)		.	.	.	.	+	+	.	.	+	.	1	.	1	+	.	.	.	1	.	.	35	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Carpinus betulus (Q-F)	b/c	.	.	.	/+	/1	/+	.	/+	.	.	/1	.	.	.	.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Fragaria vesca		.	2	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	.	+	+	30	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	13
Anemone nemorosa (Q-F)		.	.	.	.	.	+	.	.	.	.	.	.	1	+	.	.	.	+	.	.	20	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	13
Poa nemoralis (Q-F)		1	.	.	.	.	.	2	.	+	.	.	.	+	+	.	1	.	.	.	+	35	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	7
IV. *Vaccinio-Piceetea*																																						
Pinus sylvestris	a1,a;a2^	.	+	.	.	.	.	.	1	+	.	.	.	.	.	.	2	2	2	3	4	40	1	.	.	2	1;1^	.	3	2	2	3	2	.	1	.	3	67
Pinus sylvestris	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0	.	.	.	/+	+/+	.	.	.	.	/+	/+	.	.	.	.	27
Vaccinium myrtillus		1	2	+	.	.	+	.	.	.	.	.	2	+	+	.	.	1	2	.	.	45	1	.	.	3	3	2	.	+	+	.	4	1	+	1	+	73
Pleurozium schreberi		.	.	+	1	.	.	.	1	.	.	.	.	+	+	.	.	+	.	2	.	35	1	.	.	.	1	1	.	.	.	3	2	.	2	2	+	53
V. Ch. *Calluno-Ulicetea* (C-U)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
Agrostis capillaris		.	.	.	+	+	.	.	2	+	2	.	+	.	.	1	.	.	.	.	.	35	.	.	.	+	+	+	1	.	.	+	.	.	.	.	1	40
Pohlia nutans		+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	+	.	+	30	.	.	.	+	+	.	+	.	.	.	+	.	.	.	.	27
Solidago virgaurea s. s.		+	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	25	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Luzula multiflora		.	.	+	+	.	1	.	.	+	.	.	.	.	.	+	.	.	.	.	.	25	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	13
VI. Others																																						
Quercus petraea	a1,a	4	3	4	2	+	.	4	4	4	3	1	.	.	.	.	.	2	2	4	.	65	4	5	5	.	4	4	.	3	3	.	.	4	4	4	.	67
Quercus petraea	a2	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	3	.	.	15	.	.	.	3	2	1	.	.	.	.	2	.	.	.	.	27
Quercus petraea	b/c	+/1	/+	/+	1/+	/+	.	/+	/+	/+	.	.	.	.	.	.	/+	.	+/1	/2	/+	60	/1	+/+	/1	+/+	2/1	2/2	.	+/	1/+	.	/+	+/	+/+	1/+	.	80
Quercus robur	a1,a	2	2	.	3	4	4	.	.	.	3	3	4	4	4	3	.	1	.	.	.	60	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Quercus robur	a2	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	10	.	.	.	1	.	.	.	.	.	+	.	.	.	.	2	20
Quercus robur	b/c	.	/+	.	.	/+	.	.	/+	.	.	/+	+/+	/+	/+	.	/+	/+	.	.	.	45	/+	.	.	.	.	.	.	.	.	+/+	.	.	.	.	2/+	20
Sorbus aucuparia	b	.	.	.	+	.	.	.	+	.	.	.	+	1	1	.	+	.	1	.	.	35	.	.	.	1	+	.	.	.	1	+	+	.	.	.	.	33
Sorbus aucuparia	c	+	+	.	+	.	+	+	.	+	+	+	+	+	1	+	+	.	+	+	.	75	+	+	+	.	.	+	.	+	+	.	2	.	+	+	.	60
Frangula alnus	b	+	+	.	.	.	.	.	.	.	.	.	+	+	+	.	+	+	.	.	+	40	.	.	.	1	+	.	.	.	.	.	+	.	.	.	1	27
Frangula alnus	c	.	+	.	.	.	+	+	.	.	.	+	.	+	+	.	.	.	.	.	.	30	.	+	.	+	+	+	.	+	.	+	+	.	.	.	.	47
Luzula pilosa		1	1	+	+	.	.	+	+	+	.	+	+	1	1	+	.	+	1	2	.	75	1	+	.	1	+	+	1	+	+	.	+	+	+	+	+	87
Anthoxanthum odoratum		.	.	+	+	+	+	.	2	+	.	2	1	+	+	.	.	.	.	+	.	55	+	.	.	.	+	+	.	.	.	1	.	.	.	+	.	33
Calamagrostis epigejos		+	.	.	.	.	.	.	.	.	.	.	1	.	.	2	+	3	1	.	.	30	.	+	.	+	+	.	1	.	.	.	+	+	.	.	2	47
Poa angustifolia		+	1	.	.	.	.	.	2	.	.	.	.	.	.	2	.	.	.	+	.	25	1	+	.	.	1	+	1	.	.	.	.	.	+	+	.	47
Festuca rubra s. s.		.	2	1	1	+	.	.	+	.	+	.	+	.	.	.	.	.	.	.	.	35	+	.	.	+	+	.	.	.	.	.	.	.	.	.	.	20
Plagiomnium affine		.	.	.	+	.	.	.	1	.	.	+	.	+	+	.	1	.	.	.	.	30	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	20
Ajuga reptans (Q-F)		.	.	.	+	.	+	.	+	.	.	.	.	.	1	+	.	.	.	+	.	30	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Impatiens parviflora		.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1	1	.	1	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Sciuro-hypnum oedipodium		.	.	.	1	+	.	.	+	.	1	.	.	.	.	.	.	.	.	+	.	25	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	-
Maianthemum bifolium		.	1	.	.	.	.	.	.	.	.	.	.	3	3	.	.	.	2	.	.	20	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	13

Sporadic species: I.: *Calamagrostis arundinacea* 16(1),19,27(1); *Hieracium lachenalii* 27,30(1); *H. laevigatum* 16; *H. umbellatum* 22; *Lophocolea heterophylla* 17; *Plagiothecium laetum* 2(2); **IV.:** *Dicranum polysetum* 4,30; *D. scoparium* 10,17,27,33,34; *Galium rotundifolium* 30; *Hylocomium splendens* 4,33,34; *Juniperus communis* b 25(1), bc 4,8,19,21, c 22,25,26,30; *Leucobryum glaucum* 27(1),33,34; *Monotropa hypopitys* s.s. 26; *Orthilia secunda* 24; *Picea abies* a1,a 17(1), a2 17(1), b 17(1),18(2), c 18; *Plagiothecium curvifolium* 32; *Pseudoscleropodium purum* 4,13,23(1); *Pyrola minor* 11; *Rubus saxatilis* 8,13(1),14(1),19,27; *Trientalis europaea* 13(1),14(1),18(1),25,26; *Vaccinium vitis-idaea* 19,25(1),26,31; **V.:** *Calluna vulgaris* 25,30,31; *Carex pallescens* 9,12,13; *Danthonia decumbens* 5,30(1); *Hieracium pilosella* 4,6,8,30; *Hypericum maculatum* 5,6,13,14,23; *Luzula campestris* 1; *Polytrichum juniperinum* 4,11,34; *Potentilla erecta* 2,6,19,21(1); **VI.:** *Acer platanoides* (QF) a1 35, b 35, c 8,35; *A. pseudoplatanus* (QF) a 16, b 35, c 28,29; *Achillea millefolium* 6,8,19; *Agrostis gigantea* 2; *Arrhenatherum elatius* 1,12(1),30; *Astragalus glycyphyllos* 10(1); *Berberis vulgaris* b 16; *Betula pendula* a 1(1),33,34(1), a1 12(1),24, a2 17,30(2), b 15(r),25,30(1), c 9,24; *Brachypodium sylvaticum* (QF) 10,16(1); *Brachythecium albicans* 4; *B. rutabulum* 16(1),21; *Campanula patula* s.s. 5; *C. persicifolia* (QF) 5,19; *C. rotundifolia* 9; *Cardaminopsis arenosa* 16; *Carex brizoides* 1; *C. digitata* (QF) 4,21; *C. montana* (QF) 19,25; *C. pairae* 5; *Carex* sp. 19; *C. sylvatica* (QF) 13; *Cerastium holosteoides* 30; *Cerasus mahaleb* b 16; *Ceratodon purpureus* 4; *Chaerophyllum temulum* 34; *Chamaenerion angustifolium* 15(r),35; *Chelidonium majus* 16(3); *Chenopodium album* 3; *Clinopodium vulgare* 8,14; *Crataegus laevigata* c 8; *C. monogyna* b 19; *C. monogyna* et *laevigata* b 13,16, c 13; *Cruciata glabra* 25,26; *Dactylis polygama* (QF) 10,16(1); *Deschampsia caespitosa* 15,19; *D. flexuosa* 12(4),15(2),16,17(1),20(2),24,31(2),33(1); *Dryopteris carthusiana* 2,12,16,18(1),20(1),24(1),28,31,35(1); *D. filix-mas* (QF) 16,20(1); *Epilobium montanum* 25; *Euphorbia cyparissias* 8,30; *Fagus sylvatica* (QF) a1,a 15(4),35(1), a2 31(3),35(1), b 28(2), c 11,23,28(1),29,31; *Fallopia convolvulus* 3,7,9,28; *F. dumetorum* 16; *Festuca gigantea* (QF) 10,16,24(r); *F. heterophylla* (QF) 24; *F. pratensis* 12(1); *Fraxinus excelsior* (QF) c 23; *Galeobdolon luteum* (QF) 4; *Galeopsis pubescens* 7,18,22; *G. speciosa* 16; *G. tetrahit* 1,3,5,8,12,28,29; *Galium album* 8,21; *G. aparine* 3,16(1); *G. boreale* 19,21; *G. mollugo* 12,14,19,23; *G. schultesii* (QF) 16(1),25; *G. sylvaticum* (QF) 2; *G. verum* 10; *Geranium robertianum* 2(1),16(3),20(1); *Holcus lanatus* 15,19; *Hypericum montanum* (QF) 9,26; *Hypnum cupressiforme* 1,16(2),27; *Lamium purpureum* 20; *Lathyrus pratensis* 15; *Leontodon autumnalis* 16; *Lilium martagon* (QF) 28; *Linaria vulgaris* 15,16(1); *Lysimachia vulgaris* 10,17; *Malus sylvestris* (QF) 19; *Melampyrum nemorosum* (QF) 13(1),14(1); *Milium effusum* (QF) 24,35; *Padus avium* (QF) c 19; *P. serotina* a2 16(5), b 10(3),16(4), c 10(1),16(2); *Peucedanum oreoselinum* 22,31; *Pimpinella saxifraga* 19,21,30; *Plagiomnium rostratum* 16; *Plagiothecium ruthei* 10(1); *Plantago lanceolata* 20; *Platanthera bifolia* (QF) 13; *Poa compressa* 33; *P. pratensis* 1(1),4(1),5(1),6(1),32; *P. trivialis* 3,14; *Polygonatum multiflorum* (QF) 1; *Prunus spinosa* c 10; *Pulmonaria obscura* (QF) 14; *Pyrus communis* a 16(1), a2 16, c 8,11(r); *P. pyraster* c 31(r); *Quercus rubra* c 1; *Q. x rosacea* a 27(4), c 27; *Rhamnus cathartica* c 19; *Ribes spicatum* (QF) c 18; *Robinia pseudacacia* a2 16(1); *Rubus caesius* 1(1),7,9; *R.* cfr. *hirtus* 18(2); *R. idaeus* 2(1),12(1),15(1),20,24,35(1); *Rubus* sp. 3,18(2),19,25,29,31,35(4); *Rumex acetosa* 5,6,16; *R. acetosella* 1,15,16(1),20; *Sambucus nigra* b 16, c 16; *Sanicula europaea* (QF) 18; *Sarothamnus scoparius* c 12; *Scorzonera humilis* 19; *Scrophularia nodosa* (QF) 3,7,9,15; *Sedum maximum* 2; *Senecio ovatus* 20,24; *Silene nutans* subsp. *nutans* 16; *Stellaria holostea* (QF) 13; *Taraxacum officinale* 4; *Tilia cordata* (QF) a 20, c 14(2); *Trifolium alpestre* 30; *Urtica dioica* 2,16(1); *Viburnum opulus* (QF) c 21; *Vicia angustifolia* 11(r); *V. cassubica* 3,10(1),11,19; *V. sepium* 1; *Vicia* sp. 19; *Vincetoxicum hirundinaria* 16; *Viola reichenbachiana* et *riviniana* (QF) 8,19,21; *V. riviniana* (QF) 11(1),14,23(1),25.

Table A18. *Calamagrostio arundinaceae-Quercetum petraeae polygonatetosum odorati* in stage III of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
ID-1		42	42	24	17	42	42	42	29	29	17	17	43	24	17	23	17	17	17	55		50	24	18	18	18	50	18	18	18	18	18	18	47	29	18	17	47	
ID-2		1	1	-	9	1	6	3	10	10	12	12	7	-	9	12	11	9	9	16		3	-	5	3	3	3	1	3	3	1	3	3	176	10	1	9	176	
ID-3		12	13	-	6	9	6	11	12	10	1	3	19	-	16	8	3	5	17	3		21	-	4	3	2	15	16	7	5	27	4	6	4	5	17	18	7	
Date (year)		1981	1981	1995	1996	1981	1981	1981	1979	1979	1995	1995	1960	2006	1995	1965	1995	1996	1995	1992	1-19	1976	1995	1990	1990	1990	1976	1990	1989	1990	1990	1990	1990	1983	1979	1989	1995	1983	20-36
Density of tree layer	a1,a [%]	85	95	60	50	85	85	80	65	65	45	40	85	55	50	75	60	60	40	60		85	30	85	70	75	80	80	70	70	75	80	70	70	60	80	80	70	
Density of tree layer	a2 [%]	-	-	5	-	-	-	-	-	-	5	-	-	-	-	-	-	-	50	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Density of shrub layer	b [%]	+	-	-	5	-	10	-	+	15	30	-	20	-	-	10	80	15	5	5	%	-	10	5	-	-	-	10	-	-	40	-	20	5	5	40	-	10	%
Cover of herb layer	c [%]	95	95	60	70	90	75	100	60	70	80	90	90	85	60	90	10	60	20	80		90	85	70	90	85	55	70	85	90	90	85	75	60	70	30	45	40	
Cover of moss layer	d [%]	+	+	+	50	-	-	-	5	40	70	30	40	-	+	5	5	10	5	-		-	40	-	-	5	+	-	-	-	-	-	-	-	15	-	-	-	
Area of relevé		100	100	250	150	100	120	120	200	150	150	200	400	100	150	300	150	150	150	80		200	250	200	300	200	200	200	150	250	200	250	200	200	150	120	150	200	
Location (ATPOL)		BD59	BD59	CC80	BC66	BD59	BD59	BD49	CD17	CD17	BC66	BC66	BC99	BC66	BC66	CD53	BC66	BC66	BC66	BC72		BD28	CC80	BD44	BD44	BD44	BD28	BD44	BD44	BD44	BD44	BD44	BD44	BC99	CD17	BD44	BC66	BD18	
Total number of species		20	20	24	20	16	15	18	30	26	34	31	38	29	29	54	23	41	31	26		12	31	21	18	16	12	17	13	12	20	19	16	13	18	12	20	20	
Number of mosses, liverworts and lichens species		2	1	3	2	-	-	-	4	3	2	1	2	-	1	4	1	1	1	-		-	2	-	-	2	1	-	-	-	-	-	-	-	3	-	-	-	
I. Ch., D.* *Quercetea robori-petraeae*																																							
Calamagrostis arundinacea		4	5	4	3	4	.	.	.	.	1	1	2	.	.	.	+	.	+	+	58	3	3	3	3	3	3	2	2	1	1	2	1	1	.	2	.	2	88
* *Pteridium aquilinum*		.	.	.	2	.	+	4	.	.	1	.	1	.	.	.	+	1	1	.	42	1	+	2	2	3	4	3	4	.	1	+	1	+	.	1	2	.	82
* *Melampyrum pratense*		.	.	.	.	.	.	.	3	3	.	.	.	1	1	1	.	.	.	.	26	.	.	.	.	.	r	.	.	.	.	.	.	.	4	+	+	1	29
Festuca ovina		.	.	.	.	.	.	+	2	2	.	.	.	.	.	+	.	.	.	.	21	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	1	12
Carex pilulifera		.	.	.	.	.	1	.	.	.	.	.	.	+	+	+	.	.	.	.	21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
* *Polytrichastrum formosum*		+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	6
Hieracium lachenalii		.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Holcus mollis		.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	+	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
II. D. *Ca-Q polygonatetosum*																																							
Corylus avellana (Q-F)	b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	5	.	.	.	.	.	.	2	.	.	.	.	2	+	.	3	.	.	24
Corylus avellana (Q-F)	c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	5	.	.	.	.	.	.	+	+	.	r	+	.	.	.	.	.	.	24
Convallaria majalis		+	1	+	+	3	4	2	.	.	+	.	1	.	1	.	.	+	1	.	63	+	1	2	1	1	+	+	4	4	4	3	3	3	.	1	.	2	88
Moehringia trinervia		+	+	2	.	+	+	+	+	.	+	.	1	+	+	+	.	+	+	.	74	.	.	1	+	+	.	+	.	+	1	+	+	.	+	r	.	.	59
Melica nutans (Q-F)		.	+	+	1	+	+	+	+	+	.	1	+	1	+	+	+	1	+	1	89	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	+	.	12
Polygonatum odoratum		.	.	.	.	.	.	+	.	+	.	.	.	+	+	+	+	.	+	.	37	+	+	1	.	.	.	.	.	.	.	.	.	.	.	.	+	r	29
Mycelis muralis		+	+	.	.	.	.	1	.	.	.	.	+	.	.	.	.	.	.	+	26	.	.	.	.	.	.	+	.	.	1	.	.	.	.	r	.	.	18
III. D. *Anemone* var. (rich var.)																																							
Poa nemoralis (Q-F)		+	+	1	.	.	+	3	.	.	.	.	.	+	.	2	+	1	1	.	53	.	.	1	.	.	.	.	.	.	.	+	.	1	.	.	+	.	24
Anemone nemorosa (Q-F)		+	+	.	+	+	+	.	.	.	+	+	.	.	+	1	1	1	1	.	63	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Oxalis acetosella		3	3	.	1	.	.	.	.	.	+	.	.	.	+	+	.	1	+	+	47	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Fragaria vesca		.	.	+	.	.	.	.	.	1	+	+	+	+	.	.	.	+	+	.	42	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	6
Viola reichenbachiana (Q-F)		+	+	.	.	+	.	.	.	.	.	.	+	.	.	1	+	.	r	+	42	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Veronica chamaedrys		.	.	+	.	.	.	.	+	+	.	.	.	.	r	3	.	.	+	.	32	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Hypericum perforatum		.	.	.	.	.	.	.	+	.	+	+	+	+	.	.	.	.	.	.	26	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
IV. Ch. *Vaccinio-Piceetea*																																							
Pinus sylvestris	a1,a	.	.	2	3	2	3	.	+	2	3	1	5	.	.	.	2	3	2	1	68	.	3	4	4	4	.	.	4	2	1	2	2	.	2	.	.	1	65
Vaccinium myrtillus		.	.	+	2	+	+	.	.	+	2	2	1	3	1	1	1	2	1	+	79	4	3	.	.	.	1	1	1	.	.	.	.	+	+	1	2	2	59
Pleurozium schreberi		.	.	.	2	.	.	.	1	3	3	.	2	.	.	.	.	2	+	.	37	.	1	.	.	1	.	.	.	.	.	.	.	.	2	.	.	.	18
Rubus saxatilis		.	.	.	.	.	.	.	+	1	.	+	.	+	.	+	.	1	+	.	37	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	12
Pseudoscleropodium purum		.	.	.	2	.	.	.	.	.	3	3	3	.	r	.	.	.	.	.	26	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
V. Ch. *Querco-Fagetea* (Q-F)																																							
Fagus sylvatica	b/c	.	+/	.	/1	.	.	.	.	.	/+	.	.	.	.	.	.	/+	/+	.	26	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Lilium martagon		.	.	.	r	.	+	.	.	.	.	+	.	.	.	.	.	+	.	.	21	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	12
VI. Others																																							
Quercus petraea (Q. x rosacea^)	a1,a	5	5	4	.	4	3	5	4	4	1	.	.	2	3;1^	.	3^	2^	.	2	74	5	.	.	.	.	5	4	.	3	4	4	3	4	4	4	2;4^	2	71
Quercus petraea (Q. x rosacea^)	bc*;b	.	.	.	+^	2	+	.	+	+	1	.	1	.	.	.	r*	.	.	.	42	.	2	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	18
Quercus petraea (Q. x rosacea^)	c	+	+	1	.	+	+	.	.	.	++^	.	1	.	+	.	.	.	+	+	53	1	+	1	+	.	+	1	+	+	3	+	1	+	1	.	.	+	82
Quercus robur	a1,a	.	.	.	.	.	.	.	.	.	.	2	.	4	.	4	.	1	3	2	32	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	6
Quercus robur	b\c	.	.	.	/+	.	.	.	.	.	.	/+	.	/+	.	/+	.	1/	.	.	26	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	1/2	12
Betula pendula	a1,a	.	.	.	.	.	.	.	.	.	1	2	.	.	.	.	2	2	2	2	32	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	12
Betula pendula	b/c	.	.	.	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	5	.	+/	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Frangula alnus	b/c	.	.	.	.	.	.	/+	.	/+	.	.	.	/+	/+	/+	.	.	.	+/+	32	.	.	.	.	.	.	/+	/+	.	/r	.	.	.	/+	/+	/+	.	35
Sorbus aucuparia	b/c	.	.	.	.	+/+	/+	.	/r	.	/1	/+	.	/+	/r	/+	.	/+	/+	/+	58	.	/+	/r	/+	/+	/r	/+	/+	.	/r	/+	.	1/	/+	.	.	/+	65
Luzula pilosa		+	.	1	.	+	+	.	1	+	.	+	+	+	+	+	.	+	r	.	68	+	.	1	.	.	+	1	.	.	1	.	.	.	.	+	+	+	47
Dryopteris carthusiana		+	.	+	+	.	.	.	.	.	1	+	1	+	+	.	.	+	+	.	53	.	+	1	+	1	.	.	.	1	.	+	.	.	.	.	+	.	41
Maianthemum bifolium		+	.	.	+	.	.	.	.	.	+	.	.	2	+	1	+	+	+	.	47	+	.	.	.	.	+	+	.	.	+	.	+	+	.	.	1	.	41
Galeopsis tetrahit		+	1	.	.	+	+	.	+	.	.	.	.	.	.	+	.	.	.	.	32	.	.	1	1	+	.	+	.	.	2	1	2	.	.	.	.	.	41
Calamagrostis epigejos		.	.	.	.	.	.	.	.	.	3	2	.	1	.	.	.	.	.	1	21	.	.	.	3	3	.	.	3	3	.	2	2	1	.	.	.	+	47
Fallopia convolvulus		+	+	.	.	+	.	+	.	.	.	+	+	.	.	.	+	.	+	.	42	.	.	.	.	.	.	.	.	1	.	.	2	.	.	.	.	.	12
Urtica dioica		.	.	2	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	16	.	+	.	+	+	.	+	.	+	r	+	.	.	.	.	.	.	41
Agrostis capillaris		.	.	+	.	.	.	.	1	+	2	.	1	+	.	.	+	.	.	.	37	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Deschampsia flexuosa		.	.	.	2	.	.	.	.	.	3	2	.	3	3	.	+	1	1	.	42	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	6
Rubus idaeus		.	.	.	.	.	.	.	.	.	2	2	3	.	.	1	.	1	.	1	32	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	12
Rubus caesius		+	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	1	.	32	.	.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	12
Fallopia dumetorum		.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	+	1	+	1	.	.	r	.	1	1	.	.	.	.	.	.	41
Poa angustifolia		.	.	+	.	.	.	.	1	1	.	.	.	+	.	.	.	.	.	.	21	+	.	1	.	.	.	.	.	.	.	.	.	.	+	.	.	+	24
Brachypodium pinnatum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	4	11	.	.	1	.	.	.	.	.	1	1	.	.	.	.	.	.	.	18

Sporadic species: I.: *Dicranella heteromalla* 15; *Hieracium sabaudum* 35; *H. laevigatum* 32(r); *H. umbellatum* 27; **IV.** *Dicranum polysetum* 16; *Juniperus communis* b 22(1), bc 8,9(2),33(1), 35; *Monotropa hypopitys* s.s. 8; *Orthilia secunda* 9,20; *Picea abies* a1 18 (2), a2 3 (1), b 10(2), c 4,22,23;*Trientalis europaea* 4(1),17; *Vaccinium vitis-idaea* 27(r); **V.:** *Acer campestre* b 15, c 15; *A. platanoides* b 36, c 7,19(r); *A. pseudoplatanus* c 5; *Adoxa moschatellina* 17; *Ajuga reptans* 9,15(1); *Atrichum undulatum* 3,15(1); *Brachypodium sylvaticum* 10,14,19; *Campanula persicifolia* 11,17; *Carex digitata* 8,9(2); *C. montana* 14; *C. sylvatica* 15; *Carpinus betulus* c 14,25(1); *Dryopteris filix-mas* 2,10,21; *Epipactis helleborine* 11; *Equisetum sylvaticum* 17(2); *Festuca gigantea* 17,19,23,28,29(1),30; *F. heterophylla* 15,22(1),29(1),31(1); *Galeobdolon luteum* 17(1); *Impatiens noli-tangere* 2; *Malus sylvestris* c 8,10(1); *Melampyrum nemorosum* 30; *Milium effusum* 15; *Padus avium* b 10(2),17(2), c 11; *Phyteuma spicatum* 15; *Pulmonaria obscura* 15(r); *Scrophularia nodosa* 7,31; *Stellaria holostea* 15; *Ulmus glabra* c 34(r); *Viola reichenbachiana* et *riviniana* 8,9,33; *V. riviniana* 13,17,21; **VI.:** *Achillea millefolium* 8(r),15; *Aesculus hippocastanum* c 26; *Agrostis gigantea* 7,11(2); *Alopecurus pratensis* 16; *Anthoxanthum odoratum* 8(1),12(1),14,15,21(2); *Arrhenatherum elatius* 11(3),12(2); *Astragalus glycyphyllos* 17; *Berberis vulgaris* b 19; *Bromus inermis* 24(1); *Campanula rotundifolia* 3,12,21(1); *Carex hirta* 12(2),14(r),17.21; *C. pallescens* 13,15; *C. rostrata* 31; *Cerastium arvense* 19(r); *Chaerophyllum temulum* 1; *Chelidonium majus* 12; *Clinopodium vulgare* 12; *Conyza canadensis* 3; *Cornus sanguinea* c 15; *Crataegus laevigata* b 17,21, c 10(1); *C. monogyna et laevigata* c 15; *Dactylis glomerata* 15,16; *Deschampsia caespitosa* 9,17; *Equisetum hyemale* 35; *Euonymus europaea* c 15,21(r); *Euphorbia cyparissias* 8,12,19; *E. esula* 19(r); *Festuca rubra* s.s. 3,8,20; *Galeopsis pubescens* 7,8; *Galium album* 8,9,33; *G. boreale* 10,11(1),17,21,35; *G. mollugo* 11(1),12,14,15; *G. verum* 19,20,21(1); *Genista tinctoria* 15; *Geranium robertianum* 1,2(1),7,12,30,31(2); *Glechoma hederacea* 19; *Hieracium murorum* 14,15(1),26,36; *H. pilosella* 15; *Hypericum maculatum* 15; *Hypnum cupressiforme* 1,15; *Impatiens parviflora* 10(1),17(1),32,36; *Juncus conglomeratus* 36; *J. effusus* 21; *Knautia arvensis* 12; *Lapsana communis* s.s. 15; *Larix decidua* subsp. *decidua* a 16; *Linaria vulgaris* 8,12; *Lupinus polyphyllus* 11; *Luzula multiflora* 13,15; *Lysimachia nummularia* 15(1); *L. vulgaris* 15(1); *Mentha arvensis* 15; *Molinia caerulea* 28(1); *Padus serotina* b 16(5), bc 12, c 7,13,16,21,26; *Peucedanum oreoselinum* 12; *Pimpinella saxifraga* 9(r),12(1),33(r); *Plagiomnium affine* 8,9(2),15,24(1),33(1); *Pohlia nutans* 3; *Polytrichum juniperinum* 8; *Populus tremula* c 16; *Potentilla erecta* 12,15; *Prunus spinosa* b 12, c 18; *Pyrus communis* c 2,14; *Rhamnus cathartica* c 10; *Robinia pseudacacia* b 29(3); *Rosa canina* bc 9; *Rosa* sp. c 13; *Rubus corylifolius* 13; *R. plicatus* 4,14(r); *Rubus* sp. 5,12,16,21(1); *R. sprengelii* 10(2),11(1),13,17(1); *Rumex acetosa* 21; *R. acetosella* 13(r),21(1); *Sambucus nigra* c 1,5; *Sciuro-hypnum oedipodium* 3,8,9,33; *Scorzonera humilis* 33,35; *Taraxacum officinale* 15; *Thalictrum minus* 3; *Veronica officinalis* 11,15,18(1); *Vicia cassubica* 10(1),11(2),12,17,22,23; *V.sativa* 11; *Vincetoxicum hirundinaria* 22(r),23(1), 24,29(1),30(1); *Viola* sp. 35.

Table A19. *Calamagrostio arundinaceae-Quercetum petraeae* – mixed form of *Ca-Qp molinietosum* and *Ca-Qp polygonatetosum*

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12
ID-1		16	16	21	16	30	4	25	37	4	23	4	36
ID-2		17	21	1	17	5	50	-	12	50	12	50	13
ID-3		6	1	3	5	27	15	-	5	4	1	10	19
Date (year)		1972	1972	1957	1972	1957	1967	2003	1986	1964	1965	1965	1985
Density of tree layer	a1,a [%]	80	40	50	80	50	60	60	65	75	60	65	60
Density of tree layer	a2 [%]	40	80	+	70	60	-	-	5	-	-	-	-
Density of shrub layer	b [%]	40	10	+	60	10	45	30	+	15	+	-	+
Cover of herb layer	c [%]	80	50	70	90	60	100	70	60	90	90	85	95
Cover of moss layer	d [%]	60	60	30	10	+	-	25	5	-	+	15	5
Area of relevé		200	200	450	250	1000	400	250	900	400	300	400	900
Location (ATPOL)		CD96	CE14	CD82	CD96	CD73	CC02	CD83	BD80	CB94	CD53	CB94	-
Total number of species		48	41	45	44	24	37	34	28	38	47	37	45
Number of mosses, liverworts and lichens species		8	12	6	6	1	-	2	4	-	2	1	4
I. Ch., D.* *Calamagrostio arundinaceae-Quercetum petraeae*													
Hieracium sabaudum		1	.	.	.	.	+	r	+	.	+	+	1
Hieracium lachenalii		+	.	+	+	+	.	.	2	+	.	+	1
* *Calamagrostis arundinacea* (Qrp)		2	3	+	1	1	.	.	+	2	1	.	.
Hieracium laevigatum		.	.	.	+	.	+	+	+	.	.	.	1
* *Festuca ovina* (Qrp)		2	+	1	3	.	.	.	3	.	+	.	1
Lathyrus montanus		+	.	.	.	.	1	.	.	+	.	.	.
II. D. *Ca-Q molinietosum*													
Quercus robur	a1,a	3	.	2	2	2	4	4	.	4	4	4	4
Quercus robur	a2	1	.	1	3	.	.	.	.	.	.	.	.
Quercus robur	b/c	/+	.	/+	/+	+/	.	/r	.	+/+	/+	/+	+/1
Picea abies (V-P)	a1,a	2	2	.	.	.	.	+	.	.	.	.	.
Picea abies (V-P)	a2	2	5	.	1	.	.	.	.	.	.	.	.
Picea abies (V-P)	b/c	2/+	2/+	+/+	2/	.	3/	.	.	.	.	.	+/
Frangula alnus	b	.	.	1	2	1	.	1	+	+	+	.	.
Frangula alnus	c	+	.	+	.	+	.	.	+	+	+	+	.
Trientalis europaea (V-P)		1	1	+	1	1	1	.	.	+	1	.	.
Carex pallescens (C-U)		+	.	.	.	.	+	r	+	.	1	+	+
Lysimachia vulgaris		.	1	+	+	.	.	+	+	.	1	.	+
Dryopteris carthusiana		.	.	.	+	+	.	+	.	.	.	+	+
Deschampsia caespitosa		.	.	+	.	.	+	.	.	+	.	+	.
Molinia caerulea		.	.	.	+	+	.	+	.	.	.	.	.
Potentilla erecta (C-U)		+	.	.	.	.	.	.	.	+	.	+	.
III. D. *Ca-Q polygonatetosum odorati*													
Quercus petraea	a1/a2	.	.	.	.	.	.	.	4/1	.	.	.	.
Quercus petraea	b	.	.	.	.	.	.	.	+	.	.	.	.
Corylus avellana	b/c	+/	.	.	.	.	.	.	.	+/+	+/+	+/1	.
Veronica officinalis		.	.	+	.	+	.	.	+	+	+	+	+
Mycelis muralis		.	+	.	.	.	+	.	.	+	+	+	1
Moehringia trinervia		.	+	.	1	.	+	.	+	.	.	+	.
Hieracium murorum		+	.	.	+	.	.	+	.	+	+	.	.
Convallaria majalis		1	.	+	.	1	.	2	.	.	1	.	.
Melica nutans		.	1	.	3	.	.	.	.	.	.	.	.
Festuca heterophylla		+	.	.	.	.	+	.	.	.	.	.	.
Polygonatum odoratum		.	.	+	.	.	.	.	.	.	.	.	.
Galeopsis tetrahit		.	.	.	.	.	.	.	.	.	.	.	+
IV. D. *Anemone* var.													
Carpinus betulus (Q-F)	a;a2*	.	.	.	2*	3	.	1	.	.	.	.	.
Carpinus betulus (Q-F)	b-c	.	.	.	+/+	+/	/1	2/1	.	.	/+	/+	.
Oxalis acetosella		+	3	1	2	1	2	+	.	2	+	1	.
Poa nemoralis (Q-F)		1	.	+	1	.	.	+	1	.	+	+	4
Anemone nemorosa (Q-F)		.	.	+	.	+	2	.	.	.	1	2	.
Viola reichenbachiana (Q-F)		.	1	.	1	.	.	.	.	+	.	+	+
Viola riviniana (Q-F)		.	.	+	.	.	1	.	.	1	+	1	.
V. Ch., D.* *Quercetea robori-petraeae* (Qrp)													
Carex pilulifera		3	+	1	1	+	.	1	+	.	1	.	+
* *Polytrichastrum formosum*		2	2	1	1	+	.	2	.	.	.	2	1
Holcus mollis		1	.	1	.	.	2	r	.	3	3	3	1
* *Melampyrum pratense*		3	.	+	3	.	1	1	1	.	2	+	.
* *Pteridium aquilinum*		+	2	1	.	2	.	.	.	2	.	+	.
Dicranella heteromalla		2	+	.	+	.	.	.	1	.	.	.	.
Hieracium umbellatum		.	.	.	.	.	.	.	+	.	.	.	+
VI. Ch. *Vaccinio-Piceetea* (V-P)													
Pinus sylvestris	a1,a	3	2	3	4	3	.	.	.	.	.	.	.
Pinus sylvestris	b	2	1	.	+	.	.	.	.	.	.	.	.
Pinus sylvestris	c	+	.	+	.	.	.	r	.	.	.	.	.
Vaccinium myrtillus		1	1	4	3	4	2	2	1	+	+	.	.
Pleurozium schreberi		2	3	3	1	.	.	.	.	.	+	.	.
Betula pubescens subsp. pubescens	b/c	+/+	/+	/r	.	.	.	/r	.	.	.	.	.
Vaccinium vitis-idaea		+	+	.	1	.	.	.	.	.	.	.	.
Pseudoscleropodium purum		2	+	+	.	.	.	.	.	.	.	.	.
VII. Ch. *Querco-Fagetea* (Q-F)													
Stellaria holostea		1	.	+	2	+	.	+	.	.	+	.	+
Atrichum undulatum		.	1	.	+	.	.	.	.	.	+	.	+
Fagus sylvatica		.	+	+	.	.	.	.	.	+	.	+	.
Ajuga reptans		.	+	.	+	.	.	.	.	.	+	.	.
Milium effusum		.	.	.	.	.	.	1	.	.	+	+	.
VIII. Ch. *Calluno-Ulicetea* (C-U)													
Agrostis capillaris		.	.	.	.	.	.	r	+	1	.	2	1
Luzula multiflora		+	.	.	.	.	.	.	+	.	+	.	+
Pohlia nutans		+	.	+	+	.	.	.	+	.	.	.	.
Solidago virgaurea s. s.		+	.	.	.	1	.	+	.	.	+	.	.
Hypericum maculatum		.	.	+	.	.	.	.	.	2	1	.	.
IX. Others													
Sorbus aucuparia	a2*;b/c	/+	/+	/+	1/	+*/+	/+	+/+	.	.	+/+	/+	/+
Luzula pilosa		2	+	1	1	+	+	1	+	.	1	1	1
Maianthemum bifolium		1	1	1	+	+	2	+	.	3	2	1	+
Fragaria vesca		.	+	+	+	.	1	r	.	1	+	2	+
Hypnum cupressiforme		1	1	+	1	.	.	1	+	.	.	.	.
Veronica chamaedrys		.	.	+	.	.	1	r	.	.	2	.	2
Anthoxanthum odoratum		.	.	1	.	.	2	.	.	.	1	.	+
Galeopsis pubescens		.	+	.	.	.	.	.	.	+	.	.	+
Calamagrostis epigejos		+	.	.	3	.	.	.	.	.	1	.	.
Galium mollugo		.	.	.	.	.	1	.	.	+	.	.	+
Stellaria graminea		.	.	.	.	.	+	.	.	+	.	+	.

Sporadic species: V.: *Lophocolea heterophylla* 2(1); *Plagiothecium laetum* 2; **VI.** *Dicranum scoparium* 1(1); *Galium rotundifolium* 12; *Juniperus communis* b 3,4, c1; *Monotropa hypopitys* s. s. 3; *Orthilia secunda* 3; *Pyrola chlorantha* 6; *Rubus saxatilis* 10; *Thuidium tamariscinum* 2; **VII.:** *Acer platanoides* c 9; *A. pseudoplatanus* c 7; *Campanula persicifolia* 12; *Carex digitata* 1,2; *Dactylis polygama* 8; *Equisetum sylvaticum* 4; *Fagus sylvatica* a 5(4), a2 1(2), b 1,9; *Festuca gigantea* 9,11; *Fraxinus excelsior* b 9, c 8(r); *Hypericum montanum* 4; *Malus sylvestris* bc 5; *Polygonatum multiflorum* 3 *Ranunculus auricomus* 6; *Sanicula europaea* 11; *Scrophularia nodosa* 11,12; *Tilia cordata* c 10,12(1); **VIII.:** *Calluna vulgaris* 1; *Danthonia decumbens* 4; *Genista tinctoria* c 10; *Hieracium pilosella* 10; *Polytrichum juniperinum* 8; **IX.:** *Abies alba* a1 1(1),4(1), a2 1(1), b 1(2),4(2), c 2; *Aegopodium podagraria* 2; *Astragalus glycyphyllos* 6(10) *Athyrium filix-femina* 9,11; *Betula pendula* a 12, a1 8, a2 8, c 10; *Brachytheciastrum velutinum* 12; *Brachythecium rutabulum* 12; *Campanula rotundifolia* 9(1),12; *Cirsium vulgare* 2; *Clinopodium vulgare* 6(1),10; *Cornus sanguinea* b 4; *Dactylis glomerata* 11,12; *Deschampsia flexuosa* 12; *Euphorbia cyparissias* 2,12; *Festuca pratensis* 6(1); *F. rubra* s. s. 12; *Galium boreale* 6(2); *Hypericum perforatum* 12; *Juncus conglomeratus* 10; *Lathyrus sylvestris* 6(1); *Plagiochila asplenioides* 1; *Plagiomnium affine* 2(2),3; *P. elatum* 2; *Poa angustifolia* 3; *P. pratensis* 6: *Pohlia lescuriana* 2; *Pyrus communis* 4; *Quercus rubra* b 7(r); *Quercus* x *rosacea* a1 3(2), a2 3(1), c 3;; *Rhamnus cathartica* b 2, c2;; *Robinia pseudacacia* b 12; *Rubus idaeus* 9(1),11; *R. nessensis* 1,4(1); *R. pedemontanus* 7(r); *R. plicatus* 10; *Rumex acetosella* 1,3; *Salix caprea* c 10; *Sarothamnus scoparius* c 12; *Silene vulgaris* 8: *Taraxacum officinale* 10; *Torilis japonica* 9(1); *Trifolium alpestre* 6(2),9; *Urtica dioica* 9,11; *Vicia cassubica* 6(3); *V. cracca* 9; *V. dumetorum* 6; *V. sepium* 8,9.

Table A20. *Galio sylvatici-Carpinetum holcetosum mollis* variant with *Lysimachia vulgaris*

		Relevés 1–81	
Successive number of relevé		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81	1-81
ID-1		23 23 23 23 23 23 35 26 15 15 16 37 35 4 36 4 4 36 4 37 26 55 37 26 21 21 21 15 26 55 15 16 30 26 26 36 36 36 36 24 26 26 36 24 36 26 26 23 26 31 26 26 30 36 37 51 36 31 37 37 26 21 26 26 35 35 21 26 30 15 15 15 15 15 15 15 30 30 38 30 30	
ID-2		10 10 10 10 10 10 10 10 8 17 9 10 50 9 50 50 9 50 9 10 14 9 10 1 1 1 8 10 14 8 17 5 10 10 9 9 9 9 - 10 10 9 - 9 11 10 10 10 2 10 11 5 9 9 1 9 2 9 11 1 11 10 10 10 1 11 5 8 8 8 8 8 8 5 5 4 5 5	
ID-3		25 18 16 15 19 17 37 12 14 11 15 9 45 3 14 6 7 3 1 1 14 28 3 3 20 19 11 13 8 31 4 8 19 10 9 10 2 9 13 - 6 11 4 - 7 3 1 20 7 1 2 2 16 6 4 19 5 2 5 2 4 27 5 4 44 41 18 1 17 3 7 8 9 5 2 12 1 5 29 4 3	
Date (year)		1965 1965 1965 1965 1965 1965 1976 1965 1962 1962 1971 1987 1976 1964 1985 1964 1964 1986 1965 1987 1964 1984 1987 1962 1957 1957 1957 1962 1964 1984 1962 1971 1955 1965 1964 1984 1986 1986 2006 1964 1964 1986 2005 1984 1965 1962 1965 1964 1981 1962 1965 1957 1984 1987 1981 1984 1981 1986 1986 1964 1957 1964 1965 1975 1977 1957 1965 1957 1962 1964 1964 1963 1962 1963 1956 1955 1987 1955 1956	
Density of tree layer	a1,a [%]	20 75 75 50 40 80 60 50 30 30 90 70 90 80 70 75 70 70 75 70 60 55 80 60 50 30 50 15 70 50 50 40 50 60 60 80 65 65 70 75 30 30 70 20 65 70 60 40 85 30 60 60 90 80 50 60 50 50 25 40 70 50 60 70 60 80 40 90 30 30 90 100 90 90 40 80 75 75 60 40 70	%
Density of tree layer	a2 [%]	95 15 30 90 60 50 5 60 45 40 100 - - - 15 - - 10 - 65 70 - 55 30 5 50 5 75 - - 30 60 70 70 80 25 20 5 5 60 80 85 15 80 20 70 80 80 - 50 80 75 - 20 5 - 30 70 90 65 50 5 60 50 - 5 55 - 70 40 - - - - 50 40 - 50 85 50 -	
Density of shrub layer	b [%]	10 75 50 75 20 75 30 - + + 30 40 + 40 15 20 35 25 60 20 10 40 40 + + 20 40 15 + 30 + 90 - - - 30 5 20 + - - - 30 - + + 30 + - 5 5 + - + 65 30 + + 40 10 + 25 + - 20 30 + + + - + + 30 + 5 10 10 + 20 + +	
Cover of herb layer	c [%]	90 50 60 80 95 60 60 50 60 80 30 100 90 80 90 95 90 90 75 60 60 75 70 70 50 75 60 70 60 60 100 40 80 70 60 70 75 75 40 70 80 80 40 90 40 15 60 60 50 20 30 30 25 80 100 40 60 30 80 50 85 70 20 70 35 50 40 20 90 30 30 40 30 50 75 70 25 80 40 60	
Cover of moss layer	d [%]	+ + + + + + - + + 30 40 5 - + 5 - - 5 10 + + 5 5 + 15 + + 10 + + + 5 + 10 + 5 25 + 10 - + + + 10 + + + 5 5 + + + + + + + 5 10 5 25 + + + + 10 5 + + + + 10 5 10 + + 15 5 5 40 + +	
Area of relevé		200 500 300 400 400 300 100 200 200 320 300 900 200 400 800 400 400 800 400 800 300 150 900 150 500 700 600 200 250 100 300 350 150 200 400 900 600 200 900 250 400 400 800 200 500 200 250 250 200 300 200 1000 200 900 200 300 100 400 600 150 700 300 200 100 200 700 200 450 450 240 150 155 200 260 310 1000 600 800 2000 800	
Location (ATPOL)		CD63 CD53 CD53 CD53 CD53 CD53 CE01 CD83 CE36 CE36 CD60 BD80 CE00 CB94 BE28 CC02 CC02 BE28 CB94 BD80 CD51 BC84 BD80 BD79 CD82 CD82 CD82 CE36 CD51 BC84 CE36 BD87 CD73 CD83 CD84 CE11 CE12 BE28 CE20 CE36 CD84 CD84 DE01 CE36 CE11 CD84 BD79 CD52 CD84 CD84 BD79 CD84 CD73 - BD80 CD93 - CD84 AD89 - CD84 CD82 CD84 CD83 CE01 CE11 CD82 CD83 CD73 CE36 CE36 CE36 CE36 CE36 CE36 CD82 CD83 AD77 CD73 CD73	
Total number of species		38 43 36 39 35 34 35 28 28 33 43 46 36 46 33 39 37 56 36 40 20 35 33 27 45 44 46 30 19 23 25 45 20 19 22 38 44 43 47 35 28 30 34 32 39 25 32 25 27 39 30 29 25 35 42 37 33 37 43 45 21 35 31 28 34 31 29 24 24 37 37 34 37 41 40 40 56 30 34 26 26	
Number of mosses, liverworts and lichens species		4 5 3 4 5 3 - 5 5 5 8 6 - 2 3 - - 1 1 2 3 2 5 4 4 5 3 3 1 1 4 3 1 6 4 5 7 3 5 - 4 6 3 2 4 3 4 3 4 1 2 2 1 3 2 1 2 5 13 6 2 2 3 4 2 2 2 1 1 3 6 5 5 5 5 5 7 2 6 4 2	
I. Ch.* *Carpinion betuli*, Ch.^, D. *Galio sylvatici-Carpinetum*			
* *Carpinus betulus*	a1,a	. . . . 4 . . . 4 . . . 1 . . . . . . 5 . . . . 5 . . . 4 . . . . . . 1 . . . . 3 4 . 4 4 3 4 . 2 . 4 . 3 3	21
* *Carpinus betulus*	a2	5 2 1 3 3 + + 4 3 3 5 . . . 1 . . 1 . 4 4 . 2 3 1 3 1 4 . . 3 2 . 4 5 . 2 . . 3 5 5 . . 1 4 5 5 . 3 5 4 . 2 . . 1 4 5 4 3 2 4 3 . + 4 . . 3 . . . . 3 3 . . 1 . .	63
* *Carpinus betulus*	b [bc]	1 2 2 2 2 . 1 + . . 3 2 . . + 2 2 . 1 2 2 2 1 + . 2 . . + . . 2 [+] . . 1 1 . . . . . . 1 . + 1 2 + . 1 2 + . + . 1 . + 3 1 1 2 . . 2 + . . [+] . . . + . . . [+] [+] . [+] [+]	58
* *Carpinus betulus*	c	1 1 + 2 2 . . + 2 2 1 1 . + . + + . . 1 1 . 1 + 1 + + 1 + . 2 1 . + + + 1 . . + + + . 2 1 + + 1 + 1 + + ... + + + + 1 + + . . 1 + . 1 + + . 1 1 1 . . + . .	69
* *Tilia cordata*	a1,a	. . . . 2 . . . . 3 1 . . . . 2 . .	5
* *Tilia cordata*	a2	. . 2 . . 3 . . . . 1 . . . 3 . . . . 2 . . . . 1 1 . 2 . . + ... 4 . .	12
* *Tilia cordata*	b	. . 1 . . 3 3 . . . . 1 . . . . . 2 . . . 3 . . . . + ... 2 . . . . + 3 . + . . + ... 2 . .	16
* *Tilia cordata*	c	. . + . . 1 . . . . + . . . 1 . . . . + ... + ... + . .	9
Acer campestre	a2	. . . . + ...	1
Acer campestre	c	+ . . . . + ... + . + ... + ...	6
* *Stellaria holostea*		2 2 3 3 4 3 3 3 . . 1 + 1 . + 1 1 . 2 . . 2 . 2 + 1 1 . 2 2 . . + 2 2 + ... 2 . . . . . 2 . + 1 2 2 + + . . . + 2 . 2 2 1 + 1 + + 1 + + ... + + 1 + +	63
* *Melampyrum nemorosum*		. + ... 2 . 2 + . + ... + ... + + ... 1 . . . . + . . 3 + + + + 2 . . + . .	22
* *Dactylis polygama*		. . . . + ... 2 . . . 1 + ... + ... + + . . + + + ... + + 3 . . + ...	17
Festuca heterophylla		. . . 1 + ... + ... 1 + ... + ... + . . + . . . 1 . . . . + ... + + ... + ... 1 . . + . .	18
^ *Ranunculus auriculus*		. . . . . . + ... + . + . + + + . . . 1 . . . . + ... + ...	11
^ *Galium sylvaticum*		. . . . + . + ... 1	4
II. D. *Galio sylvatici-Carpinetum holcetosum mollis*			
Quercus robur	a1,a	2 4 4 5 4 5 4 3 3 2 1 4 5 4 3 4 4 3 4 4 4 4 4 4 2 2 4 2 3 4 2 3 4 4 4 . + . 1 . 3 2 4 . 4 4 4 2 + 2 4 4 3 4 3 3 3 3 2 3 4 4 4 3 4 4 3 + 3 1 2 3 2 1 2 3 4 4 3 2 3	95
Quercus robur	a2	. . . . . . + . . . 1 . . . . 1 . . . . . 4 . . . . 2 . . . . + . . . 1 . . 2	10
Quercus robur	b [bc]	. . . . [+] . + 1 1 + ... + ... + . [1] . . . . + ... + 2 + ... [+] . . . . + . . [+] . . [+] [+]	21
Quercus robur	c	+ + + + + + . + + + 1 + 1 + + 1 1 + + + + 2 1 + + + + + + 1 . + 1 . . . . 1 + . . . + + + + + . + 1 . + . + . + + + 1 + + + + + + + ... + ...	67
Frangula alnus	b	. + 1 1 + 1 . . + + + 2 + 1 + + . 1 1 . . 2 . + + . 2 1 + 3 + 1 . . . + + + ... 1 . . . + ... + . . 1 . . . + . . . + ... + . + + . + 1 + . + .	51
Frangula alnus	c	. + + + + + + . . + . . + . + + + + . . . + + . 1 + + + + . + ... + . + . + + + + + + + 1 + ... + + . . . + . + + + . . 1 + + + . . + + . + + ... +	56
Polytrichastrum formosum		+ + . + + . . + 3 3 3 1 . + 1 . . 1 . . + 1 . + 2 1 + 2 1 1 2 1 + 1 + + 2 + 1 . + + + 2 + + + 1 1 . + + + + . + 1 1 1 . + 1 + + 1 + 1 1 + + 2 1 2 2 1 2 1 1 + + +	84
Holcus mollis (Qrp)		+ . 1 2 . 1 1 . + . + 4 4 3 3 3 3 3 3 1 . 1 1 . + + . + . . . 1 . . . 2 1 . 2 + + . 1 2 + + . . . 1 + + + 1 1 2 1 1 . 1 . 1 + . 1 + . + . . + + + + . + 1 + + 2 . .	67
Dicranella heteromalla (Qrp)		. + + + + 1 . + . . + . . + ... + . . + + ... + + . + + ... + + ... + + 1 . . + + ... 1 . .	32
Hypnum cupressiforme		. . . . + + 1 + . . + ... 1 + + + . . + . . . + + + . . + + ... + ... + . . . + ... + + + 1 . + ...	30
Melampyrum pratense		. . . . + . . . 1 1 . 1 + 1 . . . . + + . + 1 + . . 1 . . . . + . . + ... 1 + . 1 . . . 1 + ... + + .	27
III. D. *Lysimachia vulgaris* var.			
Oxalis acetosella		. 2 2 . + + . 2 + + 1 + 1 2 + 2 2 + 2 + 2 . . + 1 1 + + + . . 2 . + 2 2 1 . + 2 4 4 + + 2 2 2 2 2 2 2 1 1 . . . 2 . 1 1 1 + + 2 2 2 1 1 1 . + 1 + 2 1 + 3 1 + . + +	82
Deschampsia caespitosa		+ + + + . + . + . 1 . + . + + + . 1 + r + + r . + + + + + . + 2 + . + . . + + + + + + + . . + + + + + + . . 1 2 . 2 + . + + . . . + + . . + 2 1 1 + 1 1 + + + + .	72
Dryopteris carthusiana		. + + . . + . . + . 1 . . + 1 . . + ... r . . + . . . + + . + 1 + . . 1 + + + + + + . + + + + + + + . 2 + ... + 1 + + . + + + + . + . + . . + . + 1 . .	54
Carex pallescens		. + . + + + + . + . + . . + + . + . . + + + + 1 + + 1 . . . + + . + + + + + + + + . . . + . . . + ... + . . . + . + . . . + ... + + + + . . + + ...	49
Carex pilulifera (Qrp)		. + . + ... 1 . . . + ... + + . . . + 1 + 1 + . . + . + + . . . 2 + . + . + . + . + . + + + ... + . + . + + + + . . + . . + . + . . . + . + . + . +	45
Lysimachia vulgaris		. . + ... + ... + + . + . . + . . . 1 . + + . + ... 2 + . + . . 1 . . . . + . . + ... + + . + + . . . + ... + . + + +	32
IV. D. *Pulmonaria obscura* subvar.			
Corylus avellana (Q-F)	b [bc]	. 3 3 4 3 3 . . . . + ... 3 [1] . . . . 2 . . . . 1 2 . . . . + ... [2] 2 . . [1] [1] . . . . . . + ...	21
Corylus avellana (Q-F)	c	. 1 + 2 2 2 . . . . + ... + ... + ...	10
Pulmonaria obscura (Q-F)		+ 1 1 + 1 + ... + . . . + ... 1 . . . . + ...	12
Adoxa moschatellina (Q-F)		+ . + + + + 1 . . . . + ...	9
Asarum europaeum (Q-F)		+ . + + 1 + ... + ... + ...	9
Glechoma hederacea		+ + + . + 1 . . . . + ... + ...	9
Lysimachia nummularia		+ 1 1 1 . + ... + ... + ... + ... + ...	11
Plagiomnium affine		+ + + + + + . . + ... + . + ... + . . . + ... + ... + + ... + . . . + ...	20
V. Ch. *Querco-Fagetea* (Q-F)			
Fagus sylvatica	a1,a	. . . . . . + 1 . 2 . . . . 2 1 . . . + ... + ... 1 . 1 . 3 . . . 4 . . 2 . 2 2 2 3 . . . . +	21
Fagus sylvatica	a2	. . . . . . + ... + ... + ... 1	6
Fagus sylvatica	b[bc]	. . . . . . 1 . . . + . . + ... 2 . . . 1 . . . + . + . . . 1 + ... + . 1 . + ... + ... [+] . [+] [+]	20
Fagus sylvatica	c	. . . . . . + + . + + ... + + ... + ... + ... + + ... + . . . + . + . . . + + . + + . . . + + ... + . .	28
Anemone nemorosa		+ 1 + 1 1 + . + 1 1 + + . 1 . 2 2 . 3 3 3 2 2 1 + + . 1 2 . 2 2 . + + + . + 1 2 + . 2 2 1 + 1 1 + + 1 + + . . 1 . . + . + + + . 2 . + 1 + 2 2 2 1 1 1 + + + + +	80
Atrichum undulatum		. + + + + + . + + + 1 + . + ... 2 . + 1 1 + + . . + . . + . . + + 1 2 + 1 . + 1 + + + + + 2 + + + + . . + . . + 1 + 1 + . + + 1 1 . . . + 1 1 + + + + + . 3 . .	70
Poa nemoralis		5 + + 1 . + + . 1 2 1 + . . 1 . . 1 . 2 . 3 3 + + + . 1 1 1 1 . . . . + 1 1 . 2 . . + + + + + + + + + + + + + 1 2 2 1 1 1 . . . . 1 + 1 + 1 1 + 2 + 2 . .	67
Viola reichenbachiana		1 1 1 1 1 1 + . . . + 1 + + 1 + . 1 . + . + 1 . . . . + . + . + . . + 1 1 1 . . . + . 1 . . + . 1 . . 2 1 1 1 1 + ... 2 + . . . + 1 1 + 1 + 1 + . + . .	56
Ajuga reptans		1 + + 1 1 . 1 + + . . . + ... + + . + ... + ... + + + 1 . 1 . . + + 1 . + . . . 1 . 1 . . . . + . . + . . . + + + + + + + + . . + .	44
Milium effusum		. + . + + + . + ... + . + . + . 3 . . + + ... + . . . 2 . . + 1 + + + 1 . + . + . 2 . + ... + 1 + . + + . . + 2 + ... + . + + . .	43
Scrophularia nodosa		. + . . + + . + + . . . + . + . + + + + + + + + ... + . . . + + + . + ... + + ... + ... + + . + + +	35
Melica nutans		. . . . + . . . 2 . . 1 . . . . + . 2 . . . . . . 1 2 . 2 + . . . + ... + ... + 1 . . + 1 . . . . + + + + 1 2 + + . . .	28
Dryopteris filix-mas		. + + + . + ... + . . . + ... + ... + . + + ... + ... 1 . + + ... + . + ... 1 + . 1 + + . . 1 . .	27
Polygonatum multiflorum		+ . . + . . . + ... + . . . + . + + ... + ... + . + + ... + ... 1 + . + + . . 1 + + ... + +	27
Sanicula europaea		. + ... 1 + ... + . . + 1 . 1 + ... + ... 1 . . + + ... + ... + ... + ... + 1 + 1 1 1	26
Carex sylvatica		+ + + + + + ... + + . . + + ... + ... + . . + + ... 1 . . . 1 . . . . + . + ...	23
Festuca gigantea		+ . . . . + . + . + ... + ... + + + . . . + . . 2 . . + . + ... + . + ... + + ... + . + ...	22
Galeobdolon luteum		. . + ... + ... + ... + . + + ... 1 . . + . + . . + 2 . . + ... + 2 . . . . 1	20
VI. Ch., D.* *Quercetea robori-petraeae* (Qrp)			
Hieracium lachenalii		. . . . . . + . . + . + . . 1 . + . + 1 . + . . . r + . + ... 1 . . . . + ... + . . + . + ... + + ... + . . . +	24
* *Pteridium aquilinum*		. . . . 2 + ... 3 4 4 . . . . 1 . 3 . . . . + ... + ... + + + ... 1 + ... + + . . 1	21
Hieracium laevigatum		. . . . . . + ... 1 . . . . . 1 . + . 1 . + ... + 2 . . . . 1 . . . . . + . . + ... + . + ... + . . +	18
Calamagrostis arundinacea		. . . . 2 . . . . 1 . . . . 3 3 . . . . . . 2 . . . . + ... + 2 . . . . + . + . + ... 2 . . . . + . . .	17
Festuca ovina		. . . + ... + . . . + ... 1 + ... + ... + ... + ... + ... + . . + ... + ... +	16
Hieracium sabaudum		. . . . + . + . + 1 . . . . . + . + ... 1 . + ... + + . . . + . r	15
VII. Ch. *Vaccinio-Piceetea*			
Picea abies	a1	. . . . + ... + ...	2
Picea abies	a2	. . . . 2 . . . . 1 . . . . 2 . . . . 1	5
Picea abies	b	. . . . . 1 . . . + . + + 2 2 . . 1 . . . + . . . 1 . 2 2 . . . . 3 + . 1 . . . . . + + ... + 1 . . 1 2 + 1 2	28
Picea abies	c	. . . . + ... + + + ... + ... + ... + . + r + ... + ... + .	15
Pinus sylvestris	a1,a	. . . . 2 . . . . 1 2 . . . . . 1 . . . . 1 . . . . . 1 + + ... 1 . . . . 1 1	13
Pinus sylvestris	c	. . . . r + ... r . . . . r	5
Vaccinium myrtillus		. . . . + 1 2 . . 1 + . . . 1 . . + . 3 3 3 . . . . . + 1 . . 1 1 1 2 + . . 2 + 2 2 . . . . . . 2 2 1 1 1 . + 1 + 2 2 1 . . + 2 2 + ... + + + ... +	50
Trientalis europaea		. . . . + . + + . + ... + 1 + ... 1 . . . . + . . 1 . . . . + + + . . . + + ...	18
VIII. Ch. *Calluno-Ulicetea*			
Solidago virgaurea s. s.		. . . . + . 1 . . . + + . + . . . 1 . . . . + ... 1 . . . . . . + . . + + + + . . . + . + . 1 . . . + ... + ... + + . . +	26
Veronica officinalis		. . . . . . + . + + . + ... + + . + ... + . + ... + + ... + ... + . . 1 + + . . + . . + . + + .	24
IX. Others			
Betula pendula	a1,a	. . . . 2 . . . + . 1 . 1 2 . + . + . . 1 . 1 . . . 1 . . 1 . 1 + ... 2 . . . 3 . . 2	20
Betula pendula	b/c	. . . . +/+ . . . . /+ . . . . +/ . . . . . . +/	5
Quercus petraea	a1,a	. . . . 3 . . 2 . . . . 4 4 4 4 4 . . 1 2 . . . . + ... 1 . . . . . 1	15
Quercus petraea	a2	. . . . 2 . . . . 1 1 1 . . . . + ...	6
Quercus petraea	b/c	. . . . /1 . . /3 . /1 . . . . /+ /+ +/2 +/+ /+ . . . /+ . . . . /+ . . . . /+	13
Sorbus aucuparia	b	. . . . . + ... + + . + . . + . + . . + + ... 2 . . . + + ... + ... 1 1 . . + 1	20
Sorbus aucuparia	c	+ + . . + + + + . + + + . + + + + . + + + + . . + + + + + + + + + + + + + . + + . + + + + + + + + + + + + + . . + + + . + . +	76
Luzula pilosa		. + + + 1 + . + 3 2 + + . + + ... + + + 1 + 1 1 + 3 + + 2 + . . + + 1 . 1 + 1 + + 2 + 1 + 1 1 + + + + + + 1 2 + 2 1 1 + 1 . 1 . . 1 + + 3 1 + 1 1 2 + + . + .	80
Maianthemum bifolium		+ 1 1 . 1 2 . 1 2 3 1 . . 1 1 2 2 . 2 1 . 2 . 1 1 1 + 3 3 3 3 3 + 2 1 + + + + + 1 + . 2 1 1 1 1 + + 1 + + . . 1 1 + 1 2 + + + 1 + + 1 + + + + 1 1 + + 2 1 + + . + +	87
Moehringia trinervia		+ + . + + + 1 + . . . + + ... + . 1 . . 1 . . . . 2 . + + . . + . 2 + + . + 1 + . + + 2 . + . . 1 1 . + . 1 . . + + . + . . . + ... 2 . .	44
Veronica chamaedrys		+ + + . . 1 1 . . . . . 1 1 . 1 1 1 2 . . . . . . r . + + . + ... + . . + + ... + . . + . + + 1 . . . . 1 + + + . . + 1 + . + . .	38
Convallaria majalis		. . . . + ... 1 . . . . 2 . + + . + ... + 4 3 . . . + + ... + . + + + . + . . 2 . 1 . 2 2 + 1 1 . + . + + ... + . + . . +	37
Mycelis muralis		. . . . + + . + + + + . + + ... + + . + + + + ... + + ... 1 1 . . . . . + . 1 . . . . . . + . . + . + ...	32
Hieracium murorum		. + . . . + . . 1 + ... 1 . . . . + + . + . . + . + . + + ... + + + + + . . . + + . . . + 1 . + ... + . . + . . + . + + + . + . . .	32
Rubus idaeus		. 1 1 1 + ... + 1 + + + ... + ... + ... + + ... + ... 1 1 . . . . + . . . + ... +	26
Fragaria vesca		. . + 1 + ... + 1 . 1 1 1 2 . . . . . + + + ... + + . . + ... + ... 1 1 . + ... + ...	24
Athyrium filix-femina		. . . + ... + . . + . . + ... 4 1 . . . . + . + . . + + . + + . + + . . + ... + . . . + . . . + . . + + ... + + + ...	23
Aegopodium podagraria		. . . . + . . . + ... + ... + . . + . + + ... + ... +	11
Galium rotundifolium		. . . . 1 . . . . 1 . . . . + + . 1 . . . . 2 + + + + ...	13
Lathyrus montanus		. . . . 1 1 . 1 . . . . + . 1 + + + 1	11
Cruciata glabra		. . . . + ... + ... + ... + 1 + 1 + + + 1	12
Rubus hirtus		. . . . + ... + + + + + 1	9
Vicia dumetorum		. . . . + + + + + + ...	7
Carex brizoides		. . . . 3 3 3 3 4	7

Sporadic species: V.: *Acer platanoides* c 12,22,30,53,78; *A.* a2 20(1), b 38, c 20,22(r),37,40,64; *Brachypodium sylvaticum* 4,18,20(1),36(2),37(2),39,44,45(1),48,55(3),57,59(1),65(1),66; *Carex digitata* 9,10,27(1),28(1),30,31,36,60,67,70(2),71(1),72(1),76(1); *C. remota* 37; *Cephalanthera longifolia* 57; *Cerasus avium* b 38, c 18,23; *Circaea lutetiana* 20(1); *Daphne mezereum* 27; *Eurhynchium angustirete* 23,27,31,35,42,49,59,71(1),72,73,74,75,76; *Ficaria verna* 23,43,66; *Fraxinus excelsior* b 14,20(1),43, c 14,19,20,30,32,54; *Galium odoratum* 8,22(1),30,41(1),43(2),68; *Hedera helix* c 25,47,51,64,68,77(1),78; *Hepatica nobilis* 17,27; *Hypericum montanum* 22,30; *Impatiens noli-tangere* 18,32,38; *Lathyrus niger* 36; *L. vernus* 8; *Malus sylvestris* bc 11,53,69,78,81, c 47,51,61,62; *Melica uniflora* 25,27; *Padus avium* b7,20,32(3),55(2),59,66, c 1,7,18,20,32(1),55,59,66(1); *Paris quadrifolia* 14,20; *Phyteuma spicatum* 47; *Plagiomnium undulatum* 54; *Platanthera bifolia* 22,41; *Primula veris* 6,17; *Ranunculus lanuginosus* 19; *Ribes spicatum* c 55; *Sorbus torminalis* a2 47, b 47,c 11,24,47,51; *Stachys sylvatica* 12(r),18,22(r), 66; *Tilia platyphyllos* b 22, c 22; *Ulmus laevis* a1 32, b 32(1); *Viburnum opulus* c 1,2(1),13,14,19(1),32,59; *Viola odorata* 43; *Viola reichenbachiana et riviniana* 8,21,24,35,41,42(1),49,52,63; *Viola riviniana* 1,7,14(1), 16(1),17(1),19(2),25,26,27,40,44,77; **VI.:** *Herzogiella seligeri* 8; *Hieracium umbellatum* 10,74,76; *Lonicera periclymenum* b 38(1) c 38(3); *Luzula pallescens* 55; *Mnium hornum* 20,39,49,59,60(2),79; *Plagiothecium denticulatum* 2,34,47,59; *P. laetum* 8,11,32(1),55; **VII.:** *Betula pubescens* subsp. p*ubescens* a 53(1)69(1), a2 10,35, c 11; *Dicranum scoparium* 26; *Dryopteris dilatata* 37; *Hylocomium splendens* 80; *Juniperus communis* b 10,25,28(1), c 9,14,74,75; *Orthilia secunda* 55,75; *Plagiothecium curvifolium* 24,34,64; *Pyrola minor* 13; *Pyrola rotundifolia* 71,74; *Rubus saxatilis* c 1,3,4,11(1); *Thuidium tamariscinum* 9,10,73,77; *Pleurozium schreberi* 11(2),12,77; *Leucobryum glaucum* 26,78; **VIII.:** *Agrostis capillaris* 14,16(1),19,24,57,62,65(2),77; *Carex ovalis* 26,40,44,48,54,57(1); *Hypericum maculatum* 14,16(2), 17(1),19(1),21,25,27(1),77; *Luzula multiflora* 18,26,34,38,62,77; *Pohlia nutans* 1,11,12,23,26,34,36,37,58,59,60(1),79(1); *Potentilla erecta* 11,13,14,16,17(1),19(1),25,27,38,56,58,77; *Scorzonera humilis* 38; *Viola canina* 70,77; **IX.:** *Abies alba* a 71(1), c 73,74; *Agrostis canina* 58; *A. stolonifera* 77,78; *Alliaria petiolata* 79; *Angelica sylvestris* 7; *Anthoxanthum odoratum* 12(1),18(2),25,31,40,56(1),62,77,78; *Anthriscus sylvestris* 14,16; *Arrhenatherum elatius* 12,18(r); *Astragalus glycyphyllos* 14,17(1); *Betonica officinalis* 7; *Brachytheciastrum velutinum* 1,32,37,39,59,81; *Brachythecium rutabulum* 5,21,45,59; *Calamagrostis epigejos* 10,26(1),31,36,38,39,44,56(1),62(1),70,77; *Calliergonella cuspidata* 74,76; *Campanula patula* s.s. 77; *C. rotundifolia* 14,19; *Carex cespitosa* 32; *C. elongata* 32; *C. hirta* 13; *Carex* sp. 61; *Chaerophyllum temulum* 7,65; *Chamaenerion angustifolium* 20; *Clinopodium vulgare* 7,27,56,65; *Cornus sanguinea* b 55(1), c 55(1); *Crataegus laevigata* c 66; *C. monogyna* b 11,18,27,39,55,62, bc 77,78,81, c 26,27,45,54,57,58,60,62,66; *C. monogyna et laevigata* b 72,73(2), bc 21,29,47,51 c 1,2,3,4,5,6(1); *C. rhipidophylla* var. *rhipidophylla* c 56; *Crataegus* sp. *c* 10,28,71,72,73(1),76; *Dactylis glomerata* 2,5,24,26,29,47,51,60,63,64,77; *Deschampsia flexuosa* 11(1),12,18,23,30(2),39,44,54,57(1); *Epilobium montanum* 55; *Euonymus europaea* b 7,20,23,37,59,60, c 1,3,4,7,32,37; *Festuca rubra* s.s. 12,26(1),27,31,38,39,40,46,50,52,58(1),77; *Fissidens taxifolius* 59,60;*Galeopsis bifida* 27; *G. pubescens* 13,14,16,36,47,55,60(1),65,79; *G. tetrahit* 8,12,13,15,18,37,50,52; *Galium aparine* 1,7(2),32,38, 54,55(1),57; *G.* 12,13,16,17(1),19,39,52,56,57; *G. palustre* 5,21; *G. verum* 19; *Geranium robertianum* 17,32,50,55,60,79; *Geum urbanum* 1,14,16,17,20,23,38,43,45,59,66; *Hieracium* sp. 76; *Holcus lanatus* 29,67,70; *Humulus lupulus* 55,79; *Hypericum perforatum* 3,12,13,18,36,39,48,56,75,76; *Impatiens parviflora* 15,18(1),38,39(1),44,45(3),54(1),60,79; *Juncus effusus* 2,10,12(r),33,40,58; *Lapsana communis* s.s. 14; *Larix decidua* ssp. *polonica* a1 11(4), b 11, c 11; *L. decidua subsp. decidua* a1 15; *Lathyrus pratensis* 14,17; *Listera ovata* 18; *Lotus corniculatus* 18(r); *Lychnis flos-cuculi* 18; *Molinia caerulea* 11(2),13,15,33,69,78; *Oxalis fontana* 65; *Oxyrrhynchium hians* var. *hians* 10,45,60,71,72,74,75,76,79; *Padus serotina* b 38(1),54, c 40,47,57; *Peucedanum oreoselinum* 55; *Pimpinella major* 13; *Plagiomnium cuspidatum* 42; *P. rostratum* 59(1); *Plagiothecium cavifolium* 36; *Poa angustifolia* 25(1),26(1),27,67; *P. palustris* 46; *P. pratensis* 9,10,18,28(1),31,52,62,70,75(2),77; *P. trivialis* 2,4,5,42,65(1),77; *Polygonatum odoratum* 25; *Polypodium vulgare* 37; *Populus tremula* a 12(1), a1 54(2),57(1), a2 7,59, b 18,54,57,59, bc 77, c 12,18,57; *Potentilla reptans* 3,6,39; *Prunella vulgaris* 58,65; *Prunus spinosa* b 38, c 1,7; *Pyrus communis* b 18, c 1,11,38; *Quercus rubra* a1 57(1), c 11; *Quercus* x *rosacea* a1 25(3), b 62, c 25,62; *Ranunculus sardous* 13; *Rhamnus cathartica* b 18,27, c 32; *Rhizomnium punctatum* 11; *Rhodobryum roseum* 42; *Robinia pseudacacia* a1 79; *Rosa canina* c 1,4,54; *Rosa* sp. bc 7, c 36; *Rubus caesius* 2,20,21,22,30,32,47,51,59; *R.* cfr. *hirtus* 36,38,39,43(2); *R. corylifolius* 40,56; *R. gracilis* 50; *R. plicatus* 1,2,9,10(1),18,28,32,45(1),54; *R. serpens* 11; *Rubus* sp. 12,13,23,26,29,61,65,66,81; *Rumex acetosa* 12; *R. acetosella* 11,13; *Sambucus nigra* b 55(1), c 7,32,50; *S. racemosa* b 18, c 32; *Sciuro-hypnum oedipodium* 77,80; *Sedum maximum* 16,37(r); *Selinum carvifolia* 7,13,58,65; *Solanum dulcamara* 45(r); *Stellaria graminea* 14,16,19; *S. media* 18,23,36(1),37(1),39, 45(1),55,60,74; *Taraxacum officinale* 18,20; *Thuidium philibertii* 77; *Thuja gigantea* c 11; *Torilis japonica* 16,17; *Trifolium alpestre* 19; *Tussilago farfara* 58; *Urtica dioica* 14,16,19; *Vicia cassubica* 16(1); *V. cracca* 14,17(1); *V. sepium* 17,58,77,80.

Table A21. *Galio sylvatici-Carpinetum holcetosum mollis* variant with *Lysimachia vulgaris*, transformed form (relevés 1-30); community *Oxalis acetosella-Pinus sylvestris* (relevés 31-40)

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		31	32	33	34	35	36	37	38	39	40	
ID-1		21	21	21	29	30	30	30	4	15	46	46	36	15	38	29	35	38	34	35	35	36	55	30	55	55	39	29	55	17	36		16	39	15	15	15	15	15	15	15	15	
ID-2		1	1	1	6	5	5	5	50	8	3	3	9	8	4	6	10	4	3	10	20	9	14	5	17	17	31	6	16	4	9		17	31	8	8	8	8	8	8	8	8	
ID-3		22	14	26	5	30	23	24	18	16	6	4	11	6	25	4	40	26	5	42	8	1	33	6	3	8	3	2	17	7	8		9	11	15	17	18	19	20	21	22	23	
Date (year)		1957	1957	1957	1979	1955	1955	1957	1965	1962	1955	1955	1985	1962	1984	1979	1975	1987	1997	1975	1976	1986	1974	1956	1987	1989	1991	1980	1987	1995	1985	1-30	1971	1991	1963	1963	1963	1963	1963	1963	1963	1963	31-40
Density of tree layer	a1,a [%]	50	65	65	60	40	50	50	70	90	80	70	75	50	85	30	50	75	60	65	80	85	80	70	50	55	70	60	70	75	65		80	75	50	60	30	40	40	40	60	40	
Density of tree layer	a2 [%]	-	+	-	20	70	60	30	-	20	-	-	-	30	-	70	-	-	30	-	-	25	-	-	-	-	-	-	-	-	5		20	20	60	80	70	40	40	60	40	60	
Density of shrub layer	b [%]	65	20	65	+	10	20	+	5	60	5	20	+	20	+	10	5	20	+	40	35	20	70	60	10	5	25	15	10	5	+		70	20	+	+	-	-	-	-	-	-	
Cover of herb layer	c [%]	30	75	35	75	40	50	60	90	50	40	50	95	75	70	60	90	80	85	45	80	30	70	60	60	50	90	60	60	40	80	%	90	70	90	75	90	90	90	75	90	90	%
Cover of moss layer	d [%]	+	+	15	-	5	+	+	-	+	20	50	5	25	5	5	-	+	+	+	-	5	-	+	-	-	-	+	-	-	+		10	+	-	-	-	+	-	-	-	-	
Area of relevé		500	700	600	150	400	600	900	400	100	1200	1400	800	200	400	bd	100	800	400	200	200	800	100	500	100	200	400	200	100	150	700		250	800	120	150	110	110	150	176	135	144	
Location (ATPOL)		CD82	CD82	CD82	CD17	CD73	CD73	CD73	CC02	CE36	CC92	CC92	AD24	CE36	AD85	CD17	CE01	AD65	CD73	CE01	CE01	-	BC72	CD73	BC72	BC83	BE15	CD17	BC72	BC66	-		BD87	BE15	CE35	CE35	CE35	CE35	CE35	CE35	CE35	CE35	
Total number of species		38	40	39	32	40	27	25	34	43	31	36	60	35	28	49	24	34	33	28	25	40	23	29	23	21	27	61	33	36	36		47	30	24	28	17	25	26	26	26	24	
Number of mosses, liverworts and lichens species		6	4	5	-	14	1	2	-	1	3	3	6	9	3	5	-	1	4	2	-	3	-	7	-	-	-	6	-	-	4		1	2	-	-	-	2	-	-	-	-	
I. Ch.* *Carpinion betuli*, Ch.^, D. *Galio sylvatici-Carpinetum*																																											
* *Carpinus betulus*	a^;a2	.	.	.	.	3^	2^	1^	.	1	+	.	.	3	.	+	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	27	1	.	4	5	4	3	3	4	3	4	90
* *Carpinus betulus*	b;bc^	.	.	.	.	+^	1^	.	+	1	2	.	.	.	.	.	.	.	+	.	+	1	.	.	.	.	.	.	.	.	.	27	1	.	+	+	.	.	.	.	.	.	30
* *Carpinus betulus*	c	+	+	1	.	.	.	.	1	+	+	+	.	2	.	+	.	.	2	.	+	.	.	.	.	.	.	+	.	.	.	40	+	.	+	+	1	1	+	+	1	1	90
* *Tilia cordata*	a*;a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1*	.	.	.	1	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	–
* *Tilia cordata*	b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	–
Acer campestre	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	–
* *Stellaria holostea*		+	.	+	.	.	+	+	2	.	r	+	+	.	.	.	.	.	2	.	+	+	.	.	.	.	.	+	.	.	.	40	.	.	.	.	.	.	.	.	.	.	–
Festuca heterophylla		.	.	1	.	.	.	.	+	.	.	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17	.	.	+	.	.	.	.	.	.	.	10
Melampyrum nemorosum		.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	–
* *Dactylis polygama*		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	1	10	.	.	.	.	.	.	.	.	.	.	–
^ *Galium sylvaticum*		+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	–
II. D. *Galio sylvatici-Carpinetum holcetosum mollis*																																											
Quercus robur	a1,a	4	4	2	.	3	2	3	4	.	.	+	3	4	4	.	3	4	4	4	4	4	4	4	4	4	2	3	3	.	.	80	3	3	.	.	.	.	.	.	.	.	20
Quercus robur	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	2	.	.	.	1	.	.	.	.	1	13	2	1	.	.	.	.	.	.	.	.	20
Quercus robur	b;bc^	+	.	.	.	+^	+^	.	.	2	.	+	+	.	.	.	.	.	.	.	.	+	.	+^	.	.	.	.	.	.	+	30	.	.	.	.	.	.	.	.	.	.	–
Quercus robur	c	+	+	+	.	.	.	.	+	.	+	+	+	+	+	.	+	+	+	+	+	+	+	.	.	1	+	+	.	.	.	63	+	+	.	.	.	.	.	.	.	.	20
Frangula alnus	b	1	1	3	.	1	2	+	.	+	+	+	+	+	+	.	+	+	.	+	2	1	+	4	2	.	+	.	1	.	.	73	2	1	+	+	.	.	.	.	.	.	40
Frangula alnus	c	1	+	1	+	+	1	+	+	.	+	+	+	+	.	+	+	.	.	+	.	.	+	1	.	+	.	+	1	.	.	67	.	.	+	+	.	+	+	+	+	+	70
Holcus mollis (Qrp)		+	.	+	1	.	+	.	2	+	.	.	3	3	4	+	+	2	.	2	2	1	+	.	.	3	2	+	.	+	2	70	1	.	.	+	.	.	1	+	+	+	60
Melampyrum pratense		+	+	+	.	.	.	+	3	.	.	.	+	.	1	+	+	.	.	+	+	.	.	+	.	+	.	1	+	.	.	50	1	.	.	.	.	.	.	.	.	.	10
Polytrichastrum formosum		+	+	1	.	+	+	1	.	.	+	+	1	3	.	.	.	.	+	+	.	.	.	1	.	.	.	.	.	.	.	43	.	.	.	.	.	.	.	.	.	.	–
Dicranella heteromalla (Qrp)		+	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	.	+	.	.	.	+	.	.	+	23	.	.	.	.	.	.	.	.	.	.	–
Festuca ovina (Qrp)		+	.	.	.	.	.	.	.	.	.	.	+	1	.	+	.	3	.	.	.	.	.	.	.	.	.	+	.	.	.	20	.	.	.	+	.	.	.	.	.	.	10
Pohlia nutans (C-U)		.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	17	.	.	.	.	.	.	.	.	.	.	–
III. D. *Lysimachia vulgaris* var.																																											
Oxalis acetosella		+	+	+	.	+	+	+	2	+	+	+	+	+	.	.	+	1	+	+	+	.	2	+	2	.	.	.	2	1	+	77	3	3	4	4	4	4	4	4	4	4	100
Dryopteris carthusiana		+	.	1	+	.	1	1	.	+	1	+	.	+	.	+	.	+	.	.	.	+	.	.	+	r	+	.	1	+	1	60	+	1	.	+	.	.	1	+	+	+	70
Lysimachia vulgaris		1	+	+	.	+	+	+	.	+	.	.	.	.	+	.	.	.	r	+	1	.	+	.	1	.	+	.	2	+	.	53	2	1	.	.	.	.	.	+	r	.	40
Deschampsia caespitosa		.	+	.	.	+	.	.	+	+	.	.	+	+	.	+	.	.	+	.	.	.	.	+	+	.	+	+	+	+	.	47	2	.	.	.	.	.	.	.	.	.	10
Carex pilulifera		+	+	+	.	+	+	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	27	+	+	.	+	.	+	+	+	.	.	60
Carex pallescens		.	+	+	.	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	1	+	+	.	.	.	.	+	30	+	.	.	.	.	.	.	.	.	.	10
IV. Ch. *Querco-Fagetea*																																											
Fagus sylvatica	a1,a	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	.	.	.	.	.	.	.	10	.	.	2	.	.	.	.	.	2	.	20
Fagus sylvatica	a2	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	2	.	.	1	.	.	.	1	.	.	.	.	.	13	.	.	.	.	.	.	.	.	.	.	–
Fagus sylvatica	b,bc^	.	.	.	.	.	+^	+^	.	3	.	.	.	.	.	.	.	.	.	3	.	.	.	+^	.	.	.	.	1	.	.	20	.	.	.	.	.	.	.	.	.	.	–
Fagus sylvatica	c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	r	.	.	+	.	.	10	.	.	.	.	.	.	.	.	.	.	–
Corylus avellana	b	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	1	4	.	.	+	.	.	.	.	+	20	+	+	.	.	.	.	.	.	.	.	20
Corylus avellana	c	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	20	.	+	.	.	.	.	.	.	.	.	10
Anemone nemorosa		+	.	+	.	+	+	.	3	+	.	.	+	+	+	.	.	.	1	+	.	.	.	+	.	+	.	.	.	1	.	47	+	.	1	1	1	1	3	1	1	1	90
Melica nutans		+	.	.	2	.	.	.	.	1	.	+	+	.	.	3	3	.	.	.	.	.	+	.	.	1	.	2	+	+	2	43	.	+	1	.	+	.	+	+	+	+	70
Viola reichenbachiana		.	.	.	.	.	.	.	+	2	.	+	+	.	+	.	+	2	.	+	+	+	.	.	.	.	+	.	+	.	1	43	1	.	2	1	1	1	1	1	1	+	90
Ajuga reptans		.	.	.	+	.	.	.	.	+	.	.	+	.	.	1	.	.	.	.	.	+	.	+	.	.	.	+	+	.	.	27	+	.	1	+	+	1	+	+	+	+	90
Poa nemoralis		+	.	+	+	.	.	.	.	.	.	.	3	.	+	.	1	+	+	.	.	2	.	.	.	+	1	+	.	1	+	47	.	.	.	+	.	.	.	.	.	.	10
Atrichum undulatum		+	.	+	.	+	.	.	.	.	.	.	+	.	1	+	.	.	+	+	.	1	.	+	.	.	.	+	.	.	+	40	.	.	.	.	.	+	.	.	.	.	10
Milium effusum		.	.	+	+	+	.	+	.	.	.	.	.	.	.	.	3	.	+	1	.	.	2	+	.	.	.	+	.	+	.	37	.	.	.	.	.	.	.	.	.	.	–
Brachypodium sylvaticum		.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1	1	+	.	.	.	.	.	+	2	+	2	30	.	+	.	.	.	.	.	.	.	.	10
Festuca gigantea		.	.	.	.	.	.	.	.	.	2	+	1	.	.	.	.	.	.	.	.	+	.	.	+	.	+	+	+	+	.	30	+	.	.	.	.	.	.	.	.	.	10
Scrophularia nodosa		.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	.	+	.	.	.	.	.	.	+	+	+	r	+	27	.	.	+	.	.	.	.	.	.	.	10
Carex digitata		.	1	+	1	+	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	23	.	.	.	.	.	.	.	.	.	.	–
V. Ch., D.* *Quercetea robori-petraeae* (Qrp)																																											
* *Pteridium aquilinum*		.	4	.	.	.	+	+	1	1	.	+	.	.	.	.	.	.	.	+	+	.	+	.	2	+	.	1	2	.	+	47	+	.	+	r	.	.	+	+	.	.	50
Calamagrostis arundinacea		+	1	+	.	2	1	1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	27	.	.	.	.	.	.	+	.	.	.	10
Hieracium lachenalii		.	+	.	.	.	.	.	+	.	.	.	1	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	–
VI. Ch. *Vaccinio-Piceetea*																																											
Pinus sylvestris	a1,a	.	.	.	2	3	4	3	3	5	4	5	.	.	.	2	.	.	.	+	.	.	.	.	.	.	.	2	.	.	.	37	4	2	3	4	3	3	3	3	3	3	100
Pinus sylvestris	c	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	.	+	.	.	.	.	.	.	.	.	10
Picea abies	a1,a	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	+	.	.	.	.	10	.	2	.	.	.	.	.	.	.	.	10
Picea abies	a2	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	2	.	.	.	.	.	.	.	.	10
Picea abies	b	4	2	2	.	+	+	+	+	.	.	.	.	2	+	.	1	.	.	+	2	.	.	.	.	.	.	.	.	+	.	43	.	+	.	.	.	.	.	.	.	.	10
Picea abies	c	1	+	+	.	+	+	+	.	+	.	.	.	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	33	.	.	.	.	+	.	.	.	.	.	10
Vaccinium myrtillus		4	4	4	3	3	4	4	+	+	.	1	+	+	1	2	.	+	+	2	2	.	.	+	.	.	.	.	+	+	.	70	+	.	1	1	.	+	+	+	+	.	70
Trientalis europaea		.	+	1	.	+	+	.	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	33	.	.	+	+	.	+	+	.	.	.	40
Rubus saxatilis		.	.	.	2	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	10	.	.	+	+	+	+	1	+	+	+	80
Galium rotundifolium		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	+	10	.	.	2	2	1	+	.	2	+	2	70
Pseudoscleropodium purum		.	+	.	.	.	.	+	.	+	+	2	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	27	.	.	.	.	.	.	.	.	.	.	–
Pleurozium schreberi		.	.	.	.	+	.	.	.	.	+	1	.	+	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	–
VII. Ch. *Calluno-Ulicetea* (C-U)																																											
Solidago virgaurea s. s.		.	+	.	.	+	+	.	.	.	2	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	–
VIII. Others																																											
Quercus petraea	a1,a	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	3	4	4	17	.	.	.	.	.	.	.	.	.	.	–
Quercus petraea	a2	.	.	.	2	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	10	.	.	.	.	.	.	.	.	.	.	–
Quercus petraea	b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	10	.	.	.	.	.	.	.	.	.	.	–
Quercus petraea	c	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	1	.	+	17	.	+	.	.	.	.	.	.	.	.	10
Sorbus aucuparia	a2	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	–
Sorbus aucuparia	b	.	.	.	+	.	.	.	.	+	+	+	.	.	.	1	.	.	.	+	.	1	.	.	+	.	.	2	.	.	.	30	+	2	+	+	.	.	.	.	.	.	40
Sorbus aucuparia	c	+	+	+	.	+	+	+	.	.	+	+	.	+	+	+	.	+	+	+	+	.	+	+	+	.	+	+	+	+	+	77	+	+	+	+	.	+	.	+	+	+	80
Luzula pilosa		1	+	1	+	+	+	+	.	+	.	.	.	2	.	1	+	.	.	+	.	.	.	.	.	+	.	+	+	+	+	57	+	+	+	.	.	+	.	+	.	+	60
Moehringia trinervia		.	.	.	+	+	.	.	.	+	+	+	+	.	+	+	1	.	+	+	.	+	.	.	.	1	+	1	+	+	+	60	1	+	1	1	2	2	+	+	2	2	100
Mycelis muralis		.	.	.	+	.	.	.	.	+	+	+	1	.	+	2	+	1	.	+	+	.	+	.	+	1	.	+	+	+	+	60	1	.	.	.	.	+	+	1	+	+	60
Fragaria vesca		+	+	+	1	.	.	.	2	+	+	+	1	.	.	2	.	+	.	+	+	.	.	.	.	.	.	+	+	.	.	50	1	.	+	+	.	.	+	.	.	.	40
Maianthemum bifolium		.	+	+	.	1	+	+	1	2	2	+	.	3	.	.	.	.	+	.	+	.	1	+	+	+	.	+	1	+	.	63	4	.	+	+	+	+	+	+	.	.	70
Rubus idaeus		.	.	.	.	.	.	.	.	.	2	+	+	.	.	+	.	.	r	.	2	+	+	+	1	+	1	+	+	1	.	50	+	1	.	.	.	.	.	.	.	.	20
Veronica chamaedrys		.	r	+	+	.	.	.	+	+	.	.	1	.	+	1	.	1	.	.	.	.	.	.	.	.	.	2	+	.	.	37	+	.	.	.	.	.	.	.	.	.	10
Convallaria majalis		1	+	+	.	.	+	+	.	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	+	33	.	.	.	.	.	.	.	.	.	.	–
Agrostis capillaris		.	.	.	+	+	.	.	2	.	+	2	1	.	.	.	.	2	.	.	.	.	.	.	.	+	.	1	.	.	+	33	.	.	.	.	.	.	.	.	.	.	–
Veronica officinalis		.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	+	1	.	.	.	+	.	.	.	.	.	+	.	+	+	30	.	.	.	.	+	+	.	.	.	+	30
Anthoxanthum odoratum		.	.	+	.	.	.	.	1	+	.	.	1	+	.	.	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	27	.	.	.	.	.	.	.	.	.	.	–
Hypnum cupressiforme		1	+	1	.	+	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	27	.	.	.	.	.	.	.	.	.	.	–
Urtica dioica		.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	+	+	.	.	.	+	.	.	.	+	.	23	+	.	.	.	.	.	.	.	.	.	10
Hypericum perforatum		+	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	1	.	.	.	.	.	.	+	.	.	.	20	.	.	.	.	+	.	.	.	.	.	10

Sporadic species: **IV.:** *Acer pseudoplatanus* a1 21(2), a2 21(o), b 21(1), c 15,21; *Adoxa moschatellina* 21(1); *Campanula persicifolia* 8; *Carex sylvatica* 21; *Cerasus avium* a2 21(1), c 15; *Circaea alpina* 24(2); *Daphne mezereum* c 2; *Dryopteris filix-mas* 13,21,30(1),37,38,39,40; *Epipactis helleborine* 16; *Equisetum pratense* 2; *Eurhynchium angustirete* 2,13; *Ficaria verna* 21(1); *Fraxinus excelsior* b 17,31(1), c 10,15,27(2); *Galeobdolon luteum* 22(3),24(2),27(1); *Galium schultesii* 9(2),19; *Gymnocarpium dryopteris* 9,37(2),39(2); *Hedera helix* 7,14,20(1); *Hepatica nobilis* 2,27; *Hypericum montanum* 25(r); *Impatiens noli-tangere* 12(r); *Lilium martagon* 9,29; *Luzula luzuloides* 36; *Malus sylvestris* bc 5,6(r), c 2,39; *Padus avium* b 17(2),26(1),29(1),31(3),32, c 17(1),26,27,29,32; *Paris quadrifolia* 8; *Platanthera bifolia* 3; *Polygonatum multiflorum* 18; *Pulmonaria obscura* 12,21,27; *Ribes spicatum* c 15; *R. uva-crispa* c 21(1),24,29(r); *Sanicula europaea* 12(1),14,19(1); *Ulmus minor* b 10, c 27; *Viburnum opulus* c 1,4,31; *Viola reichenbachiana* et *riviniana* 4(1),15(1),27(1); *V. riviniana* 2,3,8(2),25(1); **V.:** *Aulacomnium androgynum* 5; *Hieracium laevigatum* 12,14; *H. sabaudum* 1(r),12,16,17; *H. umbellatum* 13; *Lathyrus montanus* 8(1),13,33,34,35; *Luzula pallescens* 12(1); *Mnium hornum* 14; *Plagiothecium denticulatum* 32; *P. laetum* 31(2); **VI.:** *Betula pubescens* subsp. *pubescens* a 7(1); *Dicranum scoparium* 13; *Dryopteris dilatata* 5,32; *Juniperus communis* bc 15, c 8,20; *Monotropa hypopitys* s.s. 2(r); *Orthilia secunda* 8,15; *Plagiothecium curvifolium* 5; *Thuidium tamariscinum* 3,5,13; *Vaccinium vitis-idaea* 4; **VII.:** *Carex ovalis* 9,10,27; *Cladonia chlorophaea* 13; *Hieracium pilosella* 11; *Hypericum maculatum* 1,2(r); *Luzula multiflora* 1,2,3; *Potentilla erecta* 1,18,19; *Ptilidium ciliare* 13; *Viola canina* 9,11; **VIII.:** *Abies alba* c 33,34,36(r),39; *Aegopodium podagraria* 24; *Agrostis* cfr. *canina* 23; *A. stolonifera* 23; *Alliaria petiolata* 17; *Allium oleraceum* 21; *Alnus glutinosa* a 22,26(3), b 26(1); *Angelica sylvestris* 12; *Astragalus glycyphyllos* 15,27,34(r),40; *Athyrium filix-femina* 1,16,21,22(1),30,32,36,37,38,39; *Betula pendula* a1,a 10,11,12(1),26(2),28(1),32(1), a2 4,31(1), b 10, c 5,11; *Brachytheciastrum velutinum* 15,27; *Brachythecium albicans* 5; *B. rutabulum* 1,12,17,21; *Bryum* sp. 27; *Calamagrostis epigejos* 9(1),10(2),12,16,30(1),31(1); *Campanula rotundifolia* 12,17; *Carex acutiformis* 24(2); *C. brizoides* 18(5),23(3); *C. canescens* 18(r); *C. hirta* 17,28; *C. nigra* 5; *Cerastium semidecandrum* 11; *Ceratodon purpureus* 5; *Chaerophyllum temulum* 14,15; *Chamaenerion angustifolium* 12,28,29; *Clinopodium vulgare* 12; *Cornus sanguinea* c 27; *Crataegus monogyna* b 3,11,21, bc 23; *Cruciata glabra* 9(1),13,33(1); *Dactylis glomerata* 8,10,12; *Deschampsia flexuosa* 14,16(1),17(1),26,30,32; *Epilobium montanum* 18(r); *Euonymus europaea* b 17,31(1), c 17,22,27,28,31; *Fallopia convolvulus* 24(1),28,29; *F. dumetorum* 17,26,32; *Festuca pratensis* 8; *F. rubra* s.s. 1(1),12(1),15,23,27(2); *Galeopsis pubescens* 9,11,22,26,27,28,34(1),37,39,40; *G. tetrahit* 15,18,25,29; *Galium aparine* 18(r),21,26,27,31; *G. boreale* 8(1); *G. mollugo* 4,8(2),11,15,17,27; *G. palustre* 18(r); *Geranium robertianum* 4,15,16,24,27,31(1); *Geum urbanum* 4,15,27,28; *Glechoma hederacea* 31,32(1); *Hieracium murorum* 12(1),13,15,27,30,31,38,40; *Humulus lupulus* 26(1),31,32; *Impatiens parviflora* 12,20(1),21,29(1),30(2),32(2); *Iris pseudacorus* 26; *Juncus effusus* 9,12(r),14(r),30; *Larix decidua* subsp. *decidua* a1 20(2),32; *Lysimachia nummularia* 3,17,31; *Molinia caerulea* 2,7,9,20(1),28; *Oxalis fontana* 12; *Padus serotina* b 29,30, c 29; *Peucedanum oreoselinum* 12; *Phalaris arundinacea* 26(1); *Plagiomnium affine* 1,3,5,15(1),23; *Plagiothecium cavifolium* 5; *Plagiothecium* sp. 36; *Poa angustifolia* 1,2,27,31; *P. pratensis* 2,9,12(1),13,27; *P. trivialis* 18,29; *Polygonatum odoratum* 38; *Populus tremula* a1,a 22,23(1), b 10, bc 23, c 1; *Potentilla reptans* 9,26,31,34; *Prunus spinosa* b 26(2), c 26(1); *Pyrus communis* c 11,15,22,23,27; *Quercus rubra* a1 12(3),14(2); *Q. x rosacea* a1 3(2), c 3; *Ranunculus repens* 18(r); *Rhamnus cathartica* b 2, c 17,22(r); *Robinia pseudacacia* b 17(1); *Rosa canina* c 4,15,37; *Rosa* sp. 30; *Rubus caesius* 15,31; *R. corylifolius* 4,15,24(1),27; *R. hirtus* 9,13; *R. plicatus* 31(1); *Rubus* sp. 3,5,6(r),19,32; *Rumex acetosella* 10,11; *Sambucus nigra* b 21,22, c 21,35,36,37,40; *S. racemosa* c 9,31; *Sciuro-hypnum oedipodium* 5,15,27; *Scutellaria galericulata* 24(2),31; *Sedum maximum* 12; *Stellaria graminea* 8; *S. media* 14,17(1),21,30,32(1),34,36,38,39,40; *S. uliginosa* 18; *Taraxacum officinale* 15; *Thuidium philibertii* 23; *Torilis japonica* 4; *Veronica hederifolia* 21; *Vicia cassubica* 8(2),12; *V. dumetorum* 13,34,35,39,40.

Table A22. *Galio sylvatici-Carpinetum holcetosum mollis* variant with *Solidago virgaurea* (relevés 1-12), *Gs-C holcetosum mollis* typical variant (relevés 13-24); *Gs-C typicum* (relevés 25-38)

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38			
ID-1		37	38	38	23	35	36	37	38	37	37	37	38	38	37	38	23	23	23	38	38	15	40	37	37	26	35	6	6	26	26	6	6	6	6	6	55	26	26			
ID-2		9	4	4	10	10	9	9	4	9	9	9	4	4	9	4	10	10	10	4	4	8	2	9	9	10	10	22	22	10	10	22	22	22	22	22	14	10	10			
ID-3		10	20	21	22	47	12	7	18	12	13	14	19	23	6	24	21	23	24	22	28	10	1	8	11	13	38	9	13	16	15	8	10	14	6	7	34	17	5			
Date (year)		1986	1987	1987	1965	1975	1985	1987	1987	1986	1986	1986	1984	1987	1986	1984	1965	1965	1965	1987	1987	1961	1999	1987	1986	1964	1976	1977	1982	1964	1964	1977	1977	1977	1977	1977	1992	1964	1964	1-12	13-24	25-38
Density of tree layer	a1,a [%]	60	70	75	80	65	75	70	75	75	70	70	80	80	65	70	25	60	50	90	60	50	90	60	60	80	60	40	50	50	70	10	40	80	60	60	40	30	10	%	%	%
Density of tree layer	a2 [%]	20	50	20	75	-	5	15	20	20	-	15	20	85	25	40	80	80	90	20	65	65	10	5	20	-	20	80	20	80	70	95	70	-	60	50	-	80	80			
Density of shrub layer	b [%]	25	20	10	20	+	5	25	20	35	60	35	10	15	25	20	5	5	+	15	+	+	5	30	40	+	30	15	30	5	+	10	20	25	10	20	10	-	-			
Cover of herb layer	c [%]	90	90	95	90	85	90	95	95	90	95	100	50	90	90	100	70	80	90	90	55	60	60	95	95	60	50	50	60	50	40	35	40	40	40	20	10	60	80			
Cover of moss layer	d [%]	+	5	+	-	+	-	+	+	+	+	+	5	+	5	+	5	40	+	+	5	5	-	5	+	+	+	10	5	-	+	10	5	-	10	5	-	-	+			
Area of relevé		900	800	800	600	100	500	700	400	900	800	900	200	600	900	800	500	200	500	700	800	300	400	900	600	300	100	100	100	300	300	100	100	200	150	200	200	400	250			
Location (ATPOL)		BD94	AD77	AD77	CD53	CE01	BE28	AD77	AD77	-	-	-	AD87	AD87	BD92	AD75	CD53	CD52	CD52	AD77	AD77	CE36	CC91	BD80	BD92	DD31	CE01	CD35	CD35	CD51	CD51	CD35	CD35	CD35	CD35	CD35	BC72	CD84	CD84			
Total number of species		35	43	43	35	28	32	52	54	43	45	36	30	25	31	30	37	33	18	20	24	22	28	43	48	24	24	29	42	11	19	36	28	35	30	35	20	25	41			
Number of mosses, liverworts and lichens species		4	6	3	-	2	-	2	8	4	5	2	3	1	1	5	5	4	1	2	5	2	-	5	2	5	1	6	8	-	3	4	1	-	4	3	-	-	5			
I. Ch.* *Carpinion betuli* ,																																										
Ch.^, D. *Galio sylvatici-Carpinetum*																																										
* *Carpinus betulus*	a1,a	.	.	1	.	.	.	.	2	.	.	.	2	.	.	.	.	.	.	.	.	2	.	.	.	5	.	.	.	.	.	.	.	.	.	3	.	.	.	25	8	14
* *Carpinus betulus*	a2	+	1	2	.	.	.	.	2	2	.	1	1	5	.	.	5	5	5	.	1	4	2	.	2	.	2	4	1	5	4	4	3	.	3	3	3	5	5	58	67	86
* *Carpinus betulus*	b	.	+	2	1	.	1	.	2	2	+	+	.	+	.	.	1	+	1	.	+	+	.	1	2	.	2	2	1	2	+	2	2	+	1	2	.	.	.	67	67	71
* *Carpinus betulus*	c	.	+	.	+	.	+	.	+	+	+	+	.	+	.	.	1	1	1	.	.	1	+	+	+	+	.	+	+	+	1	+	2	.	1	2	+	+	+	58	67	86
* *Tilia cordata*	a1,a	2	2	3	.	.	.	.	3	.	.	.	3	.	1	2	.	.	.	3	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	42	42	0
* *Tilia cordata*	a2	2	2	1	.	.	.	1	1	.	.	.	2	.	2	3	.	.	.	2	1	.	.	1	1	.	.	2	.	.	.	2	3	.	1	+	.	.	.	50	50	36
* *Tilia cordata*	b	2	2	1	.	+	.	+	1	.	.	.	1	+	2	2	.	.	.	2	+	.	.	2	.	.	.	.	.	.	.	+	2	2	1	+	.	.	.	58	50	36
* *Tilia cordata*	c	+	+	+	.	1	.	+	+	.	.	.	.	.	+	+	.	.	.	+	+	.	.	+	.	.	.	+	.	.	.	.	1	+	.	+	.	.	.	50	42	29
Acer campestre (Q-F)	a,a2	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	–	–	7
Acer campestre (Q-F)	b/c	.	.	.	1/+	.	.	.	.	.	.	.	.	.	.	.	+/+	.	.	.	.	.	.	/+	+/+	.	.	.	.	/+	.	.	+/	.	.	+/	.	.	.	8	17	14
* *Stellaria holostea*		1	.	.	1	+	.	+	.	1	3	2	2	2	.	.	1	.	1	.	+	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	2	2	67	42	29
* *Melampyrum nemorosum*		1	2	1	.	1	.	2	1	2	2	2	2	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	83	8	–
Festuca heterophylla (Q-F)		.	+	+	.	.	+	1	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	42	17	–
^ *Ranunculus auricomus*		.	.	1	.	.	.	+	+	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	+	.	.	+	+	.	+	+	+	.	.	.	33	8	57
* *Dactylis polygama*		.	.	.	.	.	+	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	+	.	.	.	.	1	.	.	.	.	.	.	.	25	17	14
^ *Galium sylvaticum*		.	.	.	.	.	.	.	.	1	2	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	–	–
II. D. *Galio sylvatici-Carpinetum holcetosum*																																										
Quercus robur	a1,a	1	3	3	5	4	1	4	2	.	.	.	3	4	.	4	2	4	3	4	3	1	.	4	2	+	4	3	1	3	4	2	3	4	4	3	4	3	2	75	83	100
Quercus robur	a2	.	2	.	.	.	.	2	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	+	.	.	.	.	.	.	17	17	14
Quercus robur	b/c	.	/+	/+	/+	/+	.	1/+	.	.	.	.	+/+	+	.	/+	/+	/+	/+	/+	.	.	.	1/	.	.	.	.	/+	1/	2/	/+	/+	.	/+	/+	+	1/	1/	50	58	71
Frangula alnus	b/c	+/	.	.	.	+/	.	1/+	.	1/+	3/	2/	+/	.	.	.	/+	+/r	/+	.	.	.	.	+/	.	.	2/	.	+/	.	/+	/+	.	+/+	.	/r	/+	.	.	58	33	50
Holcus mollis (Qrp)		1	1	2	+	.	3	3	1	1	1	2	.	4	3	2	.	+	.	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	83	58	–
Pohlia nutans		+	1	+	.	.	.	.	+	+	+	+	.	.	.	+	.	.	+	+	1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	58	42	–
Polytrichastrum formosum		+	.	.	.	+	.	.	.	.	+	.	.	.	.	+	1	+	.	.	+	1	.	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	25	50	14
Dicranella heteromalla (Qrp)		.	1	.	.	.	.	.	+	+	.	.	1	.	+	+	+	.	.	+	1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33	50	–
Melampyrum pratense		.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	+	.	.	.	+	1	2	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	25	33	7
Festuca ovina (Qrp)		.	1	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	25	25	7
Deschampsia flexuosa		.	.	.	.	2	1	.	.	+	1	+	.	.	.	.	.	+	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	42	17	–
Hypnum cupressiforme		+	+	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	17	–
III. D. *Solidago virgaurea* var.																																										
Solidago virgaurea s. s.		1	1	+	+	.	.	1	1	1	1	1	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	83	8	–
Hypericum perforatum		.	+	+	+	+	+	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	67	–	–
Brachypodium sylvaticum		.	.	.	.	2	+	+	.	+	1	1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	.	.	.	.	.	.	.	2	+	+	.	.	50	8	29
IV. Ch. *Querco-Fagetea* (Q-F)																																										
Fraxinus excelsior	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	.	.	.	–	–	14
Fraxinus excelsior	b/c	+/	.	/+	.	/+	.	/+	.	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	1/	+/	.	.	1/	.	.	.	1/	+/	1/	+/	.	.	.	.	33	25	36
Ulmus minor	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	1	.	.	2	.	.	.	.	–	–	29
Ulmus minor	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/+	/1	.	.	.	.	.	.	/+	.	.	.	–	–	21
Corylus avellana	b [bc]	[1]	.	.	2/+	.	1	.	.	[2]	[2]	[2]	[1]	.	[1]	.	+	.	.	.	.	.	1	[+]	[2]	.	.	.	.	.	.	.	.	.	.	.	+	.	.	58	42	7
Padus avium	b/c	1/	.	.	/+	.	.	2/	.	.	.	.	+/	+/+	1/	1/	.	.	.	/+	+/+	.	/+	1/+	+/	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33	67	–
Viola reichenbachiana		1	+	2	+	1	1	+	2	+	1	1	+	.	2	+	+	+	+	+	+	+	1	1	1	.	1	1	1	.	.	+	+	1	+	1	.	.	.	100	92	57
Poa nemoralis		3	4	3	3	3	3	2	2	2	1	1	1	+	3	5	3	4	5	2	1	2	2	1	2	+	.	.	.	.	.	.	.	+	.	.	+	.	.	100	100	21
Atrichum undulatum		+	+	+	.	+	.	+	+	+	+	.	.	1	.	+	1	1	.	.	1	.	.	+	.	+	+	2	1	.	+	1	1	.	2	1	.	.	+	67	50	71
Anemone nemorosa		.	.	.	1	.	.	+	4	.	.	.	+	+	.	.	1	+	1	+	.	1	.	.	1	4	3	3	3	3	3	2	2	2	1	1	.	.	.	33	58	79
Melica nutans		.	.	.	.	.	1	+	.	1	2	2	.	.	1	.	+	.	.	4	1	1	+	1	.	.	.	.	1	.	.	+	+	+	.	.	+	.	.	42	58	36
Scrophularia nodosa		+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	+	+	+	.	.	r	.	+	+	25	8	50
Carex digitata		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	+	.	.	.	.	.	1	.	.	+	1	+	+	+	.	.	.	–	17	43
Galeobdolon luteum		.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	.	.	1	.	.	1	.	.	.	.	.	1	1	.	.	.	8	17	29
Ajuga reptans		.	.	1	+	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	+	1	.	+	+	+	1	+	+	.	+	+	25	25	71
Sanicula europaea		.	.	.	.	+	.	.	.	+	+	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	33	17	7
Campanula persicifolia		.	1	1	.	.	1	.	1	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	67	–	–
Stachys sylvatica		.	.	.	.	+	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	33	8	14
Adoxa moschatellina		.	.	2	+	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33	–	–
Pulmonaria obscura		.	.	.	+	1	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	25	8	7
V. *Quercetea robori-petraeae* (Qrp)																																										
Hieracium sabaudum		1	.	.	.	.	1	1	.	+	+	+	1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	+	.	+	+	+	.	.	58	8	50
Hieracium lachenalii		.	1	.	.	.	1	.	1	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	33	17	21
Carex pilulifera		.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	8	25	7
Hieracium laevigatum		.	.	1	.	+	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17	17	0
VI. Others																																										
Quercus petraea	a1,a	3	1	.	.	.	4	.	.	4	4	4	.	.	4	.	.	.	.	.	.	.	5	1	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	33	–
Quercus petraea	a2	1	.	.	.	.	+	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	8	–
Quercus petraea	b/c	/1	/+	.	.	.	/+	.	.	1/1	1/1	1/+	.	.	/+	.	.	.	.	.	.	.	/+	/+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	33	–
Betula pendula	a1,a,a2^	1	+	.	.	.	.	.	.	+	.	1	1	1	.	.	1	.	.	.	.	3	.	+	+	.	+^	+	2	.	.	+	+	2	.	+	.	+	+	42	42	64
Betula pendula	b/c	.	.	.	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	/+	.	.	+/	.	.	.	.	.	.	.	.	.	.	.	.	8	8	7
Sorbus aucuparia	a2	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	2	.	.	.	.	.	+	1	.	.	.	17	–	29
Sorbus aucuparia	b/c	1/	+/	.	/+	.	.	1/+	/+	+/+	1/	1/	+/	+/+	+/	+/	/+	/+	/+	.	.	.	/+	1/	+/	.	+/+	.	2/	.	.	+/	+/	+/+	+/	/+	/+	.	/+	75	75	64
Euonymus europaea	b/c	+/+	.	/1	+/	+/	.	.	+/	.	+/+	.	.	.	+/	+/	+/	.	.	.	.	.	.	.	.	.	+/	.	+/	.	.	.	.	+/	1/+	.	.	.	.	50	25	29
Crataegus monogyna	b/c	.	+/	+/	.	.	.	1/	+/	+/	.	.	.	+/	+/	/+	.	.	.	.	.	.	.	.	+/	.	.	.	.	.	.	.	.	+/	.	.	.	.	.	42	33	7
Veronica chamaedrys		+	+	+	+	1	1	1	+	+	+	.	.	.	+	.	.	+	+	.	.	.	.	.	.	+	.	r	.	.	+	.	.	.	r	.	.	+	+	83	25	43
Moehringia trinervia		.	+	1	+	.	.	1	1	+	+	.	+	2	1	1	.	+	.	1	+	+	+	+	+	.	.	.	.	.	+	+	.	+	.	.	.	+	+	67	83	36
Vaccinium myrtillus (V-P)		2	.	.	.	.	.	1	+	3	2	+	1	+	+	.	.	+	+	.	.	+	.	3	2	.	.	+	1	.	.	+	1	1	+	+	+	.	+	58	58	64
Maianthemum bifolium		.	.	.	+	+	1	.	.	1	1	2	.	.	.	.	1	1	2	.	.	2	+	.	.	2	+	1	1	+	+	+	1	+	+	+	+	1	1	50	42	100
Luzula pilosa		.	.	.	.	+	.	.	.	+	.	+	+	.	.	.	+	+	+	.	.	3	+	+	.	+	.	+	.	.	.	+	1	+	+	+	.	+	+	33	50	64
Aegopodium podagraria		.	.	+	1	.	.	2	1	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	1	.	.	2	2	.	.	1	.	1	.	+	.	+	.	33	33	43
Fragaria vesca		+	.	.	.	.	+	+	.	.	.	+	.	.	+	.	+	+	.	.	.	.	.	1	+	.	+	.	+	.	.	.	.	+	.	.	.	.	.	33	42	21
Rubus caesius		.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	+	2	+	+	.	.	.	17	–	50
Geum urbanum		.	.	.	+	.	+	+	+	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	42	17	7
Oxyrrhynchium hians var. *hians*		.	+	.	.	.	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	2	.	.	1	.	.	.	.	33	–	29
Brachythecium rutabulum		.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	+	.	.	.	+	+	.	.	+	17	8	36
Oxalis acetosella		.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	1	1	+	+	.	1	+	+	.	3	4	17	–	79
Deschampsia caespitosa		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	+	+	+	+	+	+	.	+	+	–	–	86
Convallaria majalis		.	.	.	+	.	.	.	+	1	+	.	+	.	.	.	.	.	.	.	.	.	3	.	1	.	.	.	.	.	.	.	.	.	.	1	2	+	+	42	17	29
Hieracium murorum		.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	1	1	+	.	.	1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	17	58	14
Galeopsis pubescens		+	+	.	.	.	1	+	.	+	+	+	.	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	58	25	–
Stellaria media		+	+	+	.	.	+	+	+	.	.	.	.	1	1	+	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	33	–
Veronica officinalis		.	.	+	+	.	1	+	+	.	.	.	.	.	.	.	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	42	33	7
Dactylis glomerata		.	+	.	+	1	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33	17	–
Geranium robertianum		.	.	+	+	.	+	.	+	.	.	.	.	1	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	33	33	7
Anthoxanthum odoratum		.	+	+	.	+	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33	17	–
Clinopodium vulgare		.	.	.	+	1	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	17	–
Mycelis muralis		.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	17	33	14

Sporadic species: IV.: *Acer platanoides* a 33, a1 35,a2 13(1),b12,c1,8,13,15,19,22; *A. pseudoplatanus* a1 20(1), a2 20(2); b 33, c9,15,20(1),22,30; *Anemone ranunculoides* 27,31,32(1); *Campanula trachelium* 5,8; *Carex sylvatica* 26(2),34(1),37,38; *Cerasus avium* a1 14(1), a2 14(1), b 14(1), c 1,13,26; *Dryopteris filix-mas* 1,20,24,27,31,38; *Epipactis helleborine* 33; *Eurhynchium angustirete* 16,21,25; *Fagus sylvatica* a1 20(2), a2 9(1), 20 (3), 32(1), 36(1), c 5,20,21; *Festuca gigantea* 6,10,11,37; *Ficaria verna* 19,27,35; *Hedera helix* 1(2), 31(1); *Lathyrus vernus* 16; *Lonicera xylosteum* c 22(r); *Malus sylvestris* a2 28, c 29,36; *Milium effusum* 4,25,38; *Phyteuma spicatum* 9,10,11,25; *Plagiomnium undulatum* 31,35; *Platanthera bifolia* 37,38; *Polygonatum multiflorum* 1,4,14,17,25,38; *Primula veris* 27; *Ranunculus lanuginosus* 31,34,35*;* *Ribes spicatum* c 24; *Ribes uva-crispa* b 15,24; *Ulmus glabra* b 33; *Viburnum opulus* c 1,16,23,28,32; *Viola reichenbachiana et riviniana* 25,29,30,37,38(2); *Viola riviniana* 23,28. **V.:** *Herzogiella seligeri* 2(1),8; *Hieracium umbellatum* 10; *Lathyrus montanus* 21; *Mnium hornum* 8,12(1); *Plagiothecium denticulatum* 8; *P. laetum* 12. **VI.:** *Achillea millefolium* 4,17; *Agrostis capillaris* (C-U) 6,10,11,23; *Alliaria petiolata* 3,8(1),15; *Alnus glutinosa* a1 12(1), b 33; *Angelica sylvestris* 5,11; *Anthriscus sylvestris* 3,7,8; *Arrhenatherum elatius* 3,23(2); *Athyrium filix-femina* 37,38; *Betonica officinalis* 28(1); *Betula pubescens* subsp. *pubescens* (V-P) b 28; *Brachytheciastrum velutinum* 3,16,17,28; *Brachythecium salebrosum* 27,28,34; *Calamagrostis epigejos* 23; *Campanula rotundifolia* 6(1); *Carex brizoides* 8,12,20; *C. pallescens* (C-U) 16,28,38; *Chaerophyllum temulum* 3,24(1); *Cornus sanguinea* b 2,14,26; *Crataegus laevigata* b 2(1),24(1),28,35; c 28,35; *C. monogyna* et *laevigata* bc 24,25,29,30,37; *Cruciata glabra* 21; *Dicranum scoparium* (V-P) 23; *Dryopteris carthusiana* 8,11,20,37,38; *Euphorbia cyparissias* 14; *E. esula* 2; *Fallopia convolvulus* 4,17,22,36(1); *Fallopia dumetorum* 3; *Festuca rubra* s.s. 7,9,14; *Fissidens taxifolius* 27,31; *Galeopsis tetrahit* 3,13,22,37: *Galium aparine* 7(1),14(1),15; *Glechoma hederacea* 4,8,16; *Heracleum sphondylium* 1,2,3,7,8; *Humulus lupulus* 4; *Hypericum maculatum* (C-U) 17,29,38; *Impatiens parviflora* 6(1),15,19(1),20(2), 24(4); *Isothecium alopecuroides* 38; *Lapsana communis* s.s. 38; *Lophocolea bidentata* 28; *Luzula multiflora* (C-U) 3,7,22; *Lysimachia nummularia* 25; *Lysimachia vulgaris* 33; *Melandrium album* 8; *Monotropa hypopitys* s.s. (V-P) 37; *Picea abies* (V-P) a2 20(1), a1 22(1),36, a(36(1); *Pinus sylvestris* (V-P) a 36(1), a1 2,22(1),38, a2 32(1), b 12; *Plagiomnium affine* 8,25,27,28(1); *Plagiomnium cuspidatum 25,28, 38; Pleurozium schreberi (V-P) 17,23; Poa annua 17; Poa pratensis 7,9,23; Poa trivialis 7(1),38;* *Polygonatum odoratum* 36(1); *Populus tremula* a1 13(1), a2 23,28(2); b 7(1), c 2,9,33,38; *Potentilla erecta* (C-U) 9,10; *Prunus spinosa* b 7,14, c16; *Pseudoscleropodium purum* (V_P) 28; *Pteridium aquilinum* 22(1),24,31,32,33; *Pyrus communis* a2 2(1),8, b 2(1),7,10,13; *Pyrus communis* b 2(1),7,10,13, c 3,7,17,36(r); *Quercus rubra* a1 7(1),13(2), b 7, c 7,13; *Ranunculus acris* s.s. 7; *R. repens* 7; *Rhamnus cathartica* b 2,7 c30, c 30; *Rhizomnium punctatum* 38; *Robinia pseudacacia* a1 15(1), b 15; *Rosa canina* c 32; *Rosa* sp. 8; *Rubus idaeus* 10,13,22,23(1),24,28; *R. plicatus* 1,9,10,11,24; *R. saxatilis* (V-P) 16,17; *Rubus* sp. 14,15,26; *Rumex acetosella* 7; *Sambucus nigra* b 15,24(1), c 3,8,19,36; *Sanguisorba officinalis* 28; *Saxifraga granulata* 3,8; *Sedum maximum* 2,12,22; *Selinum carvifolia* 26,28; *Serratula tinctoria* 28,35; *Silene nutans* subsp. *nutans* 2,3; *Taraxacum officinale* 3,8,17,25; *Trifolium alpestre* 2; *Urtica dioica* 7,9,10,24,33; *Vaccinium vitis-idaea* (V-P) 28; *Veronica hederifolia* 3(1),8; *Vicia sepium* 35.

Table A23. *Galio sylvatici-Carpinetum* : *calamagrostietosum* (relevés 1-9), *lathyretosum* (relevés 10-25)

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
ID-1		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	55	4	4	4	4		
ID-2		31	31	31	31	31	31	31	31	50	31	31	31	31	31	31	31	31	31	31	31	14	31	31	31	31		
ID-3		12	22	20	19	14	17	15	16	12	9	23	5	4	21	11	3	13	1	10	18	36	6	2	7	8		
Date (year)		1966	1966	1967	1967	1964	1966	1966	1966	1964	1966	1966	1966	1966	1964	1966	1964	1963	1965	1966	1964	1992	1966	1965	1966	1966	1-9	10-25
Density of tree layer	a1,a [%]	40	60	50	85	80	50	50	65	70	70	75	65	70	65	60	70	75	85	45	75	70	45	80	75	85		
Density of tree layer	a2 [%]	50	-	40	30	-	-	30	10	-	-	25	45	-	40	60	40	85	-	60	40	-	25	45	30	-	%	%
Density of shrub layer	b [%]	10	30	20	20	+	50	30	10	45	10	+	25	70	15	10	30	10	25	45	50	-	10	20	+	+		
Cover of herb layer	c [%]	100	80	70	90	95	95	90	100	85	100	95	95	90	90	100	90	85	95	90	95	40	95	80	100	100		
Cover of moss layer	d [%]	20	+	-	+	+	15	10	5	-	25	+	-	15	+	+	-	-	-	-	+	5	40	5	-	+		
Area of relevé		500	400	400	400	400	300	400	500	400	400	400	450	600	400	400	400	400	400	500	400	100	400	400	400	600		
Location (ATPOL)		BC29	CB82	CB82	CB82	CC02	BC29	BC29	BC29	CC02	BC29	CB82	BC29	BC29	CB82	BC29	BC29	BC29	CB94	BC29	BC29	BC74	BC29	CB94	BC29	BC29		
Total number of species		32	29	26	42	26	35	33	45	39	36	35	40	38	30	48	44	25	36	41	46	28	53	37	41	56		
Number of mosses, liverworts and lichens species		4	2	-	2	1	3	2	4	-	3	2	-	3	1	2	-	-	-	-	3	1	3	1	-	5		
I. Ch.* *Carpinion betuli* ,																												
Ch.^, D. *Galio sylvatici-Carpinetum*																												
* *Carpinus betulus*	a1,a	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	4	11	13
* *Carpinus betulus*	a2	3	.	2	2	.	.	2	1	.	.	.	3	.	1	2	3	4	.	3	2	3	2	3	1	.	56	69
* *Carpinus betulus*	b	.	.	1	1	.	1	1	1	3	1	1	.	4	1	+	2	1	1	+	2	.	+	+	.	.	67	75
* *Carpinus betulus*	c	1	1	.	1	1	1	2	1	+	1	1	2	2	1	+	+	1	+	1	+	+	3	+	+	1	89	100
* *Tilia cordata*	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	2	.	–	19
* *Tilia cordata*	a2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	1	.	1	1	.	.	.	3	.	11	31
* *Tilia cordata*	b	2	.	.	1	.	.	1	.	.	+	.	2	.	.	1	+	1	2	3	3	.	1	1	.	.	33	63
* *Tilia cordata*	c	1	.	.	1	.	1	.	+	.	1	.	+	.	.	+	+	+	1	1	+	+	+	+	1	+	44	81
* *Stellaria holostea*		1	1	1	1	.	1	1	1	.	1	+	1	1	2	2	1	1	1	1	1	.	2	1	2	2	78	94
Festuca heterophylla (Q-F)		1	.	.	.	+	2	1	2	.	+	1	2	2	+	+	.	+	1	+	+	.	.	+	1	2	56	81
* *Melampyrum nemorosum*		.	1	+	1	1	.	.	.	.	.	2	2	.	+	+	.	.	.	.	.	+	.	.	.	.	44	31
^ *Galium sylvaticum*		.	.	.	1	.	.	1	+	.	+	.	1	2	.	2	+	+	.	2	1	.	1	.	1	.	33	63
^ *Ranunculus auricomus*		.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1	.	.	+	.	1	.	–	25
* *Dactylis polygama*		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	–	6
II. D. *Gs-C calamagrostietosum arundinaceae*																												
Vaccinium myrtillus (V-P)		+	+	1	+	1	2	+	+	+	1	1	.	+	+	.	1	+	.	.	+	.	.	.	.	.	100	44
Leucobryum glaucum (V-P)		+	+	.	+	.	+	+	.	.	+	+	.	.	.	.	.	.	.	.	+	.	1	.	.	.	56	25
Trientalis europaea (V-P)		.	.	+	+	1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	44	–
Campanula rotundifolia		.	.	.	.	.	1	1	1	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	44	6
Polygonatum odoratum		.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	22	6
III. D. *Gs-C lathyretosum*																												
Sorbus torminalis (Q-F)	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	–	6
Sorbus torminalis (Q-F)	b/c	.	.	.	.	.	.	/+	.	.	1/1	.	.	/+	.	/+	.	.	.	/1	.	.	.	.	.	.	11	25
Lathyrus niger (Q-F)		.	.	.	.	.	.	.	+	.	+	+	1	1	+	+	1	+	+	+	+	2	2	+	+	.	11	94
Pulmonaria obscura (Q-F)		.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	1	.	+	+	2	+	2	2	1	2	–	69
Lathyrus vernus (Q-F)		.	.	.	.	.	.	.	.	.	.	.	1	+	+	+	.	.	1	1	+	.	2	.	1	3	–	63
Carex montana (Q-F)		.	.	.	.	.	.	.	.	.	.	2	2	1	1	1	1	.	1	1	1	.	.	.	1	.	–	63
Phyteuma spicatum (Q-F)		+	.	.	.	.	.	.	+	.	.	1	.	.	.	.	+	.	1	1	+	.	+	+	.	1	22	50
Solidago virgaurea s. s.		.	+	.	.	.	.	.	.	.	+	+	.	+	.	.	+	+	.	.	.	1	.	.	.	+	11	44
Aegopodium podagraria		.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	2	.	.	+	.	.	1	.	1	+	11	44
Hypericum montanum (Q-F)		.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	+	+	.	.	+	.	.	+	–	44
Vicia cassubica		.	.	.	.	.	.	.	.	1	+	.	.	.	.	+	+	.	+	.	.	.	.	+	+	.	11	38
Hieracium murorum		.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	.	+	.	+	.	.	.	.	.	–	31
Campanula rapunculoides		.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	2	3	–	25
Brachypodium pinnatum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	+	.	.	.	.	.	2	2	–	25
IV. Ch. *Querco-Fagetea* (Q-F)																												
Fagus sylvatica	a1,a	.	2	.	3	1	.	.	.	.	.	.	.	.	2	.	.	.	5	.	.	.	.	4	.	.	33	19
Fagus sylvatica	a2	.	.	2	2	.	.	.	.	.	.	2	.	.	2	.	.	.	.	.	.	.	.	.	.	.	22	13
Fagus sylvatica	b	.	3	1	2	.	.	.	.	.	.	.	.	.	1	.	.	3	1	.	+	.	.	2	.	.	33	31
Fagus sylvatica	c	.	+	.	1	+	+	.	.	+	.	2	.	.	1	.	.	.	1	.	.	.	.	1	.	+	56	31
Fraxinus excelsior	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/1	.	.	/+	.	/1	.	/+	–	25
Acer pseudoplatanus	a1/a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2/1	.	–	6
Acer pseudoplatanus	b/c	.	.	.	/+	.	/+	.	/+	.	.	.	.	.	/+	1/+	.	/2	/+	/+	+/+	.	/+	/+	/3	.	33	56
Poa nemoralis		+	2	+	2	1	3	4	4	.	+	+	2	+	2	1	1	+	2	3	3	2	1	1	2	1	89	100
Carex digitata		+	.	+	+	1	+	1	1	+	+	1	.	2	.	1	+	+	1	.	+	+	+	.	.	1	89	69
Melica nutans		.	2	1	+	1	+	+	1	.	.	1	.	.	2	2	3	2	+	+	+	+	+	.	1	+	78	75
Galeobdolon luteum		+	+	.	1	.	+	1	1	.	+	+	+	.	+	+	.	.	.	+	1	2	3	2	2	1	67	75
Viola reichenbachiana		.	1	.	+	1	+	.	+	1	.	.	1	+	.	.	+	.	+	+	+	+	+	+	+	1	67	69
Galium odoratum		+	2	.	2	.	+	.	.	.	+	1	2	1	+	.	.	2	2	3	2	.	3	3	3	+	44	81
Anemone nemorosa		1	.	2	2	.	1	.	.	.	1	2	2	1	1	1	2	.	2	2	2	.	2	1	.	1	44	81
Viola riviniana		+	+	.	1	.	.	.	+	1	+	.	.	1	.	.	+	.	1	1	+	.	1	1	1	+	56	63
Scrophularia nodosa		+	.	.	.	.	+	1	+	+	+	+	+	+	+	+	.	.	.	+	.	.	+	+	+	.	56	63
Campanula persicifolia		.	+	.	.	+	.	+	.	+	+	.	.	.	.	+	+	.	.	+	+	+	+	+	.	+	44	56
Hepatica nobilis		.	.	.	2	1	.	.	.	.	.	1	1	.	.	1	2	1	.	.	1	+	2	2	1	1	22	69
Milium effusum		.	.	2	1	.	+	.	+	+	.	.	+	.	.	+	+	+	1	.	.	.	+	+	.	.	56	44
Atrichum undulatum		+	.	.	.	+	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	1	3	1	.	1	22	38
Polygonatum multiflorum		+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	+	+	+	+	11	38
Lilium martagon		.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	+	.	.	1	11	31
Eurhynchium angustirete		.	.	.	.	.	.	.	+	.	+	.	.	.	.	+	.	.	.	.	+	.	1	.	.	1	11	31
Platanthera bifolia		+	.	.	+	.	.	.	.	.	.	+	1	.	+	.	.	.	.	.	.	.	.	.	.	.	22	19
Festuca altissima		.	.	2	1	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	22	13
Sanicula europaea		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	1	–	25
V. Ch., D.* *Quercetea robori-petraeae*																												
Lathyrus montanus		+	+	1	.	2	+	.	+	1	1	2	2	2	+	1	+	+	.	2	1	.	2	.	+	1	78	81
Calamagrostis arundinacea		5	3	3	3	3	2	1	+	.	5	4	3	3	3	3	1	1	2	1	2	.	1	1	.	+	89	88
Hieracium sabaudum		+	+	.	+	.	.	+	1	.	+	.	+	1	.	+	+	.	1	1	.	+	1	.	+	1	56	69
Hieracium lachenalii		+	.	.	+	.	+	+	1	+	+	+	1	.	+	+	.	+	.	+	+	.	1	.	.	.	67	56
* *Polytrichastrum formosum*		2	1	.	+	.	2	+	+	.	2	.	.	2	+	.	.	.	.	.	.	.	.	.	.	.	67	19
VI. Others																												
Quercus petraea	a1,a;a2^	2;1^	3	.	2	.	3	3	4	.	.	.	4	4	3	3	4	3	.	3	4	4	3	2	1	2	67	81
Quercus petraea	b/c	/+	.	.	.	.	1/+	2/+	2/+	.	.	.	/+	2/1	/+	.	1/+	.	.	/+	+/+	.	/+	/+	/+	/+	44	63
Quercus robur	a1,a;a2^	.	.	3	3	4	.	.	.	4	4	4;2^	.	.	.	.	.	.	.	.	.	.	.	.	.	.	44	13
Quercus robur	b/c	.	.	.	.	/+	.	.	.	.	1/1	/+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	13
Sorbus aucuparia	b/c	/+	/+	.	/+	/+	1	.	/+	/+	/+	/+	/+	/+	/+	/+	1/+	/+	/+	.	/+	.	.	/+	.	/+	78	75
Veronica chamaedrys		.	+	.	1	2	+	.	+	1	+	+	2	+	+	+	+	.	+	+	+	.	+	+	1	1	67	88
Maianthemum bifolium		1	+	1	2	+	.	.	.	2	+	1	1	+	1	1	2	.	2	1	1	.	1	1	.	1	67	81
Convallaria majalis		.	+	2	3	3	1	+	.	.	1	2	1	+	2	3	3	3	3	3	2	.	1	.	.	.	67	75
Mycelis muralis		+	+	.	+	1	+	+	+	+	.	.	1	+	+	+	.	.	+	1	+	+	1	+	+	.	89	69
Dactylis glomerata		.	.	.	.	.	+	+	1	.	.	.	1	+	.	2	+	.	1	2	1	.	2	+	1	2	33	69
Luzula pilosa		+	1	.	+	.	.	.	+	.	+	+	+	1	.	+	.	.	.	.	+	+	+	.	.	1	44	56
Oxalis acetosella		1	.	1	1	.	.	.	.	3	.	.	.	.	.	.	1	.	.	.	1	.	.	1	.	.	44	19
Pleurozium schreberi (V-P)		1	.	.	.	.	1	.	1	.	.	+	.	1	.	.	.	.	.	.	+	.	.	.	.	+	33	25
Galium boreale		.	.	.	.	2	.	+	.	+	.	+	.	.	+	1	+	.	.	.	.	.	.	.	.	.	33	25
Pteridium aquilinum		.	.	.	.	+	.	+	+	.	.	+	.	.	+	1	+	1	.	.	+	.	.	.	.	+	33	44
Astragalus glycyphyllos		.	.	.	.	.	+	.	+	1	.	.	.	.	.	.	.	.	.	+	.	.	+	+	+	1	33	31
Trifolium alpestre		.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	+	.	+	.	.	.	.	+	.	+	22	31
Vicia sepium		.	.	.	.	1	.	.	.	+	.	.	.	.	.	+	+	+	.	.	.	.	1	.	.	+	22	31
Anthoxanthum odoratum		+	.	.	.	.	1	+	2	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	44	6
Galium mollugo		+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	33	13
Moehringia trinervia		.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	22	13
Fragaria vesca		.	.	.	.	.	.	.	.	2	.	.	+	+	.	.	1	.	.	.	+	.	.	.	.	.	11	25
Carex pallescens		.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	+	.	.	+	.	.	.	–	25

Explanation: V-P - *Vaccinio-Piceetea*

Sporadic species: IV.: *Acer platanoides* c 21; *Adoxa moschatellina* 16; *Ajuga reptans* 21,22,25; *Brachypodium sylvaticum* 21; *Carex sylvatica* 25; *Cephalanthera longifolia* 22; *Corylus avellana* c 4,16; *Dryopteris filix-mas* 1,22,24; *Equisetum sylvaticum* 3; *Hierochloe australis* 15,20; *Lonicera xylosteum* c 16; *Mercurialis perennis* 3; *Neottia nidus-avis* 15,21(r); *Paris quadrifolia* 4; *Potentilla alba* 16; *Primula veris* 9; *Ranunculus lanuginosus* 19,23; *Ulmus glabra* c 23; *U. minor* c 21(r); *Viola mirabilis* 18,22.25. **V.:** *Carex pilulifera* 4; *Hieracium laevigatum* 21; *Holcus mollis* 9(3),11,22. **VI.:** *Achillea millefolium* 7,8; *Agrostis capillaris (C-U) 8,9;* *Anthriscus sylvestris* 3; *Arctium nemorosum* 24; *Athyrium filix-femina* 2,3(3),4; *Avenula pubescens* 22; *Betula pendula* c 6,7; *Bromus* sp. 24; *Cerastium arvense* 9; *Clinopodium vulgare* 12,22(1),24; *Crataegus monogyna* b 15(1),19(1), c 19(1); *Deschampsia caespitosa* 7,9,12; *Dryopteris carthusiana* 4,22; *Euonymus europaea* c 19,25; *Eurhynchium* sp. 8; *Fallopia dumetorum* 6,7,8; *Frangula alnus* c 9; *Geum urbanum* 24,25; *Hypericum perforatum* 10,22; *Lapsana communis* s. s. 10,12,24(1); *Lathyrus sylvestris* 9(2); *Luzula multiflora* (C-U) 8,13,25; *Lysimachia vulgaris* 3; *Mnium* sp. 25; *Oxyrrhynchium hians* var. *hians* 25; *Picea abies* (V-P) b 9(1),c9; *Pinus sylvestris* (V-P) c 15; *Rubus saxatilis* (V-P) 3,4; *Poa pratensis* 9; *Polygonatum verticillatum* 2,3(1),4*;* *Populus tremula* c 16,20(1),25(1); *Prunus spinosa* c 25; *Pyrus communis* c 3,24; *Rosa* sp. c 10,24; *Rubus idaeus* 7,8; *Rubus* sp. 9; *Rumex acetosella* 6; *Sedum maximum* 8; *Serratula tinctoria* 10(2),13,25; *Silene* sp. 6; *Stellaria graminea* 9; *Thalictrum aquilegiifolium* 16; *Torilis japonica* 8,24,25; *Veronica officinalis* (C-U) 2,5,20; *Vicia cracca* 9(2); *Vincetoxicum hirundinaria* 24.

Table A24. Substitute forest communities from the *Querco-Fagetea* class

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	1-42
ID-1		39	46	19	42	35	46	46	2	2	35	29	20	37	36	29	42	29	16	17	29	42	55	16	55	17	59	17	17	41	35	55	49	35	35	55	59	55	55	55	55	16	16	
ID-2		31	3	1	6	20	3	3	7	7	29	6	4	14	16	6	6	6	19	4	6	6	14	19	14	4	5	9	9	1	10	14	5	10	10	14	5	5	14	17	17	19	19	
ID-3		19	5	15	1	20	21	7	3	7	4	8	7	9	3	3	7	6	7	9	1	2	27	10	29	8	15	12	19	12	39	32	5	46	48	30	14	16	38	9	11	5	13	
Date (year)		1991	1955	1988	1981	1975	1955	1955	1988	1988	1975	1979	2007	1984	1985	1979	1981	1979	1972	1995	1980	1981	1975	1972	1978	1995	1993	1995	1995	1997	1976	1992	1975	1976	1976	1976	1993	1993	1975	1992	1976	1972	1972	
Density of tree layer	a1,a [%]	50	80	50	95	40	50	70	60	50	50	50	60	30	45	50	80	50	80	70	70	70	80	90	80	60	80	5	90	60	60	65	70	65	65	70	70	85	80	70	75	90	100	
Density of tree layer	a2 [%]	10	-	-	-	60	-	-	-	-	-	60	75	50	60	70	-	55	30	-	-	-	-	40	-	-	-	70	-		-		-	-	-	-	-	-	-	-	-	50	-	
Density of shrub layer	b [%]	55	+	60	+	20	60	5	+	+	+	+	10	25	5	+	-	+	40	5	5	45	-	60	20	+	-	-	-	5	40		-	-	20	-	-	-	10	-	+	60	10	
Cover of herb layer	c [%]	40	30	80	45	55	20	60	50	60	60	75	80	80	80	70	70	80	80	70	60	55	50	90	80	70	80	50	40	80	45	70	70	70	65	50	80	80	60	70	50	80	95	
Cover of moss layer	d [%]	-	+	3	+	-	+	10	+	+	-	+	+	+	+	-	-	5	60	-	-	-	+	+	20	-	-	-	-	+	+	+	-	5	+	-	-	-	-	-	-	80	40	%
Area of relevé		500	1200	400	100	100	1400	1000	200	200	100	150	200	600	800	150	100	180	300	150	120	100	100	200	100	150	200	150	150	100	300	100	200	100	200	100	150	250	100	100	100	300	200	
Location (ATPOL)		BE15	CC92	DD91	BD59	CE01	CC92	CC92	BD81	BD81	CE00	CD17	CD39	-	BE06	CD17	BD59	CD17	BC19	BC66	CD17	BD59	BC72	BD31	BC83	BC66	BC88	BC66	BC66	CC25	CE01	BC73	-	CE00	CE01	BC73	BC88	BC88	BC72	BC73	BC73	BC19	BD31	
Total number of species		25	38	37	22	23	36	24	25	24	12	26	24	28	25	34	18	27	58	41	42	24	18	39	31	45	25	23	26	29	33	24	13	21	40	13	18	18	45	20	13	78	50	
Number of mosses, liverworts and lichens species		-	3	2	1	-	4	-	1	1	-	4	1	3	2	-	-	4	11	-	-	-	1	2	2	-	-	-	-	2	2	1	-	2	3	-	-	-	-	-	-	18	9	
I. Ch. *Querco-Fagetea*																																												
Corylus avellana	b/c	3/+	/r	3/+	.	.	/+	.	.	+/	.	.	.	.	.	/+	.	.	.	.	.	+/+	.	3/	2/	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+/+	.	24
Melica nutans		1	.	1	1	.	.	.	+	+	+	1	2	.	.	2	+	**4**	.	1	2	+	+	+	.	1	+	+	+	.	.	.	+	1	.	.	.	+	2	.	.	1	.	60
Poa nemoralis		.	.	.	+	.	.	.	1	1	+	.	1	.	.	.	+	.	+	.	.	+	**3**	.	+	1	+	+	+	.	.	1	.	**3**	**3**	**3**	.	+	1	+	2	1	+	57
Viola reichenbachiana		.	+	.	.	1	+	+	1	1	.	.	.	+	.	.	.	.	+	.	.	.	2	.	1	.	+	.	.	+	.	1	+	1	.	+	+	.	+	1	.	.	.	45
Brachypodium sylvaticum		+	.	1	.	+	.	.	.	.	1	.	.	.	.	.	.	+	.	+	.	+	.	.	**4**	**3**	+	+	.	.	.	+	.	+	+	.	1	1	2	1	.	.	1	45
Anemone nemorosa		.	.	+	+	.	.	.	.	.	.	.	.	.	+	.	**4**	.	.	1	.	2	.	.	.	+	.	1	1	.	2	.	.	.	.	.	.	.	.	.	.	.	.	24
Festuca gigantea		.	+	+	.	.	.	+	.	.	.	.	.	.	+	.	.	+	.	+	.	.	.	.	.	1	.	.	.	+	.	.	.	.	.	.	.	+	.	+	.	.	1	26
Dactylis polygama		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	+	+	.	+	+	.	.	+	.	.	2	1	.	.	.	.	1	26
Milium effusum		.	1	.	.	+	.	+	1	.	.	2	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	+	.	1	.	.	.	.	.	.	.	.	.	.	24
Dryopteris filix-mas		.	+	.	.	+	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	2	.	.	+	.	r	**4**	.	+	.	.	.	.	.	1	.	.	.	.	.	24
Atrichum undulatum		.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	+	+	1	.	+	+	.	.	.	.	.	.	+	2	21
Viola riviniana		.	.	.	.	.	+	.	.	+	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	1	.	.	17
Stellaria holostea		.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	2	.	.	.	.	.	.	.	.	.	12
II. Ch., D.* *Quercetea robori-petraeae*																																												
* *Pteridium aquilinum*		.	1	2	+	.	.	1	.	.	.	.	.	.	2	+	.	.	.	**3**	1	.	.	1	+	1	2	1	2	.	.	+	.	.	.	.	2	+	.	**3**	.	+	+	48
Hieracium lachenalii		.	.	.	.	.	.	.	.	.	+	.	+	.	.	+	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	+	.	.	+	.	21
Calamagrostis arundinacea		.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	1	2	.	.	+	.	.	.	.	.	.	.	3	.	.	.	.	1	19
Festuca ovina		.	+	+	.	.	.	+	.	.	.	.	+	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	+	.	19
Holcus mollis		.	.	.	.	+	.	.	.	.	.	.	.	1	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	**3**	**3**	.	2	.	.	.	.	2	.	.	.	19
* *Melampyrum pratense*		.	.	.	.	.	.	.	.	1	.	.	+	+	.	.	.	.	1	.	.	.	2	.	.	.	.	.	+	.	.	.	.	.	.	1	.	.	.	.	1	.	.	19
* *Polytrichastrum formosum*		.	+	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	1	.	.	.	.	.	.	.	2	.	17
III. Ch. *Vaccinio-Piceetea*																																												
Pinus sylvestris	a1,a	**3**	**4**	**3**	**3**	**3**	**4**	**3**	**4**	**3**	**4**	**3**	**3**	**3**	**3**	**3**	**4**	**3**	**3**	.	2	2	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	60
Pinus sylvestris	b/c	.	.	.	.	.	.	.	.	+/+	/+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Vaccinium myrtillus		.	.	+	+	+	+	+	.	2	**3**	**4**	**4**	**3**	**3**	2	+	.	+	.	.	2	.	.	.	r	+	1	1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	48
Pleurozium schreberi		.	+	.	.	.	+	+	+	+	.	+	.	.	.	.	.	+	2	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	24
IV. Ch. *Artemisietea*																																												
Moehringia trinervia		+	+	1	+	+	.	.	.	.	+	1	+	+	+	1	+	1	**3**	+	+	1	.	**3**	.	+	1	+	+	.	.	+	1	.	.	+	1	1	.	1	+	**3**	**3**	74
Mycelis muralis		+	+	.	.	+	.	.	.	.	.	+	.	+	.	+	+	1	+	+	.	+	.	**3**	1	.	.	.	r	+	.	2	.	+	.	.	.	.	2	2	.	1	1	50
Galeopsis tetrahit		.	+	.	+	.	+	.	.	1	.	+	.	.	.	+	+	.	.	1	.	+	.	1	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	1	.	.	1	33
Geranium robertianum		+	.	+	.	.	.	.	.	.	1	+	.	.	+	2	.	+	.	.	+	+	.	2	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	**4**	31
Galeopsis pubescens		+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	1	.	.	.	.	+	.	+	.	.	+	.	.	.	+	.	r	1	.	.	.	.	+	.	26
Geum urbanum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	+	.	+	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	1	.	.	+	1	29
Impatiens parviflora		2	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	r	.	.	.	.	.	1	2	**3**	.	.	.	.	.	.	.	.	2	2	.	.	.	.	.	19
Urtica dioica		.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	1	+	.	.	+	.	1	.	.	.	1	.	+	.	.	.	.	.	.	.	.	.	.	1	21
V. Ch. *Molinio-Arrhenatheretea*																																												
Veronica chamaedrys		.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	+	r	2	.	1	.	+	+	.	.	.	+	1	+	+	.	1	2	.	.	2	1	+	2	.	43
Galium mollugo		.	+	.	.	.	+	+	1	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	+	.	21
VI. Others																																												
Quercus petraea	a1,a	.	.	.	2	.	.	.	+	1	.	**.**	**1**	**.**	**1**	**.**	**4**	**1**	**2**	**4**	**4**	**3**	**3**	**5**	**5**	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	2	.	40
Quercus petraea	a2	.	.	.	.	.	.	.	.	.	.	**4**	**4**	**3**	**3**	**4**	**.**	**4**	**3**	**.**	**.**	**.**	**.**	**3**	**.**	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	24
Quercus petraea	b/c	.	.	.	+/+	.	.	.	.	.	.	.	2/1	1/+	/+	+/+	/+	/+	3	/+	/+	+/+	.	/1	/+	.	.	.	.	.	.	.	.	.	.	.	.	.	1/1	.	.	1/1	/+	38
Quercus robur [*Q.* x *rosacea*^]	a1,a	.	.	1	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	**4^**	**4^**	**.**	**5^**	**3^**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**5**	**4**	**4**	**3**	.	.	43
Quercus robur [*Q.* x *rosacea*^]	a2	+	.	.	.	3	.	.	.	.	.	+	1^	.	1	.	.	.	.	.	.	.	.	.	.	**.**	**.**	**3^**	**.**	**.**	.	.	.	.	.	.	.	.	.	.	.	1	.	17
Quercus robur [*Q.* x *rosacea*^]	b/c	.	+/+	1/+	.	2/+	+/+	2/+	.	.	1/+	+/	.	.	+/	.	.	.	.	.	.	.	1	.	.	/+^	.	.	/+^	.	.	.	/+	/+	/+	.	.	.	.	/+	/+	+/	.	40
Betula pendula	a1,a	.	r	1	.	.	+	.	.	1	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	3	.	19
Betula pendula	a2	1	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	12
Betula pendula	b/c	+/+	+/	.	.	.	+/+	+/+	.	.	.	.	.	+/	.	.	.	.	1/	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14
Sorbus aucuparia	a^;a2	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Sorbus aucuparia	b	1	.	.	.	1	+	+	.	.	.	+	.	2	1	.	1	+	1	.	1	+	.	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	+	1	+	43
Sorbus aucuparia	c	+	+	.	+	.	.	+	.	.	.	.	.	+	+	.	+	+	+	.	.	.	r	+	.	+	.	.	+	.	.	.	+	+	+	.	.	.	+	.	.	.	+	43
Frangula alnus	b	.	.	2	.	+	+	.	+	+	+	.	+	.	+	.	.	+	1	.	.	+	.	.	.	+	.	.	.	.	**3**	.	.	.	2	.	.	.	+	.	.	+	.	38
Frangula alnus	c	.	+	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	+	.	.	+	.	+	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	26
Luzula pilosa		.	.	.	+	.	.	.	.	+	.	+	2	1	.	+	+	+	+	+	+	+	+	.	.	+	.	.	+	+	+	1	2	.	.	.	.	.	.	+	+	1	.	52
Rubus idaeus		.	+	.	.	.	+	+	.	.	.	.	.	1	.	.	.	+	+	+	1	.	+	.	.	2	1	.	+	+	+	1	.	+	.	.	.	1	2	2	.	+	.	48
Fragaria vesca		.	+	1	.	.	r	.	.	1	.	1	+	.	.	+	.	2	1	+	1	.	+	.	+	.	.	.	.	.	+	1	.	.	.	.	.	.	1	+	1	2	.	45
Dryopteris carthusiana		+	+	.	.	+	+	+	+	.	.	.	.	+	1	+	+	+	.	.	.	+	.	1	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	36
Hypericum perforatum		.	+	+	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	.	+	.	.	.	+	+	.	+	.	+	.	.	.	+	.	.	.	+	33
Oxalis acetosella		.	1	.	.	.	+	+	.	.	.	2	.	.	.	2	.	2	.	+	+	.	.	.	.	.	1	+	+	.	.	1	.	.	.	.	+	.	.	+	.	.	.	33
Convallaria majalis		.	+	1	**3**	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	2	.	**3**	.	.	2	+	+	.	.	.	.	.	.	.	1	1	.	.	.	.	+	31
Maianthemum bifolium		.	+	.	.	+	+	.	+	.	.	.	.	.	.	.	.	.	.	+	+	1	.	.	.	.	+	.	+	.	+	.	.	.	.	.	+	.	.	.	.	.	.	26
Anthoxanthum odoratum		.	.	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	1	+	.	.	.	+	.	+	.	.	.	.	+	+	.	.	1	.	.	.	.	.	1	.	.	26
Agrostis capillaris		.	2	1	.	2	+	+	.	.	.	+	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	2	.	.	.	24
Rubus sp.		+	.	**4**	+	2	.	.	.	.	.	.	.	1	1	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	21
Fallopia convolvulus		.	.	.	+	.	.	.	.	.	.	+	.	.	.	+	+	.	.	+	.	+	.	.	.	2	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	21
Hieracium murorum		.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	+	**3**	.	.	.	1	.	.	.	.	.	.	.	+	.	.	+	+	r	.	.	.	.	.	.	.	21
Deschampsia flexuosa		2	.	.	.	+	.	.	.	1	2	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	2	.	.	.	.	.	.	.	.	.	.	.	.	.	1	19
Calamagrostis epigejos		.	+	1	.	.	+	.	.	1	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	19

Sporadic species: I.: *Acer campestre* b 6, c 33,41; *A. platanoides* a2 23(1), b 22,36,38(1), c 13,22(1),23,27,30,35(r),38(2); *A. pseudoplatanus* a 4(3), a2 15(1), b 21,22(1), c 4,15,21,38,42; *Adoxa moschatellina* 14,19(r),20,41; *Ajuga reptans* 3,7,20,24; *Asarum europaeum* 20,36(1); *Campanula persicifolia* 19; *Carex digitata* 15,18(2),20(2),41(3); *C. sylvatica* 30(2); *Carpinus betulus* a1,a 7(2), a2 191),15(1), b 2,6,7,20,26(1),30, c 2,7,15(1),20; *Cerasus avium* c 30; *Circaea lutetiana* 15,39; *Elymus caninus* 1(1); *Equisetum pratense* 5; *E. sylvaticum* 13; *Eurhynchium striatum* 42(1); *Fagus sylvatica* a1,a 5(2), a2 5(2),14(2), b 13,14(1),22(1), c 4,16,21,22(r),24,25; *Festuca heterophylla* 18(1),24,40,41(2); *Ficaria verna* 38; *Fraxinus excelsior* a2 41(1), b 41(1), c 18,41(1); *Galeobdolon luteum* 19(1),20(1),26(2),36(2),37(2); *Galium odoratum* 15(1),24(3); *Gymnocarpium dryopteris* 13(1),29; *Hepatica nobilis* 3,15(1),19(r),20(1),26,36; *Hypericum montanum* 18,23,24(r),41; *Lathyrus niger* 29; *L. vernus* 29; *Lilium martagon* 4,29; *Lonicera xylosteum* b 18(1),41(2), c 41; *Luzula luzuloides* 9; *Malus sylvestris* c 25; *Melampyrum nemorosum* 34(1); *Melica uniflora* 2; *Padus avium* b 1(2),2,6,14,19(1), c 1(1),20,29; *Paris quadrifolia* 36; *Phyteuma spicatum* 29; *Plagiomnium undulatum* 34; *Platanthera bifolia* 34(2); *Primula veris* 42; *Pulmonaria obscura* 24,34(1); *Ribes spicatum* b 41, c 11,16,17; *R. uva-crispa* b 41, c 15,23; *Sanicula europaea* 34(1); *Scrophularia nodosa* 6,18(1),19(r),23,29,35,41; *Stachys sylvatica* 31; *Stellaria nemorum* 42; *Tilia cordata* a 8,29(1), a2 41(2), b 18,29,34(1),41, c 33; *T. platyphyllos* b 19, c 41; *Ulmus glabra* c 25; *U. laevis* c 38; *Viburnum opulus* c 3,4; *Viola mirabilis* 18,35; *V. reichenbachiana et riviniana* 15,20(2); **II.:** *Carex pilulifera* 4,14,21,41; *Dicranella heteromalla* 14,18; *Hieracium laevigatum* 30,34(1); *H. sabaudum* 24(1),27; *H. umbellatum* 38; *Lophocolea heterophylla* 18; *Luzula pallescens* 10,41; *Mnium hornum* 41; *Plagiothecium denticulatum* 29; *P. laetum* 18; **III.:** *Betula pubescens* subsp. *pubescens* b 41; *Chimaphila umbellata* 18; *Dicranum polysetum* 6; *Dryopteris dilatata* 13(2),14; *Galium rotundifolium* 30,33,34(1); *Juniperus communis* b 12(1),18, c 18,24(r); *Orthilia secunda* 18(1); *Picea abies* a1,a 18(2),41(3), a2 18(1), b 30,41(2), c 2,18,41(1); *Pseudoscleropodium purum* 2,6,7,17(1); *Pyrola minor* 41; *Rubus saxatilis* 3,11(1),12(2),15(2),17(1),36; *Thuidium tamariscinum* 41; *Trientalis europaea* 28(1); *Vaccinium vitis-idaea* 8(2),9,18; **IV.:** *Aegopodium podagraria* 9,19,29; *Alliaria petiolata* 19(1),25(2); *Bryonia alba* 8; *Chaerophyllum temulum* 18,38(1),41; *Chelidonium majus* 1,23(3),42(2); *Equisetum arvense* 25; *Fallopia dumetorum* 1,23,42(1); *Galium aparine* 12,25,29,38,41,42(1); *Glechoma hederacea* 8,25,30,38(1),42(3); *Heracleum sibiricum* 41; *H. sphondylium* 38; *Humulus lupulus* 8; *Lamium maculatum* 9; *Lapsana communis* s.s. 23(2),42(1); *Rubus caesius* 12,16,23,41(1),42; *Tanacetum vulgare* 38(1); *Torilis japonica* 29,42; **V.:** *Achillea millefolium* 3,34,38; *Agrostis gigantea* 25(2); *Angelica sylvestris* 34(1); *Arrhenatherum elatius* 8,34(1),38(1); *Carex hirta* 2,12,20,25,38,41; *Dactylis glomerata* 2(1),6,34,38(1); *Deschampsia caespitosa* 3,4,16,24,28,42; *Equisetum palustre* 1; *Festuca rubra* s.s. 3,11,20(1),42; *Galium boreale* 3,28; *Holcus lanatus* 8,30(1); *Juncus effusus* 25; *Lysimachia nummularia* 24,31,39; *L. vulgaris* 37; *Poa pratensis* 38; *P. trivialis* 1(1),19(1); *Prunella vulgaris* 24; *Ranunculus acris* s.s. 8,9(1),34,38(1); *Rumex acetosa* 38,42; *Selinum carvifolia* 30,34; *Taraxacum officinale* 20,34,38(r); *Vicia cracca* 41; **VI.:** *Agrimonia eupatoria* 34,38(1); *Anthericum ramosum* 24(1); *Astragalus glycyphyllos* 20; *Athyrium filix-femina* 13(1); *Brachytheciastrum velutinum* 18(3),41(2); *Brachythecium albicans* 41(2); *B. rivulare* 41; *B. rutabulum* 13,42(1); *B. salebrosum* 42; *Bryum turbinatum* 41; *Campanula rotundifolia* 2,7,18(1),40,41; *Carex pallescens* 34; *Carex* sp. 27; *C. spicata* 20; *Chamaenerion angustifolium* 5(1),13(1),14,19(r); *Chenopodium album* 25; *Cirriphyllum piliferum* 41; *Clinopodium vulgare* 3,20,24(1),34,39; *Conyza canadensis* 25; *Cornus sanguinea* b 34, c 20,24(r),38; *Coronilla varia* 12; *Crataegus monogyna* b 3,13,20, c 15,20,25; *C. monogyna* et *laevigata* b 18,23(1), c 41; *Dicranoweisia cirrata* 41; *Epilobium ciliatum* 39; *Erysimum cheiranthoides* 25; *Euonymus europaea* b 23(1), c 24; *Euphorbia cyparissias* 18,34; *Fragaria viridis* 38; *Galium verum* 18,31; *Geranium sanguineum* 23; *Hieracium pilosella* 6; *Hypericum maculatum* 35; *Hypnum cupressiforme* 18(1),23(1),42(1); *Knautia arvensis* 34,38,41; *Knautia dipsacifolia* 41; *Larix decidua* subsp. *decidua* a 6,8; *Ligustrum vulgare* c 18; *Lophocolea bidentata* 42; *Lupinus polyphyllus* 19,25; *Luzula multiflora* 16,18; *Orthodicranum tauricum* 18(1),41; *Padus serotina* a 42(5), b 23(1),42(1), c 6,12,23,24(r),42(1); *Peucedanum oreoselinum* 23; *Pimpinella saxifraga* 3,38,41; *Plagiochila asplenioides* 41; *Plagiomnium affine* 3,11,17,23,41(1),42(2); *P. elatum* 41(1); *P. rostratum* 6,18,34,41(1),42(2); *Plagiothecium* sp. 4; *Poa angustifolia* 11,20; *Pohlia cruda* 18; *P. nutans* 13,14,18,41; *Polygonatum odoratum* 21,23,28,41,42(1); *P. lapathifolium* 25; *P. mite* 25; *Populus tremula* a 8, b 5,6,41(2), c 30,34; *Potentilla erecta* 25,34; *Prunus spinosa* b 3(1),23(3),41(2), c 3(1),23(1),38; *Pyrus communis* b 23(1),26, c 15,19,24(r); *P. pyraster* b 12; *Quercus palustris* a 9; *Q. rubra* b 41, c 18,41; *Rhamnus cathartica* b 18,41,42, c 38; *Robinia pseudacacia* a 42(1), b 42, c 42; *Rosa canina* c 18,41,42; *Rosulabryum capillare* 18; *Rubus* cfr. *hirtus* 14(1); *R. corylifolius* 15; *R. gracilis* 11(1); *R. plicatus* 23; *R. sprengelii* 27(1),28(1); *R. x corylifolius* 12; *Rumex acetosella* 1,2,6,18; *Sambucus nigra* b 14, c 5,23,29,42(1); *S. racemosa* b 5; *Sciuro-hypnum oedipodium* 3,11,12,17(1); *S. populeum* 41(2),42(1); *Scorzonera humilis* 28; *Sedum maximum* 20; *Senecio sylvaticus* 18,25,41; *S. vernalis* 42; *Silene nutans* subsp. *nutans* 31,38(1),41; *Solidago virgaurea* s.s. 2(1),4,30; *Sorbus intermedia* c 41; *Stellaria media* 1,33; *Syringa vulgaris* b 42(1); *Thalictrum aquilegiifolium* 29; *Valeriana dioica* 37; *Veronica officinalis* 8(1),11,18(2),25,28,34,41(1); *Vicia cassubica* 23,26; *V. sepium* 25,41; *Vincetoxicum hirundinaria* 3(1),42; *Viola canina* 3,18,38; *Viola* sp. 28,34; *Viscum album* subsp. *album* a 1.

Table A25. *Potentillo albae-Quercetum* : *astrantietosum* (relevés 1-9); *molinietosum* (relevés 10-19); *typicum* (relevés 20-37); mixed form (relevés 38-45)

Successive number of relevé		1	2	3	4	5	6	7	8	9	1-9	10	11	12	13	14	15	16	17	18	19	10-19	20	21	22	23	24	25	26	27	28	29	30	20-30	31	32	33	34	35	36	37	31-37	38	39	40	41	42	43	44	45
ID-1		19	19	19	19	19	19	19	19	19		9	56	57	56	56	17	56	56	56	56		43	43	43	43	43	43	43	43	43	43	43		29	29	19	29	17	17	57		17	57	29	29	4	8	19	19
ID-2		1	1	1	1	1	1	1	1	1		-	2	1	2	2	7	2	2	2	2		9	9	9	9	9	9	9	9	9	9	9		11	11	1	11	6	7	1		7	1	11	11	46	-	1	1
ID-3		8	9	6	5	4	2	1	7	3		-	8	17	1	9	3	2	3	4	5		4	10	12	15	16	5	11	13	14	6	8		10	2	16	12	3	1	16		4	15	14	13	5	-	12	21
Date (year)		1981	1979	1979	1979	1980	1980	1980	1980	1980	1-9	2000	2006	1991	2005	2006	1995	2005	2005	2005	2006	10-19	1959	1959	1958	1958	1959	1959	1959	1958	1958	1958	1957	20-30	1979	1980	1988	1977	1996	1995	1991	31-37	1995	1991	1980	1980	1995	2006	1979	1979
Density of tree layer	a1,a [%]	60	70	70	70	70	60	60	60	70		70	55	55	55	60	70	70	65	65	51		80	85	80	80	80	90	90	80	70	80	40		70	70	75	80	60	75	60		70	70	55	80	60	75	60	70
Density of tree layer	a2 [%]	-	50	10	-	-	-	-	30	-	%	5	-	-	-	+	-	5	5	5	-	%	-	-	-	-	-	-	-	-	-	-	-	%	-	-	-	-	-	-	-	%	-	-	-	-	-	-	20	-
Density of shrub layer	b [%]	40	60	20	20	5	15	10	60	5		10	15	15	5	5	25	5	15	5	5		+	10	20	50	5	+	5	20	10	40	30		-	-	40	+	5	15	5		10	+	10	10	65	5	15	20
Cover of herb layer	c [%]	100	80	90	90	100	100	100	90	100		90	40	40	65	60	60	70	50	60	60		75	75	70	80	80	70	80	75	75	80	70		80	80	90	50	80	50	40		55	60	90	80	100	70	80	70
Cover of moss layer	d [%]	5	10	10	2	2	3	2	5	2		+	+	+	+	-	5	-	5	5	15		-	7	10	+	+	+	+	5	5	5	+		+	-	3	+	-	-	+		-	+	5	+	-	5	3	5
Area of relevé		400	400	500	400	400	400	400	400	400		300	100	100	400	400	300	400	200	400	400		500	250	300	400	300	250	300	300	300	300	200		150	200	400	200	200	150	150		150	200	150	150	400	400	500	400
Location (ATPOL)		DD91	DD91	DD91	DD91	DD91	DD91	DD91	DD91	DD91		CD21	BC76	BC66	BC76	BC66	BC66	BC76	BC76	BC76	BC66		BC99	BC99	BC99	BC99	BC99	BC99	BC99	BC99	BC99	BC99	BC99		CD28	CD17	DD91	CD28	BC66	BC66	BC66		BC66	BC66	CD28	CD28	CC22	BC98	DD91	DD91
Total number of species		61	59	63	69	80	81	77	72	86		77	44	47	79	77	61	94	76	82	72		52	48	55	40	37	55	45	50	51	52	54		41	35	44	53	45	49	33		57	68	67	64	61	78	53	56
Number of mosses, liverworts and lichens species		1	3	2	2	2	1	2	1	2		2	1	3	-	6	-	9	4	10	6		-	3	4	3	1	3	1	3	5	3	2		2	-	1	3	-	-	2		-	1	5	5	-	10	2	1
I. Ch.* , D.^ *Potentillo albae-Quercetum*
Ch. *Quercetalia pubescentis*
^ *Betonica officinalis* (M-A)		1	+	3	2	1	2	2	1	2	100	1	+	+	1	+	+	+	r	+	r	100	+	.	r	.	.	+	+	+	+	+	+	73	.	.	+	.	+	.	.	29	+	+	.	.	.	2	+	+
^ *Galium boreale* (M-A)		.	.	+	+	1	+	.	.	+	67	1	+	+	1	+	+	2	+	1	+	100	1	1	1	+	1	1	1	1	+	+	2	100	.	+	1	+	+	.	+	71	+	+	1	+	.	1	.	+
Campanula persicifolia		+	.	.	+	1	+	.	+	+	67	1	+	+	.	+	.	+	.	+	r	70	1	+	+	.	1	+	1	.	+	+	+	64	.	.	+	+	+	.	+	57	+	+	+	+	1	1	+	+
* *Ranunculus polyanthemos*		+	.	+	+	1	+	1	+	1	89	+	.	+	.	+	.	r	+	+	+	60	.	.	.	.	.	.	.	+	r	+	+	36	r	.	+	.	.	.	.	29	+	.	+	.	.	.	+	.
* *Potentilla alba*		.	.	.	.	.	.	.	.	.	–	1	+	+	1	+	+	1	1	r	r	100	+	+	1	1	+	1	1	+	.	1	+	91	.	.	.	+	.	+	r	57	1	1	+	.	2	.	.	.
* *Carex montana*		+	1	2	2	2	.	.	1	1	78	1	+	+	1	1	1	1	+	+	1	100	.	.	.	.	.	.	.	.	.	.	.	–	.	+	1	+	+	1	+	86	2	+	.	1	.	+	+	1
Lathyrus niger		.	1	1	2	1	+	1	+	2	89	.	.	.	.	.	.	.	.	.	.	–	+	+	+	1	+	+	1	1	+	1	1	100	+	1	.	+	.	.	.	43	.	.	.	.	3	+	+	+
Hypericum montanum		.	.	.	.	+	+	.	.	+	33	.	.	.	.	.	.	.	.	.	.	–	+	.	+	.	+	1	+	+	+	.	.	64	1	+	.	+	.	.	.	43	.	.	+	+	.	+	.	+
Platanthera bifolia		.	.	.	.	.	.	.	.	.	–	+	+	+	+	.	.	.	+	.	.	50	.	.	.	.	.	+	.	.	.	.	.	9	.	.	.	.	.	.	.	–	.	+	.	.	.	.	.	.
* *Hypochoeris maculata*		+	.	.	.	.	1	1	1	.	56	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Primula veris		.	.	.	.	.	.	.	.	.	–	.	.	.	.	r	.	.	.	.	.	10	.	+	.	.	.	.	+	.	.	.	.	18	+	.	.	.	.	.	.	14	.	.	2	+	+	.	.	.
* *Pulmonaria angustifolia*		.	.	.	.	.	.	.	.	.	–	.	.	.	.	r	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	+	+	.	.	.	.	.	.
* *Festuca amethystina* subsp. *ritschlii*		.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	+	.	14	.	.	.	.	.	.	.	+
II. D. group of moist subassociations
Succisa pratensis (M-A)		1	+	1	+	+	2	1	1	1	100	+	.	.	+	.	r	1	1	+	.	60	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	r	14	+	1	.	.	+	.	.	.
Deschampsia caespitosa (M-A)		+	+	+	.	.	.	.	+	+	56	+	.	.	2	2	.	1	2	+	+	70	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	+	.	14	.	.	+	+	+	+	+	+
Carex pallescens (C-U)		+	+	+	1	+	.	.	.	.	56	.	1	1	+	.	+	+	+	+	+	80	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	+	+	+	+	+	.
Hieracium sabaudum (Qrp)		.	.	+	+	+	1	1	+	+	78	+	.	.	+	1	r	.	+	.	1	60	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	+	+	.	.	+	.	.	+
Selinum carvifolia (M-A)		+	.	.	+	.	+	.	+	.	44	+	.	.	1	.	.	1	.	+	+	50	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	+	+	.	+	.	.	.	.
Scorzonera humilis (C-U)		+	.	+	+	+	+	.	.	.	56	+	r	r	.	.	.	.	.	.	.	30	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	+	.	14	.	.	.	.	.	.	+	.
Ranunculus acris s. s. (M-A)		+	+	+	.	.	+	+	+	.	67	.	.	.	r	.	.	+	1	.	.	30	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	1	.	.	.	.	.
III. D. *Pa-Q astrantietosum*
Corylus avellana (Q-F)	a2^,b	3	2^3	1	1	+	+	1	2^3	+	100	.	.	.	.	.	r	+	.	+	.	30	+	.	.	3	.	+	+	+	1	.	+	64	.	+	.	.	+	.	+	43	.	.	.	.	4	.	1	1
Corylus avellana (Q-F)	c	+	+	+	+	+	+	+	+	+	100	.	.	.	.	r	.	.	.	r	r	30	.	+	+	+	.	.	+	.	.	.	.	36	.	+	.	.	.	+	+	43	.	.	.	+	.	1	+	+
Galium schultesii (Q-F)		3	3	3	4	3	1	2	2	2	100	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	1	.	.	.	.	14	.	.	.	.	.	.	.	.
Melampyrum nemorosum (Q-F)		2	1	1	3	1	3	4	+	1	100	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	+	.	.	14	.	.	.	.	.	.	.	.
Serratula tinctoria (M-A)		1	+	2	1	2	2	2	1	2	100	+	.	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.	–	+	.	1	+	.	.	.	43	.	.	.	.	.	.	.	.
Melittis melissophyllum (Q-F)		+	+	1	2	1	2	1	.	1	89	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	+	.	.	.	.	14	.	.	.	.	.	.	.	.
Campanula glomerata (M-A)		+	+	.	+	+	1	+	+	1	89	+	.	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	+	.	.	.
Hieracium umbellatum (Qrp)		+	+	+	1	+	1	1	.	+	89	+	.	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	+	.	14	.	.	.	.	.	+	.	+
Laserpitium prutenicum (M-A)		+	+	+	+	.	2	1	+	1	89	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Angelica sylvestris (M-A)		+	+	1	1	.	1	+	+	1	89	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Holcus mollis (Qrp)		.	.	+	2	1	1	1	1	+	78	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	+	1	1	.	.	1
Pyrus communis	b/c	.	+/+	1/+	+/+	/+	+/	+/+	.	+/+	78	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	/+	.	14	.	.	+/	/+	.	.	.	.
Viburnum opulus (Q-F)	b/c	.	.	+/+	/+	+/+	/+	.	+/+	+/+	67	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	/+	.	.	/+	.	.	.	18	.	.	.	.	.	.	.	–	.	.	.	.	/+	.	.	.
Astrantia major (Q-F)		.	.	1	+	+	.	.	+	+	56	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Peucedanum cervaria (T-G)		.	.	+	+	+	+	+	.	+	67	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	+	.
Stellaria graminea (M-A)		+	.	.	.	+	1	+	1	+	67	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	+	.	.	.	.	9	.	.	.	.	.	.	.	–	.	.	.	.	+	.	.	.
Lathyrus pratensis (M-A)		.	+	+	.	.	+	+	.	.	44	.	.	.	.	.	.	.	+	.	.	10	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	1	.	.	.
IV. D. *Pa-Q molinietosum*
Molinia caerulea (M-A)		.	.	.	.	.	.	.	.	.	–	1	2	2	2	+	+	1	2	1	2	100	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Lysimachia vulgaris M-A)		.	.	.	.	.	.	.	.	.	–	+	2	2	.	+	.	+	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Hypericum maculatum (C-U)		.	.	.	.	.	.	.	.	.	–	+	.	.	1	+	+	+	+	1	+	80	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	1	.	.	.	.	.
Juncus effusus (M-A)		.	.	.	.	.	.	.	.	.	–	.	+	.	r	+	.	+	.	.	r	50	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Cnidium dubium (M-A)		.	.	.	.	.	.	.	.	.	–	+	.	.	2	.	.	1	+	+	.	50	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Carex nigra (S-C)		.	.	.	.	.	.	.	.	.	–	.	+	+	.	.	.	.	+	.	1	40	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	+	.	14	.	.	.	.	.	.	.	.
Carex ovalis (C-U)		.	.	.	.	.	.	.	.	.	–	.	+	+	r	.	.	.	.	.	+	40	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Carex flacca		.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	1	+	+	+	40	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
V. D. *Pa-Q brachypodietosum*
Pimpinella saxifraga (F-B)		+	.	.	.	1	+	+	+	+	67	.	.	.	r	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	1	+	.	.	.	+	+
Sedum maximum (T-G)		.	+	.	.	+	+	+	.	+	56	.	.	.	.	.	.	.	.	.	.	–	+	.	+	.	.	.	.	r	.	.	.	27	.	.	+	.	.	.	.	14	.	.	.	.	.	.	.	+
Geranium sanguineum (T-G)		.	.	.	.	1	2	2	+	1	56	.	.	.	.	.	.	.	.	.	.	–	.	.	+	.	.	.	.	.	.	+	.	18	.	.	.	.	.	.	.	–	.	+	.	.	1	.	1	.
Euphorbia cyparissias (F-B)		.	.	.	.	+	+	.	.	.	22	.	.	+	.	.	.	.	.	.	.	10	.	r	.	.	.	.	.	.	.	.	1	18	.	.	.	.	.	.	.	–	.	.	.	+	.	+	+	+
Anthericum ramosum T-G)		.	.	.	.	+	.	+	.	.	22	+	.	.	.	r	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.	–	+	.	.	+	.	.	+	29	+	1	.	.	.	.	1	.
Brachypodium pinnatum (F-B)		.	.	.	.	1	1	1	.	1	44	.	.	.	.	.	+	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	+	.	14	+	1	.	.	1	.	.	.
Peucedanum oreoselinum (T-G)		.	.	.	.	+	1	.	.	.	22	+	.	.	.	.	.	.	.	.	.	10	+	.	.	.	.	.	.	+	.	.	+	18	.	.	1	.	.	.	.	14	.	.	.	.	.	.	+	+
Galium verum (T-G)		.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	+	+	+	+	.	.
VI. D. *Pleurozium schreberi* var.
Hypnum cupressiforme		.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	+	.	+	+	30	.	.	.	.	.	+	.	.	.	.	.	9	.	.	.	.	.	.	.	–	.	.	.	.	.	+	.	.
Pseudoscleropodium purum (V-P)		.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	1	1	2	2	40	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	+	.	.
Pyrola minor (V-P)		.	.	.	.	.	.	.	.	.	–	.	.	.	.	r	.	1	1	.	.	30	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
VII. D. *Asarum europaeum* var.
Galium mollugo (M-A)		.	.	+	+	1	+	.	+	1	67	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	+	+	+	+	.	1	+	55	.	+	.	.	.	.	.	14	.	.	.	.	1	.	+	+
Carex digitata (Q-F)		.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	+	.	.	.	10	2	1	2	1	1	2	1	1	1	1	.	91	.	+	.	+	.	.	.	29	.	.	.	.	.	.	.	.
Galium sylvaticum (Q-F)		.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	1	1	1	1	1	2	1	+	1	1	1	100	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Viola reichenbachiana (Q-F)		.	.	.	.	.	.	.	.	.	–	1	.	.	.	1	.	.	.	.	.	20	1	.	+	+	+	.	.	.	+	+	+	64	.	.	.	.	.	.	.	–	.	.	.	.	1	.	.	.
Lathyrus vernus (Q-F)		.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	.	+	1	+	1	.	.	+	+	+	.	64	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
VIII. Ch. *Querco-Fagetea* (Q-F)
Carpinus betulus	a,a2	.	1	1	.	.	.	.	1	.	33	+	.	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Carpinus betulus	b	.	1	+	1	.	.	.	1	.	44	1	.	.	.	+	.	.	.	+	.	30	.	1	+	1	.	.	.	.	+	1	2	55	.	.	.	+	.	.	.	14	.	.	+	.	.	.	.	.
Carpinus betulus	c	.	+	+	+	+	.	.	+	+	67	+	.	.	.	.	.	.	.	.	.	10	+	1	.	+	.	+	.	.	+	1	.	55	+	.	.	+	.	.	.	29	.	.	+	.	.	+	.	.
Fagus sylvatica	a,a2	.	.	.	.	.	.	.	.	.	–	.	.	.	.	+	.	.	.	1	.	20	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Fagus sylvatica	bc^b	.	.	.	.	.	.	.	.	.	–	.	+	+^	+	1	2	+	.	1	+	80	.	1	.	.	.	.	.	2	.	3	.	27	.	.	.	.	+	+	1^	43	+	+^	.	2	.	.	.	.
Fagus sylvatica	c	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	+	.	.	.	.	10	.	+	.	.	.	.	.	+	.	.	.	18	.	.	.	.	.	+	.	14	+	.	+	.	.	.	.	.
Melica nutans		+	2	2	2	2	2	3	1	1	100	2	1	1	+	1	2	2	1	1	1	100	2	1	1	1	1	1	1	1	1	1	1	100	.	3	3	2	1	2	1	86	2	1	+	1	2	.	3	2
Ajuga reptans		1	2	+	1	.	+	1	1	+	89	+	+	+	1	+	.	1	1	+	+	90	+	1	1	+	.	1	+	+	1	1	.	82	+	.	1	+	+	.	.	57	+	+	+	1	.	.	.	+
Anemone nemorosa		+	3	3	3	2	2	3	1	2	100	1	2	2	.	+	+	+	.	+	.	70	.	+	.	+	.	1	.	+	2	.	+	55	.	.	+	2	.	+	2	57	+	2	.	2	.	.	2	1
Poa nemoralis		.	1	1	1	1	+	1	+	1	89	1	+	+	1	1	1	+	.	1	r	90	.	.	.	.	+	.	.	.	1	.	.	18	+	.	.	+	1	+	.	57	+	+	.	.	3	1	.	.
Brachypodium sylvaticum		2	.	1	1	2	1	.	1	1	78	.	.	.	.	2	.	1	+	+	+	50	1	+	2	.	.	1	.	.	.	1	.	45	.	+	.	+	.	.	.	29	.	+	.	.	.	.	.	.
Hepatica nobilis		.	.	.	.	+	.	.	.	.	11	1	.	.	.	1	.	.	.	r	+	40	1	2	1	+	.	2	1	.	1	.	1	73	.	1	.	+	+	.	.	43	.	.	.	.	2	.	.	.
Atrichum undulatum		+	1	+	+	+	.	.	+	+	78	.	.	.	.	1	.	+	2	1	1	50	.	1	+	+	+	1	.	+	+	+	.	73	.	.	.	.	.	.	.	–	.	+	+	1	.	+	.	.
Viola riviniana		+	+	1	1	1	+	1	+	+	100	+	+	+	+	+	.	1	+	1	+	90	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	1	2	+	+
Scrophularia nodosa		.	.	+	.	+	+	.	+	+	56	.	.	.	.	.	+	.	+	.	.	20	.	.	.	.	.	.	+	.	.	.	.	9	.	.	.	.	+	.	.	14	.	+	.	.	.	.	.	.
Milium effusum		.	.	.	+	.	.	+	+	.	33	.	.	.	.	+	.	+	.	+	+	40	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	1	.	14	+	+	.	.	.	.	.	.
Festuca heterophylla		.	.	.	.	.	.	+	+	+	33	.	.	.	.	.	.	.	.	.	.	–	+	1	1	+	1	+	1	.	1	+	.	82	2	.	.	3	.	.	.	29	.	+	.	+	.	.	.	.
Festuca gigantea		.	.	.	.	.	.	.	.	.	–	.	+	+	.	1	+	+	+	+	+	80	.	+	+	.	.	.	.	.	.	+	.	27	.	+	+	.	+	+	.	57	+	+	.	.	+	.	.	.
IX. Ch., D*. *Quercetea robori-petraeae* (Qrp)
Hieracium lachenalii		+	+	+	+	.	+	+	+	.	78	.	+	+	+	.	+	+	.	1	+	70	.	.	.	.	.	.	.	.	.	.	.	–	1	.	.	+	+	+	.	57	.	+	.	+	.	1	.	1
Carex pilulifera		+	.	+	+	.	.	.	.	+	44	.	+	+	+	.	+	.	.	+	+	60	.	.	.	.	.	.	.	.	.	.	.	–	.	+	+	+	+	.	+	71	.	+	+	+	.	.	.	.
* *Polytrichastrum formosum*		.	+	1	+	+	+	+	.	+	78	.	+	+	.	+	.	+	.	+	2	60	.	+	.	.	.	.	+	1	+	+	.	45	.	.	.	.	.	.	+	14	.	.	.	.	.	1	+	.
* *Melampyrum pratense*		+	+	+	+	+	.	1	.	+	78	.	2	2	1	r	1	1	1	1	+	90	1	1	1	2	2	1	1	1	1	1	.	91	3	.	.	.	+	+	2	57	+	2	1	+	.	.	.	.
Festuca ovina		1	.	+	.	1	.	1	+	1	67	+	.	.	1	.	.	+	.	+	+	50	.	.	.	1	.	.	.	1	1	.	+	36	.	.	+	+	.	.	+	43	.	+	+	+	.	+	1	+
Calamagrostis arundinacea		.	.	.	.	.	.	.	.	.		1	.	.	.	.	.	+	1	.	+	40	2	2	1	1	2	1	1	1	1	1	.	91	.	2	.	1	+	+	.	57	.	1	+	.	.	.	.	.
* *Pteridium aquilinum*		+	+	.	.	.	.	.	.	.	22	+	.	.	+	2	.	.	.	+	2	50	2	1	1	2	1	2	2	2	2	2	r	100	.	.	2	+	2	1	.	57	3	+	1	+	.	.	+	1
X. Ch. *Vaccinio-Piceetea* (V-P)
Pinus sylvestris	a1,a	+	.	.	.	1	+	1	.	+	56	.	.	.	.	.	.	.	.	.	3	10	2	.	2	.	2	.	2	1	.	3	3	64	.	.	+	.	.	.	.	14	.	.	.	.	.	.	3	1
Juniperus communis	bc^b	.	.	1	+	.	.	.	+	.	33	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	1	.	.	.	.	14	.	.	^+	.	.	.	1	1
Juniperus communis	c	+	+	+	+	+	+	+	.	.	78	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	.	–	.	.	+	.	.	.	.	14	.	.	+	.	.	.	.	+
Vaccinium myrtillus		.	+	1	+	.	.	.	.	+	44	+	1	1	2	+	2	+	2	2	3	100	2	1	2	3	2	1	2	2	2	2	+	100	+	.	2	+	1	2	3	86	1	2	+	+	.	+	2	2
Rubus saxatilis		.	+	.	.	.	.	.	.	.	11	1	1	1	2	+	2	+	1	1	+	100	1	1	+	2	1	1	1	1	1	1	.	91	.	+	1	.	.	+	.	43	+	1	.	.	.	.	.	1
XI. Ch. *Trifolio-Geranietea* (T-G) et *Festuco-Brometea* (F-B)
Trifolium alpestre (T-G)		+	+	+	+	.	1	1	+	+	89	.	.	.	r	.	.	.	.	.	.	10	+	1	.	1	.	1	+	+	+	+	1	82	.	.	1	+	+	.	.	43	+	.	+	.	3	+	+	.
Hypericum perforatum (T-G)		+	.	+	+	+	+	+	+	.	78	+	.	.	.	+	.	.	.	+	+	40	.	.	.	.	.	.	+	.	+	+	.	27	.	.	.	.	+	+	.	29	.	.	+	.	+	1	+	+
Poa angustifolia (T-G)		1	+	1	1	1	+	1	+	1	100	1	.	.	1	.	.	1	1	2	.	50	.	.	.	.	.	.	.	.	.	.	.		+	+	1	+	.	.	+	71	.	+	1	1	.	2	1	1
Fragaria vesca (T-G)		2	+	+	1	1	1	1	+	1	100	1	2	2	2	1	2	2	2	1	.	90	1	+	1	+	1	1	1	+	+	+	1	100	+	+	2	.	+	1	+	86	2	2	1	2	1	+	2	3
Vicia sepium (T-G)		1	+	2	1	.	+	+	+	+	89	+	.	.	.	.	.	.	+	.	.	20	+	+	+	+	1	1	1	+	+	.	1	91	+	+	.	+	.	.	.	43	.	.	+	+	.	.	.	.
Clinopodium vulgare (T-G)		1	+	2	2	+	1	+	+	1	100	+	.	.	.	.	.	1	.	.	.	20	+	+	1	.	.	1	+	1	+	1	+	82	2	1	1	.	.	.	.	43	.	.	1	1	2	1	+	+
Vicia cassubica (T-G)		.	.	.	.	.	+	.	+	+	33	+	.	.	.	.	.	.	.	.	.	10	1	+	1	+	1	1	1	1	+	1	.	91	.	+	+	.	.	.	+	43	.	.	.	.	3	2	+	+
Polygonatum odoratum (T-G)		.	.	.	+	+	+	2	+	1	67	+	.	.	+	+	.	.	.	.	.	30	+	+	1	+	+	+	.	.	+	.	+	73	+	+	1	+	+	+	.	86	.	+	+	+	.	.	+	+
Astragalus glycyphyllos (T-G)		+	.	.	.	+	.	.	1	1	44	+	.	.	.	.	+	.	.	.	.	20	.	.	.	.	.	r	+	+	.	+	+	45	+	.	.	+	+	.	.	43	+	.	1	+	+	+	.	.
Filipendula vulgaris (F-B)		.	.	.	.	.	.	.	.	.	–	.	+	+	1	.	+	r	+	.	.	60	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	+	+	.	.	.	.	.	.
XII. Ch. *Molinio-Arrhenatheretea* (M-A)
Veronica chamaedrys		1	1	1	1	+	+	1	1	1	100	+	+	+	+	+	+	+	2	+	+	100	1	2	1	+	1	1	1	1	1	1	+	100	+	.	2	1	+	.	+	71	+	+	2	2	1	1	1	+
Dactylis glomerata		1	.	.	.	+	+	+	+	+	67	.	+	+	.	.	.	.	.	.	.	20	.	1	.	.	.	+	.	.	.	.	+	27	.	+	.	.	.	.	.	14	.	.	.	.	+	.	.	.
Poa pratensis		.	+	1	+	.	+	+	.	+	67	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	+	+	+	.	+	36	.	.	+	.	.	.	.	14	.	.	+	.	.	+	.	.
Rumex acetosa		.	+	.	.	.	.	+	+	.	33	+	r	r	+	.	.	r	.	.	r	60	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	r	.	.	.	.	+	.	.
Festuca rubra s. s.		+	+	.	.	1	+	1	+	+	78	+	.	.	+	+	.	+	1	+	.	60	.	.	.	.	.	.	.	.	.	.	.	–	+	+	.	.	.	.	+	43	.	+	2	2	+	+	.	.
XIII. Ch. *Calluno-Ulicetea* (C-U)
Agrostis capillaris		.	.	.	.	+	+	1	.	.	33	1	+	+	.	1	1	2	+	2	.	80	.	1	.	.	.	+	+	.	.	.	+	36	+	.	1	.	.	2	+	57	.	+	2	2	1	2	.	.
Veronica officinalis		+	.	+	.	.	+	.	.	+	44	.	.	.	+	+	.	+	+	+	+	60	+	.	.	.	.	+	.	.	.	.	1	27	+	.	.	+	.	.	.	29	.	+	+	.	+	+	.	+
Potentilla erecta		+	1	+	+	.	.	.	+	.	56	+	1	1	+	.	+	1	1	+	r	90	.	.	.	+	+	+	.	.	+	+	.	45	.	.	.	.	.	1	+	29	+	+	.	.	+	.	.	+
Solidago virgaurea s. s.		+	.	.	+	+	.	2	+	+	67	+	.	.	.	+	+	.	.	.	+	40	.	.	.	+	.	+	+	.	.	.	.	27	+	+	+	+	.	+	+	86	.	1	+	+	.	+	+	1
XIV. Ch. *Rhamno-Prunetea*
Crataegus monogyna	b	.	1	1	1	1	+	+	.	.	67	.	.	.	.	+	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Crataegus monogyna	c	.	+	+	+	+	+	+	.	+	78	.	.	.	.	.	+	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	+	.	+	29	.	.	.	.	.	+	.	.
Frangula alnus	b	1	.	.	1	.	1	+	+	.	56	+	2	2	+	.	+	1	+	+	.	80	.	.	.	+	.	.	.	.	.	.	.	9	.	.	3	.	+	+	1	57	.	+	.	.	.	+	1	1
Frangula alnus	c	1	.	.	+	.	+	+	+	+	67	.	.	.	1	.	+	+	2	+	+	60	.	.	.	.	.	+	.	.	+	+	.	27	+	.	+	+	.	.	.	43	.	+	.	+	.	+	+	+
Prunus spinosa	b	+	.	.	.	+	.	.	.	.	22	.	.	.	+	.	+	r	.	.	.	30	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	–	.	.	.	.	.	.	+	.
Prunus spinosa	c	+	.	.	.	+	+	.	+	.	44	.	+	+	.	r	+	.	+	.	.	50	.	.	.	.	.	.	.	.	.	.	.	–	+	.	.	.	+	.	.	29	.	+	.	+	.	.	+	.
XV. Others
Quercus robur [*Q.* x *rosacea**]	a1,a	4	4	4	4	4	4	4	3	4	100	4	4	4	4	2	4*	4	4	4	3	100	.	.	.	.	.	.	.	.	.	.	.	–	.	.	4	.	4	4	4	57	.	4	.	.	4	4	2	4
Quercus robur	a2	.	1	.	.	.	.	.	.	.	11	1	.	.	.	.	.	1	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.		.	.	.	.	.	.	1	.
Quercus robur	b	+	+	+	.	.	.	.	+	+	56	1	.	.	.	.	.	.	+	.	1	30	.	.	+	.	.	.	.	.	.	.	+	18	.	.	1	.	.	.	.	14	.	.	.	.	.	+	1	2
Quercus robur [*Q.* x *rosacea**]	c	1	1	1	.	+	.	.	.	+	56	+	2	2	+	+	.	1	+	1	+	90	.	.	.	.	.	+	.	.	.	.	.	9	.	.	+	.	.	+*	1	29	.	2	+	.	.	1	+	1
Quercus petraea	a1,a	.	.	.	.	1	.	.	.	1	22	+	.	.	.	3	1	.	.	1	.	40	4	5	3	4	4	3	4	4	4	2	.	91	4	4	.	4	.	.	.	43	.	.	4	5	.	1	.	.
Quercus petraea	a2	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	1	.	2	1	1	1	1	1	1	2	.	82	.	.	.	.	.	.	.	–	.	.	.	.	.	.	2	.
Quercus petraea	b	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	1	.	2	1	1	.	.	+	.	1	1	64	.	.	.	.	.	.	.	–	.	.	2	1	.	.	+	.
Quercus petraea	c	.	.	.	.	.	.	.	.	.	–	.	.	.	.	1	+	.	.	+	.	30	1	1	1	1	1	.	1	1	1	1	+	91	+	1	.	+	.	.	.	43	.	.	1	+	.	+	.	.
Sorbus aucuparia	a2^,b	.	1^	.	.	.	.	.	.	.	11	1	.	.	.	.	.	.	.	.	.	10	.	.	.	+	.	.	1	+	+	+	+	55	.	.	.	.	.	.	.	–	.	.	.	.	.	1	.	.
Sorbus aucuparia	c	.	+	+	.	+	+	+	+	+	78	+	.	.	.	.	+	+	r	+	r	60	+	r	+	+	+	+	+	+	+	+	.	91	.	+	.	+	.	+	+	57	.	.	+	+	+	+	.	+
Convallaria majalis		+	2	3	3	1	2	2	+	2	100	3	1	1	+	+	+	+	+	2	1	100	2	2	+	1	2	2	2	2	2	1	+	100	1	2	2	2	1	3	.	86	1	+	.	+	.	1	3	2
Luzula pilosa		+	1	.	+	.	+	.	+	+	67	+	+	+	+	+	+	1	+	+	.	90	1	1	.	1	1	2	1	1	1	.	.	73	+	.	+	+	.	+	+	71	.	+	1	+	.	+	.	1
Moehringia trinervia		.	.	.	.	+	+	1	+	.	44	.	.	.	r	.	1	r	+	.	+	50	1	.	1	.	1	+	+	+	.	+	+	73	+	+	+	+	.	.	.	57	1	r	+	+	+	+	.	1
Anthoxanthum odoratum		+	+	2	1	1	.	1	.	1	78	.	+	+	.	.	1	.	.	.	+	40	1	.	+	.	.	+	.	+	+	.	.	45	+	.	.	.	.	1	+	43	+	+	1	1	+	1	.	1
Mycelis muralis		.	.	.	.	.	.	.	.	.	–	.	.	.	+	+	1	+	1	.	+	60	1	1	1	.	.	.	+	+	+	+	.	64	.	.	.	+	+	+	.	43	+	.	+	1	.	r	.	.
Maianthemum bifolium		.	1	2	2	1	1	2	+	1	89	+	+	+	+	+	+	1	1	1	r	100	1	.	.	+	.	.	.	1	+	+	+	55	2	.	.	2	+	+	.	57	+	+	+	1	1	+	.	.
Oxalis acetosella		+	3	.	1	.	.	.	.	1	44	.	.	.	2	1	1	2	2	2	+	70	+	1	+	.	1	.	.	+	+	1	.	64	.	.	.	.	1	+	.	29	1	+	.	.	.	.	.	.
Plagiomnium affine		.	+	.	.	.	.	+	.	.	22	+	.	+	.	+	.	1	1	1	+	70	.	+	2	+	.	.	.	+	+	1	+	64	.	+	.	.	.	.	.	14	.	.	.	+	.	+	.	.
Thalictrum aquilegiifolium		+	+	.	+	.	.	.	.	+	44	.	.	.	.	.	.	.	.	.	.	–	1	+	.	.	.	.	1	+	+	+	+	64	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.
Hieracium murorum		.	.	.	.	+	.	.	.	+	22	.	.	.	.	.	.	.	.	.	.	–	1	+	+	+	.	1	1	1	+	+	.	82	1	.	.	+	.	.	.	29	.	.	+	1	.	+	.	+
Rubus idaeus		.	.	.	.	.	.	.	.	.	–	.	.	.	r	1	+	+	+	.	+	60	1	.	+	.	.	.	.	.	.	.	2	27	.	.	.	.	+	+	.	29	+	r	.	.	.	+	.	.
Campanula rotundifolia		.	.	.	.	.	.	.	.	.	–	+	.	.	1	+	+	.	r	+	+	70	.	.	+	.	.	+	.	.	.	+	.	27	.	.	.	.	.	.	.	–	.	+	.	.	+	1	.	.
Geum urbanum		.	.	.	.	.	.	.	.	.	–	.	.	.	+	1	+	+	+	.	.	50	+	.	+	.	.	.	.	.	.	.	+	27	.	.	+	.	.	+	.	29	+	r	+	+	+	r	.	.
Urtica dioica		.	.	.	.	.	.	.	.	.	–	.	.	.	+	1	+	+	+	+	+	70	+	.	+	.	+	.	.	.	.	+	+	45	.	.	.	.	+	.	.	14	+	+	.	.	+	.	.	.
Galeopsis pubescens		.	.	.	.	.	.	.	.	.	–	.	.	.	+	.	1	+	1	+	.	50	.	.	+	.	.	.	+	.	.	.	.	18	.	.	.	.	+	+	.	29	+	+	.	.	.	.	.	.
Galeopsis tetrahit		.	.	.	.	.	.	.	.	.	–	.	.	.	+	+	1	+	.	+	+	60	.	.	.	.	+	.	.	.	.	.	.	9	.	.	.	.	+	+	.	29	+	.	.	.	.	r	.	.
Impatiens parviflora		.	.	.	.	.	.	.	.	.	–	.	.	.	1	1	+	+	+	+	1	70	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	4	+	.	29	+	.	.	.	.	.	.	.
Dryopteris carthusiana		.	.	.	.	+	.	.	.	.	11	.	+	+	+	r	.	+	r	+	r	80	1	.	+	.	+	.	.	.	.	+	+	45	.	.	.	.	.	.	.	–	.	.	.	+	.	+	.	+

Sporadic species: VIII.: *Acer platanoides* c 13(r); *A. pseudoplatanus* b 43, c 43; *Adoxa moschatellina* 10,43; *Asarum europaeum* 10,30; *Cerasus avium* b 7, bc 41, c 7,43; *Dactylis polygama* 13,14(2),15,19,35,38,39,43; *Daphne mezereum* c 21; *Dryopteris filix-mas* 13,19(r),42; *Epipactis helleborine* 13,16(1),17; *Euonymus verrucosus* b 7,33(1), c 7,33; *Eurhynchium angustirete* 14; *Fraxinus excelsior* b 10, c 10,12,29; *Galeobdolon luteum* 10,30,31,32(2),34; *Galium odoratum* 31,34(1); *Lilium martagon* 5,21,35; *Malus sylvestris* a2 17,18, b 10,18, c 10,14,39; *Neottia nidus-avis* 34; *Padus avium* b 10,43, c 10,14,15,16(r),18(r),31,36,37,38,43; *Phyteuma spicatum* 5,9,38; *Polygonatum multiflorum* 2,34; *Pulmonaria obscura* 1,3,4,34,42; *Ranunculus lanuginosus* 42; *Sanicula europaea* 34; *Stellaria holostea* (Q-F) 10,21,28(1),30; *Tilia cordata* a2 10(1), b 10(1), c 10,34; *Ulmus glabra* c 17; *Viola reichenbachiana* et *riviniana* 15(1),31,32,34,35,37,40(2),41(1); **IX.:** *Hieracium laevigatum* 15,17; *Plagiothecium laetum* 16; **X.:** *Chimaphila umbellata* 44; *Hylocomium splendens* 18; *Koeleria grandis* 44,45; *Picea abies* a2 14,17,18, b 39(r), bc 14,15(2),35,36(2),37(1),38(2),41, c 14(r),18(r),38,41; *Pleurozium schreberi* 18(1),30,37,43,44,45; *Trientalis europaea* 18; *Vaccinium vitis-idaea* 20,25,40,44,45(1); *Viscaria vulgaris* 5,6,7,9,30,33,44,45(1); **XI.:** *Acinos arvensis* (FB) 17; *Agrimonia eupatoria* 42; *Ajuga genevensis* (FB) 30,45; *Asperula tinctoria* (FB) 20; *Campanula rapunculoides* 41,42; *Coronilla varia* 2,6,7(1),30,40,41; *Dianthus superbus* s.s. (FB) 13,16(r); *Galium album* 10,18,43; *Knautia arvensis* 5,6(1),7(1),8,9,10,15,20,33,38,42,43,44; *Origanum vulgare* 22; *Poa compressa* (FB) 43; *Potentilla heptaphylla* (FB) 44; *Silene nutans* subsp. *nutans* 14,20,27,39,42; *Thalictrum minus* (FB) 20,24,25,27,29(r),30; *Trifolium medium* 5,7,8,9; *Veronica spicata* (FB) 44; *Vincetoxicum hirundinaria* 7,21,30(1),44,45; **XII.:** *Achillea millefolium* 1,4,7(1),8,10,40,41,43; *Agrostis gigantea* 15(2),38(1); *Arrhenatherum elatius* 43; *Bellis perennis* 40; *Campanula patula* s.s. 26; *Carex hirta* 13(1),16(1),17,18,19,27,33; *Centaurea jacea* 5,9; *Cerastium holosteoides* 42; *Festuca pratensis* 42; *Lysimachia nummularia* 10,16(1),17(r); *Phleum pratense* 8,9; *Pimpinella major* 3,5,6,7(1),9(1); *Plantago lanceolata* 5,6,7,8; *P. major* 40; *Prunella vulgaris* 16(r),17,41; *Sanguisorba officinalis* 13,16(r); *Taraxacum officinale* 16(r),17,18(r),19,31,34,39(r),40,41,42; *Trifolium pratense* 40; *T. repens* 40,41; *Trollius europaeus* 5,6,8; *Vicia cracca* 42; **XIII.:** *Danthonia decumbens* 44; *Genista tinctoria* 2,3,6,7(1),8,18,42,43(1); *Hieracium pilosella* 8,9,28,43,44; *Luzula multiflora* 1,2,5,8,43; *Pohlia nutans* 12(r); *Polytrichum juniperinum* 23,28; *Viola canina* 21,22,24,25,26,27; **XIV.:** *Cornus sanguinea* b 3,5,6(1),9, c 3,6,9,10; *Crataegus laevigata* b 10,11,12,13(1),14,16(1),17(2),18,19,39, c 10,13,16,18,38; *C. rhipidophylla* var. *rhipidophylla* b 16,17, c 14,16; *Euonymus europaea* c 5,6,7,9,10,32,42; *Rhamnus cathartica* b,bc 30,33(1), c 6,7,13,17(r),32,33,36(r),40; *Rosa canina* 10,17(r),32; *Rubus gracilis* 13,14; *R. plicatus* 16,18; **XV.:** *Abies alba* c 27; *Adenophora liliifolia* 4,8; *Alliaria petiolata* 14(1),19(1),35,38; *Aquilegia vulgaris* 40; *Betula pendula* a 4(1),9, a1 10,29, a2 29, b 1(1),30, c 1; *Brachytheciastrum velutinum* 28,31,34,40,41; *Brachythecium albicans* 40; *B. rutabulum* 14,16,17,19,22,25,34,43; *B. salebrosum* 31,34,40,41; *Calamagrostis epigejos* 11,13,14,19(1); *Carex acutiformis* 17; *C. spicata* 41; *Centaurea phrygia* 1,4; *Cerastium arvense* 43; *Ceratodon purpureus* 22; *Chaerophyllum temulum* 17(r),32; *Chamaenerion angustifolium* 30; *Crataegus* sp. c 14; *Cruciata glabra* 45(1); *Deschampsia flexuosa* 14,16,18,19,36,38; *Digitalis grandiflora* 4,5,31,44; *Epilobium montanum* 22; *Equisetum arvense* 13(r),16; *Erodium cicutarium* 38; *Fallopia convolvulus* 14,15(1),19,22,32,35,38(1); *Galium aparine* 15(1),35,36,38(1),39,42,43; *G. mollugo* et *dumetorum* 32,34,40(1),41; *Geranium pratense* 2,6; *G. robertianum* 10(r),14,15,41; *Glechoma hederacea* 13,16; *Heracleum sibiricum* 4,9; *Hypochoeris radicata* 16(r),40; *Juncus conglomeratus* 12; *Kindbergia praelonga* 18,43; *Lapsana communis* s.s. 30; *Linaria vulgaris* 43; *Lupinus polyphyllus* 13(r),16,17,18(2),36; *Mentha arvensis* 16,17(r); *Oxyrrhynchium hians* var. *hians* 43; *Padus serotina* b 13,17,43(1), c 14(r),15,16,18,19,43; *Phalaris arundinacea* 18; *Picris hieracioides* 42; *Plagiomnium cuspidatum* 14,16(1),18; *Populus tremula* a 1,4(1), b 3,4,9,10,45, c 1,3,4(1),6,8,9,45; *Prunus* sp. c 43; *Pyrus pyraster* b 14, c 13,14,16(r),18,37,39,43; *Robinia pseudacacia* c 39(r); *Rosa* sp. 15,38; *Rubus corylifolius* 12; *Rubus* sp. 44(2),45(1) *R. sprengelii* 14; *R. x corylifolius* 11,17,19; *Rumex acetosella* 5,19(r),44; *Sciuro-hypnum oedipodium* 10,16,18(1),40,41,43; *Scutellaria galericulata* 13,16(1); *Stellaria media* 14(2); *Torilis japonica* 22,40,42; *Vicia hirsuta* 12(r); *Viola* sp. 36,38.

Table A26. *Potentillo albae-Quercetum petraeae molinietosum* (relevés 1-4) and *typicum* (relevés 5-23) in stage II of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
ID-1		56	56	56	48	48	48	43	19	19	56	56	20	20	17	29	59	43	16	55	42	59	59	43	
ID-2		2	2	3	5	3	3	7	1	1	3	3	3	4	6	11	4	9	19	14	4	4	6	9	
ID-3		6	7	10	4	28	15	13	25	30	19	30	1	1	2	3	2	17	6	37	11	6	11	18	
Date (year)		2006	2006	2006	1976	1976	1976	1959	1983	1987	2006	2006	2006	2006	1995	1980	1993	1958	1972	1975	1981	1993	1993	1958	1-23
Density of tree layer	a1,a [%]	55	55	40	70	60	70	75	75	40	30	30	75	50	75	70	70	80	100	80	75	80	75	80	
Density of tree layer	a2 [%]	-	-	40	-	-	-	-	-	10	40	70	5	-	-	-	-	-	10	-	-	-	-	-	%
Density of shrub layer	b [%]	+	10	5	-	-	-	+	20	20	10	5	10	15	+	+	20	-	5	-	+	20	5	10	
Cover of herb layer	c [%]	65	50	50	70	80	80	70	80	70	70	60	60	80	75	50	80	70	90	80	80	80	80	70	
Cover of moss layer	d [%]	-	5	5	-	10	+	10	-	10	35	15	5	15	-	+	+	5	70	+	+	-	-	+	
Area of relevé		400	400	200	200	200	200	400	400	400	400	200	300	100	150	200	100	300	300	100	100	130	170	300	
Location (ATPOL)		BC66	BC66	BC76	BD39	BD39	BD39	BC89	DD92	DD83	BC66	BC66	CD39	CD39	BC66	CD17	BC98	BC99	BC19	BC72	BD49	BC98	BC88	BC99	
Total number of species		62	64	49	38	19	36	38	49	39	45	55	62	36	38	32	35	47	61	29	35	26	30	36	
Number of mosses, liverworts and lichens species		-	4	3	-	6	3	3	-	3	5	4	4	4	-	1	2	4	12	3	4	-	-	4	
I. Ch.*, D.^ *Potentillo albae-Quercetum*																									
Ch. *Quercetalia pubescentis*																									
^ *Galium boreale* (M-A)		.	1	.	+	.	1	2	.	+	+	1	+	.	.	1	+	1	+	.	1	2	2	1	70
^ *Betonica officinalis* (M-A)		+	.	.	.	+	+	+	.	.	.	.	.	r	+	.	1	+	.	.	.	.	+	+	43
Campanula persicifolia		.	.	.	.	.	.	+	+	+	.	.	.	r	.	+	+	.	.	1	.	+	.	.	35
* *Carex montana*		1	+	+	+	.	1	.	1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	30
Lathyrus niger		.	.	.	.	.	.	.	.	.	r	.	.	.	.	+	.	1	1	2	+	.	.	+	30
* *Potentilla alba*		.	.	r	.	.	.	.	.	.	.	+	.	.	r	.	.	.	.	.	+	.	+	.	22
Hypericum montanum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	+	.	+	17
Platanthera bifolia		.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	9
* *Ranunculus polyanthemos*		.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Primula veris		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	4
II. D. *Pa-Q molinietosum*																									
Molinia caerulea (M-A)		3	+	.	2	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22
Lysimachia vulgaris (M-A)		+	2	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17
Hypericum maculatum (C-U)		1	1	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	17
Juncus effusus (M-A)		r	+	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
III. D. *Pleurozium schreberi* var.																									
Pinus sylvestris (V-P)	a1,a	.	.	3	3	3	3	3	2	3	3	3	.	.	.	.	.	1	1	.	.	.	2	.	52
Pinus sylvestris (V-P)	c	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	9
Pseudoscleropodium purum (V-P)		.	+	2	.	r	.	1	.	.	3	2	+	+	.	.	.	.	.	.	.	.	.	.	35
Vaccinium vitis-idaea (V-P)		.	.	+	+	.	1	+	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	26
Pleurozium schreberi (V-P)		.	.	.	.	r	.	+	.	1	1	1	+	.	.	.	.	.	.	.	.	.	.	.	26
IV. Ch. *Querco-Fagetea*																									
Corylus avellana	b	.	.	1	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	2	2	1	30
Corylus avellana	c	.	.	+	.	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	22
Melica nutans		+	1	2	1	.	+	+	2	1	+	1	2	r	1	2	2	1	.	.	+	2	+	1	87
Poa nemoralis		1	+	.	1	.	.	.	.	.	1	+	1	1	.	+	.	.	+	+	+	1	+	2	61
Viola riviniana		1	1	+	.	.	.	.	+	+	r	+	1	r	.	.	.	.	.	.	.	.	.	.	39
Dryopteris filix-mas		.	+	1	.	.	.	.	.	.	+	+	+	+	.	.	.	.	+	.	.	.	.	+	35
Ajuga reptans		+	+	+	.	.	.	.	.	.	.	.	+	+	.	.	.	1	.	.	.	.	.	+	30
Atrichum undulatum		.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	2	+	+	.	.	+	30
Brachypodium sylvaticum		+	1	+	.	.	.	+	.	.	.	2	.	.	.	+	.	.	.	.	.	.	.	.	26
Viola reichenbachiana		.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	1	+	.	+	.	26
Milium effusum		.	.	+	.	.	2	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	22
Festuca heterophylla		.	.	.	.	.	.	1	.	.	.	.	.	.	.	+	.	.	3	3	.	.	.	1	22
Hepatica nobilis		.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	1	2	.	.	.	+	.	.	22
V. Ch., D.* *Quercetea robori-petraeae*																									
Calamagrostis arundinacea		.	+	1	1	2	2	2	1	.	2	.	r	1	.	1	.	1	+	.	.	3	1	2	70
Festuca ovina		+	.	.	1	1	1	1	2	+	.	.	.	1	+	1	1	2	1	3	1	.	.	.	65
* *Polytrichastrum formosum*		.	.	2	.	+	.	.	.	+	+	.	.	+	.	.	.	.	1	.	.	.	.	+	30
Hieracium lachenalii		.	.	.	+	.	1	.	.	.	.	.	.	r	.	.	.	.	+	1	.	+	.	.	26
VI. Ch. *Vaccinio-Piceetea* (V-P)																									
Picea abies	a2^b/c	.	+/	/r	.	.	.	.	.	.	+^1/	.	.	.	.	.	.	.	1/	.	/+	.	.	.	22
Vaccinium myrtillus		2	1	.	3	4	3	3	4	+	1	1	2	.	r	.	.	2	.	.	.	+	2	2	70
Rubus saxatilis		.	.	.	.	.	1	1	.	+	.	.	1	.	+	.	+	+	.	.	.	1	.	1	39
VII. Ch. *Trifolio-Geranietea*, *Festuco-Brometea**																									
Fragaria vesca		+	2	+	.	.	1	2	2	1	.	2	1	+	.	.	.	+	.	2	.	.	.	+	57
Polygonatum odoratum		.	.	.	1	.	.	+	+	+	.	.	+	.	.	1	+	.	.	1	+	.	+	.	43
Poa angustifolia		1	.	.	1	.	+	.	1	+	.	.	+	.	.	+	+	.	.	.	.	.	.	.	35
Clinopodium vulgare		.	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	1	.	1	1	.	.	1	30
Hypericum perforatum		.	.	.	1	+	.	.	+	+	.	.	1	.	.	.	.	.	+	.	.	.	+	.	30
Vicia cassubica		.	.	.	.	.	.	.	+	.	r	.	.	.	.	.	2	1	.	.	.	2	+	1	30
Vicia sepium		.	1	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	+	.	.	.	+	26
* *Euphorbia cyparissias*		.	.	.	.	.	.	.	.	+	.	+	+	+	.	.	.	.	+	.	.	.	.	.	22
Galium album		+	+	.	.	.	.	.	.	.	.	+	1	2	.	.	.	.	.	.	.	.	.	.	22
VIII. Ch. *Molinio-Arrhenatheretea* (M-A)																									
Veronica chamaedrys		+	+	.	.	.	.	1	1	+	.	+	+	.	.	+	+	1	+	1	+	+	+	1	70
Festuca rubra s. s.		+	+	.	.	.	1	.	.	.	.	+	1	.	.	1	.	.	.	.	.	+	.	.	30
Carex hirta		2	2	.	.	.	.	.	.	+	.	+	r	.	.	.	.	.	+	.	.	.	.	.	26
Deschampsia caespitosa		2	1	1	.	.	.	+	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	22
IX. Ch. *Calluno-Ulicetea* (C-U)																									
Veronica officinalis		+	+	.	.	.	.	+	.	.	.	+	+	r	.	.	+	+	+	1	+	.	+	.	52
Solidago virgaurea s. s.		1	.	+	1	+	+	.	1	+	.	.	+	r	.	.	1	.	.	.	+	1	+	.	57
Agrostis capillaris		.	+	+	.	.	.	+	.	1	1	.	+	.	.	.	2	.	.	.	.	.	+	.	35
Potentilla erecta		+	r	r	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	22
X. Others																									
Quercus petraea [*Q* . x *rosacea* ^]	a1,a	.	.	.	4	3	3	.	3	1	.	.	4;1^	2	.	4	4	4	5	5	5	5	4	4	70
Quercus petraea [*Q* . x *rosacea* ^]	a2	.	.	.	.	.	.	3	.	1	.	1^	1	.	.	.	.	1	1	.	.	.	.	2	30
Quercus petraea	b	.	.	.	.	.	.	+	.	1	.	.	1	1	.	.	.	.	.	.	.	.	.	1	22
Quercus petraea [*Q* . x *rosacea* ^]	c	.	.	.	+^	+^	+^	1	.	.	+	.	1	3	.	+	.	1	+	1	+	.	1	1	61
Quercus robur	a1,a	4	4	1	.	.	.	.	1	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	22
Quercus robur	a2	.	.	3	.	.	.	.	.	.	2	3	.	.	.	.	.	.	.	.	.	.	.	.	13
Quercus robur	b/c	.	.	+/+	.	.	.	.	2/+	.	1/+	+/+	.	.	/+	.	.	.	.	.	.	.	.	+/	26
Frangula alnus	b	.	2	.	.	.	.	.	+	1	.	+	+	.	+	.	.	.	.	.	+	.	.	.	30
Frangula alnus	c	+	1	.	1	.	.	.	+	+	.	+	+	1	+	.	.	+	.	+	+	.	.	.	52
Sorbus aucuparia	b;a2^	.	.	.	.	.	.	.	.	.	1;+^	.	+	.	.	.	.	.	.	.	.	+	.	.	13
Sorbus aucuparia	c	.	+	.	1	.	+	+	+	+	+	+	+	r	.	+	.	+	+	1	.	.	+	+	70
Padus serotina	b/c	r/	/+	/+	.	.	.	.	.	.	+/	/+	1/+	r/r	.	.	.	.	.	.	.	.	.	.	30
Convallaria majalis		1	+	.	1	2	1	1	1	.	1	+	1	2	4	3	3	1	.	.	.	2	2	1	78
Moehringia trinervia		+	+	+	.	.	+	1	1	1	+	1	+	.	1	+	.	+	5	+	.	.	+	.	70
Melampyrum pratense		+	.	.	2	.	+	+	1	+	.	.	.	.	+	.	1	1	.	2	4	1	1	+	61
Luzula pilosa		+	+	+	1	.	1	1	1	+	+	+	1	.	r	.	+	+	.	.	.	.	+	1	70
Pteridium aquilinum		r	.	1	3	1	2	1	1	+	+	.	.	.	4	.	.	2	.	.	.	.	.	1	52
Mycelis muralis		1	.	+	.	.	.	1	.	.	.	.	1	+	+	+	.	1	2	.	.	.	+	+	48
Dryopteris carthusiana		+	+	1	.	.	.	+	.	.	1	+	+	.	.	.	.	.	.	.	+	.	+	.	39
Rubus idaeus		+	+	2	.	.	.	+	.	.	1	+	+	.	+	.	.	.	+	.	.	.	.	.	39
Plagiomnium affine		.	.	+	.	.	+	.	.	.	+	+	1	1	.	.	.	1	.	.	.	.	.	1	35
Maianthemum bifolium		+	1	+	1	.	.	.	1	.	2	.	.	.	.	.	.	+	.	.	.	.	+	.	35
Oxalis acetosella		+	2	1	.	.	.	.	.	.	2	1	.	r	+	.	.	.	.	.	.	.	.	.	30
Sciuro-hypnum oedipodium		.	+	.	.	.	.	.	.	1	1	+	+	+	.	1	.	.	.	.	.	.	.	.	30
Impatiens parviflora		1	1	2	.	.	.	.	.	.	+	+	.	.	r	.	.	.	.	.	.	.	.	.	26
Anthoxanthum odoratum		.	.	+	.	.	.	1	+	3	.	+	.	.	.	.	.	+	.	.	.	.	.	.	26
Hieracium murorum		.	.	.	.	.	.	.	+	+	.	.	+	+	.	.	+	1	.	.	.	.	+	+	35
Fallopia convolvulus		r	+	+	.	.	.	.	.	.	.	+	.	.	2	+	.	.	.	.	+	.	.	.	30
Galeopsis tetrahit		+	+	.	.	.	1	.	.	.	.	.	.	.	+	r	.	+	.	.	.	.	+	.	30
Calamagrostis epigejos		1	.	.	.	.	.	.	.	.	1	.	+	+	.	.	.	.	+	.	.	.	.	.	22
Galeopsis pubescens		+	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	.	1	.	.	.	22

Sporadic species: IV.: *Acer platanoides* b 16(2), c 11(r),19(r); *A. pseudoplatanus* b 16, c 20; *Anemone nemorosa* 8,9,16(2),21; *Carex digitata* 8(1),15,17(1),23(2); *Carpinus betulus* c 15; *Cephalanthera damasonium* 18; *Cerasus avium* b 12; *Dactylis polygama* 2,14,22(2); *Daphne mezereum* c 23; *Epipactis helleborine* 1(r); *Fagus sylvatica* a2 11(3), b 1(1),11(1),14, c 1(r),11,14; *Festuca gigantea* 2,3,11,14; *Fraxinus excelsior* c 20; *Galeobdolon luteum* 15; *Galium sylvaticum* 17,23; *Lathyrus vernus* 17,23(1); *Lilium martagon* 8,14; *Lonicera xylosteum* b 16; *Malus sylvestris* b 2, c 4,5,12; *Melampyrum nemorosum* 4(1),19(2); *Padus avium* b 10,11, c 3(r),10,11,14(r); *Phyteuma spicatum* 14; *Ribes spicatum* b 10,11; *R. uva-crispa* c 11; *Scrophularia nodosa* 2,6,12; *Ulmus glabra* a2 11, c 11; *U. minor* c 4,11; *Viburnum opulus* c 8,12; *Viola reichenbachiana* et *riviniana* 4,6; **V.:** *Carex pilulifera* 1,2; *Dicranella heteromalla* 5,6,17,20; *Hieracium laevigatum* 4(1),18(2),22; *H. sabaudum* 1,16(1); *H. umbellatum* 4(1),19(1),20; *Holcus mollis* 8(1); *Plagiothecium laetum* 6,18; **VI.:** *Chimaphila umbellata* 8; *Dryopteris dilatata* 3,10; *Galium rotundifolium* 7; *Hieracium pilosella* 9,13(1),17; *Hypnum cupressiforme* 17,18(1),19; *Juniperus communis* b 8(1),13(1),18, c 8,13(2),18,20; *Leucobryum glaucum* 20; *Orthilia secunda* 4(1),8,18(1); *Plagiothecium curvifolium* 5; *Pyrola minor* 1,18; *Trientalis europaea* 8,9; **VII.:** *Acinos arvensis** 16,21; *Anthericum ramosum* 4,15; *Astragalus glycyphyllos* 9,12,14,18; *Brachypodium pinnatum** 2,3,10(1),14; *Carex praecox** 18; *Geranium sanguineum* 21; *Knautia arvensis* 12,20; *Peucedanum oreoselinum* 6,7(r),20; *Sedum maximum* 8,19(r); *Silene nutans* subsp. *nutans* 19; *Thalictrum minus** 14,15(r),16,17; *Trifolium alpestre* 2(1),17(1),19(1); *T. medium* 16; *T. montanum** 13; **VIII.:** *Achillea millefolium* 1(r),20; *Agrostis gigantea* 4,6(1); *Centaurea jacea* 13; *Cnidium dubium* 1; *Dactylis glomerata* 4,5; *Galium mollugo* 3(r),7,9,17(1); *Lysimachia nummularia* 2; *Pimpinella major* 21; *Poa pratensis* 8,17(1),20(3); *P. trivialis* 18; *Rumex acetosa* 1(r); *Serratula tinctoria* 16(1),21; *Succisa pratensis* 1(1); *Taraxacum officinale* 11(r),12(r),18; *Vicia cracca* 2(r),18; **IX.:** *Carex ovalis* 1; *C. pallescens* 3,12; *Genista tinctoria* 1(r),9,16; *Luzula multiflora* 6,12; *Pohlia nutans* 5,18,19; *Scorzonera humilis* 8,21; *Viola canina* 7(1),17(1),18,23; **X.:** *Acer negundo* a2 11, b 11; *Aegopodium podagraria* 14,17; *Alliaria petiolata* 1(1),3; *Berberis vulgaris* b 11,12,18, c 12,13(r); *Betula pendula* a 2(1),9(1), a1 9(1),10(1),18(1), a2 9(1),10(2), b 10(1), c 1(r); *Brachytheciastrum velutinum* 16,23; *Brachythecium campestre* 18; *B. rutabulum* 16; *Bromus benekenii* 6; *Bromus* sp. 21; *Bryum* sp. 20; *Calamagrostis canescens* 10; *Campanula rotundifolia* 1(r),7,13(r),20; *Carex acutiformis* 4(1); *C. guestphalica* 2; *C.nigra* 1(1); *Chaerophyllum temulum* 14,18; *Cirsium arvense* 18; *Cornus sanguinea* c 19; *Crataegus laevigata* b 1,3(1),11, c 3; *C. monogyna* b 3,8(1), c 1,8; *C. rhipidophylla* var. *rhipidophylla* b 2,11, c 2; *Cruciata glabra* 8(3); *Deschampsia flexuosa* 2(1),10,11(1); *Epilobium montanum* 18; *Equisetum arvense* 1,2; *Euonymus europaea* c 15(r); *Fallopia dumetorum* 18; *Galium aparine* 12(1),13(r),14; *G. mollugo* et *dumetorum* 15; *Geranium robertianum* 11,12,18; *Geum urbanum* 2,8,11,12; *Glechoma hederacea* 2(2); *Heracleum sphondylium* 14; *Hieracium* sp. 6; *Ligustrum vulgare* b 12, c 12; *Linaria vulgaris* 18; *Lophocolea bidentata* 18; *Melandrium album* 18; *M. rubrum* 18; *Orthodicranum tauricum* 18(1); *Plagiochila asplenioides* 18; *Plagiomnium cuspidatum* 2(2); *P. rostratum* 18(2); *Polypodium vulgare* 18; *Prunus spinosa* b 2(r), c 1(r),8,12; *Pyrus communis* b 8, c 8,9; *Quercus rubra* c 18; *Rhamnus cathartica* b 11, c 11,14,20; *Rosa canina* b 10,12; *Rosulabryum capillare* 18; *Rubus caesius* 12,20; *R. grabowskii* 10; *R. gracilis* 1,2(1),3(1),10; *R. plicatus* 10(1); *Rubus* sp. 8,9(1); *R. sprengelii* 2,3(2),10(2),11(2); *R. x corylifolius* 2(r),12(1); *Rumex acetosella* 4,6; *Sciuro-hypnum populeum* 18(2); *Senecio sylvaticus* 18; *Silene vulgaris* 12(r); *Torilis japonica* 11(r),12; *Urtica dioica* 1,11,14,18(r); *Verbascum nigrum* 12; *V. phlomoides* 18(1); *Viola* sp. 14.

Table A27. *Potentillo albae-Quercetum brachypodietosum* variant with *Pleurozium schreberi*

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13		14	15	16	17	18	19	20	21	22	23		24	25	26	27	28	29	30	31		32	33	34	35	36
ID-1		58	56	58	58	56	58	56	58	56	58	56	56	56		9	19	29	29	20	20	20	20	20	43		53	53	53	53	53	53	53	53		53	53	53	53	53
ID-2		1	1	1	1	1	1	1	1	1	1	1	1	1		-	1	11	11	2	2	2	2	2	9		1	1	1	1	1	1	1	1		1	1	1	1	1
ID-3		5	7	6	7	10	8	13	9	15	13	19	20	24		-	10	4	5	1	4	5	6	8	3		5	6	3	4	8	13	2	1		10	9	12	11	7
Date (year)		1998	1995	1996	1998	1995	1998	1995	1998	1995	1998	1995	1995	2006	1-13	2000	1979	1980	1977	2006	2006	2006	2007	2007	1957	14-23	1952	1952	1951	1952	1951	1952	1951	1951	24-34	1951	1952	1952	1951	1951
Density of tree layer	a1,a [%]	60	50	55	55	45	65	70	35	35	50	60	55	75		75	70	60	70	60	75	60	65	70	70		nd	nd	nd	nd	nd	nd	nd	nd		nd	nd	nd	nd	nd
Density of tree layer	a2 [%]	-	-	-	-	-	-	-	-	-	-	-	-	5	%	+	20	-	-	-	5	-	5	-	-	%	nd	nd	nd	nd	nd	nd	nd	nd	%	nd	nd	nd	nd	nd
Density of shrub layer	b [%]	+	+	+	+	1	+	1	+	+	1	2	2	10		+	20	10	10	10	5	20	10	5	15		nd	nd	nd	nd	nd	nd	nd	nd		nd	nd	nd	nd	nd
Cover of herb layer	c [%]	40	40	50	30	30	35	35	55	50	35	40	50	65		80	90	60	70	50	65	60	60	60	80		nd	nd	nd	nd	nd	nd	nd	nd		nd	nd	nd	nd	nd
Cover of moss layer	d [%]	1	1	+	2	+	2	+	+	+	+	+	+	5		35	-	+	+	10	+	15	5	10	10		nd	nd	nd	nd	nd	nd	nd	nd		nd	nd	nd	nd	nd
Area of relevé		100	100	250	250	250	250	250	250	250	250	250	250	150		400	400	200	100	300	300	300	300	300	150		800	400	600	250	400	200	600	200		400	800	300	200	100
Location (ATPOL)		BC76	BC76	BC76	BC76	BC76	BC76	BC76	BC76	BC76	BC76	BC76	BC76	BC56		CD21	DD91	CD17	CD17	CD39	CD39	CD39	CD39	CD39	BC99		BC99	BC99	BC99	BC99	BC99	BC99	BC99	BC99		BC99	BC99	BC99	BC99	BC99
Total number of species		82	77	86	74	83	72	72	73	79	66	76	84	84		68	69	43	41	60	61	66	54	55	54		70	65	68	84	71	53	73	81		65	82	67	45	60
Number of mosses, liverworts and lichens species		6	7	6	5	4	4	5	5	5	4	4	4	4		11	-	4	4	6	4	8	5	5	3		5	3	8	4	7	2	6	3		5	5	6	6	4
I. Ch.*, D.^ *Potentillo albae-Quercetum*																																								
Ch. *Quercetalia pubescentis*																																								
^ *Galium boreale* (M-A)		1	1	2	+	1	1	1	1	1	+	1	+	2	100	1	.	+	+	+	1	1	1	+	1	90	1	1	1	1	+	1	2	1	100	2	1	1	+	1
Campanula persicifolia		+	1	1	1	1	1	1	+	1	+	1	1	1	100	1	.	+	+	+	+	1	r	.	+	80	+	+	+	+	2	.	+	1	88	+	+	+	.	+
Carex montana		1	1	2	2	1	1	1	1	+	+	1	.	+	92	1	1	+	1	1	+	1	+	1	.	90	1	1	+	+	+	+	+	+	100	+	+	+	+	+
^ *Betonica officinalis* (M-A)		+	+	1	+	1	1	1	1	1	1	1	1	+	100	.	1	.	.	.	.	.	.	.	.	30	+	1	1	1	1	+	+	1	100	1	1	+	.	1
* *Ranunculus polyanthemos*		+	+	+	+	+	.	.	+	r	+	+	+	.	77	+	+	.	.	+	r	.	r	+	1	70	+	1	+	+	+	.	+	+	88	+	+	+	.	+
* *Potentilla alba*		2	1	2	2	2	1	1	2	1	2	2	1	+	100	+	.	+	+	.	.	.	.	.	+	40	1	1	1	1	1	1	1	2	100	1	1	1	+	2
* *Pulmonaria angustifolia*		+	+	1	+	+	1	+	1	1	1	1	1	.	92	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	+	.	13	.	.	1	.	+
Primula veris		.	.	.	+	.	+	.	.	.	r	+	+	.	38	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	+	25	.	+	+	.	+
Hypericum montanum		.	.	.	+	.	.	.	.	.	.	.	.	.	15	.	+	+	.	.	.	+	.	.	1	50	.	1	+	+	+	.	+	+	75	+	+	+	.	1
Lathyrus niger		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	1	10	1	+	.	+	1	1	1	1	88	+	+	1	.	+
* *Festuca amethystina* subsp. *ritschlii*		r	r	.	.	.	.	.	.	.	.	.	.	.	15	+	.	.	.	.	+	.	.	.	.	20	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Platanthera bifolia		.	.	.	.	.	r	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
II. D. *Pa-Q brachypodietosum*																																								
Pimpinella saxifraga (F-B)		+	+	+	+	+	+	+	+	+	+	+	+	+	92	r	1	+	+	+	r	+	+	+	+	100	+	+	.	+	1	1	.	1	75	1	+	+	+	2
Euphorbia cyparissias (F-B)		.	+	+	+	+	+	+	+	+	+	+	+	+	92	+	+	+	+	+	+	+	+	+	1	80	+	+	+	+	+	+	1	1	100	+	.	1	2	+
Anthericum ramosum (T-G)		1	+	1	1	+	+	+	1	1	+	+	+	+	100	+	+	.	.	1	+	.	1	+	.	60	+	1	+	1	+	+	.	2	88	1	+	+	+	1
Brachypodium pinnatum (F-B)		1	1	1	2	2	1	2	2	3	2	1	3	2	100	.	.	.	1	.	.	.	.	.	.	10	.	.	+	.	.	.	.	+	25	.	+	.	.	.
Galium verum (T-G)		+	+	+	+	.	.	r	.	+	+	r	+	+	85	.	.	.	.	.	.	.	.	.	+	10	1	+	+	+	+	1	+	+	100	1	+	1	+	2
Sedum maximum (T-G)		.	.	.	.	.	.	.	.	.	.	.	.	+	8	.	+	.	+	+	+	+	+	+	+	80	+	+	+	+	+	+	.	1	88	.	+	+	.	+
Peucedanum oreoselinum (T-G)		.	.	.	.	.	.	.	.	.	.	.	.	+	8	1	+	+	.	+	.	+	.	+	.	60	1	1	+	1	1	2	1	3	100	.	2	3	.	+
Geranium sanguineum (T-G)		.	.	+	.	.	1	1	.	.	.	.	.	.	23	+	1	.	.	.	+	+	+	.	+	60	+	+	.	1	+	1	+	1	–	.	2	1	.	.
III. D. *Pleurozium schreberi* var.																																								
Pinus sylvestris (V-P)	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	+	8	+	.	1	.	1	1	+	2	.	4	70	2	1	.	+	5	4	3	3	88	1	+	.	.	.
Pinus sylvestris (V-P)	c	.	.	.	.	.	.	.	.	.	.	.	.	r	8	+	.	.	.	.	+	.	.	.	.	20	+	+	.	.	.	.	.	.	38	+	+	+	+	.
Vaccinium vitis-idaea (V-P)		+	.	.	+	r	+	r	+	+	+	+	+	+	69	+	+	+	.	+	+	.	+	+	r	70	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Pleurozium schreberi (V-P)		+	.	+	+	.	+	+	.	.	+	+	.	.	54	2	.	+	+	2	.	2	.	2	+	70	+	+	+	1	3	1	2	1	100	1	1	2	+	.
Pseudoscleropodium purum (V-P)		+	+	+	+	+	+	+	.	+	.	.	.	1	62	2	.	.	.	+	+	.	+	.	.	40	+	+	+	.	1	+	+	+	63	+	+	+	+	.
Hypnum cupressiforme		+	+	+	.	+	.	+	+	+	+	+	+	.	77	+	.	.	.	.	.	.	.	.	.	10	.	.	+	+	+	.	+	1	63	.	.	.	+	.
Viscaria vulgaris		.	.	.	.	.	.	.	.	.	.	.	.	1	8	.	+	.	+	+	.	.	.	+	.	40	+	+	+	+	+	+	.	1	88	1	+	+	+	.
IV. Ch. *Querco-Fagetea*																																								
Fagus sylvatica	b	.	+	+	+	1	+	1	+	1	+	1	+	.	85	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Fagus sylvatica	c	+	.	.	+	.	.	+	.	+	.	.	.	r	46	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Padus avium	b/c	+/	+/	+/	+/	+/	.	.	r/	+/	+/	/r	/+	r/	85	/r	.	.	.	.	+/	.	.	.	.	20	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Malus sylvestris	b/c	/+	/+	.	r	r	.	.	.	.	.	.	.	/+	38	/+	.	.	.	+/	.	.	.	.	.	20	.	.	.	.	.	.	.	.	–	.	/+	.	.	.
Melica nutans		1	1	2	2	2	2	2	2	1	1	1	+	1	100	1	1	1	1	1	2	2	1	1	1	100	1	.	.	1	+	+	3	+	75	.	+	+	.	.
Poa nemoralis		1	+	+	1	+	.	.	.	.	.	.	.	2	46	+	2	.	.	1	1	1	2	2	1	80	1	.	+	+	.	.	2	1	63	.	.	.	.	.
Ajuga reptans		.	.	+	+	+	+	+	+	+	+	+	+	+	77	.	+	+	1	+	1	1	1	1	1	90	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Atrichum undulatum		.	.	1	+	.	1	+	+	+	+	+	.	2	62	.	.	.	.	.	.	+	.	.	.	20	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Scrophularia nodosa		+	+	r	+	+	1	+	r	+	.	+	+	.	85	.	+	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Viola riviniana		.	.	.	.	.	.	+	.	+	.	+	.	+	31	+	1	.	.	.	+	+	+	+	.	60	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Festuca gigantea		.	r	.	r	+	r	+	+	+	.	+	1	r	77	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Dactylis polygama		+	.	+	1	1	.	.	+	+	.	.	.	+	54	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Festuca heterophylla		+	+	.	+	.	.	.	.	+	+	+	+	+	46	.	.	+	.	.	.	.	.	.	1	20	+	+	.	+	.	.	+	.	50	.	.	.	+	+
Viola reichenbachiana et riviniana		+	1	.	.	+	.	+	.	+	.	+	+	.	54	.	.	+	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Anemone nemorosa		1	.	1	.	.	.	.	.	.	.	.	.	.	15	1	2	.	.	.	+	.	+	.	.	40	.	.	.	.	.	.	.	.	–	.	.	.	.	+
Brachypodium sylvaticum			r			+								1	21										2	9	.	.	2	.	.	.	+	+	38	.	.	.	.	1
V. Ch., D*. *Quercetea robori-petraeae* (Qrp)																																								
Festuca ovina		+	+	+	+	+	+	+	+	+	+	+	.	.	69	2	1	+	2	2	+	1	1	+	.	90	+	+	3	+	.	+	2	.	75	+	.	1	2	+
* *Melampyrum pratense*		+	+	.	+	+	+	+	+	+	+	+	+	+	92	1	1	1	.	+	.	+	.	1	1	70	+	+	.	.	.	.	.	.	25	.	.	.	.	.
Hieracium lachenalii		.	.	+	+	+	1	+	.	.	r	.	.	+	54	.	.	+	.	.	1	+	.	+	+	50	.	.	.	.	.	.	.	.	–	.	.	.	.	.
* *Pteridium aquilinum*		.	.	.	.	.	.	.	.	.	.	.	.	2	8	+	3	.	+	.	+	1	+	2	.	70	.	.	+	1	+	2	.	1	75	1	.	.	.	.
Carex pilulifera		.	.	.	+	+	.	.	.	.	+	.	.	+	38	.	.	+	.	.	.	.	.	.	.	20	.	+	.	.	.	.	.	.	13	.	+	.	.	.
Calamagrostis arundinacea		.	.	.	.	.	.	.	.	.	.	.	.	+	8	2	+	1	.	1	+	+	.	.	.	70	1	2	.	1	.	.	2	2	63	.	.	.	.	.
Hieracium laevigatum		+	+	+	.	.	+	+	.	.	.	.	r	.	46	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
* *Polytrichastrum formosum*		.	+	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	+	+	+	.	+	+	.	50	.	.	.	.	.	.	.	.	–	.	.	.	.	.
VI. Ch. *Vaccinio-Piceetea* (V-P)																																								
Juniperus communis	bc	.	.	+	.	.	.	.	.	r	.	+	.	+	31	.	+	.	1	2	+	2	1	+	.	70	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Vaccinium myrtillus		1	1	1	1	1	1	2	1	.	.	2	.	1	69	+	1	1	+	1	3	2	3	+	+	100	.	.	.	.	.	+	.	.	13	.	.	.	.	.
Rubus saxatilis		.	.	.	.	.	.	.	.	.	.	.	.	.	–	+	.	+	.	.	1	+	1	1	+	70	.	.	+	+	.	.	+	.	38	1	.	.	.	.
Koeleria grandis															–					+						9	+	.	.	+	+	.	+	.	50	.	+	.	.	.
VII. Ch. *Trifolio-Geranietea* (T-G)																																								
Fragaria vesca		2	2	2	2	2	2	2	2	2	2	1	1	1	100	+	2	+	.	+	+	1	1	1	2	90	+	+	+	+	2	+	1	1	100	1	+	1	+	+
Trifolium alpestre		+	r	+	1	1	1	+	+	.	1	.	1	+	85	1	1	+	+	+	.	+	.	1	1	80	2	2	+	1	1	1	+	2	100	1	1	+	+	2
Poa angustifolia		1	2	2	2	2	2	2	2	2	1	2	1	3	100	2	1	.	+	.	+	1	+	1	.	70	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Hypericum perforatum		+	.	1	+	1	+	+	+	1	+	.	+	+	85	1	+	.	+	.	+	+	.	1	+	70	+	+	+	+	+	1	+	1	100	1	+	+	+	+
Astragalus glycyphyllos		+	.	+	.	.	r	+	.	.	+	+	+	+	62	.	+	.	+	+	+	+	+	1	+	80	1	+	.	.	.	.	+	1	50	.	.	.	.	+
Knautia arvensis		+	+	+	1	1	+	+	+	1	+	+	+	.	92	.	+	+	.	.	.	.	.	.	1	30	+	+	+	1	1	+	+	+	100	+	+	1	.	.
Filipendula vulgaris		+	+	+	+	1	+	1	+	+	1	2	+	+	100	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	+	.	.	.
Polygonatum odoratum		.	.	.	.	.	.	.	.	.	.	.	.	+	8	+	1	+	+	1	r	1	+	+	+	100	+	.	+	.	1	+	+	1	75	.	.	+	.	1
Silene nutans subsp. *nutans*		.	.	.	.	.	.	.	.	.	.	.	.	+	8	+	+	.	.	+	.	+	.	+	+	60	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Galium album		.	.	.	.	.	.	.	.	.	.	.	.	.	–	1				1	+	+	+	1		55	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Clinopodium vulgare		+	+	.	.	+	.	.	.	+	.	.	.	.	31	.	.	.	+	+	.	.	.	.	.	20	+	+	+	+	.	.	+	+	75	1	1	.	+	1
Peucedanum cervaria											r		r		14	.	.	.	.	+	.	r	.	.	.	27	.	1	.	+	.	.	.	+	38	+	.	.	.	.
Vicia cassubica		.	.	.	.	.	.	.	.	.	.	.	.	1	8	1	.	.	.	.	+	.	+	.	+	40	2	2	2	2	2	+	2	+	100	1	1	+	+	3
Origanum vulgare		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	1	.	.	.	10	1	+	.	1	.	+	+	1	75	2	1	2	+	1
Vincetoxicum hirundinaria		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	+	.	.	.	.	.	.	.	.	10	2	1	.	+	+	+	+	1	88	1	2	1	+	+
Vicia sepium		.	.	.	.	.	.	.	.	.	+	.	+	.	15	.	.	.	.	.	.	+	.	.	.	10	+	.	.	+	.	+	+	.	50	.	+	+	.	.
Fragaria viridis		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	.	+	.	.	.	.	.	+	25	2	1	+	2	.
VIII. Ch. *Festuco-Brometea* (F-B)																																								
Dianthus carthusianorum		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	.	.	.	+	+	+	+	+	63	+	+	+	+	.
Asperula tinctoria		.	.	+	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	+	10	1	1	+	1	1	.	+	+	88	.	.	+	.	.
Veronica spicata		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	+	.	10	.	.	+	+	+	.	.	+	50	+	+	+	+	.
Phleum phleoides		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	+	1	+	+	.	.	.	.	50	2	+	+	.	.
Potentilla arenaria		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	+	+	+	.	+	.	.	.	50	1	+	+	1	.
Verbascum lychnitis		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	+	.	.	+	+	.	.	+	50	1	+	.	.	.
Stachys recta		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	+	.	.	.	.	.	.	1	25	+	+	1	.	.
Ajuga genevensis		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	+	.	.	.	.	.	.	.	.	10	.	.	+	.	.	.	+	+	38	.	+	+	+	.
Thymus pulegioides		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	+	.	.	.	+	.	.	+	38	.	+	1	.	.
IX. Ch. *Molinio-Arrhenatheretea* (M-A)																																								
Festuca rubra s. s.		+	1	+	1	1	+	1	1	1	+	1	+	+	100	1	.	+	.	+	+	+	+	+	.	70	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Veronica chamaedrys		+	2	+	+	1	+	+	+	+	+	1	+	+	100	.	1	+	+	.	.	+	.	+	1	60	+	+	+	+	+	+	1	.	88	+	+	1	+	1
Achillea millefolium		+	.	+	+	+	+	+	.	.	.	+	.	+	62	+	+	.	+	+	r	+	1	+	.	80	+	+	+	+	+	+	.	+	88	1	.	+	1	1
Taraxacum officinale		.	r	+	r	r	r	r	r	+	.	+	.	.	69	.	.	.	.	.	.	r	.	.	.	10	.	.	.	.	+	.	.	.	13	.	.	.	.	.
Rumex acetosa		+	.	r	.	.	r	r	+	.	.	r	r	.	54	.	.	.	.	.	.	.	.	.	.	–	.	.	.	+	.	.	+	.	25	.	.	+	.	.
Cnidium dubium		.	.	+	.	.	.	.	+	1	+	1	2	.	46	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Galium mollugo		r	+	.	.	+	+	.	.	.	.	.	.	.	31	.	+	.	.	.	.	.	.	.	+	20	.	.	+	+	.	.	+	.	38	+	.	+	.	.
Serratula tinctoria		.	.	.	.	.	.	.	.	.	.	.	.	+	8	.	1	.	.	+	.	.	.	.	.	20	.	.	+	+	.	+	+	1	63	.	.	.	.	1
Dactylis glomerata		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	+	.	.	+	1	.	+	2	63	1	+	+	+	1
Arrhenatherum elatius		.	.	.	.	.	.	.	.	.	.	.	.	1	14	.	.	.	.	.	.	.	.	.	.	9	+	+	.	+	.	1	.	1	63	.	+	+	.	+
Campanula patula s.str.		.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	+	.	.	.	.	.	.	.	.	9	+	.	.	.	+	+	.	.	38	+	.	.	.	+
Carex hirta		.	.	.	.	.	.	.	.	.	.	.	.	2	7	.	.	.	.	.	.	.	.	.	.	–	.	.	+	1	+	.	.	.	38	.	.	.	.	.
X. Ch. *Calluno-Ulicetea*																																								
Agrostis capillaris		1	2	2	1	2	1	1	1	2	1	2	1	1	100	1	.	.	+	+	.	+	.	.	.	40	+	1	.	1	+	+	.	.	63	1	+	.	.	.
Veronica officinalis		.	+	+	.	+	+	1	r	+	.	+	+	+	77	1	+	+	.	+	+	.	1	+	1	80	.	+	+	.	.	+	+	+	63	.	.	+	.	+
Potentilla erecta		1	+	1	+	+	1	1	+	+	1	+	+	.	92	+	+	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Solidago virgaurea s. s.		.	.	+	+	+	+	+	.	.	.	.	.	+	46	+	1	+	.	1	+	+	+	+	.	80	.	.	+	.	+	+	+	1	63	.	.	.	.	+
Hypericum maculatum		+	+	+	.	+	+	+	1	r	.	1	+	1	85	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Genista tinctoria		+	+	+	+	+	+	+	r	+	+	.	+	+	92	.	.	.	.	.	.	.	.	.	.	–	.	+	.	+	.	.	.	.	25	.	+	.	.	.
Pohlia nutans		.	+	+	+	.	.	.	+	+	.	+	.	.	46	.	.	.	.	.	.	+	.	.	.	10	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Luzula multiflora		r	.	+	+	.	.	.	.	.	.	.	.	.	23	+	.	.	+	+	.	.	.	.	.	30	.	.	.	+	.	.	.	.	13	.	+	.	.	.
Hieracium pilosella		.	.	.	.	.	.	.	.	.	.	.	.	.	–	+	+	.	.	+	.	r	.	.	.	40	.	1	+	+	+	.	+	+	75	1	+	.	2	.
XI. Ch. *Rhamno-Prunetea*																																								
Frangula alnus	b	+	.	+	+	+	+	+	+	+	r	+	.	.	77	.	1	.	.	+	+	+	+	+	+	70	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Frangula alnus	c	.	+	.	+	.	+	+	+	+	r	+	+	+	77	r	+	.	.	.	+	+	+	.	.	50	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Crataegus rhipidophylla var. rhipidophyl	b	+	+	+	+	+	+	+	+	+	+	+	+	.	92	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Prunus spinosa	b	+	+	+	+	+	+	+	.	.	.	.	+	.	62	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Prunus spinosa	c	r	+	.	+	+	+	+	+	+	.	+	.	.	69	.	.	.	.	.	.	.	.	.	.	–	.	.	+	2	+	1	+	.	63	+	2	.	+	.
Rhamnus cathartica	bc	+	.	+	.	.	r	.	r	r	+	+	.	r	62	.	.	.	+	.	.	r	.	+	.	30	.	.	+	.	.	+	+	+	50	+	+	.	.	.
Crataegus monogyna et laevigata	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	.	.	.	+/+	.	1/1	+/+	+/+	50	+	1	.	.	+
Rosa canina	b	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	.	.	–	.	.	+	.	+	+	+	+	63	+	1	.	.	.
Rosa canina	c	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	+	.	.	.	9	.	.	+	.	+	+	+	+	63	+	1	.	.	.
XII. Others																																								
Quercus robur	a1,a;a2*	4	4	4	4	4	4	4	3	3	4	4	4	3	100	4;+	3;1	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	+	13	.	.	.	.	+
Quercus robur	b/c	/+	/+	/+	1	/+	/+	/+	r/1	/+	1	/+	1	.	92	+/1	1/+	.	.	.	.	.	.	.	.	20	.	.	.	+/+	.	.	.	+/+	25	.	+/+	.	.	+/+
Quercus petraea [*Q* . x *rosacea* ^]	a1,a	.	.	.	.	.	.	.	.	1	.	.	.	4^	15	.	.	4	4^	4	4	4	4	4	1	80	2	2	5	3	.	1	3	1	88	1	+	.	.	2
Quercus petraea [*Q* . x *rosacea* ^]	a2	.	.	.	.	.	.	.	.	.	.	.	.	2^	8	.	.	.	.	.	1	.	1	.	1	30	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Quercus petraea [*Q* . x *rosacea* ^]	b/c	.	.	.	.	.	.	.	.	.	.	.	.	1^/1^	8	.	.	+/+	/1	1/1	1/1	2/2	1/+	1/2	1/1	80	+/+	.	.	1/	.	/+	/+	/+	63	.	/+	1/	.	.
Padus serotina	b/c	+/	+/	/+	.	/+	/r	/+	/r	/+	.	+/+	.	r/+	77	.	.	.	.	.	+/+	+/	+/+	.	.	30	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Pyrus pyraster	b/c	r/	r/	.	.	/+	.	.	/+	+/+	/+	/+	/+	.	62	.	.	.	.	.	+/+	+/+	.	+/+	.	30	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Sorbus aucuparia	b	r	.	+	+	.	+	+	+	+	r	+	.	1	77	.	.	.	.	.	+	.	1	.	+	30	.	+	+	+	1	1	1	1	88	1	1	.	.	.
Sorbus aucuparia	c	r	r	+	+	+	+	+	+	r	.	+	r	+	92	+	+	+	+	.	+	+	+	+	+	90	+	.	.	.	.	+	.	.	25	.	.	.	.	.
Luzula pilosa		+	+	+	+	+	+	+	+	+	r	+	+	1	100	1	+	+	+	1	1	1	1	+	.	90	.	.	.	.	+	.	+	+	38	+	.	1	.	.
Moehringia trinervia		+	1	1	1	+	+	+	1	+	+	+	+	+	100	+	+	.	+	+	1	.	1	+	1	80	.	.	+	.	+	.	1	.	38	.	.	.	.	.
Convallaria majalis		.	.	1	1	1	1	1	1	1	+	1	1	2	85	3	3	3	.	2	2	2	2	+	1	90	2	1	+	1	.	1	4	1	88	1	1	.	.	3
Plagiomnium affine		+	1	+	1	+	1	+	1	+	+	+	1	.	92	1	.	+	.	1	+	+	+	+	+	80	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Mycelis muralis		1	+	+	+	+	1	+	+	+	+	+	+	1	100	.	.	.	.	+	1	.	1	.	+	40	.	.	.	.	+	.	.	.	13	.	.	.	.	.
Anthoxanthum odoratum		1	2	+	.	+	+	1	+	+	1	+	+	.	85	1	+	.	.	+	.	+	.	1	+	60	+	+	+	1	+	+	.	+	88	.	1	1	.	1
Campanula rotundifolia		+	+	+	+	+	+	+	+	+	+	+	+	r	100	+	.	.	.	+	.	.	.	+	.	30	.	.	+	.	.	.	.	.	13	.	.	.	.	.
Impatiens parviflora		+	1	+	+	1	+	2	+	1	1	1	+	1	100	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Oxalis acetosella		1	2	1	2	2	2	2	2	2	1	2	1	.	92	.	.	.	.	.	.	.	.	.	.	–	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Fallopia convolvulus		+	+	+	+	1	+	+	+	1	+	.	+	+	92	.	.	.	.	.	.	.	.	.	.	–	.	.	.	+	+	.	.	.	25	.	.	.	.	.
Geum urbanum		+	+	+	+	+	+	+	+	1	+	+	+	.	92	.	.	.	.	.	+	.	+	.	.	20	.	.	.	.	.	.	+	+	25	+	.	+	.	.
Deschampsia flexuosa		+	1	+	+	+	+	+	.	.	+	+	+	1	85	.	.	.	.	.	.	.	.	+	.	10	+	.	.	.	.	.	.	.	13	.	.	.	.	.
Urtica dioica		+	1	+	1	1	+	+	2	2	+	2	2	.	92	.	.	.	.	.	.	.	.	.	1	10	.	.	.	.	.	.	+	.	13	.	.	.	.	.
Galeopsis pubescens		+	.	1	+	1	+	+	1	1	+	1	1	+	92	.	.	.	.	.	.	.	.	.	.	–	.	.	.	+	+	.	.	.	25	.	.	+	.	.
Rubus idaeus		.	.	+	+	+	1	1	2	1	+	1	+	1	85	.	.	.	.	.	+	.	+	.	1	30	+	.	+	.	+	.	.	.	38	.	+	.	.	.
Galeopsis tetrahit		+	+	.	+	+	+	.	+	+	r	+	.	r	77	.	.	.	.	+	.	.	.	.	.	10	.	.	.	.	.	.	.	.	–	.	.	.	.	+
Maianthemum bifolium		+	.	+	+	+	.	.	.	+	+	1	+	.	62	1	+	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	–	.	.	.	.	.
Brachythecium rutabulum		+	+	.	.	+	.	+	.	+	.	.	+	+	54	.	.	.	.	.	.	.	.	+	.	10	+	+	+	.	+	.	.	.	50	+	.	.	.	+
Galium aparine		r	.	+	.	.	.	.	.	+	r	.	.	.	31	.	.	.	.	.	1	.	2	.	.	20	.	.	.	+	.	.	+	.	25	.	.	.	.	.
Brachytheciastrum velutinum		.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	+	+	.	+	+	+	.	.	45	.	.	+	.	+	.	.	.	25	.	.	.	.	+
Hieracium murorum		.	.	.	.	.	.	.	.	.	.	.	.	.	-	+	.	+	.	+	+	1	+	+	+	80	.	+	+	.	.	.	.	+	38	.	.	.	.	+
Pyrus communis	b/c	.	.	.	.	.	.	.	.	.	.	.	.	/r	14	.	/+	.	.	.	.	.	.	.	+/	20	/+	.	/+	/+	/+	/+	/+	/+	88	.	.	.	.	.
Thalictrum aquilegiifolium		.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	–	+	.	1	+	+	+	1	1	88	.	+	.	.	+
Plagiomnium rostratum		.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	–	+	+	+	+	+	.	+	.	75	+	.	+	.	+
Rumex acetosella		.	.	.	.	.	.	.	.	.	.	.	.	r	7	.	.	.	.	.	.	.	.	.	.	–	+	+	.	+	+	.	.	.	50	+	+	+	.	.
Pulsatilla pratensis		.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	–	+	.	+	.	1	.	.	.	38	+	+	.	1	.
Ceratodon purpureus		.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	–	1	.	+	+	.	.	.	.	38	.	+	+	+	+

Sporadic species: IV.: *Carex digitata* 1(r), 16,17(2),23(2); *Carpinus betulus* c 14,16; *Cerasus avium* c 9,12,15,18(r),27; *Corylus avellana* b 9,13(2),16(2),17,29(1),31(1), bc 30, c 8(r),13(1),15,16; *Fraxinus excelsior* c 11(r),16,30; *Galium schultesii* 15(1); *Hepatica nobilis* 14,16,24,26,34; *Lathyrus vernus* 12,23,30,31,34; *Lilium martagon* 20,27,30,36; *Lonicera xylosteum* c 30; *Malus sylvestris* b 18, c 1,2,4(r),5(r),13,14,33; *Melampyrum nemorosum* 17,28,36; *Milium effusum* 8,9,11,12,36; *Polygonatum multiflorum* 28,31(1),36; **V.:** *Dicranella heteromalla* 1,2,12,20; *Hieracium sabaudum* 3,6(r),13; *Hieracium umbellatum* 14,15(1); *Holcus mollis* 15(1); *Lophocolea heterophylla* 14; **VI.:** *Betula pubescens subsp. pubescens* a 30,31; *Cladonia furcata* 14; *Dicranum polysetum* 14(1),26,28,34(1),35; *D. scoparium* 14,23; *Hylocomium splendens* 30,33,34,35,36; *Leucobryum glaucum* 18,20; *Picea abies* b 7,11(1),12(1),15(1), c 1(r),5,12,15; **VII.:** *Agrimonia eupatoria* 3,4,5,20,27,32(1),33,35(1); *Coronilla varia* 18,20,30,33; *Lathyrus sylvestris* 20; *Potentilla rupestris* 31(1),35; *Veronica teucrium* 24(1),25; *Vicia tenuifolia* 25,26,31; *Viola hirta* 31,32,34,35; **VIII.:** *Acinos arvensis* 25; *Asparagus officinalis* 27; *Avenula pratensis* 1,2; *Campanula glomerata* 15,36; *Carex caryophyllea* 28,35; *C.* 26; *Carlina vulgaris* 32; *Helianthemum nummularium* ssp. *obscurum* 33; *Scorzonera purpuraea* 29; *Thalictrum minus* 13,17,23,31; *Trifolium montanum* 24,25; *Viola rupestris* 26; **IX.:** *Agrostis gigantea* 2; *Avenula pubescens* 26,32; *Briza media* 11,23; *Centaurea jacea* 36; *Deschampsia caespitosa* 10(r),12; *Festuca pratensis* 1(r); *Holcus lanatus* 25; *Laserpitium prutenicum* 31; *Lysimachia vulgaris* 15; *Phleum pratense* 25,27; *Pimpinella major* 15,36; *Plantago lanceolata* 24,25; *Poa pratensis* 15,23,26(1),30,35(2); *P. trivialis* 4,8; *Selinum carvifolia* 13; **X.:** *Carex pallescens* 13,15(1),20; *Danthonia decumbens* 13(1),14,20,28; *Luzula campestris* 30,31,35; *Polygala vulgaris* 27; *Scorzonera humilis* 17,18(r),19; *Viola canina* 17,22,23(1),24,27,33,34; **XI.:** *Berberis vulgaris* b 19; *Crataegus laevigata* b 2(r), c 7(r),12(r); *C. monogyna* b 7(r),9,11,12,22, c 13(r); *Rubus gracilis* c 13(r); *R. plicatus* c 19(r),28; *Sarothamnus scoparius* c 12,32; **XII.:** *Agrostis gigantea x canina* 17(1); *Alliaria petiolata* 1,2,5,9(1),11,12; *Aquilegia vulgaris* 15; *Arabis glabra* 33; *Armeria maritima* 32(1),33,35; *Betula pendula* a 15(1),16,22, a1 14,15(2),19,21, a2 15(1), c 15,27,33; *Brachythecium albicans* 32,33; *Bromus benekenii* 26,27,33; *B. ramosus* 33; *Botrychium lunaria* 35; *Calamagrostis epigejos* 2,13,14(1),19,21,27,32(1),34; *Carex echinata* 27,33; *Cerastium semidecandrum* 31; *Chaerophyllum temulum* 1(r),3,7,9,30; *Chamaenerion angustifolium* 14(r); *Chenopodium album* 12; *Cladonia glauca* 14; *Conyza canadensis* 11,12(r),36; *Digitalis grandiflora* 29(1),34,36; *Dryopteris carthusiana* 12,27,28; *Fallopia dumetorum* 12,36; *Galium mollugo* et *dumetorum* 17(1); *Geranium robertianum* 3,8,9,10,12,19,21(1); *Glechoma hederacea* 29; *Gnaphalium sylvaticum* 28,31,32; *Helichrysum arenerium* 35; *Heracleum sphondylium* 1(r); *Hieracium caespitosum* 24; *Hieracium cymosum* 24; *Koeleria pyramidata* 2; *Lapsana communis* s.s. 2,3,4,5,6,7,11; *Laserpitium latifolum* 31; *Linaria vulgaris* 1,2,3,4,5,8,32,33; *Lupinus polyphyllus* 3,8(r),9; *Medicago lupulina* 25; *Myosotis stricta* 33; *Orobanche purpurea* 27; *Plagiomnium cuspidatum* 13(2); *Populus tremula* b 15,25,31(1), c 13,15; *Salvia pratensis* 24,31,33,34(2),35; *Vicia tetrasperma* 25(1),27,33,34,35; *Rhodobryum roseum* 26,30; *Robinia pseudacacia* c 6(r); *Rosa tomentosa* b 1; *Rubus* sp. 15; *Rubus sprengelii* 4(r),5,13(1); *Rubus* x *corylifolius* 2,5,10,12,13,19,21; *Sciuro-hypnum oedipodium* 14(2),16,17,18,20(1),21,22; *Sedum sexangulare* 33;*Senecio sylvaticus* 4(r); *Silene vulgaris* 15; *Tanacetum vulgare* 13; *Thymus serpyllum* 26; *Torilis japonica* 5,7,9(2),11(1),12(1); *Trifolium arvense* 24; *Vicia hirsuta* 22,25; *V. lathyroides* 25.

Table A28. *Potentillo albae-Quercetum brachypodietosum*: variant with *Asarum europaeum* (relevés 1-15), typical variant (relevés 16-38)

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1-15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	16-38
ID-1		43	43	4	43	56	57	4	43	29	29	4	4	19	19	19		20	20	4	9	57	57	57	57	57	57	57	57	57	57	57	57	57	58	56	58	58	56	56	
ID-2		9	9	46	9	1	1	46	9	11	11	46	46	1	1	1		2	2	46	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
ID-3		2	9	6	1	25	2	3	7	9	6	4	1	23	18	17		9	11	2	-	1	3	4	5	6	7	8	9	10	11	12	13	4	11	11	12	14	22	26	
Date (year)		1959	1958	1965	1959	2006	1993	1964	1958	1977	1977	1965	1957	1983	1985	1985	1-15	2006	2007	1967	1998	1992	1990	1992	1993	1990	1993	1993	1992	1992	1990	1990	1996	1995	1998	1998	1998	1999	1995	2006	16-38
Density of tree layer	a1,a [%]	80	80	85	80	70	55	60	80	60	70	50	65	70	70	70		70	80	70	75	65	50	70	60	65	65	60	70	60	60	65	65	50	70	60	70	60	55	70	
Density of tree layer	a2 [%]	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	%	10	-	45	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	%
Density of shrub layer	b [%]	15	20	15	+	+	-	5	20	-	20	20	45	2	20	10		10	5	40	10	+	+	+	-	-	-	-	+	+	+	+	+	+	2	2	+	5	7	5	
Cover of herb layer	c [%]	70	70	85	75	50	50	90	70	40	70	95	100	80	90	80		70	75	100	60	70	50	60	65	50	65	70	70	60	50	55	60	45	50	40	40	35	30	70	
Cover of moss layer	d [%]	5	+	-	+	-	+	-	+	+	+	5	-	10	-	5		5	5	5	5	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1	+	+	
Area of relevé		200	250	400	400	400	150	400	200	150	100	400	400	400	400	400		300	300	400	300	150	200	200	100	100	100	150	150	200	150	100	100	100	250	250	250	250	250	400	
Location (ATPOL)		BC99	BC99	CC02	BC99	BC66	BC66	CC02	BC39	CD17	CD17	CC02	CB82	DD92	DD81	DD81		CD39	CD39	CB82	CD21	BC66	BC66	BC66	BC66	BC66	BC66	BC66	BC66	BC66	BC66	BC66	BC66	BC76	BC76	BC76	BC76	BC76	BC76	BC66	
Total number of species		54	49	47	63	69	61	65	58	46	48	60	65	43	56	62		65	58	63	66	55	57	74	58	59	54	51	61	64	63	71	69	72	78	65	69	76	62	74	
Number of mosses, liverworts and lichens species		3	1	-	1	-	1	-	1	2	2	1	-	1	-	1		4	5	2	5	-	1	1	1	1	1	-	1	1	-	-	1	5	1	3	2	4	2	3	
I. Ch.*, D.^ *Potentillo albae-Quercetum*	
Ch. *Quercetalia pubescentis*	
Campanula persicifolia		+	+	+	1	+	1	1	+	+	+	1	+	+	1	1	100	1	+	+	+	1	.	1	1	+	1	+	+	+	+	+	+	+	+	1	+	+	+	1	96
^ *Galium boreale* (M-A)		+	+	.	2	+	1	1	1	+	.	1	2	.	1	.	73	2	1	2	2	.	+	2	1	1	2	2	+	2	1	1	+	1	+	2	1	1	1	+	96
^ *Betonica officinalis* (M-A)		+	+	.	+	+	1	.	.	+	.	.	1	.	1	1	60	+	.	.	+	1	+	1	1	+	1	1	+	1	1	1	1	1	+	+	1	+	1	1	91
Carex montana		.	.	.	.	+	+	.	+	+	1	2	1	1	2	3	67	1	+	1	2	.	+	1	+	1	+	r	2	1	1	.	+	2	.	1	+	+	.	+	83
* *Potentilla alba*		+	+	+	1	1	2	+	+	.	+	.	2	.	.	.	67	.	.	1	1	2	1	1	2	2	1	2	2	2	2	2	2	2	1	1	2	2	1	+	91
* *Ranunculus polyanthemos*		.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	20	+	1	.	.	+	+	+	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	.	83
Primula veris		.	.	+	+	.	+	+	.	.	.	.	.	.	.	.	27	.	+	.	.	+	.	+	+	+	.	.	.	+	+	+	+	+	.	+	+	+	+	+	65
* *Pulmonaria angustifolia*		.	.	.	.	.	1	.	.	.	.	.	.	.	.	+	13	.	.	.	.	+	+	1	+	+	+	.	r	+	+	+	1	+	1	1	2	1	1	.	74
Hypericum montanum		+	+	+	+	+	.	+	+	+	+	+	.	+	+	+	80	.	.	+	+	1	.	+	r	.	.	r	.	.	.	r	+	.	.	.	.	.	.	.	35
Lathyrus niger		1	1	+	1	.	.	.	2	+	+	+	+	2	.	+	73	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	13
Platanthera bifolia		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	+	+	+	.	.	.	.	.	.	r	r	.	.	.	.	.	.	.	.	.	.	22
* *Festuca amethystina* subsp. *ritschlii*		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	9
II. D. *Pa-Q brachypodietosum*	
Brachypodium pinnatum (F-B)		.	.	2	+	2	1	1	.	.	+	.	.	3	.	.	47	+	.	.	2	1	1	3	+	1	2	4	3	3	3	2	2	+	3	1	2	2	2	2	91
Galium verum (T-G)		.	.	.	.	.	+	.	.	.	.	.	1	.	.	.	13	.	.	.	+	+	.	+	.	.	+	+	.	.	+	+	+	+	+	.	+	+	.	.	48
Anthericum ramosum T-G)		+	+	.	.	.	+	1	.	+	+	+	.	.	1	+	60	+	+	+	1	1	r	1	1	+	+	+	1	+	+	+	+	+	1	.	+	+	+	+	91
Euphorbia cyparissias (F-B)		r	.	.	+	2	r	.	+	+	.	.	.	+	1	1	60	1	+	.	1	+	.	+	+	+	.	.	.	+	+	+	.	+	+	+	1	1	+	+	74
Pimpinella saxifraga (F-B)		.	.	.	.	.	+	+	.	+	.	.	.	.	+	+	33	+	+	.	+	+	.	+	+	+	.	+	.	r	r	+	+	+	+	+	+	+	+	.	78
Sedum maximum (T-G)		+	+	.	+	.	.	1	+	+	.	+	.	.	.	+	53	+	.	+	r	.	.	.	+	+	.	+	.	+	.	.	.	r	.	.	.	.	.	r	39
Peucedanum oreoselinum (T-G)		.	+	+	.	.	.	.	+	.	.	.	+	.	.	+	33	.	r	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Geranium sanguineum (T-G)		r	+	.	1	.	.	.	.	.	.	.	.	1	.	1	33	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
III. D. *Asarum* var.	
Hepatica nobilis (Q-F)		2	+	2	2	.	r	+	1	+	1	.	2	.	.	.	67	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Vicia cassubica		+	+	1	1	.	.	1	1	.	.	1	1	.	+	+	67	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	9
Carex digitata (Q-F)		1	1	+	1	+	.	.	1	1	2	.	.	.	1	.	60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Lilium martagon (Q-F)		.	+	+	+	.	.	.	.	+	+	.	1	+	1	+	60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Viola reichenbachiana (Q-F)		1	+	.	1	1	2	1	+	.	.	.	.	.	.	.	47	.	.	.	.	.	.	+	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Serratula tinctoria		.	.	+	.	.	+	.	.	.	.	.	1	.	+	+	33	.	.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	r	13
Stellaria holostea (Q-F)		+	.	2	.	.	.	+	.	.	.	2	+	.	.	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Lathyrus vernus (Q-F)		+	+	.	+	.	.	.	+	.	.	.	.	+	.	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Galium sylvaticum (Q-F)		+	1	.	1	.	.	.	+	.	.	.	.	.	.	.	27	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
IV. Ch *Querco-Fagetea* (Q-F)	
Carpinus betulus	a,a2	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–
Carpinus betulus	b	.	.	2	.	.	.	.	.	2	.	.	2	.	.	.	20	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Carpinus betulus	c	+	+	1	.	.	.	.	.	1	.	.	1	.	.	.	33	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Fagus sylvatica	a,a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	9
Fagus sylvatica	bc	.	2	.	.	.	+	.	.	.	.	.	+	.	.	.	20	.	.	2	.	+	+	+	+	+	+	r	+	.	.	.	r	+	1	1	+	+	+	1	78
Corylus avellana	b/c	2/+	.	1/	.	/r	.	1/	.	.	1/+	.	3/+	.	.	.	40	.	.	2/1	/+	.	/+	.	/r	.	.	.	.	/r	.	.	.	.	.	.	.	.	.	.	22
Melica nutans		1	1	1	1	1	1	1	3	2	2	3	2	2	3	3	100	2	2	+	2	1	1	2	2	2	2	+	+	1	1	2	2	2	+	2	2	1	1	1	100
Anemone nemorosa		+	.	1	1	.	2	.	+	.	+	2	2	1	2	+	73	.	2	1	1	2	1	2	2	1	2	2	2	+	2	2	1	.	.	.	.	.	.	.	65
Ajuga reptans		.	1	.	1	1	+	.	+	+	2	.	.	+	1	1	67	1	1	.	+	+	.	+	+	+	+	.	r	.	.	r	.	.	+	+	+	1	1	.	65
Viola riviniana		.	.	.	.	1	.	.	.	.	.	1	+	+	1	1	40	1	1	.	+	.	+	.	.	+	.	.	+	1	1	1	1	.	.	.	.	.	.	1	48
Festuca heterophylla		2	.	.	2	.	.	1	2	.	.	.	1	.	.	.	33	+	.	3	+	+	r	+	.	+	.	.	+	r	.	.	+	.	+	.	.	.	+	.	52
Poa nemoralis		.	.	2	.	2	+	1	.	.	.	.	2	.	.	.	33	1	4	2	+	.	+	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	1	39
Atrichum undulatum		.	.	.	.	.	+	.	.	+	.	+	.	.	.	.	20	.	1	+	+	.	+	+	+	+	.	.	+	+	.	.	.	+	.	+	+	+	.	.	57
Scrophularia nodosa		+	r	+	r	+	.	.	+	.	.	+	+	.	.	.	53	.	.	+	.	.	+	r	.	r	.	.	.	.	.	.	.	+	.	+	.	+	.	.	30
Festuca gigantea		.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	7	+	.	.	.	.	.	+	.	+	.	.	r	+	+	r	.	.	+	.	r	r	+	+	52
Brachypodium sylvaticum		.	+	.	.	+	.	.	+	.	.	.	.	.	2	2	33	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	r	.	+	+	22
Viola reichenbachiana et riviniana		.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	7	.	.	.	.	+	.	.	1	.	.	+	.	.	.	.	.	1	+	.	.	+	+	.	30
V. Ch., D*. *Quercetea robori-petraeae*	
* *Pteridium aquilinum*		1	2	.	1	1	+	1	.	.	+	.	1	+	1	1	73	+	.	1	.	+	4	2	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	35
* *Melampyrum pratense*		1	.	.	+	r	1	+	+	.	+	.	+	1	1	+	73	.	+	+	.	+	+	1	+	1	+	+	1	+	+	1	1	1	+	+	+	+	+	.	87
Calamagrostis arundinacea		1	1	+	1	1	.	2	.	+	1	.	2	.	+	+	73	+	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	13
Festuca ovina		.	1	.	.	.	+	.	+	1	+	.	.	2	1	1	53	.	+	.	.	.	.	.	+	.	.	.	r	.	.	.	.	+	+	+	+	+	.	.	35
Hieracium lachenalii		.	.	.	.	.	+	+	.	+	.	.	.	+	+	+	40	.	.	.	.	.	+	r	.	.	.	.	r	.	.	+	.	.	r	r	+	.	.	.	30
Carex pilulifera		.	.	.	.	+	.	.	.	+	.	.	.	2	+	.	27	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	17
VI. Ch. *Vaccinio-Piceetea*	
Picea abies	a2"bc^b	.	.	.	.	+"	r^	.	.	.	.	.	.	.	.	+	20	.	.	.	.	.	r^	r^	.	.	.	r^	r^	+^	+^	+^	+^	+	1	.	.	1	2	.	52
Picea abies	c	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	13
Pinus sylvestris	a1,a	.	.	.	2	+	.	.	1	.	.	.	.	.	1	1	33	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	13
Pinus sylvestris	c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	+	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Vaccinium myrtillus	c	1	2	.	1	1	.	+	.	.	+	+	1	2	3	1	73	.	+	+	+	1	.	+	+	+	.	+	.	.	.	+	1	1	+	2	1	.	.	1	65
Rubus saxatilis	c	+	1	.	1	.	.	.	.	.	+	.	.	.	1	.	33	.	1	.	1	.	.	.	2	+	.	.	.	.	+	.	r	.	.	.	r	+	1	+	43
Juniperus communis	bc	.	.	.	.	.	r	.	.	.	.	.	.	+	1	2	27	+	+	.	.	+	.	.	.	.	.	r	.	.	.	r	r	.	r	.	r	.	.	.	35
VII. Ch. *Trifolio-Geranietea* (T-G), *Festuco-Brometea* (F-B)	
Fragaria vesca (T-G)		+	+	.	1	1	2	2	1	.	+	2	+	.	2	1	80	1	2	1	+	.	1	2	2	2	2	1	1	1	2	1	2	2	2	2	2	2	2	1	96
Trifolium alpestre (T-G)		+	1	2	1	.	2	3	1	+	+	3	2	.	1	1	87	+	+	+	1	1	+	2	2	1	1	+	+	1	1	+	1	+	.	+	.	2	1	.	87
Poa angustifolia (T-G)		.	.	.	.	+	2	.	.	1	+	.	.	1	1	1	47	+	+	.	2	.	+	+	1	1	1	1	+	.	+	+	.	2	1	1	1	2	1	.	78
Hypericum perforatum (T-G)		.	.	.	.	.	+	.	+	.	.	.	.	.	.	+	20	+	+	.	+	+	.	r	+	.	+	+	+	+	+	.	.	1	+	.	+	+	+	+	74
Polygonatum odoratum (T-G)		+	.	+	+	r	+	+	+	+	+	.	.	+	+	1	80	r	1	.	+	+	+	+	+	.	+	.	.	+	.	.	+	.	.	.	.	+	.	+	52
Clinopodium vulgare (T-G)		1	1	2	1	.	.	1	.	.	1	+	.	1	2	1	67	+	.	+	+	.	.	.	+	.	.	.	+	.	.	.	+	+	.	.	.	.	.	+	35
Astragalus glycyphyllos (T-G)		.	+	.	r	.	+	+	.	+	.	.	.	.	+	+	47	1	1	.	.	+	.	+	1	+	+	+	+	+	+	+	+	+	+	+	1	+	+	.	83
Vicia sepium (T-G)		.	+	+	1	.	.	.	+	+	+	+	.	+	+	+	67	.	.	.	r	+	.	r	+	+	+	.	+	+	+	+	+	.	.	.	.	+	+	r	61
Filipendula vulgaris (F-B)		.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	7	.	.	.	+	+	+	+	+	+	+	1	+	+	1	1	+	+	1	2	+	+	1	.	83
Knautia arvensis (T-G)		+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	20	.	.	.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1	1	.	83
Silene nutans subsp. *nutans* (T-G)		.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	13	+	+	+	.	.	+	.	+	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	26
VIII. Ch. *Molinio-Arrhenatheretea* (M-A)	
Veronica chamaedrys		1	1	+	2	1	+	2	1	+	2	1	1	.	1	1	93	+	1	1	+	+	+	1	1	+	+	+	+	+	1	+	+	1	1	+	+	+	+	+	100
Festuca rubra s. s.		.	.	.	.	+	.	.	.	2	1	.	.	.	.	.	20	.	+	.	+	2	+	+	.	+	.	.	+	+	+	.	1	+	1	+	.	1	2	.	65
Galium mollugo		.	1	.	+	+	+	1	1	.	.	1	2	.	1	1	67	.	.	1	.	2	.	.	.	+	.	+	.	.	+	.	.	.	.	.	.	+	.	.	26
Achillea millefolium		.	+	.	.	.	.	+	+	.	.	.	+	.	+	.	33	+	+	.	.	+	.	.	.	.	.	.	.	.	.	+	+	+	+	r	+	+	+	.	48
Rumex acetosa		.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	7	.	+	+	.	.	r	.	r	+	.	.	r	+	.	+	r	+	.	r	+	r	.	.	57
Deschampsia caespitosa		.	.	.	.	+	.	+	.	.	.	+	+	.	.	.	27	.	.	.	.	.	.	.	.	.	r	.	.	.	r	r	+	.	.	.	.	.	.	+	22
IX. Ch. *Calluno-Ulicetea*	
Agrostis capillaris		+	.	.	+	2	2	1	+	+	.	1	.	1	.	.	60	+	1	.	.	1	+	1	1	1	1	1	r	+	1	1	1	1	2	2	1	1	+	1	91
Veronica officinalis		.	.	.	+	1	+	+	1	+	+	+	.	+	.	+	67	+	+	1	+	.	+	+	+	.	+	+	+	+	.	r	+	.	+	.	.	.	.	+	65
Potentilla erecta		.	r	.	.	+	+	.	.	.	.	.	.	.	+	+	33	.	.	.	.	+	+	+	1	+	+	+	1	+	+	1	1	1	+	+	1	+	+	.	78
Solidago virgaurea s. s.		+	.	.	+	.	+	.	.	.	+	.	.	.	1	+	40	+	.	.	+	+	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	r	.	.	30
Hypericum maculatum		.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	7	.	.	+	.	.	1	.	r	1	+	.	+	+	.	+	.	.	+	2	2	.	.	+	52
X. Ch. *Rhamno-Prunetea*	
Frangula alnus	b	.	.	.	.	.	.	+	.	.	.	.	.	.	2	+	20	+	+	.	+	+	+	+	.	+	.	.	+	+	+	.	.	+	.	+	+	+	+	.	65
Frangula alnus	c	.	.	.	.	+	+	+	r	.	+	+	+	.	+	+	60	.	+	+	r	.	.	.	+	.	+	r	r	.	+	r	+	.	.	r	.	.	.	.	48
Rhamnus cathartica	bc	.	.	.	.	.	.	+	+	+	.	+	+	.	.	+	40	.	.	.	+	.	+	.	.	+	.	+	.	+	+	+	.	.	.	+	.	r	.	r	43
Prunus spinosa	b	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	r	r	.	+	22
Prunus spinosa	c	.	.	.	.	1	+	.	.	.	.	.	.	.	+	.	20	.	.	.	.	.	.	.	+	.	r	.	.	.	.	.	.	.	+	+	+	r	+	+	35
XI. Others	
Quercus robur	a1,a	.	.	.	.	4	4	4	.	.	4	2	.	.	4	4	47	.	.	1	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	2	91
Quercus robur	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Quercus robur	b	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	7	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	1	.	.	17
Quercus robur	c	.	.	.	.	.	+	1	.	.	2	.	.	.	1	1	33	.	.	+	1	.	+	2	+	1	+	+	1	2	2	1	1	+	+	+	+	+	+	+	87
Quercus petraea [*Q*. x *rosacea* ^]	a1,a	4	4	5	4	+^	.	.	4	4	.	2	4	4	2	2	80	4	4	3	1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	26
Quercus petraea	a2	1	2	.	1	.	.	.	1	.	.	.	.	.	.	.	27	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	9
Quercus petraea	b	.	+	.	+	.	.	.	.	.	.	.	.	1	.	.	20	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	13
Quercus petraea	c	+	+	+	1	+	.	.	1	+	.	2	1	.	.	.	60	.	1	1	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	26
Padus serotina	b/c	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	7	2/+	+/	.	.	.	.	.	.	.	.	.	/r	/r	.	.	.	/+	+/+	+/+	/+	/r	/+	/r	48
Pyrus pyraster	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	+/+	+/+	.	.	.	/+	/+	/+	/+	/+	/+	.	/+	/+	.	r	/+	/+	+/+	+	+/	.	.	70
Sorbus aucuparia	a2^,b	.	+	1	.	.	.	+	.	.	.	.	.	.	.	.	20	+	+	.	1	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	r	r	.	+	35
Sorbus aucuparia	c	+	+	+	+	+	r	+	+	.	+	.	+	+	.	.	73	.	+	.	+	.	.	r	r	+	r	+	+	r	+	r	+	.	+	+	r	+	.	+	74
Convallaria majalis		1	1	2	2	.	.	+	1	+	2	.	1	2	2	1	80	1	1	3	3	.	+	1	1	+	1	+	.	1	.	+	+	.	1	2	1	+	+	+	83
Luzula pilosa		+	+	.	1	+	+	.	1	+	1	.	+	1	1	1	80	+	+	1	+	+	+	+	+	+	+	.	+	+	+	+	+	+	+	r	r	+	+	+	96
Moehringia trinervia		+	+	.	+	+	.	+	+	+	+	+	+	+	1	2	87	1	+	.	.	.	+	+	+	+	+	+	+	+	+	1	2	+	+	+	+	+	+	+	87
Anthoxanthum odoratum		1	.	.	+	.	+	+	+	.	.	.	+	+	.	.	47	.	1	+	.	1	+	1	+	1	+	+	+	+	1	+	+	+	+	+	+	1	1	.	87
Mycelis muralis		1	+	+	1	+	+	1	.	.	.	1	+	.	.	+	67	1	+	+	.	.	.	r	.	.	+	+	r	+	+	1	+	+	+	+	+	+	+	+	78
Urtica dioica		.	.	.	+	+	+	+	+	+	.	+	r	.	.	.	53	.	.	+	.	+	+	1	+	+	+	+	.	+	+	+	+	+	2	+	+	1	1	+	83
Maianthemum bifolium		+	.	.	+	1	1	1	.	.	.	+	+	.	.	2	53	.	.	+	.	+	+	+	.	+	.	.	.	+	1	.	.	.	+	1	1	.	.	+	48
Oxalis acetosella		.	.	.	+	1	1	2	.	.	.	+	+	.	.	.	40	.	.	.	.	+	1	.	+	+	+	.	+	+	2	r	1	+	2	2	2	+	1	1	74
Galeopsis pubescens		.	.	.	.	r	.	+	.	+	.	+	+	.	.	.	33	.	.	+	.	+	+	.	+	+	+	.	.	+	+	+	+	1	+	+	+	+	1	.	70
Fallopia convolvulus		.	.	+	.	+	+	+	+	.	.	.	.	.	.	.	33	+	.	.	.	.	.	+	.	.	r	+	.	+	+	+	+	.	+	.	+	+	+	+	57
Geum urbanum		.	.	+	1	.	.	1	+	.	.	+	+	.	.	.	40	+	.	.	.	.	r	+	+	+	.	r	r	+	+	.	.	+	+	+	+	+	+	+	70
Campanula rotundifolia		.	+	.	.	+	+	1	.	.	.	+	+	.	.	.	40	+	.	.	+	.	.	+	.	.	.	.	.	+	.	+	+	+	+	+	+	+	+	.	52
Galeopsis tetrahit		.	.	.	+	r	+	.	+	+	+	.	.	+	.	.	47	.	.	.	.	.	.	1	.	.	.	+	r	.	.	r	+	.	+	+	+	+	.	+	43
Rubus idaeus		.	.	.	.	2	.	.	+	.	.	.	.	.	.	.	13	+	.	.	.	+	+	+	+	+	+	.	+	+	+	.	+	.	1	1	.	.	.	1	61
Plagiomnium affine		.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	13	1	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	1	.	39
Galium aparine		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	2	1	.	.	+	+	+	.	1	.	.	.	+	r	r	+	+	.	.	.	.	.	.	48
Geranium robertianum		.	.	1	.	.	.	2	.	.	.	+	.	.	.	.	20	1	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	r	+	+	+	39
Alliaria petiolata		.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	7	+	.	+	.	+	.	+	.	.	.	+	.	.	.	.	+	+	+	.	.	.	.	+	39
Hieracium murorum		+	+	.	.	.	.	.	+	.	+	.	.	+	.	.	33	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4

Sporadic species: IV.: *Acer platanoides* c 3,17(r); *A. pseudoplatanus* b 5, c 5; *Adoxa moschatellina* 5; *Asarum europaeum* 9; *Campanula trachelium* 3; *Cerasus avium* c 1,16,28(r),29,30,31,33(r),35(r); *Dactylis polygama* 27,28,33,34(r),38; *Daphne mezereum* b 14, c 11,12,14,15; *Dryopteris filix-mas* 31,38; *Equisetum sylvaticum* 38; *Euonymus verrucosus* c 15; *Eurhynchium angustirete* 18; *Fraxinus excelsior* b 35(r); c 7,11,19,20(r),31,33(r),34(r); *Galeobdolon luteum* 3,9(2),10; *Galium odoratum* 3,29(1); *G. schultesii* 13,14(2),15(2); *Hierochloë australis* 19; *Malus sylvestris* b 17,19, c 19,22,27,29,32,33(r),38(r); *Melampyrum nemorosum* 11(1),12(1),13(1),18(2); *Melittis melissophyllum* 13(1); *Milium effusum* 11,12,18,22,34(r),35; *Padus avium* b 7,33,38, c 11,18,32,36(r),37,38; *Phyteuma spicatum* 27(r),29(r); *Polygonatum multiflorum* 3,18; *Ranunculus auricomus* 29(r),30(r); *Ribes uva-crispa* c 5; *Sanicula europaea* 4; *Sorbus torminalis* 3; *Stachys sylvatica* 11; *Tilia cordata* a2 19, b 19, c 3,19; *Ulmus minor* c 33; *Viburnum opulus* b 14, c 11; **V.:** *Hieracium laevigatum* 28,32,33(r),35(r); *Hieracium sabaudum* 14; *H. umbellatum* 14; *Holcus mollis* 3,5,11,12,13(1),15(1),18,20(2); *Lathyrus montanus* 3,7,11(2), 12(1),18(1); *Luzula pallescens* 20; **VI.:** *Pseudoscleropodium purum* 16,17,32,38; *Trientalis europaea* 7,11,14,15,18; *Vaccinium vitis-idaea* 1,6(r),27,30(r),36; **VII.:** *Ajuga genevensis* (F-B) 13; *Asparagus officinalis* (F-B) 16; *Asperula tinctoria* (F-B) 1,4,19,22,23,26,30,31; *Avenula pratensis* (F-B) 32; *Campanula bononiensis* (T-G) 30(r); *C. glomerata* (F-B) 18,19; *C. rapunculoides* (T-G) 12,18(2); *Coronilla varia* 16,30(r); *Festuca trachyphylla* (FB) 32; *Galium album* (T-G) 17(1),19,38; *Lathyrus sylvestris* (T-G) 7; *Peucedanum cervaria* (T-G) 15,26,27,28(r); *Poa compressa* (F-B) 9; *Thalictrum minus* (F-B) 2(r),4(1); *Trifolium montanum* (F-B) 10; *Vicia dumetorum* (T-G) 11,12,18(1); *Vincetoxicum hirundinaria* (T-G) 1,3; **VIII.:** *Agrostis gigantea* 1,32; *Arrhenatherum elatius* 12,18,22,31; *Avenula pubescens* 18,21; *Briza media* 31(r),33; *Carex hirta* 5,7(1),11(1),16,34(r),36(r),37,38(1); *Cerastium holosteoides* 17; *Cnidium dubium* 33(2),34,35(2),36(2),37(2); *Dactylis glomerata* 3(1),4,8,12(1),18,22,25(r),38(1); *Festuca pratensis* 11; *Juncus effusus* 5,25(r),38; *Lathyrus pratensis* 12,18; *Leontodon autumnalis* 5(r); *Molinia caerulea* 27; *Poa pratensis* 4,11,12,14; *P. trivialis* 6,13; *Ranunculus acris* s.s. 18; *Selinum carvifolia* 22,29,30; *Stellaria graminea* 7,15(1); *Succisa pratensis* 21; *Taraxacum officinale* 5,6(r),7,16(r),22,27(r),28(r),29(r),30(r),34(r); *Vicia cracca* 3,5; **IX.:** *Carex pallescens* 7,21(r),26(r),30; *Genista tinctoria* 20,30,31,32,33,35; *Hieracium pilosella* 17; *Luzula multiflora* 10,13,25,32; *Pohlia nutans* 31(r),32,34,36; *Scorzonera humilis* 10,14; *Viola canina* 2(1),4,30(r),31; **X.:** *Berberis vulgaris* b 16; *Crataegus laevigata* b 4,5,19,21, 22,24(r),30(r),36(r), c 25,28,29; *C. monogyna* b 8,14,29,36(r),37, c 14; *C. rhipidophylla* var. *ripidophylla* 30,32,33,34,35,36,37,38, c 5(r),38; *Euonymus europaea* c 19; *Rosa canina* b 19, c 7,8,16(r),33(r); *Rubus gracilis* c 5; *R. plicatus* c 38(1); *Sambucus nigra*c 9; **XI.:** *Acer negundo* c 33(r); *Aegopodium podagraria* 12(1),18; *Anthriscus sylvestris* 7(1),18; *Aquilegia vulgaris* 12; *Athyrium filix-femina* 11; *Betula pendula* a 13(1),15(1), a1 19,38(1), a2 19; *Brachytheciastrum velutinum* 1,9,16; *Brachythecium rutabulum* 17,25(r),32,36,37,38; *Bromus benekenii* 1,4; *Calamagrostis epigejos* 5(2),23,37; *Carex guestphalica* 5; *C. spicata* 30(r); *Chamaenerion angustifolium* 25; *Chenopodium album* 37; *Cruciata glabra* 13(2); *Deschampsia flexuosa* 5(1),22(r),24,32,33,35,36,38; *Digitalis grandiflora* 4(r),7,11; *Dryopteris carthusiana* 5,7,11,38; *Epilobium montanum* 21(r); *Fallopia dumetorum* 33; *Galium mollugo et dumetorum* 9,10; *Heracleum sibiricum* 12; *H. sphondylium* 25(r),27,32; *Hypnum cupressiforme* 8,19; *Impatiens parviflora* 5(2),33,34,35(1),36(2),37(2),38(1); *Lapsana communis* s.s. 6,11,33; *Linaria vulgaris* 32; *Lupinus polyphyllus* 20,22,27; *Malus* sp. 10; *Oxyrrhynchium hians* var. *hians* 19; *Phalaris arundinacea* 38; *Plagiomnium cuspidatum* 38; *Poa nemoralis x compressa* 9; *Polytrichastrum formosum* 1,2,13(2),15; *Populus tremula* a2 19, b 19(1), c 12; *Pyrus communis* c 9,14; *Rosa tomentosa* b 32; *Rosulabryum capillare* 1; *Rubus caesius* 7(2),11; *R. corylifolius* 24,30; *R. sprengelii* 5,16,33,35(r),38(1); *Rubus* x *corylifolius* 16,38(1); *Sciuro-hypnum oedipodium* 10,16,17,19(1); *Senecio sylvaticus* 24(r),29(r); *S. vernalis* 6(r); *Stellaria media* 3,11,17,36; *Thalictrum aquilegiifolium* 4,12(1),18(1); *Torilis japonica* 3(1),8,9,11(1),16,25(r),31(r),33(2),36,37; *Vicia hirsuta* 17(r); *Vicia* sp. 30(r); *Viola* sp. 6; *Viscaria vulgaris* 15.

Table A29. *Potentillo albae-Quercetum petraeae brachypodietosum pinnati* in stage II of degeneration

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	
ID-1		17	20	19	48	16	19	16	44	44	20	20	19	48	41	16	16	20	17	56	20	20	19	19	16	56	17	56	17	17	17	16	16	20	59	17	17	56	56	8	59	29	57	56	29	29	45	45	45	17	45	45	16	59	41	41	41	28	41	41	41	16	19	19	41	56	
ID-2		7	2	1	5	19	1	19	2	2	2	3	1	5	1	19	19	3	7	3	3	3	1	1	19	1	7	1	7	7	6	19	19	2	4	6	7	1	1	-	4	11	1	1	11	11	11	11	11	7	11	11	19	4	1	1	1	3	1	1	1	19	1	1	1	1	
ID-3		6	7	11	2	1	14	8	1	2	2	2	26	3	2	11	2	4	5	20	3	5	24	20	16	30	7	28	8	10	1	18	15	10	4	4	2	31	29	-	5	11	14	23	8	7	1	4	2	9	3	6	4	1	1	5	7	2	6	4	8	3	22	19	3	27	
Date (year)		1995	2007	1983	1976	1971	1979	1973	1977	1977	2006	2006	1987	1976	1997	1972	1972	2006	1996	2006	2006	2007	1983	1983	1969	2006	1995	2006	1995	1995	1995	1969	1969	2006	1993	1996	1995	2005	2006	2006	1993	1977	1992	2006	1980	1977	1980	1980	1980	1995	1980	1980	1972	1993	1997	1997	1997	1974	1997	1997	1997	1971	1983	1987	1997	2006	1-65
Density of tree layer	a1,a [%]	75	60	60	60	80	60	50	50	50	80	60	60	75	70	80	100	70	50	25	75	70	75	70	30	30	80	40	40	60	70	100	100	60	70	50	80	60	65	60	70	75	60	60	75	70	60	85	75	25	85	75	100	80	70	80	80	70	85	70	65	60	70	60	90	70	
Density of tree layer	a2 [%]	.	25	20	.	10	20	30	5	20	15	.	20	.	.	30	20	.	.	+	5	5	20	30	100	50	.	50	.	.	.	.	.	+	.	.	.	5	.	.	.	.	.	10	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.	10	.	100	20	.	.	.	%
Density of shrub layer	b [%]	5	5	10	-	20	40	30	20	30	5	15	3	-	10	60	10	10	5	5	10	10	15	30	10	30	+	20	15	+	10	10	-	10	-	5	50	10	+	+	-	+	5	5	5	-	-	+	-	15	-	-	10	20	10	10	5	-	5	20	10	30	10	5	10	5	
Cover of herb layer	c [%]	35	75	90	80	100	90	100	90	70	80	75	100	70	80	70	80	60	75	55	60	60	90	90	80	50	30	30	100	60	70	80	90	75	85	80	35	65	55	75	60	60	60	80	50	40	100	100	100	80	100	100	100	70	90	90	100	50	70	100	100	70	80	100	90	50	
Cover of moss layer	d [%]	10	5	-	+	40	-	80	60	30	15	5	-	-	10	30	80	10	15	15	5	5	5	-	20	+	10	+	-	-	-	+	5	-	-	-	-	+	5	5	-	+	+	+	5	+	-	+	+	35	-	-	40	5	+	+	+	-	+	-	+	50	-	2	10	+	
Area of relevé		150	300	400	200	300	400	150	400	400	100	100	400	200	300	300	350	150	250	300	300	300	400	400	200	400	200	400	120	120	150	200	200	300	100	200	150	400	400	400	100	200	150	300	200	150	100	100	100	200	100	100	100	120	200	300	200	bd	300	300	100	300	400	400	400	300	
Location (ATPOL)		BC66	CD39	DD92	BD39	BC19	DD91	BD29	DE41	DE41	CD39	CD39	DD83	BD28	CC25	BD31	BC19	CD39	BC66	BC76	CD39	CD39	DD92	DD92	BC72	BC66	BC66	BC66	BC66	BC66	BC66	BC72	BC72	CD39	BC98	BC66	BC66	BC76	BC66	BC98	BC98	CD28	BC66	BC66	CD17	CD17	CD12	CD12	CD12	BC66	CD12	CD12	BC19	BC98	CC25	CC25	CC25	CC91	CC25	CC25	CC25	BC19	DD92	DD83	CC25	BC66	
Total number of species		43	49	59	33	65	57	92	59	56	41	39	44	39	36	59	64	46	56	57	67	55	40	47	53	55	48	50	44	31	50	44	59	50	32	52	52	66	70	64	22	50	64	61	42	44	38	49	54	45	40	41	62	38	36	42	38	45	31	28	22	56	43	52	35	68	
Number of mosses, liverworts and lichens species		1	6	-	2	4	-	4	5	6	2	2	-	-	4	5	10	3	1	2	6	6	1	-	4	3	1	1	-	-	-	2	4	-	-	-	-	3	6	6	-	3	3	1	5	7	-	1	1	1	-	-	7	2	2	6	1	-	1	-	1	13	-	1	2	2	
I. Ch.*, D.^ *Potentillo albae-Quercetum*																																																																				
Ch. *Quercetalia pubescentis*																																																																				
^ *Galium boreale* (M-A)		+	2	+	2	2	.	.	.	.	r	.	.	1	+	.	.	+	1	.	1	1	.	.	2	+	.	1	+	+	+	1	2	+	2	.	+	+	1	+	1	+	+	2	+	+	.	2	1	1	2	1	2	1	+	+	+	.	+	.	.	+	.	.	+	1	71
^ *Betonica officinalis* (M-A)		+	.	+	.	.	+	.	+	+	.	.	+	+	+	+	.	.	+	+	+	+	.	+	+	1	.	+	.	.	+	+	.	.	1	+	+	.	.	.	+	.	.	+	.	.	+	+	1	+	.	+	.	.	+	.	.	.	.	+	+	.	.	1	+	+	54
Campanula persicifolia		.	+	1	.	+	.	.	.	.	r	+	.	.	.	.	.	+	+	.	+	+	+	+	+	.	1	+	.	.	+	+	.	+	+	.	.	+	1	1	+	+	+	1	+	1	.	+	+	.	+	.	.	+	.	r	.	.	.	.	.	1	+	+	.	1	55
* *Potentilla alba*		1	.	.	1	.	.	.	.	.	.	.	.	+	r	.	.	.	+	.	.	.	.	.	.	r	+	.	+	+	.	.	+	.	+	+	+	.	.	.	+	.	+	+	+	.	1	.	1	+	+	+	.	.	+	.	r	.	.	.	.	.	.	.	.	.	37
* *Carex montana*		.	.	.	.	.	.	.	.	.	1	.	+	+	.	.	.	.	.	.	+	.	+	.	.	.	.	1	.	.	.	.	.	1	.	+	1	+	+	+	.	2	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	1	.	1	28
Lathyrus niger		.	+	.	.	.	.	.	+	+	.	.	+	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	2	.	+	.	.	+	+	+	+	.	+	+	.	.	23
Hypericum montanum		.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	9
* *Ranunculus polyanthemos*		.	.	.	.	.	+	2	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Primula veris		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Festuca amethystina subsp. ritschlii		.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
II. D. *Pa-Q brachypodietosum*																																																																				
Euphorbia cyparissias (F-B)		r	+	+	.	+	1	2	+	.	+	.	.	.	.	.	+	.	.	+	+	+	1	1	.	r	1	+	+	+	.	+	+	1	.	.	.	.	.	+	+	.	.	+	+	+	1	+	1	.	+	+	+	.	.	.	.	.	.	.	.	+	+	1	.	.	55
Peucedanum oreoselinum (T-G)		.	+	1	+	.	+	.	+	+	+	+	+	+	+	+	.	2	.	.	.	.	1	.	1	.	.	.	.	+	.	+	+	.	1	.	.	.	+	1	+	.	.	.	.	.	2	1	2	.	1	+	.	+	.	.	.	+	.	.	.	.	+	+	.	.	49
Brachypodium pinnatum (F-B)		2	.	.	.	3	.	.	.	.	.	.	.	.	+	.	.	.	1	.	.	.	.	1	.	1	2	2	.	.	+	.	.	.	.	+	2	2	1	1	.	.	1	2	.	.	2	.	.	2	.	.	4	.	+	+	+	.	+	3	3	2	1	.	2	2	45
Pimpinella saxifraga (F-B)		+	+	.	.	+	+	+	+	+	.	+	.	.	.	.	+	.	.	1	+	+	+	.	.	.	.	.	.	.	.	+	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	37
Sedum maximum (T-G)		.	.	+	.	.	+	+	.	.	1	+	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.	.	.	+	.	1	+	.	.	.	.	.	.	+	.	+	.	+	.	1	.	+	+	+	+	.	.	+	+	+	.	.	.	.	+	.	.	+	32
Anthericum ramosum T-G)		r	1	.	.	.	.	.	+	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	+	.	+	.	2	+	+	+	+	+	+	.	.	+	.	.	.	.	+	.	.	.	2	.	.	.	.	+	.	.	+	32
Galium verum (T-G)		.	.	.	.	+	.	2	.	.	.	.	.	+	.	+	+	.	.	1	.	.	.	.	.	.	.	.	1	.	+	.	+	.	.	.	.	.	.	1	.	.	.	+	.	.	+	+	+	+	+	.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	28
Geranium sanguineum (T-G)		.	.	+	+	.	1	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	.	20
III. D. *Pleurozium schreberi* var.																																																																				
Pinus sylvestris (V-P)	a1,a	4	4	3	3	5	3	3	3	3	.	.	2	2	.	2	1	1	2	2	+	+	2	1	3	3	5	3	3	4	.	2	1	+	.	.	.	.	1	.	.	2	.	1	.	.	.	.	.	2	.	.	.	.	.	.	.	2	.	.	.	2	.	1	.	2	57
Pinus sylvestris (V-P)	a2	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Pinus sylvestris (V-P)	b/c	.	.	.	/+	.	.	+/	+/	.	.	/+	.	.	/r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Pleurozium schreberi (V-P)		2	1	.	.	2	.	4	3	3	.	.	.	.	1	.	2	+	2	2	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25
Hypnum cupressiforme		.	+	.	+	.	.	.	+	+	.	.	.	.	.	1	2	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	+	.	.	.	.	.	2	.	.	.	.	18
Pseudoscleropodium purum (V-P)		.	+	.	.	.	.	2	.	.	+	+	.	.	+	2	.	1	.	.	+	1	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	22
Hieracium pilosella		.	.	.	.	+	+	2	.	.	r	1	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12
Vaccinium vitis-idaea (V-P)		.	.	+	+	.	.	.	+	1	.	.	1	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	12
IV. D. *Asarum europaeum* var.																																																																				
Viola reichenbachiana (Q-F)		.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1	+	.	+	+	.	+	+	+	+	+	+	+	+	1	.	.	+	.	25
Lilium martagon (Q-F)		.	.	.	+	.	+	.	.	.	.	.	.	.	r	.	.	.	+	.	.	.	.	.	r	.	.	r	.	r	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	+	1	+	23
Carex digitata (Q-F)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	2	1	.	.	.	.	.	.	1	.	.	.	.	+	.	.	.	2	2	+	.	+	15
V. Ch. *Querco-Fagetea* (Q-F)																																																																				
Melica nutans		+	1	1	2	2	1	+	.	.	1	1	1	1	+	1	.	2	1	+	1	3	3	4	3	1	+	1	.	.	2	1	2	2	.	2	1	+	2	.	1	2	1	1	2	1	.	.	.	.	.	.	1	2	2	2	1	+	+	1	2	.	3	3	1	1	78
Poa nemoralis		.	3	.	.	+	.	1	.	.	+	+	+	.	2	.	+	1	1	.	3	1	.	.	2	3	.	2	.	.	2	1	2	1	.	1	.	.	2	2	.	.	.	2	.	.	.	.	.	.	.	.	+	.	2	2	3	3	3	.	.	2	.	.	+	2	49
Ajuga reptans		.	+	1	.	.	.	.	.	+	+	+	+	.	.	.	.	+	.	.	.	1	1	1	.	.	.	.	.	+	.	+	1	+	.	+	+	+	.	.	.	+	+	.	.	+	+	.	+	+	.	.	.	.	+	+	+	.	+	.	.	.	1	+	1	+	48
Anemone nemorosa		r	.	+	.	.	.	.	1	+	.	.	.	.	.	.	.	.	1	.	+	+	2	2	.	.	.	.	.	+	.	.	.	.	1	+	+	.	.	.	2	+	1	+	.	.	+	1	1	.	+	+	.	2	.	.	.	.	.	.	.	.	2	1	.	.	38
Viola riviniana		.	+	.	.	+	1	.	.	+	+	r	1	.	.	.	.	+	.	.	.	+	1	2	.	1	.	+	.	.	.	.	.	.	.	.	.	1	+	1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	1	.	+	32
Atrichum undulatum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	.	.	.	.	.	.	.	.	+	.	1	.	.	.	.	.	.	.	.	.	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	1	.	.	+	.	.	+	.	.	1	.	.	.	+	20
Festuca gigantea		+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	.	.	+	+	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	r	17
Brachypodium sylvaticum		.	.	2	.	.	2	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	+	.	2	+	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	17
Scrophularia nodosa		.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	+	+	.	.	.	+	.	.	.	.	+	.	.	.	.	1	.	+	.	+	.	.	.	.	.	.	.	.	.	17
Hepatica nobilis		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	.	.	.	.	+	+	.	.	+	.	2	1	.	+	.	.	.	.	.	.	.	.	1	.	.	.	.	.	+	2	.	.	.	.	.	17
Dryopteris filix-mas		.	.	.	.	+	.	.	.	.	.	+	.	.	.	1	+	1	.	.	+	.	.	.	.	r	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	15
Dactylis polygama		.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	2	+	.	.	+	.	.	.	1	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	15
VI. Ch., D.* *Quercetea robori-petraeae*																																																																				
Festuca ovina		.	+	1	+	2	1	2	1	1	2	1	1	1	.	.	+	+	2	.	+	1	.	1	+	.	.	.	.	2	.	+	+	1	.	.	.	.	+	1	.	1	.	.	2	2	.	.	1	2	.	+	+	2	.	.	.	+	.	.	.	1	1	1	.	.	57
* *Pteridium aquilinum*		2	1	2	4	2	1	.	1	+	.	.	2	+	+	+	.	.	.	.	.	.	1	1	.	.	.	1	.	.	1	.	.	.	.	+	2	2	+	.	+	+	3	.	+	.	.	.	.	.	.	.	3	.	+	+	1	.	1	+	.	+	1	1	.	2	52
Calamagrostis arundinacea		.	+	1	1	.	+	.	.	.	.	+	3	4	1	1	.	+	1	.	.	2	+	1	+	.	.	+	.	.	+	.	.	+	.	.	+	+	.	.	.	.	+	+	1	+	.	.	.	.	.	.	.	.	+	+	.	.	+	+	.	.	+	2	1	+	49
* *Melampyrum pratense*		.	+	1	.	1	.	2	1	2	+	+	1	+	1	.	.	+	.	.	.	.	.	.	.	+	.	+	.	.	+	.	1	.	1	.	+	+	+	.	+	1	+	r	.	+	.	.	.	.	.	.	+	.	.	+	1	+	.	.	.	1	.	.	+	.	48
Hieracium lachenalii		.	+	+	+	+	+	.	+	.	.	+	.	+	.	+	1	+	.	r	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	.	.	.	.	.	+	.	.	.	.	.	.	1	.	.	.	.	1	+	.	.	.	+	.	.	.	31
Carex pilulifera		.	.	.	+	+	.	2	.	+	.	.	.	+	.	.	+	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	.	.	+	1	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	29
Holcus mollis		.	.	1	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	1	.	.	.	+	.	.	.	.	15
VII. Ch. *Vaccinio-Piceetea* (V-P)																																																																				
Juniperus communis	b	.	.	+	.	2	.	.	2	1	.	+	+	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	17
Juniperus communis	bc	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	8
Juniperus communis	c	.	+	+	.	.	.	.	+	+	.	+	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	15
Vaccinium myrtillus		.	1	1	2	+	2	.	4	3	3	3	4	1	+	.	.	.	2	.	1	2	3	2	.	2	.	1	.	.	+	.	+	1	+	+	1	1	+	.	.	2	1	1	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	+	.	.	3	2	+	+	60
Rubus saxatilis		+	1	.	2	.	.	.	1	+	.	+	1	+	+	.	.	.	1	.	1	1	.	2	.	.	.	+	.	.	2	.	.	.	+	1	1	.	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	+	+	+	+	.	+	.	+	.	+	2	+	+	48
VIII. Ch. *Trifolio-Geranietea* (T-G), *Festuco-Brometea* (F-B)																																																																				
Hypericum perforatum (T-G)		+	1	+	.	.	+	+	.	+	.	.	.	.	+	+	.	.	+	+	+	+	+	+	+	r	+	+	+	+	1	+	.	+	+	+	+	+	+	1	+	.	.	+	.	+	.	+	+	+	.	1	.	.	.	+	+	.	+	+	.	.	.	1	+	+	66
Fragaria vesca (T-G)		1	1	3	.	1	1	+	1	+	+	+	1	+	.	.	.	.	1	1	1	1	2	2	+	+	1	+	.	+	2	.	+	+	.	1	1	2	+	.	.	+	+	+	.	.	.	.	+	.	.	.	1	.	.	.	+	.	.	.	.	1	+	3	+	1	63
Polygonatum odoratum (T-G)		.	1	+	.	1	+	.	+	+	+	r	+	.	+	.	.	2	+	.	+	+	+	1	+	+	+	+	.	.	.	1	.	2	.	+	.	.	+	+	.	1	.	+	.	1	.	.	.	.	.	.	.	.	+	+	.	+	.	+	.	.	+	+	.	+	54
Poa angustifolia (T-G)		.	1	1	1	.	1	.	+	+	1	1	1	+	.	.	.	1	.	1	+	1	.	1	.	.	.	.	3	.	.	.	.	1	1	.	.	+	1	2	.	+	.	+	+	.	2	3	2	2	2	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	48
Clinopodium vulgare (T-G)		.	.	1	.	.	.	+	+	.	+	+	.	+	.	.	.	r	.	.	1	1	.	2	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	+	+	1	3	3	+	.	1	.	.	.	+	+	+	+	+	.	+	.	.	.	+	.	40
Knautia arvensis (T-G)		r	.	+	.	1	1	.	+	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	1	+	.	.	.	.	+	+	+	r	.	.	.	.	.	+	.	.	+	+	.	+	+	.	1	.	.	.	+	.	.	.	.	+	+	+	.	.	37
Trifolium alpestre (T-G)		+	.	.	.	+	1	.	+	+	.	.	.	+	.	+	.	.	.	.	.	.	.	+	.	.	.	.	+	1	+	.	+	+	.	+	.	r	+	.	.	.	.	+	.	.	1	.	+	.	+	+	.	.	.	.	.	+	.	.	.	+	.	.	.	.	35
Vicia cassubica (T-G)		.	+	.	+	.	+	.	1	.	+	.	.	.	+	+	.	+	1	.	.	.	1	.	.	.	+	.	.	.	.	.	.	.	2	.	.	+	.	1	2	.	.	.	+	.	.	.	.	.	.	.	.	2	.	.	.	.	.	+	.	.	.	1	.	1	31
Astragalus glycyphyllos (T-G)		1	+	+	.	+	.	+	.	.	.	.	.	.	.	.	.	+	+	+	+	+	.	.	.	.	+	.	+	.	.	.	.	+	.	+	+	+	.	+	.	.	+	.	.	.	.	.	.	+	.	.	1	.	.	.	.	.	.	.	.	+	.	+	.	.	34
Vincetoxicum hirundinaria (T-G)		.	.	+	.	1	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	.	.	.	.	.	.	+	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	17
IX. Ch. *Molinio-Arrhenatheretea* (M-A)																																																																				
Veronica chamaedrys		.	+	1	+	.	1	2	.	+	.	+	.	+	+	.	1	.	+	r	+	+	1	1	1	+	.	+	+	+	+	+	1	+	1	+	.	+	+	+	.	+	+	+	+	+	.	1	1	+	+	+	1	1	+	+	+	+	.	.	+	+	1	1	+	+	80
Festuca rubra s. s.		.	+	+	.	1	+	2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	+	+	.	.	+	.	1	.	+	+	+	1	1	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	3	.	.	.	.	29
Deschampsia caespitosa		.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	.	.	.	.	+	1	+	.	.	.	.	+	2	+	.	.	+	.	+	.	.	.	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	28
Carex hirta		.	.	.	.	2	+	+	.	.	.	.	.	.	.	.	.	.	1	+	+	.	.	.	+	.	+	+	+	+	.	.	.	+	.	.	.	r	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	26
Achillea millefolium		.	+	+	.	+	+	1	.	.	r	.	.	.	.	.	+	.	.	+	r	+	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	1	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	26
Galium mollugo		+	.	1	.	.	+	.	+	.	.	.	+	.	.	.	.	.	1	.	.	.	1	.	.	.	+	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	1	.	.	22
Vicia cracca		.	.	.	.	1	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	2	+	+	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	20
Serratula tinctoria		.	.	+	.	.	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	.	.	+	+	+	+	17
Dactylis glomerata		.	.	.	.	+	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	1	.	.	.	1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	12
Rumex acetosa		.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
X. Ch. *Calluno-Ulicetea*																																																																				
Veronica officinalis		+	+	+	.	+	.	2	.	+	+	2	+	.	.	.	1	.	.	.	+	1	+	.	.	+	+	.	.	.	+	.	+	+	.	.	.	+	+	2	.	+	+	+	+	+	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	1	.	+	.	.	45
Agrostis capillaris		.	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	3	2	.	.	.	.	2	.	+	+	2	2	.	.	+	+	.	.	1	3	4	3	3	3	.	.	.	.	+	.	.	.	.	.	+	.	.	1	34
Solidago virgaurea s. s.		.	.	1	+	.	1	.	.	1	+	.	+	+	+	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	+	.	+	1	.	.	.	.	+	+	+	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	+	.	.	32
Scorzonera humilis		.	.	+	.	.	+	.	+	+	.	.	+	+	+	.	.	r	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	+	+	+	.	25
Potentilla erecta		.	.	+	.	.	+	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	r	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	22
Viola canina		.	.	.	.	+	+	1	.	.	.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14
XI. Others																																																																				
Quercus petraea [*Q*. x *rosacea* *]	a1,a	1*	2	.	4*	.	.	.	.	1	4	3	3	4*	4*	4	5	4	1*	.	4;2*	4:2*	3	.	.	.	.	.	.	.	.	4	4	4	4	.	.	1;1*	3*	3/2*	.	4	4	2*	4*	4*	.	.	.	.	.	.	5	4*	4*	4*	4*	2;3*	5*	4*	4*	2	.	3	5*	.	62
Quercus petraea	a2	.	2	.	.	1	2	.	.	2	.	.	2	.	.	2	2	.	.	.	1	1	2	.	4	.	.	.	.	.	.	.	.	+	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	5	2	.	.	.	25
Quercus petraea [*Q*. x *rosacea* *]	b	.	1	.	.	+	+	.	+	2	.	1	+	.	1*	+	1	.	+*	.	+	1	1	.	1	.	.	.	2*	+;+*	.	1	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2*	.	.	1	.	.	.	1*	.	.	+*	.	2	+	.	+*	.	40
Quercus petraea [*Q*. x *rosacea* *]	c	.	1	.	+*	1	.	.	1	+	1	1	.	1*	+*	.	1	+	+	.	2	1	.	.	.	.	+*	.	.	.	+*	1	1	1	.	.	.	+	+	+	.	.	+	.	+	+	.	.	.	2*	.	.	+	.	+*	+*	.	+	.	+*	+*	1	.	.	+*	.	52
Quercus robur	a1,a	.	.	3	.	.	2	1	.	.	.	.	1	.	.	1	.	.	2	.	.	.	.	4	.	.	.	.	.	.	4	2	3	.	.	3	5	4	3	3	4	+	.	3	.	.	4	4	4	.	4	4	.	.	.	.	.	.	.	.	.	.	4	2	.	4	40
Quercus robur	a2	.	.	2	.	.	1	3	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	2	2	4	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14
Quercus robur	b	.	.	.	.	.	2	2	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	2	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	11
Quercus robur	c	.	.	.	.	.	+	+	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	+	25
Frangula alnus	b	+	+	1	.	1	1	+	+	+	r	+	.	.	.	+	+	1	.	.	.	.	2	1	.	.	.	.	.	.	+	.	.	+	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	+	1	.	.	.	35
Frangula alnus	c	+	+	+	.	+	+	.	.	.	.	.	.	.	+	.	.	r	.	.	.	.	+	+	+	+	.	+	.	.	+	+	+	.	.	.	.	r	.	+	.	.	.	+	.	.	.	+	.	+	+	.	.	.	1	+	1	+	+	+	.	+	+	.	.	+	46
Prunus spinosa	b	.	.	+	.	.	+	1	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	12
Prunus spinosa	c	.	.	+	.	.	+	+	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	+	+	+	+	+	+	.	.	+	+	.	.	.	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	1	.	.	29
Sorbus aucuparia	b;a2^	.	.	1^	.	.	.	.	.	+	r	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	+	.	.	+	.	.	.	.	20
Sorbus aucuparia	c	.	+	+	.	+	.	.	.	.	.	.	+	.	+	+	.	+	+	.	+	+	+	+	+	+	+	+	.	.	.	+	+	+	.	+	+	+	.	+	+	+	+	+	.	+	.	.	+	.	+	+	.	.	+	+	+	+	+	+	+	.	.	+	+	r	62
Padus serotina	b	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	.	.	1	1	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	14
Padus serotina	b/c	.	.	.	.	.	.	.	.	.	+/r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/+	+/+	.	.	/r	1	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Padus serotina	c	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	1	r	2	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	+	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	22
Convallaria majalis		+	3	1	2	.	1	.	+	+	2	1	2	2	4	3	.	2	+	.	+	1	.	1	3	1	.	2	.	.	4	3	3	3	3	1	+	+	+	1	2	2	2	2	1	+	.	.	.	.	.	.	.	2	1	4	3	.	1	1	1	.	2	1	2	+	74
Moehringia trinervia		+	.	2	+	+	1	1	.	+	.	1	.	.	.	3	4	1	+	.	1	1	2	1	1	1	1	.	.	+	.	1	1	.	.	+	+	+	+	+	.	+	+	.	+	+	.	.	+	.	+	.	2	.	.	.	.	+	.	.	.	1	1	+	.	+	60
Luzula pilosa		+	+	+	+	.	.	.	+	1	1	.	+	1	+	.	+	1	+	.	1	1	1	.	.	+	+	+	.	.	+	.	.	+	.	+	.	+	+	.	+	+	+	+	1	1	.	.	.	.	.	.	.	+	+	+	+	.	.	+	+	.	1	+	+	+	58
Mycelis muralis		+	.	.	.	+	.	.	.	+	+	+	.	.	.	+	2	3	+	.	1	1	.	.	.	+	.	r	.	.	.	2	1	.	.	+	+	+	+	r	.	.	+	.	+	.	.	.	.	.	.	1	1	.	+	+	+	.	+	+	+	1	.	.	.	+	49
Calamagrostis epigejos		.	+	.	.	1	.	1	1	+	1	.	.	.	.	1	.	.	2	1	+	.	1	.	.	+	.	1	1	1	.	.	1	.	.	.	.	.	1	.	.	.	.	2	.	.	.	4	.	1	.	+	1	.	.	.	+	.	.	1	1	+	.	.	.	1	42
Rubus idaeus		+	.	.	1	+	.	1	.	.	.	.	.	.	.	.	+	2	2	r	+	+	.	.	.	+	1	+	+	2	+	.	+	.	.	+	.	2	.	.	.	.	+	+	.	.	.	.	.	1	.	+	.	.	.	.	.	+	+	.	.	.	.	.	+	2	42
Anthoxanthum odoratum		.	1	1	.	+	+	3	.	.	.	+	.	+	.	+	2	+	.	+	.	.	+	.	.	.	+	.	+	.	2	.	.	+	.	.	+	.	.	+	.	.	+	.	+	.	1	3	4	2	1	1	.	.	.	.	.	.	.	.	.	1	.	.	.	+	43
Geum urbanum		+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	r	r	.	.	.	+	.	+	.	.	+	+	+	.	.	.	+	+	.	.	.	+	+	+	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	r	34
Urtica dioica		+	.	.	.	.	.	+	.	.	.	.	.	.	.	1	+	1	+	.	.	.	.	.	+	.	1	.	1	+	+	+	+	.	.	+	+	1	.	.	.	.	+	.	.	.	.	.	.	1	+	.	.	.	.	+	.	.	1	.	1	.	.	.	.	r	35
Fallopia convolvulus		1	.	.	.	1	.	.	.	.	+	.	.	.	.	.	.	.	.	r	+	+	.	.	1	+	1	+	.	+	+	1	1	.	.	+	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	32
Plagiomnium affine		.	+	.	.	.	.	1	+	+	1	+	.	.	+	.	2	1	.	.	1	1	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	1	.	+	.	.	.	.	.	.	+	.	+	+	.	32
Hieracium murorum		.	1	+	.	+	.	.	.	.	+	.	.	+	+	.	1	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	.	+	.	.	.	+	.	.	.	.	.	.	.	+	+	+	+	+	.	.	.	.	.	.	.	.	32
Maianthemum bifolium		.	.	.	.	.	.	.	.	+	.	.	.	+	+	.	.	.	+	.	.	.	.	2	.	1	.	+	.	.	1	.	.	.	+	1	+	.	+	.	.	1	1	+	.	.	.	+	+	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	1	34
Galeopsis tetrahit		+	.	.	.	+	.	+	.	.	+	.	.	.	.	1	.	+	.	.	.	.	+	.	.	.	+	r	.	.	+	.	.	.	.	1	+	+	.	.	.	.	.	r	.	.	+	1	+	.	+	2	+	.	.	.	.	.	.	.	.	.	.	.	.	.	31
Dryopteris carthusiana		.	.	.	.	+	.	.	.	.	1	.	.	.	.	+	+	1	+	.	.	.	.	.	+	+	+	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	+	1	29
Geranium robertianum		.	.	.	.	.	+	1	.	.	.	+	.	.	.	2	+	2	.	.	1	+	.	.	1	.	.	.	.	.	.	+	+	.	.	+	.	.	+	.	.	+	.	.	.	.	.	+	+	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	26
Campanula rotundifolia		.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	1	.	.	.	+	.	+	+	+	.	.	.	+	.	.	.	.	.	+	.	.	.	1	.	.	.	.	23
Galium aparine		.	.	.	.	+	.	.	.	.	+	2	.	.	.	.	.	2	.	.	1	1	.	.	.	.	+	.	.	.	+	.	.	+	.	+	+	.	.	.	.	.	+	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23

Sporadic species: V.: *Acer platanoides* a2 15(1), b 53(2), c 15,55,56; *A. pseudoplatanus* a2 25, b 25,53(1), c 25,32,57; *Adoxa moschatellina* 18,39,46,47; *Carex sylvatica* 52; *Carpinus betulus* a 41,44, b 20(r),42, c 1,41,42,44,45,57; *Cerasus avium* c 39; *Corylus avellana* a2 3(1),6(1),15(1),42, b 3(1),6(2),15(3),25(1),30(1),34,41,42,44,45, c 3,6,15(1),20,36(r),44,47,50,57; *Daphne mezereum* c 64; *Equisetum pratense* 61; *Equisetum sylvaticum* 18; *Eurhynchium angustirete* 45; *E. striatum* 15(2),16(2); *Fagus sylvatica* a 59(1), a2 5(1),37(1),52(1), b 18,25(2),35,36(2),37(2),52,54(1),59(1),60(1), bc 42(1), c 5,30,47,51,54,55,59,61; *Festuca heterophylla* 16(3),20,41,42,47(2),48(2),52(2); *Fraxinus excelsior* a2 61(1), b 7(1),61, c 20,61(1); *Galium odoratum* 41(1); *G. schultesii* 22(2),23(3),62(2); *G. sylvaticum* 57(1); *Lathyrus vernus* 64(1); *Lonicera xylosteum* b 53, c 57; *Malus sylvestris* c 25,38(r),39(r),42,43,65(r); *Melampyrum nemorosum* 13,32,45(1),46(4),47(1),48(2),50,51; *Melica uniflora* 51(4); *Melittis melissophyllum* 3(1),23,62,63; *Milium effusum* 4,30(1),35(2),36,37,42,47(1); *Padus avium* b 18,30,35,36,47,65, c 25(1),35,38,39,48,50,55,65; *Phyteuma spicatum* 42; *Polygonatum multiflorum* 12; *Primula elatior* 28; *Pulmonaria obscura* 47; *Ranunculus auricomus* 32; *Ribes spicatum* b 15,25, c 18; *Ribes uva-crispa* b 15, c 1,18; *Sanicula europaea* 41; *Stachys sylvatica* 24,46,47(1),48,51,57; *Stellaria holostea* 46,47,51; *Tilia cordata* c 20,25(r),27,30; *Ulmus glabra* c 14,55,56,58; *Ulmus laevis* a2 15, b 24; *U. minor* a2 15(1), b 15,24(1), c 24(1); *Viola reichenbachiana et riviniana* 1(1),13,35,41,42,44,45; **VI.:** *Aulacomnium androgynum* 55; *Dicranella heteromalla* 42,55; *Hieracium laevigatum* 42,45,52(1); *H. sabaudum* 16,23,53; *H. umbellatum* 4,13,39,41,51; *Lophocolea heterophylla* 53(2); *Mnium hornum* 38; *Plagiothecium laetum* 16,61; *Polytrichastrum formosum* 8,22(1),25,37,39(1),45,61; *Plagiothecium denticulatum* 45; **VII.:** *Betula pubescens* subsp. *pubescens* 47(3),48,50(3),51; *Dicranum polysetum* 5(2),16; *D. scoparium* 5(1),24,61(2); *Dryopteris dilatata* 4,15; *Hylocomium splendens* 8(2),9(2),45; *Koeleria grandis* 12,34; *Monotropa hypopitys* s.s. 9; *Orthilia secunda* 9(1),16(1),44,61(1); *Picea abies* a2 37, b 23,27,36(2),42, c 12,23(1),28(r),49(r); *Trientalis europaea* 8,9,22,23(1),38,63; **VIII.:** *Achillea pannonica* (F-B) 28; *Acinos arvensis* (F-B) 25(1),40,53; *Agrimonia eupatoria* (T-G) 33,42,46; *Ajuga genevensis* (F-B) 3,7,19,28,46,48; *Allium oleraceum* (F-B) 50; *Arabis hirsuta* (F-B) 24; *Asparagus officinalis* (F-B) 16; *Asperula tinctoria* (F-B) 19,28; *Campanula rapunculoides* (T-G) 57; *Carex caryophyllea* (F-B) 4(1),7,32; *C. praecox* (F-B) 16; *Coronilla varia* (T-G) 3,8,11(r),20,21,41,46,47,63; *Dianthus carthusianorum* (T-G) 5,7,19(1); *Euphorbia angulata* (T-G) 32; *Festuca trachyphylla* (F-B) 19; *Filipendula vulgaris* (F-B) 1(r),26,28,38,46(1),47(1),48(1),50,51,65; *Fragaria viridis* (T-G) 7(3),46,51; *Galium album* (T-G) 2,11(1),19,20,21(1),33,37,43,65; *G. album* fo. *dumetorum* (T-G) 7,42,46,50(1); *Knautia dipsacifolia* (T-G) 7,52; *Koeleria macrantha* (F-B) 7; *Lathyrus sylvestris* (T-G) 5,8,20; *Peucedanum cervaria* (T-G) 3,8,39(r),63; *Phleum phleoides* (F-B) 19; *Potentilla arenaria* (F-B) 5,7,19,28; *Silene nutans* subsp. *nutans* (T-G) 1(1),6,7,10(r),19(1),20,21,33,40,41,44; *Silene otites* (F-B) 5,16,52; *Stachys recta* (F-B) 5; *Thalictrum minus* (F-B) 15,27,42,53; *Thymus pulegioides* (F-B) 7,53; *Trifolium medium* (T-G) 40(1),53(1); *Veronica spicata* (F-B) 5,7,15,19,32; *Vicia dumetorum* (T-G) 16,47(1); *Vicia sepium* (T-G) 22,41,44,46(1),55,56(1),63,65; *Viola collina* (T-G) 5; *Viola rupestris* (F-B) 19; **IX.:** *Achillea ptarmica* 7; *Agrostis gigantea* 1,26(1),28(1),29(2),30,49(2); *Arrhenatherum elatius* 18(1),19(2),34(1),38,39,43,53(1); *Avenula pubescens* 19; *Briza media* 7,48,53; *Cerastium holosteoides* 8,48; *Cirsium palustre* 49; *Holcus lanatus* 7,50(3); *Lathyrus pratensis* 7; *Leucanthemum vulgare* 6,7; *Lotus corniculatus* 7,49; *Lychnis flos-cuculi* 7; *Lysimachia nummularia* 24,32,59; *Phleum pratense* 14; *Pimpinella major* 6,34; *Plantago lanceolata* 7; *Poa pratensis* 4(1),7,12(1), 39(1); *Poa trivialis* 42,46(1),48(2),51(2); *Prunella vulgaris* 35,63; *Ranunculus acris* s.s. 7,8,9,28,48; *Sanguisorba officinalis* 35; *Scutellaria hastifolia* 7; *Stellaria graminea* 7,64; *Succisa pratensis* 12; *Taraxacum officinale* 11(r),16,25(r),41,48,52,65(r); *Trifolium pratense* 7; **X.:** *Calluna vulgaris* 8,9; *Carex ovalis* 37; *C. pallescens* 30,38,51,57,64; *Chamaecytisus ratisbonensis* 8,9; *Cladonia coniocraea* 61; *Danthonia decumbens* 8,9; *Genista germanica* 8; *G. tinctoria* 3,53; *Hypericum maculatum* 8,27,37,38(1),42,43; *Luzula multiflora* 2,20,21,24,26,39,45,62; *Nardus stricta* 7; *Pohlia nutans* 4,9,15,24,39,49(3),55,61(1); *Polytrichum juniperinum* 16,45; **XI.:** *Aesculus hippocastanum* c 31; *Alliaria petiolata* 17,18,35,38(r),42,60,61; *Anthriscus sylvestris* 20,21,52; *Armeria maritima* 7(1); *Berberis vulgaris* b 15(1),16(1),20,52(1) c 16,33(r); *Betula pendula* a 1,18(2),65(2), a1 3(1),7(2),10(r),16(2),19(1),23(2),24(1),61(2), a2 5(1),7(1),15(1),19,38,61(1), b 1,3,6,7,8,9,28(1),49(1),52, c 5,6,8,28,29(1); *Brachytheciastrum velutinum* 20,21,38(1),39,41,44,61(1); *Brachythecium rutabulum* 25,31,32,41,44,61(1); *Bromus benekenii* 4(1); *B. inermis* 47,50(4); *Bryum uliginosum* 5,52; *Carex brizoides* 7; *C. echinata* 28(1); *Carex* sp. 24; *Cerastium arvense* 7,39; *Cerasus mahaleb* b 15(1); *C. vulgaris* c 7; *Ceratodon purpureus* 2,19(1); *Chaerophyllum temulum* 5,7,16,28,36,37(r),52,57,61; *Chamaenerion angustifolium* 8,49(1); *Chelidonium majus* 15(3),26,52(r),57; *Chenopodium album* 65(r); *Cirsium arvense* 52; *C. vulgare* 28,49; *Convolvulus arvensis* 19(r); *Conyza canadensis* 49; *Cornus sanguinea* b 7(2),15(1), c 15,25,31; *Crataegus laevigata* b 18,19,25,30(1),65(1), c 1(1); *C. monogyna* b 6,19,26,33(r),38(1),60, c 6,12,23,26,36,38,39(r),47,56,63; *C. monogyna* et *laevigata* b 24,31(1), c 15,16,32,52; *C. rhipidophylla* var. *rhipidophylla* b 27,37, c 37,43,44; *Crataegus* x *subsphaericea* c 65; *Cruciata glabra* 3(2),9,22(2),23(3),34,62(2); *Cucubalus baccifer* 59; *Deschampsia flexuosa* 1,5,18(2),19(1),25(1),26(1),27,28,36,37,38(1),43,49,65(1); *Dicranella varia* 61; *Digitalis grandiflora* 6,7,47,55,64; *Elymus repens* 28,30; *Epilobium montanum* 16(1),52(r); *Equisetum arvense* 28; *E. hyemale* 29; *Euonymus europaea* c 15,25,31,32,57; *Euphorbia esula* 19(2); *Fallopia dumetorum* 15,16,52; *Galeopsis bifida* 5,63; *G. pubescens* 16,35,36,42,43(r),48,52,57; *Glechoma hederacea* 7,15(2),26,32,46(2); *Heracleum sibiricum* 61; *H. sphondylium* 42; *Homalothecium sericeum* 61; *Impatiens parviflora* 18,25(1),30,35(5),36,37(1),65(1); *Juncus conglomeratus* 49; *J. effusus* 37,49,58; *Koeleria glauca* 7(2); *Larix decidua* subsp. *decidua* b 28; *Lembotropis nigricans* 8; *Linaria vulgaris* 7,19(1),31,32,49,52; *Lophocolea bidentata* 53(2); *Lupinus polyphyllus* 26(r),30,36; *Lysimachia vulgaris* 24,25,27,32(1),43(1),51(2),58; *Medicago lupulina* 53; *Melandrium rubrum* 16; *Molinia caerulea* 13,14,27,35,38,59,64,65; *Myosotis sparsilora* 7; *Orthodicranum tauricum* 16(1); *Oxalis acetosella* 11,18,22(2),23(1),25(1),27,30(2),35(1),36,37(2),38,42,43,54,55; *Oxyrrhynchium schleicheri* 24; *Plagiomnium cuspidatum* 37,41; *P. elatum* 7,52(1),61; *P. rostratum* 16; *Plagiothecium* sp. 55; *Polygonum minus* 48,50,51; *Polypodium vulgare* 52(1); *Populus tremula* a1 16(1), b 8,9,16(2), c 16,27(1),49,53(1); *Prunus* sp. c 39(r); *Pyrus communis* a2 15(1), b 3,6,8,12(1),15(1), c 3,6,7,22,23,34,38,41,46,48; *P. pyraster* b 17(r),20,21, c 20,33,39,42,43,65(r); *Quercus rubra* a2 52(1), b 52, c 16,61(r); *Rhamnus cathartica* b 1,5,15,16,52, bc 33,42,45, c 16,24,31,32,36,48,51,54; *Rhizomnium punctatum* 52; *Rosa canina* b 15,52, c 5,7,20(r),24,31,32,43,44; *Rosa* sp. c 19,38(r); *Rosulabryum elegans* 32; *Rubus caesius* 24(1),46,61(1); *R. gracilis* 19,38,65; *R. plicatus* 1,7,15(2),35,61; *Rubus* sp. c 3(2),6(3),8,9,12,22(1); *Rubus sprengelii* 18(2),19,25,26,28,29(1),37,38(r),65(1); *Rubus* x *corylifolius* 10,17(1),20,25,37,43(r),65; *Rumex acetosella* 7(2),8,12,16,26,27,28,49(2); *Sambucus nigra* b 15(1), c 15,26,42(r),57; *Sarothamnus scoparius* bc 9; *Sciuro-hypnum oedipodium* 2,14,20(1),21,39,44,45,47,48,54,56,60,64; *Sciuro-hypnum populeum* 52(2); *Scutellaria galericulata* 32,42(r); *Sedum acre* 7(1); *S. sexangulare* 7; *Senecio sylvaticus* 2(r),16,26,52; *Spergula morisonii* 49; *Stellaria media* 17(2),24; *Syringa vulgaris* c 15; *Tanacetum vulgare* 7,19(r),24,32,65(r); *Thalictrum aquilegiifolium* 47(3),50,55,56,58,59; *Thymus serpyllum* 5,7(1); *Torilis japonica* 19(r),20,21(1),31,32,47,48,50,64; *T. arvense* 19(r); *Trifolium campestre* 7; *Verbascum nigrum* 19(2),28; *V. phlomoides* 16,52(1); *V. thapsus* 5; *Vicia angustifolia* 7; *V. sativa* 26(r),28; *Vicia* sp. 7,19,28(1),34,53; *Vicia tetrasperma* 26(r),28,30,36,49; *Viola* sp. 6; *Viscaria vulgaris* 33,39.

Table A30. Substitute forest communities on the habitat of *Potentillo albae-Quercetum*

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	
ID-1		56	48	56	56	56	56	56	56	56	56	56	56	56	56	56		56	41	41	41	59	56	56	18	18	56	18	16	56	56	20	56	56	56	16	19	19		56	28	29	18	18	18	20	20	56	20	20	16	56	19	44	44	44	19	44	16	
ID-2		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		3	1	1	1	4	3	3	5	5	3	5	19	3	3	4	3	3	3	19	1	1		3	3	11	5	5	5	4	4	3	4	2	19	3	1	2	3	3	1	3	19	
ID-3		7	22	12	14	11	15	23	16	21	8	3	6	17	33	9		32	9	10	11	7	28	13	12	11	2	10	17	4	29	2	5	26	25	19	28	27		1	1	1	1	2	5	4	5	24	3	3	9	18	13	3	1	3	29	2	14	
Date (year)		2006	1976	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	1-15	2006	1997	1997	1997	1993	2006	2006	1989	1989	2006	1990	1969	2006	2006	2006	2006	2006	2006	1969	1988	1988	16-36	2006	1974	1977	1989	1989	1990	2006	2006	2006	2006	2006	1972	2006	1985	1977	1977	1977	1985	1979	1972	37-56
Density of tree layer	a1,a [%]	40	70	60	55	50	65	50	55	20	45	70	70	50	35	60		65	60	95	60	70	50	65	85	70	45	80	60	45	55	55	20	65	75	80	50	40		65	80	70	70	60	80	50	65	60	75	60	90	70	50	50	40	50	40	50	80	
Density of tree layer	a2 [%]	-	-	20	5	5	15	-	-	60	20	10	-	-	20	+		20	40	-	-	-	15	15	-	-	-	-	-	-	10	-	50	10	-	-	-	-		-	-	-	-	-	-	-	-	5	-	5	-	-	40	5	5	10	-	-	-	
Density of shrub layer	b [%]	10	-	5	+	10	10	10	5	5	40	10	-	5	15	10	%	15	10	-	10	-	-	10	20	25	5	25	5	+	15	5	10	10	45	5	20	50	%	-	-	15	-	-	-	10	20	10	15	15	40	25	50	40	20	5	40	20	40	%
Cover of herb layer	c [%]	55	70	70	80	30	60	60	75	70	55	70	30	75	80	85		15	100	90	100	80	60	70	80	90	50	65	100	40	35	85	70	75	20	100	80	60		20	40	75	60	90	80	60	70	55	60	75	95	30	90	20	60	90	80	80	100	
Cover of moss layer	d [%]	-	+	20	5	20	10	15	10	10	5	10	+	25	10	+		5	+	+	+	-	5	-	-	-	-	-	+	+	20	15	20	10	40	+	5	20		-	-	-	-	-	-	-	+	40	5	20	80	80	20	60	20	40	5	10	+	
Area of relevé		300	150	400	200	400	300	300	400	400	200	300	400	400	400	300		300	100	200	100	150	300	400	150	200	200	200	200	400	200	150	400	300	300	300	400	400		200	200	200	160	180	200	100	100	400	100	100	250	200	400	400	300	200	400	200	100	
Location (ATPOL)		BC66	BD38	BC76	BC66	BC66	BC76	BC66	BC66	BC66	BC76	BC66	BC66	BC66	BC66	BC66		BC76	CC25	CC25	CC25	BC99	BC66	BC66	BD44	BD44	BC66	BD44	BC72	BC66	BC66	CD39	BC66	BC66	BC66	BC72	DD91	DD91		BC66	CC91	CD17	BD44	BD44	BD44	CD39	CD39	BC66	CD39	CD39	BD31	BC76	DD91	DE41	DE41	DE41	DD91	DE50	BD31	
Total number of species		49	26	59	60	53	54	56	50	56	45	64	38	54	57	56		53	32	27	26	24	40	38	18	29	32	22	41	33	33	35	50	40	42	48	35	30		34	28	39	24	19	16	31	40	47	38	40	78	48	46	52	31	31	37	32	49	
Number of mosses, liverworts and lichens species		-	3	7	2	8	5	8	2	5	3	5	1	6	4	3		4	3	3	3	-	5	-	-	-	-	-	2	1	2	3	5	4	4	4	3	1		-	-	-	2	-	-	-	3	0	3	1	6	3	2	5	5	3	3	3	4	
I. Ch.*, D.^ *Potentillo albae-Quercetum*																																																													
Ch. *Quercetalia pubescentis*																																																													
^ *Galium boreale* (M-A)		1	.	.	+	.	+	+	+	.	.	1	+	+	.	+	60	.	.	.	.	2	+	+	.	.	.	.	.	1	+	.	.	.	.	+	+	.	33	+	.	+	1	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	25
Campanula persicifolia		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	14	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	15
Hypericum montanum		.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	r	r	.	.	.	.	.	.	.	.	.	10
Lathyrus niger		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
^ *Betonica officinalis* (M-A)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	15
* *Carex montana*		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
II. D. *Pa-Q molinietosum*																																																													
Deschampsia caespitosa (M-A)		+	.	1	1	2	1	+	+	+	+	+	+	1	1	+	93	+	.	.	.	.	+	+	.	.	1	.	.	.	.	.	+	.	+	.	.	.	29	+	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	20
Carex pallescens (C-U)		.	+	.	.	.	.	.	.	.	+	r	+	.	.	+	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Lysimachia vulgaris (M-A)		1	.	+	1	+	+	.	+	.	.	+	+	+	.	r	67	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Hypericum maculatum (C-U)		+	.	+	+	.	1	+	+	+	+	.	+	.	+	+	73	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	5
Molinia caerulea (M-A)		.	1	+	1	+	1	.	.	.	.	.	.	+	.	.	40	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Carex ovalis (CU)		.	.	+	.	+	.	.	.	+	.	.	.	.	+	.	27	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Juncus effusus (M-A)		.	.	+	.	.	.	r	.	.	.	.	.	.	.	+	20	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	5
III. D. *Pa-Q brachypodietosum*																																																													
Brachypodium pinnatum (F-B)		2	1	2	2	1	2	1	+	+	2	2	.	[3]	.	1	87	1	2	+	[3]	.	1	.	1	.	1	+	.	.	.	.	.	2	1	.	.	.	48	+	.	[4]	+	.	1	.	.	2	.	.	[3]	.	.	.	.	.	.	.	1	35
Peucedanum oreoselinum (T-G)		.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	5	.	.	.	2	+	+	r	+	.	.	.	2	.	.	+	.	+	.	1	2	50
Euphorbia cyparissias (F-B)		.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	2	1	+	1	.	+	1	+	2	1	+	.	.	+	+	.	1	65
Anthericum ramosum (T-G)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	+	1	.	.	+	.	.	.	.	.	+	.	.	+	+	1	.	.	1	.	40
Sedum maximum (T-G)		+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	13	.	.	.	.	1	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	10	1	+	.	.	1	.	.	.	.	.	.	+	.	.	.	+	+	.	+	+	40
Pimpinella saxifraga (F-B)		.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	7	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	+	10	.	.	+	1	.	.	.	+	.	+	.	+	.	+	+	.	.	+	+	.	45
IV. Ch. *Querco-Fagetea*																																																													
Malus sylvestris	a;a2^	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+^	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Malus sylvestris	b/c	.	.	+/	/r	.	/r	/r	.	.	.	/r	.	/+	.	.	40	.	.	.	.	.	.	.	.	.	/+	.	.	.	.	.	.	/+	/+	.	.	.	14	.	.	.	.	.	.	r/	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Fagus sylvatica	a,a2*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	2	.	.	.	.	2	.	.	.	1*	.	.	.	2	.	+	+	.	.	.	.	29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Fagus sylvatica	b'c	.	.	.	.	/+	.	/+	/+	.	.	.	.	+/	2/+	+/	40	.	.	.	.	.	1/	.	.	.	1/+	.	.	.	.	.	1/+	+	+/+	.	.	.	24	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	5
Padus avium	a2	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	5	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	5
Padus avium	b/c	.	.	+/	/+	.	.	.	1/+	.	2/1	+/	.	+/	+/+	.	47	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	+/	1/	/+	.	.	.	19	.	/+	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	10
Corylus avellana	b/c	+/	.	1/+	.	1/r	.	.	.	.	.	.	.	.	.	.	20	.	.	.	.	+/	.	.	/+	2/+	.	2/+	.	.	.	.	.	+/	.	.	.	.	24	.	/+	1/+	.	.	.	.	.	.	.	.	+/+	.	.	.	.	.	.	.	.	15
Poa nemoralis		1	.	+	.	1	2	2	2	2	1	2	2	1	[3]	2	87	+	.	[4]	.	.	2	2	2	1	2	+	+	1	1	2	[3]	1	1	1	1	.	81	2	[3]	.	[3]	.	2	+	2	2	1	+	.	.	.	.	.	.	.	.	+	50
Melica nutans		1	2	.	+	1	1	+	.	1	+	+	+	+	1	1	87	+	+	+	+	1	1	1	.	.	1	.	1	1	.	1	1	+	.	1	2	+	76	+	.	1	.	.	.	2	1	.	2	1	+	+	[3]	.	.	.	1	.	.	50
Viola riviniana		1	.	1	1	+	1	1	r	1	+	1	+	+	1	1	93	+	.	.	.	.	+	+	.	.	.	.	.	.	r	+	1	+	+	.	+	+	48	.	.	.	.	.	.	1	+	2	1	r	+	+	1	+	.	.	.	.	.	45
Brachypodium sylvaticum		.	.	+	2	1	.	.	.	+	.	+	.	+	+	1	53	+	.	.	.	.	.	.	.	1	.	1	.	.	+	.	.	.	.	.	.	.	19	.	.	.	.	+	.	.	.	.	.	.	+	r	.	.	.	.	1	.	.	20
Dryopteris filix-mas		.	.	1	.	2	.	.	+	+	+	.	.	+	+	.	47	+	.	.	2	.	.	.	.	.	1	.	.	.	.	+	+	+	.	.	.	.	29	.	.	.	.	.	.	.	.	.	.	1	.	+	.	.	.	.	.	.	.	10
Festuca gigantea		.	.	.	.	.	+	.	r	r	.	r	.	+	1	+	47	r	.	+	.	.	.	.	.	1	.	+	+	.	.	.	.	.	.	.	.	.	24	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	5
Atrichum undulatum		.	.	+	.	+	1	2	.	+	.	+	.	.	1	.	47	1	+	+	+	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	24	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	5
Ajuga reptans		+	.	+	1	.	.	+	.	.	.	.	.	.	.	.	27	+	+	+	+	.	.	.	1	.	.	.	.	.	.	+	.	.	.	.	+	.	33	+	.	+	.	.	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	25
Scrophularia nodosa		.	1	.	.	.	.	.	.	.	+	.	.	.	+	+	27	.	+	+	+	.	.	.	r	+	.	.	+	.	.	.	r	.	.	.	.	.	33	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	5
Dactylis polygama		+	.	.	+	.	+	.	.	.	2	.	+	.	1	.	40	+	+	.	+	.	.	.	.	.	.	.	2	.	.	.	.	.	.	1	.	.	24	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	5
Festuca heterophylla		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	2	1	.	+	.	.	.	.	.	.	.	.	.	.	14	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Viola reichenbachiana		+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	13	.	[+]	[+]	[+]	[+]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19	[+]	[+]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10
Hepatica nobilis		[+]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	[+]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	[+]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Carex digitata		[+]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	[+]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Galium sylvaticum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	[1]	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
V. Ch., D.* *Quercetea robori-petraeae*																																																													
Calamagrostis arundinacea		.	[3]	+	.	1	+	.	.	.	1	.	+	.	+	.	47	+	.	.	+	1	1	+	[3]	2	.	1	.	.	.	.	+	+	.	.	.	.	48	.	.	.	.	.	[3]	1	1	.	.	.	+	+	+	.	.	.	+	.	.	35
* *Pteridium aquilinum*		+	.	2	.	1	1	2	.	2	1	2	.	.	.	2	60	+	.	.	.	2	1	.	2	[4]	2	2	.	.	+	.	.	2	.	.	2	3	52	.	.	.	.	.	1	1	.	.	.	1	.	.	1	1	.	1	.	2	.	35
Carex pilulifera		+	.	+	.	.	.	+	+	+	.	r	+	.	+	+	60	+	.	.	.	.	.	.	.	.	+	.	.	.	+	.	+	+	r	.	+	+	38	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	5
* *Melampyrum pratense*		.	.	.	.	.	.	+	.	.	.	+	+	.	+	.	27	.	.	.	.	.	+	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	24	+	+	.	.	.	.	.	r	.	+	r	.	.	.	2	.	.	+	.	.	35
* *Polytrichastrum formosum*		.	.	.	.	2	+	1	.	.	.	+	.	.	.	.	27	+	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	+	+	.	24	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	5
Festuca ovina		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	2	1	+	19	.	+	.	.	.	.	.	.	.	1	1	+	.	1	+	[4]	[4]	1	[3]	.	50
Hieracium lachenalii		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	10	.	+	.	.	.	.	.	.	.	.	r	.	.	+	+	.	.	+	.	.	25
VI. Ch. *Vaccinio-Piceetea*																																																													
Pinus sylvestris	a1,a	.	[3]	[3]	[4]	[4]	[3]	[3]	[3]	2	2	1	.	2	2	1	87	2	1	.	.	.	1	[3]	.	.	.	2	.	1	.	1	1	[3]	[4]	[5]	[3]	[3]	62	2	1	1	1	2	1	+	1	[3]	.	.	[3]	[4]	[3]	[3]	[3]	[3]	[3]	1	.	85
Pinus sylvestris	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	1	.	.	.	15
Pinus sylvestris	b/c	.	.	.	.	.	.	.	.	.	/+	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	+/	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	+/	.	.	.	.	+/	.	2/+	.	15
Picea abies	a2	.	.	+	+	.	.	.	.	.	.	2	.	.	1	.	27	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Picea abies	b-c	+/	.	+/	.	+/+	.	+/	.	+/	+/	.	.	1/	+/	+/	60	.	.	.	.	.	.	2/	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	/r	.	.	.	+/2	.	.	.	2/	+/+	+/	.	.	.	.	.	25
Vaccinium myrtillus		1	1	2	+	2	2	1	1	1	2	2	2	+	+	+	100	+	+	.	+	.	2	2	.	.	1	+	.	2	1	2	1	2	+	r	3	3	76	.	.	.	.	.	.	2	2	1	1	3	.	+	2	3	.	.	3	.	.	45
Rubus saxatilis		1	1	1	.	.	1	+	.	.	.	1	.	+	+	+	60	.	+	+	.	.	r	+	.	.	.	+	.	+	.	+	+	+	.	.	1	1	52	+	.	+	1	.	+	.	r	.	+	.	.	.	1	1	.	.	.	.	.	40
Pseudoscleropodium purum		.	.	[1]	[2]	[1]	[2]	[2]	[2]	[2]	.	[2]	[+]	[2]	.	[+]	73	.	.	.	.	.	.	.	.	.	.	.	.	.	[2]	[1]	[+]	[1]	[2]	.	.	.	24	.	.	.	.	.	.	.	.	.	[+]	[2]	[1]	[4]	.	.	.	.	.	.	.	20
Pleurozium schreberi		.	.	.	.	[1]	.	.	.	.	[+]	.	.	[+]	[2]	.	27	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	[1]	[+]	[+]	[+]	.	.	19	.	.	.	.	.	.	.	.	.	.	.	[5]	[2]	[1]	[3]	[1]	[2]	[+]	[+]	[1]	45
Juniperus communis	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	[+/]	[+/+]	.	10	.	.	.	.	/+	.	.	.	.	.	[r/+]	[+/]	.	.	[1/]	[2/]	[1/+]	.	[2/1]	[2/]	40
Vaccinium vitis-idaea		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	[+]	[+]	[1]	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	[1]	.	.	.	.	.	5
VII. *Trifolio-Geranietea* (TG), *Festuco-Brometea* (FB)																																																													
Fragaria vesca (T-G)		1	.	1	1	+	1	+	+	.	+	+	1	2	+	2	87	+	+	.	.	.	+	1	.	.	.	.	.	1	.	1	r	.	.	+	2	2	48	.	.	+	.	.	.	.	r	1	.	.	+	2	1	+	.	.	1	.	.	40
Polygonatum odoratum (T-G)		.	.	+	.	.	.	+	.	.	.	+	.	.	.	+	27	+	.	.	.	+	+	+	.	.	+	+	+	1	2	r	.	+	.	+	.	.	57	1	+	+	1	r	+	r	.	+	+	+	.	.	+	+	.	.	+	.	.	65
Hypericum perforatum (T-G)		+	1	.	1	.	.	.	1	+	.	+	.	+	+	+	60	.	+	.	.	+	.	r	.	.	+	.	.	+	.	.	.	.	.	.	+	.	29	+	.	.	.	.	.	.	.	r	.	.	1	+	.	+	+	.	+	1	+	45
Poa angustifolia (T-G)		.	.	.	.	+	.	.	.	+	.	1	.	.	.	.	20	+	.	.	.	+	.	1	.	.	.	.	.	+	1	.	+	.	.	.	+	.	33	+	.	+	.	+	1	1	1	.	1	1	.	.	1	2	.	+	.	.	.	55
Vicia cassubica (T-G)		.	.	.	+	.	+	.	r	+	.	.	.	.	.	.	27	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	.	.	+	.	1	1	.	.	+	.	.	[3]	.	.	.	.	.	.	.	.	25
Clinopodium vulgare (T-G)		.	.	.	+	.	.	.	.	.	.	.	.	1	.	.	13	.	+	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	29	.	.	+	1	.	.	+	.	.	.	.	.	.	1	+	.	.	.	.	.	25
Vincetoxicum hirundinaria (T-G)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	3	.	.	.	.	.	3	+	.	.	2	.	.	.	.	.	.	+	.	.	24	.	.	.	1	2	.	.	.	.	.	.	.	.	+	.	.	.	.	.	2	20
Knautia arvensis (T-G)		.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	+	.	.	.	.	.	.	+	.	+	+	.	.	.	+	+	.	.	30
VIII. *Calluno-Ulicetea* (C-U)																																																													
Agrostis capillaris		+	1	1	+	.	1	1	2	1	1	1	.	1	.	1	80	1	+	.	.	1	+	.	.	.	+	.	.	+	+	.	+	+	1	.	.	.	48	.	.	.	+	1	.	.	.	[3]	.	+	.	+	.	+	.	1	.	1	.	40
Veronica officinalis		+	.	.	.	r	+	1	+	+	+	.	+	.	+	+	67	+	.	.	.	.	.	+	.	.	.	.	.	+	.	+	+	.	r	.	+	+	38	+	.	.	.	.	.	.	.	.	+	.	+	+	+	.	.	.	.	1	.	30
Pohlia nutans		.	.	+	.	+	.	.	.	+	.	.	.	.	.	.	20	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	14	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	1	.	.	.	+	20
Hieracium pilosella		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	5	.	.	.	.	.	.	.	+	.	+	r	.	+	+	.	1	+	.	1	+	45
Viola canina		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	1	.	.	+	.	.	.	+	+	.	+	25
IX. Others																																																													
Quercus petraea [*Q. x rosacea* ^]	a1,a	1^	3^	1^	.	.	2^	.	.	1	.	3;2^	2	.	2	.	53	+	3^	5^	3	.	+	.	2	4	1;3^	3	.	3;2^	+	3	2	.	.	.	2	.	67	.	4	4	4	3	3	3	4;+^	.	4	3	.	.	2	.	.	.	2	.	.	55
Quercus petraea [*Q. x rosacea* ^]	a2	.	.	1^	1^	.	2^	2;1^	.	3;1^	.	1^	.	.	2;+^	.	47	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	3	.	.	.	.	.	10	.	.	.	.	.	.	.	1	.	.	.	.	.	2	1	.	.	1	.	.	20
Quercus petraea [*Q. x rosacea* ^]	b	.	.	.	+^	.	1^	1;1^	r^	.	1	.	.	.	.	.	33	.	+^	.	+^	.	.	2	.	.	1^	.	.	1;+^	.	+	+	.	.	.	+	2	43	.	.	+	.	.	.	1	1	.	+	2	.	.	3	3	+	.	2	.	.	45
Quercus petraea	c	.	.	.	+^	.	+	1	+;1^	+	.	1;+^	+	.	2;+^	.	53	.	+	+^	.	.	.	+	1	r	.	1	.	2	+	2	1	.	+	1	.	.	57	.	+	+	.	.	1	+	1	+	.	3	.	+	.	+	.	.	.	.	.	45
Quercus robur	a1,a	3	.	2	.	2	.	.	.	.	3	2	4	.	.	+	47	.	.	.	.	4	3	3	.	.	.	.	.	+	.	.	.	1	.	.	.	.	24	4	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	5	15
Quercus robur	a2	.	.	2	.	4	2	.	.	2	.	.	.	.	.	+	33	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	2	.	.	.	.	14	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	10
Quercus robur	b,bc^	+	.	.	.	.	.	.	.	+	.	.	.	+	.	2	27	.	.	.	.	.	.	1	.	.	.	.	+	.	.	.	.	+	.	.	1	1	24	.	.	.	.	.	.	.	.	+	.	.	.	.	1	.	.	.	2	.	.	15
Quercus robur	c	+	.	+	.	+	1	.	.	+	1	.	+	+	.	+	60	.	.	.	.	.	+	.	.	.	r	.	1	.	1	.	.	+	.	+	1	+	38	+	.	.	.	.	.	.	.	1	.	.	+	+	+	.	.	.	+	1	+	40
Betula pendula	a1,a	.	.	.	1	.	2	.	.	.	1	1	.	2	3	4	47	.	.	.	.	.	.	2	.	.	1	1	1	.	.	.	2	2	.	.	.	.	29	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	.	.	.	3	.	15
Betula pendula	a2	.	.	.	+	.	.	2	2	+	2	.	.	.	.	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	10
Betula pendula	b/c	.	.	.	+/	.	.	.	+/	+/	2/	.	.	.	.	.	27	.	.	.	.	.	+/	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	+/	.	.	.	.	.	.	+/	.	.	+/	.	15
Sorbus aucuparia	a2	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Sorbus aucuparia	b/c	/+	.	.	/+	.	1/+	/+	r/	/+	1/+	r/	/+	/+	1/+	/+	80	.	/+	/+	.	.	/+	/+	.	/+	/+	.	.	/+	+/	/+	2/1	+/+	/+	/+	.	.	62	/+	/+	/+	.	.	.	.	.	/+	/+	.	/+	/1	/+	.	.	.	/+	.	+/	50
Padus serotina	b	2	.	+	.	.	+	2	.	.	.	+	.	+	r	.	47	.	.	.	.	.	.	+	.	.	+	.	.	+	.	.	.	1	[3]	.	.	.	24	.	.	.	.	.	.	+	.	1	+	.	[3]	.	.	.	.	.	.	.	.	20
Padus serotina	c	.	.	+	r	r	+	1	+	.	+	+	+	+	.	r	73	r	.	.	.	.	+	+	.	.	+	.	.	+	r	.	+	.	2	.	.	.	38	+	.	.	.	.	.	.	.	1	.	.	.	+	.	.	.	.	.	.	.	15
Frangula alnus	b/c	.	.	.	/+	.	+/+	/1	/+	.	/+	.	.	.	.	.	33	.	.	.	+/+	.	/+	/1	.	.	+/+	.	.	/+	.	.	.	+/	/r	.	.	.	33	/+	.	.	.	.	.	.	+/	/r	+/	/+	.	/+	2/+	+/	+/+	+/	1/+	+/+	+/	65
Prunus spinosa	b/c	.	.	.	.	r/+	/+	/r	.	+/	.	+/	.	1/+	/r	+/	53	.	.	.	.	.	.	.	.	.	.	.	+/	/r	.	.	+/	.	/r	.	.	.	19	.	.	.	.	.	.	.	.	/+	.	.	2/	.	.	.	.	.	.	.	.	10
Convallaria majalis		2	1	+	.	r	+	1	+	+	+	+	r	+	+	2	93	1	1	1	+	2	2	2	[3]	2	2	2	2	1	2	1	+	1	+	[3]	.	1	95	+	.	+	[4]	[4]	[3]	[3]	.	.	2	+	2	.	[3]	1	.	.	.	.	.	55
Dryopteris carthusiana		+	+	+	+	+	1	+	+	+	1	+	.	+	+	+	93	+	.	+	.	.	+	+	.	.	+	.	+	+	+	.	+	.	2	+	.	.	52	+	.	+	.	+	.	.	+	1	2	.	+	+	.	.	.	.	.	.	.	40
Maianthemum bifolium		+	1	1	2	+	+	1	+	+	1	2	.	1	+	1	93	+	.	.	.	+	1	1	.	2	1	1	.	2	2	.	1	1	+	.	.	+	62	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	10
Rubus idaeus		2	.	2	1	2	2	+	[3]	2	1	2	+	1	[3]	1	93	1	.	.	+	.	+	2	2	.	+	.	.	.	r	.	2	1	2	2	.	.	52	.	.	.	.	.	.	.	2	3	+	.	+	2	.	.	.	.	.	.	.	25
Moehringia trinervia		+	1	+	.	+	+	1	r	+	.	.	+	.	1	.	67	+	.	.	.	.	.	+	r	1	.	1	+	.	r	.	+	.	+	+	1	+	57	+	+	+	.	.	+	2	+	1	1	.	[3]	.	2	.	.	.	1	.	2	60
Deschampsia flexuosa		+	.	.	+	+	+	1	1	+	2	+	1	+	+	+	87	+	.	.	.	.	1	2	.	.	1	.	.	[3]	[3]	.	1	2	1	.	.	.	43	2	.	.	.	.	.	.	.	2	.	.	.	2	.	.	.	.	.	.	.	15
Luzula pilosa		+	1	+	.	+	+	+	+	1	+	r	+	+	1	.	87	+	.	+	.	.	+	.	.	.	1	+	.	1	1	1	+	+	+	.	+	+	62	.	.	.	.	.	.	.	.	+	1	+	.	+	.	1	.	.	+	.	.	30
Calamagrostis epigejos		+	+	.	+	.	1	+	1	+	2	2	+	1	2	2	87	+	.	.	.	.	+	+	.	.	.	.	[3]	1	1	.	1	+	1	[4]	.	1	52	.	.	.	1	.	.	.	.	+	.	1	[3]	+	.	+	.	+	.	+	.	40
Oxalis acetosella		1	.	2	2	2	2	+	+	1	+	2	+	+	+	1	93	1	+	.	.	.	+	2	.	.	.	.	.	.	1	.	+	2	+	.	.	.	38	.	.	.	.	.	.	.	.	1	.	.	.	+	.	.	.	.	.	.	.	10
Mycelis muralis		+	.	.	r	r	.	.	1	+	.	1	1	.	+	+	60	+	+	+	+	.	.	+	.	+	.	r	.	.	.	1	+	.	.	1	+	.	52	+	.	.	.	.	.	+	[3]	r	1	+	+	.	.	.	.	.	.	.	.	35
Fallopia convolvulus		+	.	+	.	+	.	+	+	1	.	+	r	.	+	r	67	+	.	.	.	.	.	.	.	.	.	2	+	.	.	.	+	.	+	1	.	.	29	+	+	+	.	.	2	1	+	.	+	.	.	.	.	.	.	.	.	.	.	35
Rubus sprengelii		.	.	1	1	+	1	+	2	2	+	1	+	.	1	2	80	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	2	1	.	.	.	24	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	5
Galeopsis tetrahit		.	+	+	.	r	.	.	.	+	.	+	r	.	+	.	47	+	.	.	.	.	.	.	2	1	r	r	+	.	.	.	+	.	.	.	.	.	33	r	.	+	.	+	.	.	1	.	+	+	.	.	.	.	.	.	.	.	.	30
Urtica dioica		+	.	+	+	r	.	r	.	+	+	.	.	+	+	+	67	+	.	+	.	.	.	.	2	+	.	.	[3]	.	.	.	.	.	+	1	.	.	33	.	.	.	.	r	.	.	.	+	.	.	1	.	.	.	.	.	.	.	.	15
Veronica chamaedrys		1	.	+	+	.	.	1	r	.	.	1	+	.	.	+	53	.	+	+	+	+	+	.	.	1	.	.	1	.	.	.	+	.	.	+	+	+	52	.	.	.	.	.	.	.	+	+	1	+	1	.	1	.	.	.	.	.	+	35
Impatiens parviflora		+	.	+	1	1	+	.	.	1	r	+	+	.	1	.	67	1	.	.	.	.	.	+	.	.	.	.	.	.	r	.	+	.	+	.	.	.	24	+	.	.	.	.	.	.	.	2	.	.	.	+	.	.	.	.	.	.	.	15
Plagiomnium affine		.	.	+	.	1	.	+	.	+	.	1	.	+	.	.	40	.	+	+	.	.	+	.	.	.	.	.	+	.	.	2	+	+	+	.	+	1	48	.	.	.	.	.	.	.	.	.	1	.	.	.	1	+	.	.	.	.	.	15
Geum urbanum		.	.	+	+	.	.	.	.	.	.	r	.	+	+	.	33	.	+	.	+	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	19	.	.	.	.	.	.	+	+	.	.	+	.	r	+	.	.	.	.	.	2	30
Carex hirta		.	.	+	+	.	+	.	1	+	.	1	1	+	.	.	53	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	5	+	.	.	.	.	.	.	.	+	.	.	+	2	1	+	.	.	.	1	.	35
Rubus gracilis		.	.	+	.	+	.	.	+	1	2	.	.	.	2	1	47	+	.	.	.	.	.	1	.	.	1	.	.	1	+	.	.	.	+	.	.	.	29	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	5
Brachythecium rutabulum		.	.	1	.	+	1	2	.	.	+	.	.	+	.	+	47	+	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	14	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	+	10
Plagiomnium cuspidatum		.	.	.	+	+	+	+	.	.	+	.	.	+	+	.	47	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
Sciuro-hypnum oedipodium		.	.	2	.	.	.	.	+	+	.	+	.	2	2	+	47	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	3	.	1	.	24	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	10
Hypnum cupressiforme		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	+	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	19	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	2	2	.	2	+	30
Rumex acetosella		.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	10	.	.	.	.	.	.	.	.	r	.	.	.	+	.	.	+	1	+	+	.	30
Anthoxanthum odoratum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	1	19	.	.	.	.	.	.	.	1	.	.	.	1	1	.	.	.	+	[3]	.	.	25
Achillea millefolium		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	10	.	.	.	.	.	.	r	+	.	1	+	+	.	.	.	.	.	.	.	.	25

Sporadic species: IV.: *Acer platanoides* a 17(1), a1 48(2), c 17,18,19,34,48(1); A. a2 10(1), b 22, c 14(r),24,34(1),45(r),48,49(r); *Anemone nemorosa* 3,36(1),50(2),51,54(1); *Asarum europaeum* 39; *Carpinus* betulus b 43(r); c 1(1),33(r); *Epipactis helleborine* 4; *Equisetum sylvaticum* 8; *Eurhynchium angustirete* 7(1); *E. striatum* 48(1); *Fraxinus excelsior* a2 27, b 27, c 11(r),27,39; *Galeobdolon luteum* 39(2); *Galium schultesii* 50(2); *Lathyrus vernus* 19; *Lilium martagon* 18(r),24,25(r),27,51; *Lonicera xylosteum* c 17; *Melampyrum nemorosum* 20(2); *Melittis melissophyllum* 54; *Milium effusum* 1, 5(r),6(r),9,11(r),16; *Paris quadrifolia* 4; *Potentilla alba* 17(r); *Ribes spicatum* b 4(r),6(r), c 48; *R. uva-crispa* b 15,31, c 13,32,33(r); *Stachys sylvatica* 38; *Stellaria holostea* 10(1); *Tilia cordata* a1 17(1),27(3), b 17,45, c 18,19,44; *Ulmus glabra* a 42(1), c 42; *U. minor* b 27; *Viburnum opulus* c 38; *Viola reichenbachiana et riviniana* 2,39; **V.:** *Aulacomnium* androgynum 2,17; *Dicranella heteromalla* 40(1); *Hieracium sabaudum* 14,24(r),31,38(1); *Hieracium umbellatum* 20,34,56; *Holcus mollis* 28,35(1),37,38,51; *Luzula pallescens* 11(r); **VI.:** *Dicranum polysetum 51; Dryopteris dilatata 9,48; Hylocomium splendens 51(2); Koeleria grandis 47,50; Monotropa hypopitys s. s. 55; Orthilia secunda 35; Plagiothecium curvifolium 2; Trientalis europaea* 6,8(r),11,25, 29(1),51,54(1); **VII.:** ***Trifolio-Geranietea*:** *Agrimonia eupatoria* 43(1), 44(r),48; *Astragalus glycyphyllos* 10,18; *Coronilla varia* 47; *Fragaria viridis* 48; *Galium album* 4,6,11,12,13,45,47(1); *G. verum* 37,48(1),49,56(1); *Geranium sanguineum* 56(1); *Lathyrus sylvestris* 44; *Peucedanum cervaria* 30,47; *Silene nutans subsp. nutans* 20,31,38,43,47; *Trifolium alpestre* 48(1),50,56; *T. medium* 20; *Vicia cassubica* 36; *V. sepium* 39. ***Festuco-Brometea*:** *Acinos arvensis* 20(2); *Allium oleraceum* 56; *Carex caryophyllea* 2; *Cladonia rangiformis* 52; *Dianthus carthusianorum* 24,48,52,53,55(2); *Euphorbia cyparissias* 30(r); *Filipendula vulgaris* 45,56; *Poa compressa* 52, 55(1); *Potentilla heptaphylla* 48; *Silene otites* 52(1); *Thalictrum minus* 20,39; *Thymus pulegioides* 48,55; *Trifolium montanum* 46,47; *Verbascum lychnitis* 52; *Veronica spicata* 27,48,50; **VIII.:** *Calluna vulgaris* 51,52; *Carex ericetorum* 51,52,53,55(1); *Chamaecytisus ratisbonensis* 51,52,53(1); *Danthonia decumbens* 51,55; *Genista tinctoria* 48; *Luzula campestris* 52,55; *L. multiflora* 55; *Polytrichum juniperinum* 53,55(1); *Potentilla erecta* 4,8(r),15,25(r),45,51,54(1); *Scorzonera humilis* 21(r),34,51; *Solidago virgaurea* 28,29(r),30,34(1),38,48,51,54; **IX.:** *Aegopodium podagraria* 27; *Agrostis stolonifera 27; Alliaria petiolata* 3,5(r),14(1),19,23,24(1); *Angelica sylvestris 50; Arabidopsis thaliana* 55(1); *Arrhenatherum elatius* 9,48; *Astragalus arenarius* 52; *Athyrium filix-femina* 4(r); *Berberis vulgaris* b 56(1); *Brachytheciastrum velutinum* 2,44; *Campanula rotundifolia* 12,13,30,37,38,46,47; *Cardamine impatiens* 56; *Cardaminopsis arenosa* 52,53; *Carex brizoides* 48; *C. nigra* 4; *Cerastium arvense* 48(1); *C. holosteoides* 53; *Chaerophyllum temulum* 39; *Chamaenerion angustifolium* 34,49(r),55(2); *Chelidonium majus* 27,56; *Cirsium palustre* 4; *Cladonia foliacea* 52; *Convolvulus arvensis* 49(r); *Cornus sanguinea* b 48, c 40; *Crataegus laevigata* b 3(1),5(1),9(1)16,33,43(r),45,49, c 3,33,39; *C. monogyna* b 1,5(1),8,11(1),50(1),51, c 4,5(r),49,50; *C. monogyna* et *laevigata* b 27(1),34,56(3), c 48; *C. rhipidophylla* var. *rhipidophylla* b 3,9,13, c 1,37(r),45(r); *Crataegus xsubsphaericea* c 28; *Dactylis glomerata* 2,15,31,38,48(2),50; *Digitalis grandiflora* 17(r), 18(r); *Epilobium montanum* 14; *Equisetum arvense* 4(r),6(r),8,15(r); *Euonymus europaea* b 48,56, c 3,13,27,39,40, 48,50, 56(1); *Eurhynchium hians* 3; *Fallopia dumetorum* 3,23(r),24(2),48,56(2); *Festuca pratensis* 48; *F. rubra* s. s. 2,3,15,28,48, 56(3); *Galeopsis bifida* 50(1); *G. pubescens* 19,27,38,43,48(1); *G. speciosa* 56; *Galium aparine* 14,30(3),43(1),44(1); *G. mollugo* 35,36,50,51,53,54; *G. mollugo et dumetorum* 39; *Geranium robertianum* 1(r),27(3),34,44(3),48(2),50(1),56(2); *Glechoma hederacea* 56(2); *Hieracium murorum* 17,34,38,43; *Holcus lanatus* 7,9,11(r),13(1),15; *Hypochoeris radicata* 53; *Jasione montana* 52,53,55; *Jovibarba sobolifera* 52(2); *Lapsana communis* s. s. 27,48; *Larix decidua subsp. decidua* a1 15,22(1),32; *Larix sp.* a 39; *Lathyrus pratensis* 4; *Lembotropis nigricans* 51; *Linaria vulgaris* 7,8,27(1),34,37,40(r),56; *Lycopus europaeus* 4(r); *Malus sp.* c 39; *Phalaris arundinacea* 32; *Plagiomnium medium* 48; *P. rostratum* 48(1); *Plantago lanceolata* 43; *Poa pratensis* 48,54(1),56; *Polypodium vulgare* 52(1),53; *Populus tremula* b 6(2),14(2),51, c 6(2),10,14,18; *Potentilla reptans* 4; *Prunella vulgaris* 4(r); *Pyrus communis* b 17,36,39,48,51,56, c 17,39,48; *Pyrus pyraster* b 7,8,9,44(r), c 5(r),6(1),9,11(r),12(r),14(r),21(r),49(r); *Quercus rubra* c 11; *Ranunculus acris* s. s. 13(r); *Ranunculus repens* 1,4(r); *Rhamnus cathartica* c 27,34,39,48,56(1); *Rhodobryum roseum* 7; *Robinia pseudacacia* b 23(2), c 10(r),38; *Rosa canina* b 27,48, c 34,56; *Rosa canina* 34,56; *Rosa* sp. c 4(r),45(r); *Rosa tomentosa* c 48; *Rubus caesius* 5(2),27,33(1),40,41; *R. corylifolius* 1,9,13(1),21,43,44(1),46(1),47; *R. grabowskii* 32; *R. plicatus* 8,15(1),22(1),31,32(1),48; *Rubus* sp. 35(3),36(3),50(2),54(1); *Rumex acetosa* 48,53,56; *Sambucus* nigra b 19,48,56, c 34,48,56(1); *S. racemosa* c 49(r); *Sarothamnus scoparius* b 53, c 51(1); *Scleranthus perennis* 52; *Scutellaria hastifolia* 48,56; *Senecio sylvaticus* 34,46(r); *Serratula tinctoria* 18,47,51,54; *Solanum dulcamara* 33(r),44(r),56; *Sorbus intermedia* c 56; *Stellaria graminea* 13,27; *S. media* 56(1); *Tanacetum vulgare* 7,34; *Taraxacum officinale* 4(r),30,47(r),56; *Thalictrum aquilegiifolium* 20; *Thymus serpyllum* 52(1),53; *Torilis japonica* 47; *Verbascum nigrum* 39; *Vicia cracca* 4(1), 49; *Viscaria vulgaris* 38.

Table A31. *Querco roboris-Pinetum molinietosum*

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
ID-1		22	35	7	1	52	22	22	22	22	30	13	19	7	13	7	35	7	7	22	51	51	51	7	7	19	52	52	51	7	52	19	19	38	37	38	51	
ID-2		5	29	1	3	16	5	5	5	5	5	2	2	1	2	1	20	1	1	5	2	2	2	1	1	2	16	16	2	1	16	2	2	6	14	6	2	
ID-3		12	13	1	3	2	11	14	13	10	34	41	6	4	42	5	3	7	8	4	10	11	12	2	6	15	4	3	9	9	1	13	14	7	21	8	15	
Date (year)		1961	1976	1982	1990	1973	1961	1961	1961	1961	1955	1996	1977	1996	1999	1997	1976	1997	1995	1961	1981	1981	1981	1997	1977	1983	1973	1973	1981	1977	1973	1985	1977	1984	1987	1987	1981	1-36
Density of tree layer	a1,a [%]	80	50	60	45	50	70	70	80	80	60	75	40	50	60	60	60	60	70	70	40	60	40	60	70	40	60	70	40	60	50	30	50	65	60	60	40	
Density of tree layer	a2 [%]	-	-	50	5	-	-	-	-	-	25	10	-	15	50	25	20	30	10	-	10	-	30	10	5	30	-	-	40	15	-	40	30	-	30	5	-	%
Density of shrub layer	b [%]	10	20	10	20	25	5	10	+	20	15	30	50	25	30	50	5	40	20	+	10	+	10	40	20	30	50	50	+	25	20	60	60	15	25	20	20	
Cover of herb layer	c [%]	60	75	40	40	70	90	80	90	50	90	75	80	60	70	75	80	80	60	90	90	90	90	80	70	90	90	90	80	70	90	80	70	75	90	85	100	
Cover of moss layer	d [%]	80	60	30	80	50	90	90	90	90	50	80	60	75	60	80	60	80	80	90	90	90	30	40	10	30	10	15	30	10	15	20	10	5	+	5	80	
Area of relevé		400	200	200	200	140	450	700	350	500	1500	150	400	150	200	200	200	150	200	800	200	200	200	150	100	400	250	180	150	200	180	500	400	200	600	500	100	
Location (ATPOL)		CD32	CE00	CD35	BD18	CD02	CD32	CD32	CD32	CD32	CD73	-	DD91	CD37	-	CD37	CE00	CD46	CD46	CD32	CD83	CD83	CD83	CD46	CD35	DD93	CD02	CD02	CD83	CD35	CD02	DD92	-	AD85	AD78	-	CD83	
Total number of species		26	26	38	41	21	22	21	22	23	26	34	25	32	39	38	25	40	39	34	25	35	32	42	27	22	21	17	29	24	20	20	23	24	18	22	21	
Number of mosses, liverworts and lichens species		8	3	4	9	3	5	5	9	6	7	4	4	7	8	8	4	8	8	7	6	12	6	8	3	3	3	1	7	5	5	1	1	6	2	3	6	
I. D. *Querco roboris-Pinetum*																																						
Pinus sylvestris (V-P)	a1,a	3	3	4	3	3	4	4	4	3	4	3	3	3	3	4	3	4	4	4	3	4	3	3	3	3	4	4	3	4	3	2	1	2	3	3	3	100
Pinus sylvestris (V-P)	a2	.	.	.	.	.	.	.	.	.	.	+	.	.	1	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	14
Pinus sylvestris (V-P)	b;bc^	+^	.	.	+	.	1^	2^	.	2^	.	1	.	1	+	+	+	.	1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	1	.	39
Pinus sylvestris (V-P)	c	.	+	+	1	+	.	.	.	.	.	.	1	+	.	1	+	+	1	.	.	+	.	+	+	+	.	.	+	+	.	.	.	.	.	+	.	47
Pleurozium schreberi (V-P)		4	4	3	4	3	4	4	3	5	3	3	4	4	3	3	3	4	4	3	2	2	+	2	1	2	2	2	2	2	2	.	2	1	.	1	+	94
Vaccinium vitis-idaea (V-P)		1	.	.	2	.	2	3	3	2	.	2	2	1	2	1	+	2	2	2	1	1	+	2	1	1	1	.	.	1	.	1	+	+	1	1	.	78
Dicranum polysetum (V-P)		1	+	+	2	.	2	2	2	2	.	+	+	+	1	1	.	1	+	1	1	1	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	56
Pseudoscleropodium purum (V-P)		+	.	.	+	2	+	1	1	.	+	.	.	2	.	2	.	.	.	3	3	3	1	+	.	.	1	.	+	.	1	.	.	.	.	.	3	50
Calluna vulgaris (C-U)		2	.	.	1	.	.	2	1	2	.	+	1	.	+	.	.	.	1	1	.	+	1	.	.	.	.	.	.	.	.	.	.	.	+	+	.	39
Hylocomium splendens (V-P)		1	.	+	.	.	1	.	2	1	.	.	.	+	1	1	.	1	2	1	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	36
Leucobryum glaucum (V-P)		.	.	.	.	.	2	2	2	.	.	.	1	.	.	.	1	.	.	.	+	1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	22
II. Ch. *Vaccinio-Piceetea* (V-P)																																						
Picea abies	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	6
Picea abies	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	2	.	.	.	.	.	.	+	.	.	.	.	1	.	.	3	2	.	.	.	.	17
Picea abies	b/c	.	+/	.	.	.	/+	.	.	.	+/	+/+	.	.	+/	+/	1/+	.	.	/+	1/	.	1/	.	.	1/+	.	.	1/	.	.	3/+	3/1	.	.	.	1/	42
Vaccinium myrtillus		2	2	2	1	1	4	4	4	3	5	4	3	3	3	4	3	3	3	3	4	4	5	4	4	4	.	2	2	2	1	4	3	4	4	1	1	97
Dicranum scoparium		1	.	.	1	.	.	2	1	1	+	.	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	+	.	36
III. D. *Querco roboris-Pinetum molinietosum*																																						
Quercus robur	a1,a	3	.	.	.	.	.	+	.	3	2	.	1	.	.	1	1	.	1	1	.	1	.	.	2	.	.	.	.	1	.	.	3	3	1	2	.	44
Quercus robur	a2	.	.	2	.	.	.	.	.	.	.	2	.	2	2	2	.	2	2	.	.	.	+	+	1	.	.	.	3	+	.	2	1	.	1	.	.	42
Quercus robur	b[bc]	2	.	.	2	.	+	2	1	2	[+]	2	3	2	1	2	.	1	1	1	.	.	.	+	1	.	+	.	.	.	.	1	1	+	2	2	.	64
Quercus robur	c	1	+	+	+	.	1	1	2	1	.	+	+	+	1	1	+	+	+	2	.	.	+	.	+	.	+	.	+	+	.	.	+	1	1	+	+	75
Populus tremula	a2	.	.	+	.	.	.	.	.	.	.	1	.	1	2	+	.	1	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	.	.	.	25
Populus tremula	b/c	.	.	/+	.	.	.	.	.	.	.	1/1	.	+/+	1/1	1/1	.	1/	/+	.	.	.	.	1/+	1/+	.	.	.	.	2/+	.	/+	1/1	/+	1/	/+	.	42
Frangula alnus	b[bc]	[+]	2	+	.	2	[+]	[+]	.	.	2	2	+	1	2	2	1	2	1	.	1	+	+	2	1	3	3	3	.	1	2	2	2	1	1	.	2	83
Frangula alnus	c	.	.	.	+	.	.	.	.	.	1	1	+	+	+	1	+	+	+	.	+	.	+	+	+	1	2	1	+	+	+	1	+	+	.	.	+	67
Molinia caerulea		2	.	1	+	4	4	3	3	+	2	1	+	+	+	1	+	1	2	2	1	1	+	.	+	2	2	1	.	+	4	3	3	+	+	+	2	92
Trientalis europaea (V-P)		.	1	+	.	+	+	.	.	.	+	1	+	2	2	2	1	2	1	.	+	+	.	2	+	1	.	1	+	1	+	1	+	.	.	.	.	67
Lysimachia vulgaris		.	+	.	.	+	.	.	.	.	.	1	.	.	.	+	.	+	+	.	.	.	.	+	+	.	.	+	+	.	.	.	+	.	.	.	.	31
Sciuro-hypnum oedipodium		.	.	+	1	.	.	.	.	.	+	+	.	+	1	1	.	1	+	.	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.	.	31
Rubus plicatus		.	.	.	.	2	.	.	.	.	.	.	.	+	1	+	.	+	.	.	.	.	.	.	+	.	3	+	.	.	2	.	.	.	.	.	.	25
IV. Ch. et D.* *Quercetea robori-petraeae*																																						
* *Pteridium aquilinum*		.	.	.	.	3	3	3	.	1	+	2	.	2	2	2	3	3	3	5	5	4	.	1	2	3	3	3	4	4	1	3	+	2	.	2	2	78
* *Polytrichastrum formosum*		1	.	.	1	2	.	.	1	1	+	1	.	+	2	2	2	1	+	2	2	1	2	+	.	1	1	.	+	.	2	1	.	+	.	.	+	69
Festuca ovina		4	1	.	2	.	1	.	4	3	.	+	1	+	1	1	.	1	.	4	1	.	2	1	.	.	.	.	2	1	.	.	+	1	1	3	.	61
* *Melampyrum pratense*		.	.	.	2	.	2	2	2	.	.	1	2	.	1	.	.	1	.	2	.	.	.	+	.	.	.	.	.	1	.	.	.	1	2	.	.	36
Calamagrostis arundinacea		.	.	+	+	.	2	1	.	+	.	.	.	.	.	.	.	.	+	1	.	.	.	.	+	.	1	.	.	.	.	.	.	.	.	.	3	28
Carex pilulifera		.	+	.	.	.	.	.	.	.	.	.	1	.	1	.	+	.	+	.	+	+	.	.	.	.	.	.	1	.	.	.	+	+	.	.	.	28
V. Ch. *Calluno-Ulicetea* (C-U)																																						
Pohlia nutans		+	.	.	2	.	.	.	.	+	.	.	.	.	.	.	+	.	.	1	+	1	1	+	.	.	.	.	+	+	.	.	.	1	.	1	+	39
Agrostis capillaris		.	1	+	.	.	.	.	.	.	.	.	.	.	1	.	1	1	.	.	.	.	+	.	+	.	.	.	+	.	.	.	.	.	.	1	.	25
VI. Others																																						
Betula pendula	a1,a	.	.	.	.	+	.	.	.	.	1	4	1	1	2	.	.	2	1	.	1	.	.	2	2	1	.	.	.	+	.	.	1	.	.	1	.	42
Betula pendula	a2	.	.	3	.	.	.	.	.	.	.	1	.	1	3	1	.	2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	22
Betula pendula	b [bc]	.	.	.	1	.	[+]	[+]	.	.	.	1	1	+	1	1	.	2	+	[+]	+	.	.	+	.	.	.	1	.	+	.	.	1	.	1	.	.	47
Betula pendula	c	.	.	.	+	+	.	.	.	.	.	+	1	.	1	+	.	1	.	.	+	+	+	.	.	.	+	1	.	.	+	.	.	+	+	.	+	44
Quercus petraea	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	2	.	.	8
Quercus petraea	a2	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2	.	.	3	.	.	.	.	.	.	.	.	2	.	.	14
Quercus petraea	b	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	1	.	.	.	.	.	.	1	.	.	17
Quercus petraea	c	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	1	.	.	+	.	+	+	.	+	.	.	.	.	.	.	22
Carpinus betulus	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	3
Carpinus betulus	b/c	.	/+	.	.	/+	.	.	.	/+	.	.	.	.	.	.	.	/+	/+	/+	.	.	.	.	.	.	.	.	.	.	.	1/+	+/1	.	.	.	.	22
Sorbus aucuparia	a2,a	.	.	1	+	.	.	.	.	.	.	.	2	.	.	2	.	1	1	.	.	.	.	2	.	.	.	.	.	2	.	.	.	.	.	.	.	22
Sorbus aucuparia	b [bc]	[+]	+	1	+	.	[+]	[+]	[+]	[1]	.	1	1	1	.	2	.	1	1	[1]	+	.	.	3	2	.	1	.	.	1	1	.	1	2	+	.	.	67
Sorbus aucuparia	c	.	+	+	+	+	.	.	.	.	+	+	.	2	1	1	.	+	+	.	.	.	+	1	+	+	+	+	+	1	.	.	+	+	.	.	.	58
Luzula pilosa		2	+	+	.	+	1	2	1	1	+	+	1	+	1	1	+	1	1	2	+	+	1	1	+	1	1	+	1	1	1	+	1	+	.	.	.	89
Dryopteris carthusiana		.	+	.	+	1	.	.	+	.	1	+	.	1	1	+	1	1	+	+	+	.	.	1	.	.	+	1	r	.	2	+	+	.	.	.	1	61
Oxalis acetosella		.	+	+	.	+	.	.	.	.	+	+	.	+	1	+	1	1	1	2	.	.	.	1	.	+	2	.	2	+	1	.	.	.	.	.	2	53
Maianthemum bifolium		.	.	1	.	1	.	.	.	.	+	+	1	.	+	.	+	.	+	1	+	+	.	.	.	+	1	.	.	+	+	+	+	.	.	.	.	47
Rubus idaeus		.	.	1	.	+	.	.	.	.	.	.	.	+	.	.	.	1	+	.	+	.	.	+	+	.	+	3	1	.	+	.	.	.	.	1	1	39
Anthoxanthum odoratum		.	.	.	1	.	.	.	.	.	.	.	1	.	+	.	.	+	.	.	.	+	.	+	+	+	.	.	.	.	.	.	.	+	1	.	.	28
Moehringia trinervia		.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	+	.	.	.	.	+	.	+	1	.	.	.	+	.	.	1	.	.	.	.	+	28
Calamagrostis epigejos		.	2	+	+	.	.	.	.	.	+	.	.	+	1	.	.	1	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	25
Anemone nemorosa		.	.	2	.	.	.	.	.	.	.	+	.	.	1	+	.	1	1	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	22
Plagiomnium affine		.	.	.	1	.	.	.	.	.	+	.	.	+	.	.	.	1	1	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	2	22

Sporadic species: II.: *Betula pubescens* subsp. *pubescens* a 7,8, a2 11,23,32(1), b 11,15(1),32(1), c 11,15(1),23,28,32; *Diphasiastrum complanatum* 4(1); *Dryopteris dilatata* 2(2),11(1),13,15(1),17,18; *Galium rotundifolium* 22; *Juniperus communis* b 4,14, bc 15, c 11,22; *Lycopodium annotinum* 3(1); *L. clavatum* 1(1),9(1); *Orthilia secunda* 3,4,14,18(1); *Plagiothecium curvifolium* 23(1),24; *Rubus saxatilis* 4(1),10,18,19; *Viscum album* subsp. *austriacum* 11,17,23; **IV.:** *Dicranella heteromalla* 22(1),33; *Hieracium lachenalii* 4,12,13,18,22; *H. laevigatum* 34; *H. umbellatum* 33(1),35; *Holcus mollis* 1,2(1),9,16,20,28,35(1); *Lophocolea heterophylla* 14,15; *Plagiothecium denticulatum* 18; *P. laetum* 21,23,28; **V.:** *Carex ericetorum* 4,18; *C. ovalis* 11,14,18,24; *Chamaecytisus ratisbonensis* 25; *Cladonia chlorophaea* 8; *C. fimbriata* 8; *C. pyxidata* 1,19(1);*Danthonia decumbens* 4,22; *Hypnum jutlandicum* 4; *Nardus stricta* 11; *Scorzonera humilis* 4,13,19; *Solidago virgaurea* s. s. 12,15,33; *Veronica officinalis* 1,22; *Viola canina* 4; **VI.:** *Abies alba* a2 25(1), b 25(1); *Acer platanoides* b 4, bc 17,23(1),c 4(r),35; *A. pseudoplatanus* bc 13,23; *Ajuga reptans* 3; *Arrhenatherum elatius* 4; *Athyrium filix-femina* 2,16,27(1); *Atrichum undulatum* 21; *Brachythecium rutabulum* 33; *Campanula rotundifolia* 4; *Carex nigra* 7,32; *Carpinus betulus* a2 32(2), b 31(1),32, c 2,5,9,17,18,19,31,32(1); *Cerasus avium* a2 3, bc 3; *Ceratodon purpureus* 21; *Chamaenerion angustifolium* 17; *Convallaria majalis* 1(1),6(1),9(2),19(1); *Corylus avellana* b 36(1),c 18,25; *Crataegus monogyna* c 31,32; *C.* x *subsphaericea* c 22; *Deschampsia caespitosa* 3,21; *D. flexuosa* 9; *Dryopteris filix-mas* 1,2,6; *Epilobium montanum* 21; *Equisetum sylvaticum* 7; *Fagus sylvatica* a1,a 10(1), b 5, bc 10, c 5,26; *Festuca rubra* s. s. 20,21,22(1),23,28; *Fragaria vesca* 3,15,22,29,35; *Funaria hygrometrica* 21; *Galeopsis tetrahit* 19; *Galium aparine* 23; *G. boreale* 3,15; *G. mollugo* 35; *Geranium robertianum* 15,17,23; *Geum urbanum* 3,23(r) *Hypnum cupressiforme* 14,33(1),34; *Juncus conglomeratus* 22; *J. effusus* 11,15; *Malus sylvestris* b 24, bc 10, c 14; *Marchantia polymormpha* 21; *Milium effusum* 10,27; *Oxyrrhynchium hians* var. *hians* 30; *Padus serotina* b 4, c 23; *Pinus strobus* a2 16, c 2; *Plagiothecium* sp. 22,36(2); *Poa angustifolia* 15,23; *P. nemoralis* 33; *Polygonatum multiflorum* 16; *Polytrichum juniperinum* 2; *Populus nigra* a 19, c 21; *Potentilla erecta* 11,13, 14,19,22,31(1); *Pyrus pyraster* b 4; *Quercus rubra* a2 4; *Ranunculus acris* s. s. 3(r); *Rhamnus cathartica* b 15, c 26; *Ribes spicatum* bc 3(1); *Rubus caesius* 3(1),8,19; *R. gracilis* 3(1),17(1),24(1),28(1),29; *R. nessensis* 3,11(1),18,23; *Rubus* sp. 12,16,25,31(1),32(1),35(2),36(3); *R. sprengelii* 13(1),14(1),17,18,24; *Rumex acetosa* 23,35; *R. acetosella* 2(1),4,12(1),19(1); *Salix caprea* 21;*Selinum carvifolia* 3; *Senecio vulgaris* 35; *Serratula tinctoria* 3; *Sphagnum capillifolium* 10; *Stellaria holostea* 21,26; *Tilia cordata* a2 17, bc 17, c 1,9; *Tussilago farfara* 21; *Urtica dioica* 23; *Veronica chamaedrys* 1; *Viola reichenbachiana* 3(1),19,22; *V. riviniana* 3; *Viola* sp. 1; *Viscum album* subsp. *album* a 2.

Table A32. *Querco roboris-Pinetum typicum*

Successive number of relevé		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82		
ID-1		52 1 1 1 1 1 22 52 52 52 52 24 36 39 36 51 36 19 39 1 36 36 54 52 52 52 52 52 54 36 51 46 55 48 52 37 36 19 36 36 36 35 37 38 36 52 35 35 52 52 51 7 35 16 16 35 52 47 54 35 36 36 1 38 38 35 36 36 24 36 35 35 35 36 36 36 36 35 36 36 35 36		
ID-2		16 3 3 3 3 3 5 16 16 16 16 - 17 28 17 2 17 2 28 3 17 17 11 16 16 16 16 16 11 17 2 3 16 3 16 14 17 2 17 17 17 20 14 6 17 16 20 29 16 16 2 1 20 21 21 20 16 176 11 29 17 17 3 6 6 20 16 16 - 16 20 20 20 16 16 16 16 20 16 16 20 16		
ID-3		30 2 9 7 5 6 15 31 32 17 11 - 8 4 3 6 27 7 2 11 22 26 2 26 27 20 28 29 1 2 4 13 23 7 22 14 6 3 15 16 17 11 5 5 1 18 7 14 21 25 8 12 6 4 3 4 10 8 3 17 29 28 14 2 3 19 15 4 - 14 17 24 29 13 1 12 5 22 8 9 30 17		
Date (year)		1973 1990 1990 1990 1990 1990 1961 1973 1973 1973 1973 1995 1964 1992 1976 1981 1985 1983 1992 1990 1985 1985 1975 1973 1973 1973 1973 1973 1975 1984 1981 1954 1995 1976 1973 1986 1986 1977 1985 1985 1985 1976 1986 1987 1984 1973 1976 1976 1973 1973 1981 1977 1976 1972 1972 1975 1973 1984 1975 1976 1976 1979 1979 1990 1984 1984 1976 1976 1985 2006 1976 1976 1976 1976 1976 1984 1984 1975 1985 1984 1976 1976	1-63	64-82
Density of tree layer	a1,a [%]	60 35 30 20 35 30 70 60 60 80 70 50 40 45 65 40 60 40 50 35 65 30 60 70 70 60 60 60 60 50 50 50 40 60 80 65 50 30 75 40 30 70 80 60 55 60 80 50 70 75 50 75 75 70 60 35 50 70 70 60 55 40 30 65 50 60 60 45 30 50 50 50 70 70 60 40 55 45 50 40 60 60		
Density of tree layer	a2 [%]	- 10 20 10 + 15 - - - - - - 5 40 5 10 5 - 20 30 10 60 - - - - - - - - 20 - 15 - - - 20 5 60 45 65 40 + 15 20 35 - + - - - - 10 10 5 20 50 20 - - - - 40 40 5 10 5 50 50 50 60 20 20 10 30 30 20 35 20 - 35 45 30 30	%	%
Density of shrub layer	b [%]	+ 60 60 20 20 5 5 70 5 20 - 10 30 35 20 + 20 5 30 30 20 30 10 10 + 25 5 - - 15 50 10 15 - 5 15 20 20 5 20 + 5 20 20 20 - 30 20 40 50 15 15 + 60 30 30 10 + 20 10 10 10 15 20 30 + + 20 + 20 20 20 20 20 30 5 20 20 + 40 5 5		
Cover of herb layer	c [%]	80 30 35 50 40 60 50 70 80 75 80 70 90 70 50 80 90 90 70 60 65 60 40 90 90 90 100 90 40 65 60 70 60 75 80 100 90 90 90 80 85 95 95 85 80 60 90 80 60 90 80 75 95 80 50 80 100 90 40 85 70 70 70 60 85 60 60 60 70 60 60 90 60 60 85 85 90 45 20 60 40 40		
Cover of moss layer	d [%]	70 50 35 60 60 65 90 50 80 75 90 40 95 30 30 80 70 40 60 50 35 50 60 100 60 75 90 90 30 75 80 40 80 20 + + 40 30 5 5 5 + + 20 5 . 20 25 15 20 15 5 + 95 60 5 5 20 40 20 30 50 25 + 20 30 30 5 15 90 95 45 100 85 85 5 5 20 40 30 30 30		
Area of relevé		180 200 200 120 200 180 650 150 180 400 150 150 800 600 200 150 800 500 600 90 800 800 100 130 150 200 130 150 400 900 100 1400 100 200 240 800 900 500 800 900 200 900 800 400 300 200 100 200 150 200 150 100 200 150 300 200 100 200 600 400 80 400 400 150 450 800 150 200 200 100 400 800 900 800 100 800 600 100 400		
Location (ATPOL)		CD02 BD18 BD18 BD18 BD18 BD18 CD32 CD02 CD02 CD02 CD02 CC80 CE22 BE15 CE11 CD83 CE10 CD96 BE15 BD18 - CE11 BC72 CD02 CD02 CD02 CD02 CD02 BC81 CE11 CD83 CC92 BC61 BD38 CD02 BE02 BE27 CC91 CE22 CE22 CE22 CE11 BE03 AD75 CE11 CD02 CE11 CE10 CD02 CD02 CD83 CD35 CE11 CE14 CE14 CD92 CD02 - BC81 CE00 CE14 CE14 BD18 AD74 AD74 CE11 CE11 CE22 CE36 CE11 CE11 CE01 CE11 CE11 CE11 CE00 CE22 CE05 CE00 CE00		
Total number of species		17 27 30 40 31 29 15 17 15 15 12 25 27 23 29 24 23 21 27 24 32 38 19 13 12 15 13 17 18 33 29 18 16 20 11 20 22 26 20 22 22 23 28 25 21 11 21 28 13 14 37 25 21 32 29 25 18 12 12 30 33 24 29 21 18 21 20 19 24 25 22 27 21 20 23 38 35 20 21 36 17 17		
Number of mosses, liverworts and lichens species		2 9 6 9 9 8 6 5 3 2 2 5 8 3 5 6 6 4 3 7 8 8 4 2 2 3 2 3 3 10 5 4 2 6 2 4 9 3 9 10 8 1 3 7 4 - 1 3 2 3 7 3 1 10 9 2 3 1 8 4 8 7 8 5 5 4 4 3 4 6 5 5 6 5 7 5 5 4 8 8 3 4		
I. D. *Querco roboris-Pinetum*				
Pinus sylvestris (V-P)	a1,a	3 3 3 2 3 3 4 4 4 4 4 4 3 2 5 3 3 3 3 3 4 3 3 4 4 3 4 4 4 3 3 4 3 3 3 3 2 3 2 3 2 2 2 2 2 3 1 3 3 3 3 3 4 3 3 2 3 3 4 4 4 3 2 3 3 3 4 4 3 3 3 3 3 3 4 4 3 2 3 2 3 3 3 3	100	100
Pinus sylvestris (V-P)	a2	. . . . + ... 1 . 1 1 . . . . 1	8	
Pinus sylvestris (V-P)	b;bc^	. . . . . . 2^ . . . . . . + ... 3 . . . . + ... + ... 2 + 1 . . . . + ... + ...	10	21
Pinus sylvestris (V-P)	c	. + . + + + . . + . + ... + ... + . . r . . . . . . + + + . . . + ... + + ... + + . + ... + . . 1 + . . 1 + + + + . . + + + + + ... + +	35	58
Pleurozium schreberi (V-P)		4 3 3 3 3 4 4 3 4 3 3 3 3 3 3 3 4 3 4 3 3 3 3 5 3 5 4 4 3 4 2 . 2 1 + + 2 2 1 1 1 . + 2 1 . 2 2 . 2 2 1 . 2 2 1 2 2 2 2 2 2 + + 2 2 2 1 2 5 5 3 5 5 5 1 + 2 2 2 2 2	92	100
Vaccinium vitis-idaea (V-P)		1 + . 2 . . 2 2 2 + + 1 + + + 2 1 1 . 2 . . . 2 1 2 2 1 . + . . 1 2 + 1 + 1 + + 1 1 1 1 + 1 + 2 1 + . 1 + + 1 + . + . 1 + 1 . 2 2 1 1 + 2 + + + 1 1 + + + + . + 1 1	78	95
Dicranum polysetum (V-P)		+ 2 + . + + 3 3 4 . . + 2 . . 2 1 + 1 + 1 . + 2 1 . 2 2 . 1 + + ... 1 + + + . . . + ... + + ... 2 . + ... + + . . 1 1 . . . . 1 . . 1 1	52	37
Calluna vulgaris (C-U)		+ + . 1 . 1 1 1 + . . . + ... + . . + ... 1 . . + ... 2 . . . 1 . . . + ... + ... 1 + . + + . + 1 1 + 2 2 . . . 2 . . 1 1	27	63
Leucobryum glaucum (V-P)		. 1 + + + + 1 . . . . + + ... 2 . . + + . . . + ... 2 1 . . + . . + . . . 2 2 . . + + + + + . + . + 1 . + +	25	63
Pseudoscleropodium purum (V-P)		. 1 1 . . . . 2 3 3 2 . . . 1 . + . 1 . . . . . + . . . + + 3 3 4 + ... 1 . . . . 1 . . . . 1 . .	29	5
Hylocomium splendens (V-P)		. + ... 1 . . . . . 2 . . . 1 . . . . + ... + ... 1 + + + ... 1 . . . . + ... + . .	19	5
II. Ch. *Vaccinio-Piceetea* (V-P)				
Picea abies	a1,a	. . . . 1 . . . . 3 3 . . . . . 2 2 . . . . 2 . 3 2 . .	8	16
Picea abies	a2	. . . . 1 1 1 . . . . . 3 . . . . 2 . . . . 3 1 . . . . 2 . . 2 3 . . . . . 3 3 . . . . + ...	19	5
Picea abies	b	. . . . 2 3 2 + 3 . 2 . . + ... 2 1 . . . 2 2 + 1 1 + + . . + . 2 + . . 1 . . 4 2 + ... 2 2 . . . . . . 2 + . . 2 + + + + 2 . + 2 . .	40	53
Picea abies	c	+ . . . . + + ... + ... + . 1 + . + ... + ... + . . 2 1 . . . . + + + . + ... + + + + + . . + . . . + . .	24	42
Vaccinium myrtillus		2 2 2 + + . 3 3 4 4 3 3 5 3 3 3 5 4 3 3 3 3 3 3 5 5 5 5 5 4 3 3 4 4 3 4 5 5 5 5 5 5 5 4 4 4 4 3 3 3 3 4 3 3 2 2 1 1 2 . 1 1 2 . 3 3 3 3 3 3 4 4 4 4 3 3 5 2 1 1 1 2 2 2	95	100
Trientalis europaea		1 . . . . 1 . . . 1 . 1 + ... 2 . 1 . . . . . . 1 1 . . . . 1 . . . + . . 1 . 1 1 . . 2 1 + + + 1 1 . . + 1 + ... 1 + ... + 1 1 . . 2 . .	38	32
Dicranum scoparium		. 1 1 2 1 1 2 . . . . + . + + . . . + 1 + 1 . . . . . . 1 . . . . . . + . + . + + + . . . 1 . . . + 2 . . . . + . . . 1 + . . + + + ... 1 1 + + + 1 . . . 1 . . .	41	47
III. Ch., D.* *Quercetea robori-petraeae*				
Festuca ovina		. 2 1 3 2 2 3 . . . . + + . + 1 + 1 . 1 1 . 2 . 1 . . 3 2 + 2 + + 1 + 1 . + . . + + 2 1 . 1 + 1 + + 1 . . . . 2 . + 3 + . . + . + + + + + 1 1 1 + + + + . 1 . . 1 1	65	79
* *Pteridium aquilinum*		4 . . . . . . + . 2 2 . + 2 1 1 . . . . . 2 3 5 5 4 4 4 3 3 . + 1 2 . . . 1 1 + . + 1 . 1 1 2 + . 4 4 3 3 3 3 3 3 . . + 1 2 . . . + + 1 + 2 2 2 + + 2 4 3 + 2 1 . .	63	79
* *Polytrichastrum formosum*		. 4 . 2 + . . + ... 2 . 1 1 1 + 1 2 + 3 3 . . . . . . 2 + + . . . + + . + + 1 + + + + . . 2 . . + . . 3 2 . + . . + 2 2 . . . + + + + + + 1 . . 1 1 1 . 2 + . .	54	63
* *Melampyrum pratense*		. 1 2 2 3 3 1 + ... + + 1 . + 1 2 . . . . . + 2 1 + + ... + . + . 1 1 + . + + + 2 + . . . 1 . + + . + ... 2 + 1 1 . . . 1 . + + + + + . + . . + +	52	63
Carex pilulifera		+ . . . . + . . + + . + . 1 + 1 . . . . + + . . . + . + 1 + 1 1 + . + + + . . 1 . . + . . 1 + ... + + + . + + + + + + + + + + + + . . + . 1 . + +	43	84
Calamagrostis arundinacea		2 + ... 1 . 3 5 5 3 . . . . 1 . + ... 2 2 . . . + + . + ... 2 . . . . 2 . . 4 4 . . 2 + ... 1 . . . . + ... 1 + . . .	32	21
IV. Ch. *Calluno-Ulicetea* (C-U)				
Pohlia nutans		. + + + + + . 1 . . . . . + + . + ... + 1 . . . + . 3 . + + . . + . + + . + + + . . 1 . . . . + . + ... + 1 . + 2 + + + + . . + + . + + + + + . + + . . .	44	63
Agrostis capillaris		. . . + + + ... + . + ... + ... + ... + ... + . . . + . . + . + . . 1 . . 1 . . . . + . . + . . + +	24	21
V. Others				
Quercus petraea [Q . x *rosacea* ^]	a1,a	. . . . + . 2 . + 1 1 . . 2 . . . + . 1 . . 3 . . . 1 . o . 3^ . . 3 . 4 1 2 . 4 . 1 3 . . 3 . . . . + ... 2 . 1 . . . . 2 . 2 . 1 . . .	33	26
Quercus petraea	a2	. 1 + 1 . 2 . . . . . . 1 1 . 2 + ... + . 1 . . 2 1 3 1 4 3 . 2 . 2 . . . . 1 . . 1 3 3 . . . . . 2 2 . . . 2 . .	29	37
Quercus petraea	b;bc'	. 3 1 1 . + . . 1 2 . . 2 . . . + . . 2 . . 1' . . 3 . . +' + ... 1 + . . 2 + . 2 . + 1 . . 3 . . . . 2 + . . 1 . 1 . . . . 2 . + . . + . .	33	37
Quercus petraea [Q . x *rosacea* ^]	c	. 1 + . + + . + 1 1 2 + . + . 1 + . . + ... 1 1 . . . . . . +^ . 2 1 . 1 . 1 . 2 . + 1 . . 1 . . . . 1 + ... + + . . + + ... 1 + + . + + . .	41	47
Quercus robur	a1,a	. . . . . . 1 . . . . . . 1 2 . + ... 1 . . . . 3 . . . . . . 3 . 1 1 . 3 . . 3 1 2 3 . . . . 1 1 . . . . 1	22	16
Quercus robur	a2	. 1 1 . + 1 . . . . 3 . . 1 . 2 1 . 1 . . . . 2 . . . + . 2 2 . + . . . + 1 1 . . 2 . . . . . + 1 1 + 2 2 . . . . . . 1 1 . 2 . . . 1 . .	32	42
Quercus robur	b	. 3 3 2 2 1 2 . . . . + . . + . 1 . . . 2 . . 1 . + . 2 . . . 1 . . 1 . . . + . 2 1 . + . . 3 . 1 . . . . . . 1 1 . . 1 1 3 + + ... 2 2 . . . + . + . .	38	42
Quercus robur	c	+ 1 + + + + 1 . . . . . + + . . . 1 + + + + 1 + . . + . 1 . . + . . 1 . . . + . + . + + . + + . + + 1 + + . + . . 1 + ... + + + . + + + + + + + + + . + . . + +	54	74
Fagus sylvatica	a1,a	. . . . + ... 2 . 3 . . . . 2 1 2 . . . . 2 1 . 2 2	2	47
Fagus sylvatica	a2	. . . . + ... 1 3 3 2 2 2 2 1 2 2 + 1 1 . . 1 3 3	2	84
Fagus sylvatica	b;bc^	. . . . . +^ . . . . . . + ... + ... 2 . . . . + ... 2 . . . . + 1 + + 2 + 2 2 1 1 1 + . + 2 . . 1 1	10	84
Fagus sylvatica	c	. . . . + ... r . . + ... + ... + ... + + . . . + + . + + + + + + + + . . + . + +	11	63
Betula pendula	a1,a	. . . . 1 + . 1 . . . . . + . . . 1 . . . . 1 . . . 2 . 1 . . + 1 . 2 . . . . 1 + ... + + ... + ... 1	21	21
Betula pendula	a2	. + 1 . + + ... 1 1 . . . . . 1 . . . . 1 . . . . 1 . . . . 1 . . . . 1 . .	16	5
Betula pendula	b;bc^	. + + + 1 . . . + . . . + ... 2^ . + . . . 1^ . . + ... + ... + ... + + + ... + 1 . .	21	21
Betula pendula	c	. + + . + + ... + . + . . + + . . + ... + ... + ... + ... + ... + + . + ... + ...	21	26
Frangula alnus	b	. + ... 1 + . + . 1 2 1 . + + + ... 2 . . . . 1 . . . + . . 2 . + . . . 2 + . . . 2 2 . . 1 1 1 . . . . . . + ... 1 + . . 1 . .	35	21
Frangula alnus	c	+ + ... + ... + + + . + . + ... + + + ... + ... + ... + . . + . . + 1 + . . + + 2 . . + . . . + ... + ... + + ...	35	21
Sorbus aucuparia	a2	. + ... + ... + ...	5	
Sorbus aucuparia	b	. + + r + + ... + ... 4 . . . . + ... + 1 . . . + ... 2 + . . 1 . . . . + ... + ...	22	11
Sorbus aucuparia	c	+ + . . r + r . + + + . + . + + + + + . + + + . + ... + + . . . + + + . + . . . + ... + . . + . + . . + + 1 1 + + + . + . . . + . . + . . + + + + + . . . + + ...	56	47
Luzula pilosa		+ . . . . . . + 2 2 + . 1 . + + 1 . 1 . 1 + 1 + + . + + + 1 + . . + . + 1 . 1 + 1 + . + + + + + + + + . 1 2 . + . . . + 2 . . + 1 1 + . . + . . 1 1 + . . . 1 . .	63	47
Deschampsia flexuosa		. . 2 . . 2 . . . . . . 1 2 . . + . 3 . 2 + ... + 1 . . + + + . . + . . + ... 3 . . . . 1 . . + 2 . . + + + + 1 + + ... + . . . + +	27	63
Dryopteris carthusiana		. . + ... + + . 1 1 + + . + . 1 . + + ... + + . + ... + . . + . + ... + ... + . + 1 . + ... + + + + ... 1 + . + . .	35	37
Calamagrostis epigejos		. . . . + ... + . + . + . + . 1 + ... 1 + ... 1 . 1 + . . . 1 . . . + 1 . . 1 . 1 . . . . . 3 . + + ... + + + ... + + 1 . + + . .	32	42
Maianthemum bifolium		. . . . + . . 1 + . . . + . . 1 . . . . + + ... + ... 1 . . + . . . 1 . + 2 1 + + ... + + . . . + + 1 . . . . 1 . . . + . .	29	26
Viola reichenbachiana		. . . . + . + ... + ... + ... + . + 1 . + . + ... + + + + ... + ... + + ... + + 1 . . + . .	22	32
Oxalis acetosella		. . . . 1 . . . . + + ... 1 . . . . 1 . . . . 1 + . 2 . + + . . . 3 2 . . . + ... + + + . . 1 1 1 . . 1 . .	19	42

Sporadic species: II.: *Betula pubescens subsp. pubescens* b 33(r), c 54,55,61(1); *Cladonia arbuscula* 59; *C. furcata* 5,6,63; *C. rangiferina* 59; *Dryopteris dilatata* 13,19,22(1),30,60(1),76,77; *Galium rotundifolium* 15,36,43(1),47; *Juniperus communis* b 2,4,20,33,38(1),58,63, bc 29(1), c 2,3,31,38,63; *Lycopodium clavatum* 48,72,80; *Orthilia secunda* 3(1),22,23,43; *Plagiothecium curvifolium* 8,22(1),30(1),50,69,75,76(1),77,79(1),80; *Ptilium crista-castrensis* 13(2); *Pyrola rotundifolia* 42; *Rubus saxatilis* 20,58; *Thuidium tamariscinum* 54(2),61,62(1); **III.:** *Dicranella heteromalla* 13,30,34,39,41,55,75; *Hieracium lachenalii* 3,12,31,36,42,51,64,66,67,72; *H. laevigatum* 3(r),37,60; *H. sabaudum* 18,26; *Holcus mollis* 12,19(1),21,31(1), 32,53,60,70,71,76(1),81,82; *Lophocolea heterophylla* 30(2),54(1),55(2),80; *Mnium hornum* 55(1),62; *Plagiothecium denticulatum* 20; *P. laetum* 16,34,51; **IV.:** *Carex ericetorum* 2,4,5,8,20,59,63(1); *C. ovalis* 48,60; *C. pallescens* 19,22,38,64; *Cladonia chlorophaea* 7; *Danthonia decumbens* 3,4,20,29,60; *Hieracium pilosella* 2,3,4,5,6,31(2),63; *Hypnum jutlandicum* 2,4,5(2),6(1),63(1); *Ptilidium ciliare* 4,13,39,63(1); *Scabiosa canescens* 4; *Scorzonera humilis* 18; *Solidago virgaurea* s.s. 12,18,32,34,36,52,54; *Veronica officinalis* 21,23(1),29,41,44; *Viola canina* 4,27; **V.:** *Abies alba* a1 55(2), a2 55(1),62(1), c55(1); *Acer platanoides* b 4, c 3,4,20,22,56; *A. pseudoplatanus* a2 3(1),6(1),22(2), b 3(1),4,5,15(1),22,47,80(2), bc 23, c 3,15,22,42,44,79,80; *Agrostis gigantea* 31; *A. vinealis* 4,6; *Ajuga reptans* 61; *Amelanchier ovalis* bc 6; *Anemone nemorosa* 14(1),19,51(r),52(1),57; *Anthericum ramosum* 4; *Anthoxanthum odoratum* 12(1),18(1),21,24,28,29,31,36,38,43, 44,51,53; *Arrhenatherum elatius* 4,21(1),63; *Artemisia campestris* 63; *Athyrium filix-femina* 14; *Atrichum tenellum* 55; *A. undulatum* 21,30,37,39,40,61,68,75,80; *Brachypodium sylvaticum* 75,77(2); *Brachytheciastrum velutinum* 30,40; *Brachythecium rutabulum* 64,65(1); *Campanula rotundifolia* 4,12,18,34,72; *Carex digitata* 52,55,61,62,78,80; *C. divulsa* 54,55(1); *C. hirta* 32; *C. nigra* 16,19,48; *C. vulpina* 76; *Carpinus betulus* a2 53,80(1), b 26(3),32(r),46,53, c 26,32(r),48,49,50,76; *Cerasus avium* b 3, c 5(r); *Chamaenerion angustifolium* 15,21,43,55; *Chondrilla juncea* 63; *Cladonia digitata* 49; *Convallaria majalis* 1,7,9(1), 11,17,24,25,26,28,34(2),46(1),49,56(2),57; *Corylus avellana* b 4(r), c 3; *Corynephorus canescens* 27,28(1),56; *Crataegus laevigata* b 53,56(r), c 53; *C. monogyna* b 77; *Deschampsia caespitosa* 35; *Dianthus carthusianorum* 29; *Dryopteris filix-mas* 14,22,43; *Euonymus europaea* c 50; *Euphorbia cyparissias* 63; *Festuca gigantea* 77(1); *Festuca pallens* 4,5, 63(3);*F. rubra* s.s. 6,16,31(2),76; *F. trachyphylla* 63(2); *Fragaria vesca* 29,30,52,62; *Galeopsis pubescens* 3(r),4,5,26,30,80; *G. tetrahit* 14,18,60; *Galium boreale* 58; *G. verum* 63; *Geranium robertianum* 22; *Hieracium murorum* 2,3,18,43,51,60,81,82; *Hypericum perforatum* 21,31,32,43,53,76,77; *Hypnum cupressiforme* 6,12,15,21,34,37,43,44,50,59(1),61,64,65(1),73, 79(1),82; *Impatiens parviflora* 15,19,22,30,47,56,76,77(2); *Koeleria glauca* 63; *Lapsana communis* s.s. 61; *Larix decidua subsp. decidua* a1 14(2), a2 14(1), bc 43, c 21; *Lathyrus niger* 77; *Lophocolea bidentata* 54; *Luzula luzuloides* 78; *L. multiflora* 17,21(1),23,44,66,67,72,78; *Lysimachia vulgaris* 10,54(1),61; *Malus sylvestris* c 20,34; *Medicago lupulina* 63; *Melica nutans* [Q-F] 19,38,61(1),76; *Milium effusum* 56,80(1); *Moehringia trinervia* 18,19,37,43(1),51(1),56,60,61,76, 77(1),80; *Musci* indet. 4; *Mycelis muralis* 22,48,51,53,61; *Orthodicranum montanum* 22; *Padus serotina* a2 20(1), b 12(2),20,44, c 20,43,66,67,69; *Plagiomnium affine* 4,22,40,44,51,52,54(2),61(1),62(2),63,77(1),80(1); *P. cuspidatum* 37,44; *P. elatum* 54,55(2); *P. rostratum* 15,36,37; *Poa nemoralis* 48(1),49; *Pohlia lescuriana* 55; *Polygonatum multiflorum* 45; *P. odoratum* 38,51,77; *Polytrichum juniperinum* 5,13; *Populus tremula* a1,a 29(1),44(2), a2 38(1),44(1),52(1), b 33(r),38(2), 52(1), c 19,21,29(1),38(1),42,44,47; *Potentilla reptans* 54; *Pyrus pyraster* b 4(r); *Quercus rubra* a1 80, a2 2,3(1),4(1),20(2), b 65, bc 2,3(1),4,5,36, c 44; *Ranunculus auricomus* 55; *Rhizomnium punctatum* 54; *Ribes uva-crispa* 56; *Robinia pseudacacia* 44; *Rosa* sp. 77; *Rubus caesius* 10,11; *R.* cfr. *hirtus* 15,22(1),30,76,77(1),80(2); *R. grabowskii* 5,6; *R. gracilis* 4,52; *R. idaeus* 5(r)12(r),15, 19,22,30, 31(1),43,47,51(1),53,56,76,77(1),79,80; *R. nessensis* 54; *R. plicatus* 51,52,57(2); *R. schleicheri* 5,6; *Rubus* sp. 12,19,22, 42,45,47(3),48,53(2),60(3),69,77(1),80; *R. sprengelii* 6,52(1); *Rumex acetosella* 3,4,5(1),6,16,21, 22,31(1),51,60,73,74,76; *Sambucus nigra* 51; *S. racemosa* 20; *Sarothamnus scoparius* 36; *Sciuro-hypnum oedipodium* 12,63(2),77,80(1); *Scrophularia nodosa* 40; *Sedum maximum* 51; *Senecio sylvaticus* 58,60,63; *S. vernalis* 55; *S. vulgaris* 61; *Stellaria graminea* 55; *S. media* 22,43,68,76; *Ulmus laevis* b 3; *Veronica chamaedrys* 34; *Vicia cassubica* 63(1); *Viola riviniana* 38; *Viscum album* subsp. *album* a 74,81.

Table A33. *Querco roboris-Pinetum coryletosum*

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
ID-1		7	19	43	43	22	22	52	16	7	43	43	43	43	43	43	22	22	22	22	22	43	43	46	43	48	48	19	43	43	7	7	19	52	19	48	35	48	43	43	43	48	48	2	37	48	1	1	
ID-2		1	2	7	7	5	5	16	21	1	7	7	7	7	7	7	5	5	5	5	5	7	7	3	7	3	3	2	7	7	1	1	2	16	2	3	20	3	7	7	7	3	3	7	14	5	3	3	
ID-3		11	10	9	2	3	5	16	5	14	3	4	5	8	18	6	9	8	1	6	2	11	16	16	7	6	8	4	12	14	13	10	5	24	2	13	12	4	15	1	17	10	12	2	6	1	13	12	
Date (year)		1976	1983	1960	1959	1961	1961	1973	1971	1994	1959	1961	1960	1959	1958	1959	1961	1961	1961	1961	1961	1959	1960	1955	1960	1976	1976	1977	1959	1959	1977	1983	1985	1973	1983	1976	1976	1976	1958	1960	1957	1976	1976	1988	1986	1976	1990	1990	1-47
Density of tree layer	a1,a [%]	50	50	70	70	80	70	50	90	60	85	75	70	80	80	70	60	80	70	80	80	70	80	75	80	70	70	50	60	70	70	40	40	70	30	50	60	70	70	80	70	60	80	60	85	60	40	20	
Density of tree layer	a2 [%]	-	40	-	-	-	-	-	-	20	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	-	-	-	60	20	-	70	50	+	-	-	-	-	50	-	-	-	-	-	75	%
Density of shrub layer	b [%]	30	30	50	50	30	60	-	10	50	30	50	60	50	25	50	10	10	40	20	40	50	60	10	5	-	-	20	25	+	10	25	50	20	20	-	+	-	5	40	30	-	-	5	5	-	10	15	
Cover of herb layer	c [%]	90	90	80	80	70	80	90	80	40	70	70	70	70	90	70	70	90	70	60	60	80	50	20	80	70	80	80	70	80	80	80	70	90	90	75	100	70	70	70	80	75	60	50	70	100	60	10	
Cover of moss layer	d [%]	75	50	40	40	90	80	80	70	90	40	60	50	50	40	50	70	80	90	90	90	40	70	30	60	10	5	5	30	20	10	25	20	15	5	5	-	10	+	50	40	10	+	+	+	30	60	30	
Area of relevé		120	400	200	400	600	550	300	200	150	400	400	200	250	250	400	350	600	600	400	700	200	400	1000	300	200	200	400	200	300	150	200	600	300	400	200	100	200	300	200	200	250	250	200	900	150	200	150	
Location (ATPOL)		CD77	DD93	BC89	BC89	CD32	CD32	CD02	BC19	CD25	BC99	CC80	BC89	BC89	BC99	BC99	CD32	CD32	CD32	CD32	CD32	BC99	BC89	CC92	BC99	BD39	BD28	DD92	CC80	BC89	CD35	CD38	DD92	CD02	DD92	BD28	CE11	BD39	CC80	CC80	BC89	BD28	BD28	BD81	BE03	BD28	BD18	BD18	
Total number of species		32	29	36	49	20	29	19	51	35	32	38	37	41	32	30	22	25	36	29	28	36	43	29	36	24	14	27	34	42	29	36	23	15	24	20	24	18	30	35	31	20	27	23	27	23	24	33	
Number of mosses, liverworts and lichens species		5	2	4	5	4	9	7	6	6	2	3	5	3	2	3	6	4	6	7	5	2	4	5	4	5	3	3	3	4	3	4	6	4	1	2	-	2	1	4	3	2	2	2	3	2	7	4	
I. D. *Querco roboris-Pinetum*																																																	
Pinus sylvestris (V-P)	a1,a	3	3	4	4	4	4	3	5	3	5	4	4	5	5	4	3	3	3	4	4	4	5	5	5	3	3	2	3	3	4	3	3	4	3	3	2	3	3	5	5	3	4	4	2	4	3	2	100
Pinus sylvestris (V-P)	a2	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Pinus sylvestris (V-P)	b;bc^	+	.	.	.	2^	1^	.	.	.	.	.	+	.	.	.	1^	1^	2^	2^	1^	.	.	.	.	.	.	.	1	.	1	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	28
Pinus sylvestris (V-P)	c	+	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	+	.	+	.	+	.	+	+	26
Pleurozium schreberi (V-P)		4	3	3	3	5	4	4	3	4	3	3	3	3	3	3	3	4	3	4	4	3	3	+	2	+	+	+	2	2	2	2	2	2	1	.	.	.	.	2	1	.	.	.	.	1	3	3	83
Vaccinium vitis-idaea (V-P)		1	2	2	1	2	.	.	+	+	.	1	.	.	.	.	3	2	1	2	2	.	.	.	.	1	1	1	1	1	1	+	2	+	+	1	+	+	1	.	.	2	2	+	+	1	.	.	68
Pseudoscleropodium purum (V-P)		1	1	2	1	2	+	+	.	2	2	2	2	2	1	2	.	2	2	3	3	3	3	3	3	+	+	.	2	1	.	.	.	.	.	.	.	.	.	2	2	.	.	.	.	2	2	+	66
Dicranum polysetum (V-P)		1	.	.	1	2	2	.	2	1	.	.	1	.	.	1	4	3	3	3	2	.	.	+	.	.	.	.	.	.	.	+	1	+	.	.	.	.	.	2	.	.	.	+	.	.	+	+	45
Hylocomium splendens (V-P)		.	.	.	+	.	1	.	3	1	.	+	1	1	.	.	1	2	1	1	1	.	1	.	+	.	.	+	1	.	.	.	+	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	40
Calluna vulgaris (C-U)		1	+	.	.	1	1	+	+	1	.	.	.	+	.	.	2	.	1	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	30
Leucobryum glaucum (V-P)		.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	1	.	.	.	.	+	.	11
II. D. *Querco roboris-Pinetum coryletosum*																																																	
Convallaria majalis		+	1	.	1	2	1	+	+	1	+	.	.	.	+	+	2	2	1	2	2	1	.	.	.	1	1	1	.	1	1	.	+	+	+	2	.	3	1	.	.	1	1	+	.	1	.	+	70
Fragaria vesca (T-G)		+	.	2	1	.	1	.	1	.	+	1	1	2	1	+	.	1	1	.	+	1	1	r	1	.	.	.	2	2	+	+	.	.	.	1	+	.	.	1	1	+	1	1	.	.	.	.	62
Rubus saxatilis (V-P)		+	.	.	1	1	1	+	.	.	+	.	.	.	+	+	.	2	1	1	1	1	.	.	.	+	2	.	1	2	.	.	.	+	.	+	.	+	1	.	.	1	1	.	.	1	+	+	55
Moehringia trinervia		.	.	+	1	.	.	.	+	+	+	.	1	+	.	+	.	.	+	.	.	1	1	+	1	.	.	.	1	+	+	2	+	.	.	.	+	.	1	.	.	1	1	1	1	.	.	.	51
Veronica officinalis (C-U)		.	+	.	+	.	1	.	+	+	+	1	1	+	+	.	+	.	2	1	1	+	+	.	.	.	.	.	1	+	.	.	.	.	+	.	.	.	.	1	1	.	.	.	.	.	+	.	47
Melica nutans (Q-F)		.	.	+	2	1	.	.	.	.	1	1	.	.	.	+	.	.	+	.	.	+	.	.	1	.	.	.	1	1	.	.	.	.	+	1	.	.	1	+	+	1	1	.	.	.	.	.	38
Viola canina (C-U)		.	.	1	1	.	.	.	+	.	1	1	1	1	+	+	.	.	.	.	.	1	+	.	+	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	r	.	34
Solidago virgaurea s. s.(C-U)		+	+	.	+	2	1	.	+	.	.	.	.	1	.	.	.	+	+	1	1	.	.	.	+	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	34
Veronica chamaedrys		.	.	+	+	.	.	.	+	.	+	1	+	+	+	.	.	+	.	.	.	+	.	.	+	.	.	.	1	1	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	30
Galium boreale		+	.	.	1	.	+	.	+	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	2	+	+	.	.	.	.	.	.	+	.	.	+	+	.	.	+	.	.	30
Hieracium pilosella (C-U)		.	.	1	+	.	1	.	.	.	.	1	1	1	.	.	.	.	.	+	.	.	1	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	+	1	1	.	.	.	.	.	.	.	28
Euphorbia cyparissias (F-B)		.	.	1	+	.	.	.	+	.	+	+	+	+	.	.	.	.	.	.	.	+	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	r	+	.	.	.	.	.	.	.	28
Galium mollugo		.	.	+	1	.	.	.	.	.	+	.	+	1	+	+	.	.	.	.	.	.	.	+	+	.	.	.	+	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	28
Hypericum perforatum (T-G)		.	.	+	+	.	.	.	.	.	.	.	+	+	+	.	.	+	.	.	+	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	.	26
Carex hirta		.	.	.	1	.	.	.	.	.	2	+	.	.	2	+	.	.	.	.	.	1	1	+	2	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	1	.	.	26
Peucedanum oreoselinum (T-G)		.	+	.	.	2	2	.	.	.	.	.	.	.	.	.	1	3	2	2	2	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	r	.	.	.	.	.	.	.	.	.	26
Polygonatum odoratum (T-G)		.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	+	.	+	.	.	+	.	+	+	.	.	+	.	+	.	.	.	+	1	.	.	.	.	.	23
III. Ch. *Vaccinio-Piceetea* (V-P)																																																	
Vaccinium myrtillus		2	4	3	3	4	3	+	+	2	2	2	2	2	2	2	3	4	4	3	3	2	+	+	2	4	4	4	3	3	4	3	3	4	4	4	5	3	3	2	2	1	2	1	3	1	+	+	100
Orthilia secunda		.	.	.	+	.	.	.	.	+	+	1	+	1	.	.	.	.	+	+	+	.	.	.	+	.	.	.	.	.	.	.	+	.	.	+	.	.	.	2	.	.	+	.	.	.	.	.	30
Dicranum scoparium		.	.	+	.	+	1	.	+	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.	+	+	+	+	.	+	.	28
Trientalis europaea		+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	+	.	.	.	1	.	+	.	.	.	.	.	.	.	.	.	.	.	15
IV. Ch., D.* *Quercetea robori-petraeae*																																																	
Festuca ovina		1	2	2	1	2	2	.	2	.	.	2	3	2	.	.	2	3	2	2	2	1	2	+	+	1	.	1	1	1	1	+	1	.	.	1	+	1	+	2	1	1	+	.	1	.	+	1	79
Calamagrostis arundinacea		1	.	+	1	3	4	5	3	.	1	.	.	1	.	+	2	5	3	2	3	2	1	.	+	2	1	1	.	2	1	1	.	.	.	.	.	2	2	+	1	3	3	1	.	2	.	.	68
* *Pteridium aquilinum*		4	4	.	1	.	.	.	.	.	2	.	.	1	+	2	.	.	.	.	.	.	+	1	.	+	2	1	.	+	3	3	3	3	2	2	1	1	1	.	.	+	2	.	.	2	.	.	53
* *Melampyrum pratense*		+	1	1	1	2	.	.	.	.	.	+	1	2	.	.	1	1	1	2	1	.	1	.	.	+	.	1	1	1	.	+	2	.	+	.	.	1	1	1	1	.	.	.	.	.	.	.	53
* *Polytrichastrum formosum*		.	.	+	.	.	.	1	+	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	21
V. Ch. *Calluno-Ulicetea* (C-U)																																																	
Agrostis capillaris		.	.	.	+	.	.	.	.	+	+	.	+	.	1	1	.	.	.	.	.	1	+	.	1	.	.	.	1	+	.	+	.	.	.	1	+	.	1	.	.	.	.	+	+	.	.	.	36
Pohlia nutans		.	.	.	.	.	2	2	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	+	.	+	.	.	.	19
VI. Others																																																	
Quercus robur	a1,a	.	2	.	.	3	2	.	.	.	.	.	.	.	.	.	3	3	3	2	3	.	.	.	.	.	.	3	.	.	1	.	2	2	.	.	3	.	.	.	.	.	.	.	.	.	.	.	28
Quercus robur	a2	.	2	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	3	.	4	.	+	.	.	.	.	.	.	.	.	.	.	2	17
Quercus robur	b	2	2	3	.	3	4	.	.	2	.	.	3	.	.	.	2	2	2	2	2	2	2	.	.	.	.	1	.	.	1	2	+	2	1	.	.	.	+	.	1	.	.	.	.	.	2	+	51
Quercus robur	c	+	4	+	.	1	1	.	.	+	.	.	1	.	.	.	2	1	1	1	+	.	1	r	.	.	.	1	.	.	+	+	.	1	1	.	+	.	.	.	.	.	.	.	.	.	+	+	47
Quercus petraea	a1,a	.	2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	4	.	.	.	9
Quercus petraea	a2	.	3	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	3	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	1	15
Quercus petraea	b	.	2	1	3	.	.	.	1	.	1	3	2	3	1	+	.	.	.	.	.	2	.	.	1	.	.	.	2	1	.	.	.	.	.	.	.	.	1	3	3	.	.	+	1	.	+	.	43
Quercus petraea	c	.	+	.	1	.	.	+	1	.	1	1	.	1	.	1	.	.	.	.	.	+	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	1	1	+	.	.	+	2	.	.	.	34
Betula pendula	a1,a	.	.	.	.	.	.	.	+	3	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Betula pendula	a2	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	3	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	2	11
Betula pendula	b [bc]	1	.	+	.	.	[+]	.	.	2	+	.	+	+	.	.	[+]	.	.	.	[+]	.	1	.	.	.	.	+	1	.	+	.	.	.	.	.	.	.	.	1	+	.	.	.	.	.	+	+	36
Betula pendula	c	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	9
Sorbus aucuparia	a2,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	2	6
Sorbus aucuparia	b [bc]	+	.	.	+	[+]	[+]	.	+	+	2	1	1	.	1	3	[+]	[+]	[1]	[1]	[+]	1	1	.	+	.	.	.	1	.	.	1	.	.	1	.	.	.	.	1	+	.	.	+	.	.	1	1	57
Sorbus aucuparia	c	+	+	+	+	.	.	+	+	1	+	1	+	+	+	1	.	.	.	.	.	+	+	.	.	.	+	.	+	+	.	+	.	.	+	.	+	+	+	.	+	+	.	.	.	.	+	+	57
Frangula alnus	b[bc]	.	2	.	.	.	.	.	+	1	.	.	.	.	.	.	[+]	.	[+]	[+]	[+]	.	1	.	.	.	.	1	.	.	+	+	1	.	1	.	.	.	.	.	+	.	.	.	.	.	.	+	32
Frangula alnus	c	+	+	.	.	.	.	.	.	+	.	r	r	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	23
Carpinus betulus	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Carpinus betulus	b/c	.	.	1/+	.	1/	+/	.	.	.	.	.	2/+	.	.	.	.	1/+	3/1	1/	+/	.	.	+/+	.	.	.	+/1	.	.	/+	.	.	.	1/+	.	+/+	.	/+	.	+/	.	.	.	.	.	.	.	32
Luzula pilosa		2	1	+	1	1	2	.	+	.	.	1	+	1	+	1	.	1	1	1	1	.	+	+	+	+	+	1	1	1	+	+	1	+	1	2	.	+	1	1	.	.	.	.	+	.	.	.	72
Rubus idaeus		.	.	1	2	.	.	.	+	+	+	2	+	1	1	4	2	.	+	.	.	.	2	1	+	1	.	.	+	+	.	1	.	.	.	.	+	.	+	+	1	.	.	1	.	.	+	+	55
Anthoxanthum odoratum		+	.	1	2	.	.	.	.	+	+	2	1	2	2	+	2	.	.	.	.	.	1	1	+	1	.	.	1	1	+	.	.	.	.	.	.	.	+	1	3	.	.	1	+	1	.	+	53
Dryopteris carthusiana		.	.	+	+	.	.	+	+	+	+	.	+	+	+	+	.	.	.	.	.	.	1	1	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	1	.	+	40
Rumex acetosella		.	.	1	+	.	.	.	+	.	.	+	1	1	+	+	.	.	.	.	.	.	1	1	+	1	.	.	1	.	.	.	+	.	.	.	.	.	.	2	1	.	.	.	.	.	r	+	38
Campanula rotundifolia		+	.	+	+	.	.	.	+	.	.	+	+	+	.	.	.	+	.	.	.	.	.	+	+	+	+	.	+	1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	34
Viola reichenbachiana		.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	1	.	1	.	.	.	.	1	.	.	1	1	.	1	.	.	.	.	+	.	+	+	.	.	.	.	1	.	.	.	28
Oxalis acetosella		.	.	.	.	.	.	+	1	+	1	.	.	.	1	.	.	.	+	.	.	2	.	.	.	.	.	1	.	.	+	1	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	23
Hieracium murorum		.	.	+	.	.	.	.	.	.	+	1	+	.	+	+	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	+	21
Mycelis muralis		.	.	.	.	.	.	.	+	.	1	.	.	+	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	+	+	1	.	.	1	.	.	.	.	21
Calamagrostis epigejos		.	.	.	.	.	.	.	.	1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	3	4	4	+	17
Padus serotina	a2/bc	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	/+	/+	.	.	.	.	.	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	/+	3/1	2

Explanations: F-B - *Festuco-Brometea* ; T-G - *Trifolio-Geranietea*

Sporadic species: III.: *Betula pubescens* subsp. *pubescens* c 11,28,39; *Chimaphila umbellata* 11,39; *Cladonia furcata* 9,19; *Galium rotundifolium* 28,36,44; *Juniperus communis* b 2,8,27(1),46, bc 9, c 2,27(1),46(r); *Picea abies* a1,a 43; a2 2(1),8(1),32(2), b 2(1),8(1),10,15,21,27(1),32(2),39, c 2,23,27(1),32,36,39,42; *Plagiothecium curvifolium* 7,31; *Ptilium crista-castrensis* 7(1),22,24; *Pyrola minor* 41; *P. rotundifolia* 10; *Viscum album* subsp. *austriacum* a 47; **IV.:** *Carex pilulifera* 1,2,8,25,32,34(1),36,44(1); *Hieracium lachenalii* 2,34; *H. laevigatum* 23; *Holcus mollis* 8,13,16,34,40,44; *Lathyrus montanus* 8(1); *Lophocolea heterophylla* 23; **V.:** *Carex ericetorum* 9; *C. ovalis* 23,31; *C. pallescens* 2,34; *Cladonia chlorophaea* 16,19; *C. pyxidata* 6; *Danthonia decumbens* 9,13,22,47; *Genista tinctoria* 4; *Hypnum jutlandicum* 46; *Scorzonera humilis* 2,4,6,16,18,25,27; **VI.:** *Abies alba* a2 2(2), b 2(1), c 2,34; *Acer platanoides* a2 47(1), b 47, c 14,41,42,47(r); *A. pseudoplatanus* b 47, c 36(1),45; *Achillea millefolium* 3,4,11,22,39,43; *Agrostis gigantea* 45(2); *Ajuga reptans* 8,21; *Anemone nemorosa* 27,30(2),31(2),32(1),34; *Arrhenatherum elatius* 10(1),13,14(2),22,24(2); *Athyrium filix-femina* 44; *Brachypodium sylvaticum* 29; *Campanula patula* s.s. 38; *C. rapunculoides* 8; *Carex digitata* 8(3),29,31; *Carex* sp. 18; *Cerastium arvense* 11; *C. semidecandrum* 8,28; *Cerastium* sp. 18; *Cerasus avium* 47; *Ceratodon purpureus* 12,18,38; *Chamaenerion angustifolium* 22,30,46; *Cladonia macilenta* 6; *Clinopodium vulgare* 14; *Corylus avellana* b 47; *Crataegus laevigata* b 31; *C. monogyna* b 21, c 22; *Cruciata glabra* 8; *Dactylis glomerata* 3,45(1); *Deschampsia caespitosa* 31(1),33; *Dianthus carthusianorum* 3; *Dryopteris filix-mas* 13,14,15,21,40; *Euonymus europaea* b 9; *Eurhynchium angustirete* 20; *Fagus sylvatica* b 12, c 35,41,42; *Fallopia convolvulus* 22; *Festuca heterophylla* 4(2),28,29(1),38(1),39; *F. rubra* s. s. 25,31; *Fraxinus excelsior* c 28; *Galeopsis pubescens* 1,22,41,44; *G. tetrahit* 9(r),13,19,21,23,45(1); *Galium album* 31; *G. sylvaticum* 14,21; *G. verum* 12,22; *Geranium sanguineum* 18; *Hieracium* sp. 42; *Hypericum montanum* 4,8,38; *Hypnum cupressiforme* 1(1),33,37; *Impatiens parviflora* 44; *Knautia arvensis* 4,8,13; *Lilium martagon* 35(r),42; *Linaria vulgaris* 8,11,21,29; *Lophocolea bidentata* 23; *Luzula multiflora* 9,20,25; *Lysimachia vulgaris* 31; *Maianthemum bifolium* 1(1),30,34(2),36,42(1),45(1); *Malus sylvestris* b 31, c 25; *Molinia caerulea* 35(1); *Padus avium* b 47; *Pimpinella saxifraga* 4(1),13,14,18,43; *Plagiomnium affine* 4,25,27,31(1); *Poa angustifolia* 25(1),30(1),35(1),37,45; *P. nemoralis* 8,13,40,43(1); *P. pratensis* 11(1),39,40; *Polypodium vulgare* 9(2),22; *Polytrichum juniperinum* 7,8,44; *Populus tremula* a1,a 8, a2 8, b 1,8,9(1),30, c 1(1),9(1),27,30; *Potentilla alba* 4,29; *P. erecta* 4(1),27,29; *Pyrus communis* b 12,24,40, c 17; *P. pyraster* b 47, bc 9; *Quercus rubra* a2 47(2), bc 1,47; *Q. x rosacea* a 25(4),26(3),37(4),42(3), a2 35(3),41(3), c 25,26(1),35(1),37(1),41(1),42,45(1); *Ranunculus repens* 43(1); *Rhamnus cathartica* 42; *Rosulabryum capillare* 29; *Rubus caesius* 18,33,42; *R. grabowskii* 47; *R. gracilis* 30,31; *R. plicatus* 1,9,31,47; *Rubus sp.* 2(1),21,34,36; *R. sprengelii* 9; *Salix caprea* c 30; *Sarothamnus scoparius* c 13,22; *Sciuro-hypnum oedipodium* 1,25,30; *Scrophularia nodosa* 3,24; *Senecio sylvaticus* 8,29,39; *Silene nutans* subsp. *nutans* 11,40; *S. otites* 8; *Stellaria graminea* 14,24,43; *S. media* 43(1); *Thymus serpyllum* 3,4,11,15,19; *Trifolium alpestre* 11; *Urtica dioica* 10,14,21,22(r),24; *Vicia cassubica* 4(1),11,21; *Vicia sepium* 4,11,28; *Vicia* sp. 29; *Viola reichenbachiana* et *riviniana* 42,44; *V. riviniana* 2,23,27,34; *Viola* sp. 19; *Viscum album* subsp. *album* a 44.

Table A34. *Querco roboris-Pinetum* - mixed form of *Qr-P molinietosum* and *Qr-P coryletosum*

Successive number of relevé		1	2	3	4	5	6	7
ID-1		51	22	1	7	1	1	1
ID-2		2	5	3	1	3	3	3
ID-3		7	7	1	3	8	4	10
Date (year)		1981	1961	1990	1982	1990	1990	1990
Density of tree layer	a1,a	70	70	25	60	30	30	25
Density of tree layer	a2	-	-	70	50	35	15	30
Density of shrub layer	b	5	30	15	15	10	10	40
Cover of herb layer	c	70	80	40	70	40	50	55
Cover of moss layer	d	40	90	10	10	25	65	30
Area of relevé		200	350	120	200	150	100	150
Location (ATPOL)		CD83	CD32	BD18	CD35	BD18	BD18	BD18
Total number of species		38	23	28	35	40	32	40
Number of mosses, liverworts and lichens species		7	7	6	3	9	7	7
I. D. *Querco roboris-Pinetum*								
Pinus sylvestris (V-P)	a1,a	4	4	2	4	3	3	2
Pinus sylvestris (V-P)	a2	+	.	.	1	.	.	.
Pinus sylvestris (V-P)	b;bc^	.	+^	.	+	.	.	.
Pinus sylvestris (V-P)	c	+	.	.	.	+	+	+
Pleurozium schreberi (V-P)		3	5	+	2	2	2	2
Pseudoscleropodium purum (V-P)		+	2	+	1	+	.	1
Dicranum polysetum (V-P)		1	1	.	.	+	+	+
Vaccinium vitis-idaea (V-P)		.	2	.	1	1	1	2
Calluna vulgaris (C-U)		.	1	.	.	+	.	.
Hylocomium splendens (V-P)		.	1	.	.	.	.	.
II. Ch. *Vaccinio-Piceetea* (V-P)								
Vaccinium myrtillus		3	4	3	4	3	+	2
Dicranum scoparium		.	.	.	.	+	2	+
Trientalis europaea		1	.	.	1	.	.	.
III. D. *Querco roboris-Pinetum molinietosum*								
Quercus robur	a2	+	.	3	1	2	2	2
Quercus robur	b	.	3	+	.	+	1	3
Quercus robur	c	+	2	+	+	+	+	+
Frangula alnus	b	.	.	+	+	+	.	1
Frangula alnus	c	+	.	+	.	+	.	+
Molinia caerulea		+	1	+	1	+	+	2
Lysimachia vulgaris		+	.	.	.	.	.	.
IV. D. *Querco roboris-Pinetum coryletosum*								
Convallaria majalis		.	2	+	.	.	3	2
Rubus saxatilis (V-P)		.	+	+	.	+	.	1
Fragaria vesca		+	.	.	1	.	.	.
Veronica officinalis (C-U)		+	.	.	.	.	.	+
Viola canina (C-U)		+	.	.	.	+	.	.
Hypericum perforatum		+	.	.	.	.	.	.
Polygonatum odoratum		+	.	.	.	.	.	.
Hieracium pilosella (C-U)		.	.	r	.	+	.	.
Moehringia trinervia		.	.	.	+	+	.	.
Solidago virgaurea s. s. (C-U)		.	.	.	+	.	.	.
Peucedanum oreoselinum		.	1	.	.	.	.	.
Galium boreale		.	.	.	.	.	.	+
V. Ch., D.* *Quercetea robori-petraeae*								
* *Melampyrum pratense*		+	2	+	+	2	2	1
Festuca ovina		2	3	.	1	2	2	+
* *Polytrichastrum formosum*		1	1	2	.	+	+	1
Calamagrostis arundinacea		.	3	.	.	+	1	+
* *Pteridium aquilinum*		3	4	.	1	.	.	.
Hieracium lachenalii		+	.	.	.	+	+	.
Carex pilulifera		+	.	.	+	.	.	.
VI. Ch. *Calluno-Ulicetea* (C-U)								
Pohlia nutans		+	+	.	.	+	+	.
Hypnum jutlandicum		.	.	+	.	+	2	.
Danthonia decumbens		.	.	.	.	+	+	+
Agrostis capillaris		+	.	.	.	.	+	.
VII. Others								
Acer platanoides	a2	.	.	2	.	.	.	+
Acer platanoides	b/c	.	.	1/+	.	1/+	/+	1/+
Betula pendula	a1,a	+	.	.	.	.	.	.
Betula pendula	a2	.	.	1	3	.	+	1
Betula pendula	b/c	1/+	.	/+	+/	1/+	+/+	+/
Sorbus aucuparia	a2 [a]	.	.	1	1	1	2	+
Sorbus aucuparia	b [bc]	.	[+]	.	2	+	1	1
Sorbus aucuparia	c	+	.	+	+	+	+	+
Populus tremula	a2	+	.	.	+	.	.	.
Populus tremula	b/c	/+	.	2/+	+/	1/+	.	.
Galeopsis pubescens		.	.	r	.	r	+	r
Plagiomnium affine		.	.	+	.	1	+	1
Sciuro-hypnum oedipodium		.	.	+	+	2	.	1
Chamaenerion angustifolium		.	.	r	+	.	.	+
Luzula pilosa		+	1	.	+	.	.	.
Rubus idaeus		+	.	.	+	.	.	r
Calamagrostis epigejos		+	.	.	+	.	+	.
Anthoxanthum odoratum		+	.	.	+	+	.	.
Rumex acetosella		+	.	.	.	+	+	.

Sporadic species: II.: *Juniperus communis* b 7, c 7; *Picea abies* b 1; *Orthilia secunda* 7; *Lycopodium annotinum* 4(2); **V.:** *Holcus mollis* 1; *Hieracium laevigatum* 5; *Plagiothecium laetum* 1; **VI.:** *Scorzonera humilis* 5,7; *Carex ericetorum* 6; *Cladonia coniocraea* 2; **VII.:** *Quercus petraea* a2 3(1),7, c 5; *Acer pseudoplatanus* a 2 7; *Anemone nemorosa* 4(1); *Dryopteris carthusiana* 1; *Deschampsia flexuosa* 3; *Campanula rotundifolia* 5; *Ajuga reptans* 4; *Arrhenatherum elatius* 5(1); *Cerasus avium* a2 4, b 7, bc 4, c 5,7; *Carpinus betulus* c 2(1); *Corylus avellana* b 3(1), c 6; *Maianthemum bifolium* 1(1); *Crataegus monogyna* b 4,7; *Deschampsia caespitosa* 4; *Fagus sylvatica* a1 6(1), a2 6(1); *Festuca pallens* 5; *Festuca rubra* s.s. 4; *Galeopsis tetrahit* 1; *Hieracium murorum* 6; *Hypochoeris radicata* 6; *Lophocolea bidentata* 1; *Malus sylvestris* c 3(r),7; *Padus avium* a2 3, b 7, c 3; *P. serotina* a2 3,6, b 6,7(1), c 3,6,7; *Quercus rubra* a2 5(2),7(1), bc 5,7; *Ribes spicatum* bc 4; *Robinia pseudacacia* b 7; *Rubus corylifolius* 3,7; *R. gracilis* 4; *Serratula tinctoria* 4; *Tilia cordata* c 6.

Table A35. Substitute forest communities from the *Vaccinio-Piceetea* class

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
ID-1		51	35	55	35	52	52	52	52	51	55	35	35	54	46	52	35	39	39	56	46	46	35	36	52	36	46	46	56	46	46	17	43	46	
ID-2		2	20	17	29	16	16	16	16	2	16	20	29	11	3	12	29	28	28	3	3	3	29	17	16	17	3	3	3	3	3	9	7	3	
ID-3		18	5	7	12	7	13	15	14	1	19	18	7	4	17	2	8	1	6	27	10	11	2	25	23	19	2	12	22	3	1	14	10	19	
Date (year)		1980	1976	1994	1976	1973	1973	1973	1973	1981	1978	1976	1975	1975	1954	1973	1976	1992	1992	2006	1954	1954	1975	1985	1973	1985	1955	1954	2006	1955	1955	1996	1959	1954	1-33
Density of tree layer	a1,a [%]	55	70	80	60	60	60	70	70	30	30	55	40	75	50	60	50	60	40	60	60	80	60	65	80	70	50	50	65	80	70	45	70	60	
Density of tree layer	a2 [%]	30	20	-	-	-	-	-	-	-	-	5	5	-	60	-	+	-	50	-	-	-	+	15	-	5	85	60	-	-	-	-	-	-	
Density of shrub layer	b [%]	-	+	20	5	50	+	-	+	30	+	30	50		10	-	50	-	20	10	15	+	+	+	50	70	10	10	+	15	5	10	50	10	
Cover of herb layer	c [%]	80	95	50	100	80	80	90	80	90	70	60	65	40	70	5	90	65	85	40	20	60	50	90	75	85	20	40	80	80	60	30	80	60	%
Cover of moss layer	d [%]	+	+	-	+	30	50	80	75	40	60	35	20	40	+	70	+	20	15	80	40	40	20	20	75	5	30	30	40	50	10	50	30	30	
Area of relevé		100	200	100	200	300	200	220	180	100	100	200	100	100	1000	120	100	500	400	400	900	600	100	900	150	900	800	1000	300	1500	1000	150	250	1200	
Location (ATPOL)		CD84	CE11	BC64	CE11	CD02	CD02	CD02	CD02	CD84	BC72	CE11	CE00	BC81	CC92	CD73	CE11	BE15	BE15	BC66	CC92	CC92	CE00	CE11	CD02	BE28	CC92	CC92	BC76	CC92	CC92	BC66	BC99	CC92	
Total number of species		14	28	16	18	18	16	20	19	24	13	27	15	13	16	17	18	27	26	38	18	15	17	33	19	31	22	18	43	30	36	31	40	31	
Number of mosses, liverworts and lichens species		1	2	-	4	4	4	6	2	6	2	4	2	6	2	4	1	9	3	4	3	3	3	5	2	4	2	3	5	3	4	3	3	4	
I. Ch. *Vaccinio-Piceetea* (V-P)																																			
Pinus sylvestris	a1,a;a2^	3	4	+	4	3	4	4	4	.	.	3	3	3	4	.	3	4	3;1^	4	4	4	4	2	3	4	3	4	4	4	5	3	4	4	91
Pinus sylvestris	b/c	.	.	.	.	.	.	.	.	2/1	+/	.	/+	/+	.	/+	.	.	.	.	.	.	.	.	/+	.	.	.	/+	/+	.	.	.	/+	27
Picea abies	a2;a1^	3;1^	1	3	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	15
Picea abies	b/c	3/+	+/+	1/+	1/	.	.	.	/+	1/+	.	+/+	2/	.	.	.	/+	1/	2/	.	/+	.	.	1/+	.	.	.	.	.	.	.	.	.	.	39
Pleurozium schreberi		.	+	.	+	2	4	4	4	3	3	3	2	.	.	.	+	+	2	+	.	.	2	2	5	1	+	.	+	2	+	2	2	3	76
Vaccinium myrtillus		1	1	2	+	2	1	1	2	1	.	2	+	.	2	+	+	1	2	+	2	3	3	4	3	5	3	3	1	2	+	.	2	2	91
Pseudoscleropodium purum		+	.	.	.	1	2	3	.	.	.	.	.	.	+	.	.	.	.	4	3	3	.	.	.	.	+	3	3	1	+	2	2	+	48
Dicranum scoparium		.	.	.	.	.	.	.	.	1	.	.	.	3	.	1	.	+	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	24
Vaccinium vitis-idaea		.	.	+	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	15
Dryopteris dilatata		.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	.	.	.	+	.	1	.	.	.	.	.	.	.	.	15
Dicranum polysetum		.	.	.	.	.	.	.	.	.	3	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	r	.	.	.	12
Hylocomium splendens		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	+	.	.	.	.	.	+	12
II. D. *Querco roboris-Pinetum molinietosum*																																			
Frangula alnus	b	.	.	2	.	4	+	.	.	.	.	+	.	.	+	.	1	1	1	+	+	+	+	1	+	1	+	.	.	.	.	.	.		48
Frangula alnus	c	1	+	+	.	.	.	2	+	.	.	.	.	.	.	.	+	+	+	+	.	.	.	+	+	+	+	.	+	+	+	.	+		52
Trientalis europaea (V-P)		2	+	+	+	.	.	1	1	+	.	1	.	.	.	.	.	.	.	.	+	.	.	1	1	.	+	+	.	+	+	.	.		45
Lysimachia vulgaris		1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Molinia caerulea		+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
III. D. *Querco roboris-Pinetum coryletosum*																																			
Moehringia trinervia		.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	+	.	.	+	.	.	+	.	.	r	+	+	+	1	+	36
Hypericum perforatum (T-G)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	.	+	24
Fragaria vesca (T-G)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	r	+	.	1	+	18
Veronica officinalis (C-U)		.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	1	.	15
Carex hirta		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	.	2	.	15
Euphorbia cyparissias (F-B)		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	r	.	9
Galium mollugo		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	9
Rubus saxatilis (V-P)		.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	9
Galium boreale		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	6
Veronica chamaedrys		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	6
IV. Ch., D.* *Quercetea robori-petraeae*																																			
* *Polytrichastrum formosum*		.	+	.	.	.	2	2	1	+	.	1	+	.	+	3	.	+	.	.	+	+	.	1	.	.	.	+	.	+	+	+	.	+	55
* *Pteridium aquilinum*		4	4	3	4	5	+	.	.	.	.	+	.	+	+	.	.	.	+	.	2	.	.	2	2	.	.	.	.	.	3	.	.	.	42
Festuca ovina		.	+	.	.	.	.	+	.	3	4	.	.	3	+	.	1	.	.	.	.	+	.	+	.	1	.	.	.	.	.	.	.	.	30
Calamagrostis arundinacea		.	.	.	.	4	5	5	5	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	21
Carex pilulifera		.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	1	.	+	.	.	.	.	.	.	.	.	15
* *Melampyrum pratense*		.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	1	.	.	.	.	.	12
Holcus mollis		.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	1	.	.	.	.	.	.	+	.	12
V. Ch. *Querco-Fagetea*																																			
Carpinus betulus	a1,a;a2	.	1^	.	.	.	.	.	.	.	.	.	.	.	2^	.	.	.	.	.	.	.	+	1^	.	.	2	1^	.	.	.	.	.	.	18
Carpinus betulus	b/c	.	+/	.	+/	+/	.	.	/+	.	.	1/+	.	.	+/	.	.	.	.	.	+/	.	+/	.	+/	.	+/+	+/	.	+/+	+/+	.	.	/+	42
Fagus sylvatica	a2;a1^	.	.	.	.	.	.	.	.	.	.	1;1^	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Fagus sylvatica	b/c	.	.	.	+/	.	.	.	.	.	.	2/+	2/	.	.	.	.	.	.	1/+	.	.	.	+/	.	.	.	.	+/+	.	.	1/	.	.	21
Viola reichenbachiana		.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	.	.	r	+	.	+	+	27
VI. Ch. *Calluno-Ulicetea* (C-U)																																			
Agrostis capillaris	c	.	.	.	+	.	.	.	.	.	+	.	2	.	.	.	.	+	.	+	.	+	.	.	.	+	.	.	+	+	+	2	+	1	39
Pohlia nutans	d	.	.	.	+	.	.	+	.	+	.	.	.	1	.	2	.	+	+	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	27
VII. Others																																			
Quercus petraea	a1,a	.	.	.	.	+	.	.	.	.	.	.	.	2	.	4	.	.	.	.	.	.	.	2	.	.	.	o	.	.	.	.	.	.	15
Quercus petraea	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	1	.	1	.	.	.	.	.	.	12
Quercus petraea	bc^;b/c	.	.	.	.	+/	+/+	/+	/+	.	r/1	.	.	1^	/+	/+	.	.	.	.	+/	.	.	/1	.	3/	.	.	+/+	.	.	.	1/+	.	39
Quercus robur	a1,a	.	1	3	.	.	.	.	.	3	+	.	.	.	.	.	.	2	.	.	.	.	.	2	3	1	.	.	.	.	.	.	.	.	24
Quercus robur	a2	.	2	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	3	.	.	.	+	1	.	1	2	1	.	.	.	.	.	.	24
Quercus robur	b/c	.	+/+	/r	.	.	.	.	.	.	.	1/+	.	.	+/	.	+/+	/+	+/	+/+	+/+	+/+	.	/1	2/+	3/+	+/+	/+	/1	/+	/+	.	.	r/+	58
Betula pendula	a1,a/a2	.	.	1/	+/+	.	.	.	.	.	3/	1/	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	+/	+/	.	1/	.	r/	27
Betula pendula	b/c	.	.	.	.	.	/+	/+	/1	/+	.	1/+	.	1/	.	/+	.	/+	.	.	/+	.	.	.	+/	.	.	+/+	+/+	.	.	.	.	+/+	39
Sorbus aucuparia	b	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	+	.	+	1	+	.	.	.	2	+	.	.	.	+	+	.	3	+	39
Sorbus aucuparia	c	.	.	+	+	+	.	1	1	+	.	.	.	.	+	+	+	+	+	+	+	+	.	.	1	.	+	+	+	+	+	.	1	+	67
Dryopteris carthusiana		.	+	+	+	+	2	+	+	.	.	1	.	.	+	+	+	2	+	1	+	+	.	+	.	1	+	+	1	+	.	+	1	+	76
Rubus idaeus		.	1	.	.	1	2	2	+	.	.	+	.	.	+	.	.	+	.	1	.	+	+	+	.	+	+	+	1	+	+	1	3	1	64
Luzula pilosa		.	+	+	.	2	1	1	+	3	.	+	+	.	.	+	+	+	+	.	.	.	1	+	1	+	.	.	1	.	.	+	+	.	61
Oxalis acetosella		2	1	.	1	2	+	.	.	.	.	.	1	.	.	.	.	.	.	.	+	+	.	1	.	.	1	+	.	+	+	.	+	+	45
Maianthemum bifolium		1	+	+	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.	.	+	+	.	1	+	.	+	+	.	.	+	.	.	.	39
Calamagrostis epigejos		.	1	.	+	.	.	.	.	.	.	4	3	.	.	.	+	+	.	1	.	.	.	+	.	+	.	.	3	3	.	2	.	2	39
Deschampsia flexuosa		.	.	.	.	.	.	.	.	.	.	.	1	+	.	+	.	3	4	3	.	.	+	.	.	+	.	.	2	.	.	+	.	.	30
Rumex acetosella		.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	+	+	+	.	+	+	30
Anthoxanthum odoratum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	+	.	.	+	1	+	21
Rubus sp.		.	2	.	3	.	.	.	.	.	.	1	.	.	.	.	5	.	+	.	.	.	.	1	.	+	.	.	.	.	.	.	.	.	21
Plagiomnium affine		.	.	.	.	3	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	18

Explanations: F-B - *Festuco-Brometea* ; T-G - *Trifolio-Geranietea*

Sporadic species: I.: *Cladonia furcata* 13; *Galium rotundifolium* 2; *Leucobryum glaucum* 15(3),17,18; *Lycopodium clavatum* 9(1); *Orthilia secunda* 32; *Plagiothecium curvifolium* 23,25; *Thuidium tamariscinum* 11; **IV.:** *Dicranella heteromalla* 22; *Hieracium lachenalii* 9(1),11,19; *H. umbellatum* 10; *Luzula pallescens* 22; *Plagiothecium denticulatum* 17(2); **V.:** *Acer campestre* c 29; *A. platanoides* b 16, c 16,19,23; *A. pseudoplatanus* b 11,16(1),23, c 8,11,16,23,28; *Anemone nemorosa* 31; *A. ranunculoides* 30,33; *Brachypodium sylvaticum* 11,18; *Campanula persicifolia* 33; *Dryopteris filix-mas* 12,19(1),25,28; *Festuca gigantea* 26; *Hedera helix* 5; *Hypericum montanum* 32; *Impatiens noli-tangere* 1; *Melica nutans* 32; *Milium effusum* 1,2,26,29,30(1); *Padus avium* b 19(r); *Poa nemoralis* 15,18,22,24,28; *Ribes uva-crispa* c 28; *Stachys sylvatica* 30; *Stellaria holostea* 21(1),26,29(r),33; *Viola riviniana* 19,28,31; **VI.:** *Calluna vulgaris* 10(1); *Carex ovalis* 30; *C. pallescens* 26,30; *Cladonia coniocraea* 13; *Genista tinctoria* 9(2); *Hieracium pilosella* 10(1),19,29(r),32; *Luzula multiflora* 15; *Polytrichum juniperinum* 9(1); **VII.:** *Achillea millefolium* 9; *Agrostis gigantea* 7(1),8(1); *A. stolonifera* 15; *Alnus glutinosa* a2 26; *Arrhenatherum elatius* 19(1),32; *Astragalus glycyphyllos* (TG) 31; *Athyrium filix-femina* 25,33; *Brachythecium rutabulum* 17; *Calystegia sepium* 30; *Campanula rotundifolia* 28,29,30,31; *Carex caryophyllea* (FB) 15(1); *C. nigra* 33; *Chamaenerion angustifolium* 17,23; *Cladonia* sp. 9; *Convallaria majalis* 8(1),18,24,31,32; *Corylus avellana* b 14,29,31(1), c 14; *Crataegus monogyna* b 32; *C. rhipidophylla* var. *rhipidophylla* 28, c 19(r),28(r); *Dactylis glomerata* 30,32,33; *Deschampsia caespitosa* 2; *Fallopia convolvulus* 28(r),31; *Festuca rubra* s.s. 9(1); *Filipendula vulgaris* 31; *Galeopsis pubescens* 3(r),19,23; *G. tetrahit* 18,19,28(r),29,30,32; *Galium verum* 31; *Glechoma hederacea* 30; *Hieracium murorum* 9,32; *Holcus lanatus* 19; *Humulus lupulus* 19; *Hypnum cupressiforme* 4,13(1),17(1),25; *Hypochoeris radicata* 19(r); *Impatiens parviflora* 2,3(r),17,18,23,25; *Larix decidua* subsp. *decidua* a 28,33; *Leontodon autumnalis* 19(r); *Linaria vulgaris* 28(r); *Mycelis muralis* 2,22,28,29,30,32(1); *Oxyrrhynchium hians* var. *hians* 5(3),7; *Padus serotina* b 19(2),28, c 18,19,25,28(r); *Pimpinella saxifraga* 28; *Plagiomnium ellipticum* 11; *Poa pratensis* 32; *Polygonatum odoratum* 18,24,31; *Polypodium vulgare* 13(1),24(1); *Populus nigra* b 9, c 9(1); *P. tremula* b 14, c 23; *Prunus spinosa* c 28,31; *Pyrus pyraster* c 28(r); *Quercus* x *rosacea* c 9(2); *Rhizomnium punctatum* 4; *Ribes* sp. c 1; *Robinia pseudacacia* a1 16(1), a2 16, b 16(3), c 16; *Rubus caesius* 6(2); *R.* cfr. *hirtus* 23(1); *R. gracilis* 19; *R. plicatus* 8(2); *R. sprengelii* 19(1),28; *Rumex acetosa* 16,19; *Salix caprea* c 32; *Sambucus nigra* b 2; *S. racemosa* b 12(1); *Sciuro-hypnum oedipodium* 19(2),28; *Stellaria media* 18,19; *Urtica dioica* 31; *Vicia cassubica* 31(1); *V. sepium* 32; *Viscum album* subsp. *album* 18.

Table A36. *Serratulo-Pinetum*

		1	2	3	4	5	6	7	8	9	10	11	12	13
Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13
ID-1		7	7	7	7	7	7	44	44	44	44	44	44	44
ID-2		1	1	1	1	1	1	3	4	4	3	3	3	3
ID-3		15	16	17	18	19	20	4	5	4	5	8	7	6
Date (year)		1991	1991	1989	1991	1991	1991	1977	1976	1976	1977	1976	1977	1977
Density of tree layer	a1,a [%]	50	50	50	50	60	60	50	40	60	40	60	40	10
Density of tree layer	a2 [%]	5	-	-	5	10	-	5	5	10	15	5	5	40
Density of shrub layer	b [%]	5	5	-	10	5	5	15	40	20	10	30	40	20
Cover of herb layer	c [%]	60	40	80	50	60	40	60	60	70	70	80	80	80
Cover of moss layer	d [%]	75	95	60	90	80	95	30	60	20	60	60	50	50
Area of relevé		250	150	200	150	200	200	400	400	400	300	100	400	400
Location (ATPOL)		CD34	CD34	CD34	CD34	CD34	CD34	DE51	DE41	DE41	DE41	DE51	DE41	DE50
Total number of species		64	51	37	64	51	47	38	34	34	32	32	31	45
Number of mosses, liverworts and lichens species		10	4	4	9	6	6	5	2	3	4	4	6	6
I. Ch.*, D. *Serratulo-Pinetum*														
Juniperus communis (V-P)	bc^;b/c	+^	1^	.	+^	1^	+^	2/+	/1	2/+	2/+	2/	1/+	2/+
Danthonia decumbens (C-U)		.	+	.	.	+	+	+	+	1	.	.	+	+
Hieracium pilosella (C-U)		.	+	+	+	1	.	+	+	.	1	.	.	+
Peucedanum oreoselinum (T-G)		+	.	1	+	1	.	.	.	+	.	+	+	.
Carex ericetorum (C-U)		.	+	.	.	+	.	.	+	+	1	+	.	+
Dianthus carthusianorum (F-B)		+	.	+	+	+	.	.	.	.	.	.	+	.
Thymus serpyllum		.	+	.	.	+	+	1	.	.	+	+	+	.
* *Orthilia secunda*		1	+	+	1	+	1	+	+	.	.	.	.	.
Chimaphila umbellata (V-P)		+	.	+	+	+	1	+	+	+	.	.	.	.
* *Koeleria grandis*		1	1	2	1	+	+	.	.	.	.	.	.	.
* *Pulsatilla vernalis*		+	r	+	.	.	+	.	.	.	.	.	.	.
Lathyrus sylvestris (T-G)		1	.	.	1	+	1	.	.	.	.	.	.	.
Genista tinctoria (C-U)		+	+	.	+	.	.	.	.	.	.	.	.	.
* *Chamaecytisus ratisbonensis*		.	.	.	.	.	.	.	+	1	1	.	1	.
II. Ch. *Vaccinio-Piceetea* (V-P)														
Pinus sylvestris	a1,a	3	3	3	3	4	4	3	3	2	3	4	3	1
Pinus sylvestris	a2	.	.	.	.	.	.	1	.	.	2	1	1	3
Pinus sylvestris	b	1	+	.	1	1	+	1	.	.	.	1	3	1
Pinus sylvestris	c	2	1	1	+	1	1	+	+	+	.	1	1	.
Picea abies	a2	.	.	.	+	.	.	.	.	.	.	.	.	.
Picea abies	b	.	+	.	+	.	+	.	.	.	.	.	.	.
Pleurozium schreberi		3	4	3	4	4	4	3	4	2	3	3	3	3
Vaccinium vitis-idaea		1	2	2	2	2	1	+	1	1	+	+	2	3
Vaccinium myrtillus		2	+	2	1	2	2	+	2	3	.	+	1	2
Hylocomium splendens		1	+	1	2	.	2	.	+	1	.	.	2	2
Dicranum polysetum		2	1	2	2	2	2	.	.	.	.	2	.	1
Dicranum scoparium		+	.	+	.	+	.	+	.	1	1	.	.	.
Monotropa hypopitys s. s.		.	r	.	.	.	.	+	.	+	+	.	+	.
Rubus saxatilis		1	+	+	.	.	+	.	.	.	.	.	.	.
Cladonia furcata		+	.	.	+	.	+	+	.	.	.	.	.	.
Trientalis europaea		.	+	.	+	.	.	.	1	.	.	.	+	.
Pseudoscleropodium purum		2	.	.	+	.	.	.	.	.	.	.	.	.
III. Ch., D.* *Quercetea robori-petraeae*														
Festuca ovina		1	1	2	+	1	2	.	2	+	3	4	1	+
Calamagrostis arundinacea		2	1	+	2	+	2	.	.	1	.	.	.	.
* *Melampyrum pratense*		+	.	+	1	.	.	.	2	1	.	.	+	.
* *Pteridium aquilinum*		.	.	.	+	.	.	2	1	1	1	2	.	2
Hieracium lachenalii		+	.	.	+	.	.	.	.	.	+	+	.	+
Carex pilulifera		.	+	.	.	.	.	.	+	.	.	.	+	.
* *Polytrichastrum formosum*		+	.	.	+	.	.	.	.	.	.	.	+	+
Holcus mollis		.	.	.	.	.	.	.	+	.	.	.	.	+
IV. Ch. *Calluno-Ulicetea* (C-U)														
Calluna vulgaris		2	2	2	1	+	1	.	+	+	1	+	3	+
Agrostis capillaris		+	+	.	.	.	+	+	+	.	.	.	.	1
Veronica officinalis		.	.	.	+	.	+	.	+	+	.	+	+	.
Solidago virgaurea s. s.		1	.	1	.	1	+	.	.	.	.	.	+	.
Viola canina		.	+	+	.	+	.	.	.	.	+	.	.	.
Luzula multiflora		.	.	+	+	.	.	.	.	+	.	.	.	.
Scorzonera humilis		1	.	1	.	.	.	.	.	+	.	.	.	.
Pohlia nutans		.	.	.	.	+	.	+	.	.	+	.	+	+
V. Ch. *Trifolio-Geranietea* (T-G), *Festuco-Brometea* (F-B)														
Fragaria vesca (T-G)		+	+	.	+	+	.	+	+	+	.	.	.	+
Polygonatum odoratum (T-G)		1	+	+	+	+	1	.	+	.	.	.	.	.
Hypericum perforatum (T-G)		r	+	.	.	+	+	+	+	.	+	+	.	+
Poa angustifolia (T-G)		.	+	+	1	.	+	1	.	+	.	.	+	1
Knautia arvensis (T-G)		+	.	+	+	r	+	+	.	.	.	.	.	.
Pimpinella saxifraga (F-B)		+	.	+	.	.	.	+	.	.	.	+	.	+
Galium verum (T-G)		+	r	.	.	.	+	.	.	.	.	+	.	.
Geranium sanguineum (T-G)		+	.	+	.	+	.	.	.	.	.	.	.	.
Peucedanum cervaria (T-G)		+	.	.	.	.	+	.	.	+	.	.	.	.
Trifolium alpestre (T-G)		+	.	.	+	.	+	.	.	.	.	.	.	.
Anthericum ramosum (T-G)		1	.	+	.	.	.	.	.	.	.	+	+	.
VI. Others														
Betula pendula	a1,a	1	+	.	.	+	1	.	.	.	.	.	1	1
Betula pendula	a2	1	.	.	+	2	.	.	.	.	.	.	.	1
Betula pendula	b/c	+/+	/+	.	/+	/1	.	.	/+	+	/+	/+	+/	+/
Quercus petraea	a1/a2	.	.	.	.	.	.	.	1/1	3/2	.	.	.	.
Quercus petraea	b/c	.	.	.	.	.	.	.	3/1	2/1	.	.	.	.
Quercus robur	a2	+	.	.	1	1	.	.	.	.	.	.	.	.
Quercus robur	b/c	+/1	1/1	.	2/+	+/+	+/+	+/	.	.	.	.	.	+/
Sorbus aucuparia	b/c	/+	+/+	/+	+/+	/+	/+	.	/+	/+	.	/+	+/	+/
Frangula alnus	b/c	/+	/+	.	+/+	+/+	r	.	.	.	.	/+	.	+/
Pyrus pyraster	bc	r	.	.	+	.	.	.	.	.	.	.	.	.
Anthoxanthum odoratum		1	1	.	1	2	1	+	+	+	+	.	.	+
Convallaria majalis		2	1	1	2	1	2	.	.	+	.	+	.	.
Luzula pilosa		+	.	.	1	1	+	.	1	+	.	.	1	.
Calamagrostis epigejos		+	+	.	1	1	.	2	.	.	.	.	.	+
Campanula persicifolia		+	+	.	r	.	+	.	.	1	.	.	.	.
Dryopteris carthusiana		+	+	.	+	+	+	.	.	.	.	.	.	.
Galium boreale		+	+	+	+	+	.	.	.	.	.	.	.	.
Anemone nemorosa		+	+	.	+	+	.	.	.	.	.	.	.	.
Campanula rotundifolia		1	1	.	1	.	1	.	.	.	.	.	.	.
Sciuro-hypnum oedipodium		1	.	.	+	.	+	.	.	.	.	.	.	.
Succisa pratensis		+	+	.	+	.	.	.	.	.	.	.	.	.
Plagiomnium affine		.	+	.	+	.	.	.	.	.	.	.	+	.
Viola riviniana		+	.	.	.	.	.	+	+	+	.	+	.	+
Achillea millefolium		.	.	+	.	.	.	+	+	.	+	.	.	+
Hypnum cupressiforme		+	.	.	.	.	.	1	.	.	1	.	+	+
Cerastium holosteoides		.	.	.	r	.	.	+	.	.	+	.	+	.
Veronica chamaedrys		.	.	.	+	.	.	.	.	+	.	.	.	+

Sporadic species: II.: *Vaccinio-Piceetea* [VP] *Cladonia rangiferina* 1; *Diphasiastrum complanatum* 4; *Leucobryum glaucum* 5; *Pyrola chlorantha* 13; *P. minor* 5; *Viscum album* subsp. *austriacum* 4; **IV.:** Ch. *Calluno-Ulicetea* (C-U) *Arctostaphylos uva-ursi* 2,3; *Carex ovalis* 2; *Luzula campestris* 7,10; *Potentilla erecta* 13; *Ptilidium ciliare* 5; *Scabiosa canescens* 1,5; **V.:** *Ajuga genevensis* (F-B) 11; *Clinopodium vulgare* (T-G) 4; *Coronilla varia* (T-G) 7; *Euphorbia cyparissias* (F-B) 7,11,13; *Potentilla heptaphylla* (F-B) 3; *Sedum maximum* (T-G) 5; *Silene nutans* subsp. *nutans* (T-G) 2; *Trifolium montanum* (F-B) 1,3; *Veronica spicata* (F-B) 3; *Vincetoxicum hirundinaria* (T-G) 5; **VI.:** Others: *Agrostis vinealis* 1; *Armeria maritima* 4(r),7; *Carex hirta* 7,13; *Carpinus betulus* c 4; *Cerasus avium* bc 4(r); *Cetraria islandica* 6; *Chamaenerion angustifolium* 6; *Cladonia cervicornis* subsp. *verticillata* 11; *C. foliacea* 11; *Corylus avellana* 8,10; *Corynephorus canescens* 7; *Deschampsia caespitosa* 10; *D. flexuosa* 1; *Dryopteris filix-mas* 2,4; *Equisetum arvense* 13; *Fagus sylvatica* c 4; *Festuca psammophila* 7; *F. rubra* s.s. 2(1),4; *Galium mollugo* 9,13(1); *Helichrysum arenerium* 7; *Holcus lanatus* 10; *Hypericum montanum* 8; *Hypochoeris radicata* 10; *Hypogymnia physodes* 4; *Jasione montana* 10,11; *Lysimachia vulgaris* 13; *Maianthemum bifolium* 5,6; *Moehringia trinervia* 13; *Molinia caerulea* 1,4; *Mycelis muralis* 11; *Oxalis acetosella* 5; *Plantago lanceolata* 10; *Populus tremula* a1 13(1), a2 13(1), b 13, c 10,13; *Pyrus communis* c 8; *Quercus rubra* 2(4); *Rhamnus cathartica* 5; *Rosa* sp. b 7,13; *Rosa* sp. c 11; *Rubus grabowskii* 1; *R. plicatus* 2,6; *Rubus* sp. 13; *Rumex acetosa* 5; *R. acetosella* 5,10,11,12; *Sarothamnus scoparius* b 12(1),13, c 1; *Scleranthus perennis* 7; *Scrophularia nodosa* 5(r); *Serratula tinctoria* 4(r),6(1); *Silene vulgaris* 11; *Tilia cordata* bc 6; *Viburnum opulus* b 13.

Table A37. Substitute forest communities on the habitat of don't identify forest community

Successive number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	1-63
ID-1		52	48	35	37	26	46	2	35	35	35	35	17	37	35	46	39	18	18	18	35	35	46	39	35	46	39	2	54	46	46	35	52	52	39	55	5	49	30	39	55	56	30	39	17	19	39	39	39	37	40	50	42	59	17	56	56	55	36	2	37	39	39	39	
ID-2		16	3	20	14	21	3	7	29	29	29	20	9	14	29	3	31	3	3	5	20	29	3	31	20	3	28	7	11	3	3	20	16	16	31	17	2	5	5	31	17	3	5	31	9	2	31	31	31	14	-	3	1	6	9	3	3	17	16	7	14	31	31	31	
ID-3		5	34	13	10	3	15	6	15	3	16	28	8	22	9	8	10	10	8	3	1	1	9	2	9	22	7	5	6	20	18	25	9	8	18	10	7	6	7	17	1	31	8	16	2	17	5	6	7	19	-	13	11	2	10	35	34	6	11	8	1	1	14	15	
Date (year)		1973	1976	1976	1984	1965	1954	1988	1976	1976	1976	1976	1995	1984	1976	1955	1991	1989	1990	1989	1976	1976	1955	1991	1976	1954	1992	1988	1975	1954	1954	1976	1973	1973	1991	1994	1994	1976	1956	1991	1987	2006	1956	1991	1995	1983	1991	1991	1991	1987	1999	1976	1981	1993	1995	2006	2006	1995	1985	1988	1984	1991	1991	1991	
Density of tree layer	a1,a [%]	70	60	55	55	50	50	50	45	60	50	50	30	40	50	85	55	70	60	70	60	60	70	45	50	70	60	50	70	50	80	50	75	60	25	55	80	60	80	25	50	50	60	55	30	50	40	50	50	60	90	90	85	80	70	80	80	60	35	45	40	70	25	70	
Density of tree layer	a2 [%]	-	-	10	25	75	-	-	-	20	-	5	-	45	-	-	5	-	-	-	20	20	-	15	20	10	5	-	-	60	-	50	-	-	45	-	-	-	-	50	-	95	-	10	-	50	+	10	5	5	-	-	-	-	-	-	-	-	65	-	15	20	+	10	
Density of shrub layer	b [%]	15	-	25	40	10	+	-	+	25	20	20	+	35	20	15	80	-	-	-	+	20	-	-	25	30	5	20	+	5	+	5	20	+	5	5	+	-	10	+	10	+	+	30	35	80	30	50	35	15	-	-	+	5	+	-	-	40	+	20	20	40	10	+	
Cover of herb layer	c [%]	100	70	80	80	70	30	65	65	50	80	90	70	85	65	70	60	80	90	80	100	90	20	60	90	30	20	65	30	30	15	15	100	100	80	100	40	70	40	15	30	+	80	25	70	70	65	95	90	100	30	60	95	70	60	10	10	70	15	70	85	50	100	10	
Cover of moss layer	d [%]	+	-	+	-	+	50	5	40	35	35	-	+	+	-	20	-	-	-	+	+	-	20	5	5	15	5	5	5	+	20	+	-	+	-	+	+	-	+	-	-	-	+	-	-	5	15	+	5	+	-	3	-	-	5	5	+	10	+	5	+	-	5	5	%
Area of relevé		150	150	100	500	200	800	200	200	150	100	200	100	800	100	800	400	200	200	150	200	200	800	500	200	1000	400	100	100	700	800	100	250	250	400	150	100	150	400	400	100	200	300	600	120	400	300	900	700	900	400	200	100	150	150	400	400	150	600	150	300	200	400	600	
Location (ATPOL)		CD02	BD28	CE00	-	CD83	CC92	BD81	CE00	CE00	CE10	CE01	BC66	-	CE00	CC92	BE15	BD44	BD44	BD44	CE11	CE11	CC92	BE15	CE01	CC92	BE15	BD81	BC82	CC92	CC92	CE01	CD02	CD02	BE15	BC72	BC98	-	CD73	BE15	BC72	BC76	CD72	BE15	BC66	CD93	BE15	BE15	BE15	BD80	CC91	BD28	BD59	BC99	BC66	BC76	BC76	-	CE01	BD81	AD78	BE15	BE15	BE15	
Total number of species		14	13	19	21	16	18	22	18	17	20	21	15	21	13	23	17	9	19	15	26	20	19	34	24	24	23	25	14	22	17	15	14	15	19	20	19	8	21	16	14	6	18	20	23	21	15	23	22	17	16	15	13	9	16	22	16	16	22	22	16	24	18	22	
Number of mosses, liverworts and lichens species		1	-	1	-	1	2	1	1	1	1	-	1	2	-	3	-	-	-	2	1	-	2	2	2	3	3	3	1	1	2	2	-	1	-	2	2	-	4	-	-	-	4	-	-	1	2	2	2	1	-	3	-	-	1	3	1	2	3	1	3	-	1	2	
I. Ch. *Vaccinio-Piceetea*																																																																			
Pinus sylvestris	a1,a	4	3	3	3	.	4	4	3	4	3	3	3	3	3	5	3	4	3	4	3	4	5	4	3	4	3	3	4	4	3	3	5	4	1	.	.	.	+	1	1	1	.	1	+	1	.	.	.	2	1	.	.	.	.	.	.	.	2	2	2	2	.	.	73
Pinus sylvestris	a2	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	6
Pinus sylvestris	b/c	.	/+	.	/+	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	/+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+/	.	.	.	.	.	.	.	.	.	.	.	.	+/	+/	.	.	13
Picea abies	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	4	.	.	1	.	.	.	.	8
Picea abies	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	2	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	8
Picea abies	b;bc^	.	.	.	.	+^	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	2	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	3	.	.	.	.	1	+	16
Picea abies	c	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Vaccinium myrtillus		4	3	3	3	4	3	3	3	.	2	2	r	1	.	.	.	.	1	.	1	+	.	.	1	2	.	2	.	1	1	1	2	1	.	2	.	.	+	.	.	.	.	.	+	2	.	1	3	5	.	r	.	.	+	1	+	1	1	2	2	+	.	.	62
Pleurozium schreberi		.	.	+	.	.	.	.	3	3	3	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	.	.	2	.	.	.	.	.	.	.	.	+	.	.	.	2	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	21
Pseudoscleropodium purum		.	.	.	.	.	3	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	+	.	.	r	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
II. Ch., D.* *Quercetea robori-petraeae*																																																																		
* *Pteridium aquilinum*		5	.	+	.	+	2	1	.	.	.	1	.	.	.	.	.	.	1	1	2	+	.	.	+	+	.	.	.	+	.	.	5	5	4	3	.	.	.	1	2	.	.	.	2	.	.	4	3	1	.	+	.	1	r	.	.	.	.	.	.	.	.	.	41
* *Polytrichastrum formosum*		.	.	.	.	+	+	1	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	1	.	.	.	+	.	.	.	.	1	1	.	.	.	.	.	.	1	+	.	+	1	.	.	.	.	24
Calamagrostis arundinacea		+	2	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	2	2	.	.	.	.	.	.	.	+	.	.	.	.	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	5	3	.	.	.	.	.	.	.	.	.	.	17
Holcus mollis		.	.	.	.	.	.	.	.	.	1	1	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	2	.	4	.	.	.	.	.	.	.	.	.	2	2	.	.	.	.	.	.	.	.	3	.	.	+	.	.	+	17
* *Melampyrum pratense*		.	.	+	.	.	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	+	1	.	.	2	.	.	.	.	+	.	.	.	.	.	.	.	.	.	16
III. Ch. *Querco-Fagetea*																																																																		
Carpinus betulus	a1,a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	3	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Carpinus betulus	a2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Carpinus betulus	b/c	.	.	/+	.	1/+	+/	.	.	.	.	.	.	.	.	2/2	.	.	.	.	.	.	.	.	.	/+	.	.	.	+/+	+/+	.	.	.	+/+	.	.	.	1/	.	/r	.	+/	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+/	19
Fagus sylvatica	a1,a	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	3	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	11
Fagus sylvatica	a2	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	10
Fagus sylvatica	b/c	.	.	2/+	1/	+/+	.	.	+/	.	2/	2/	/+	.	.	.	.	.	.	.	+/	.	.	.	.	.	.	.	/1	.	.	1/	.	.	/1	.	.	.	.	/3	/+	+/	.	.	.	.	.	.	.	1/+	.	.	.	.	.	.	.	.	+/+	.	.	.	.	.	25
Corylus avellana	b/c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/+	.	.	/+	.	.	+/	+/	+/	.	.	.	+/	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3/	1/	.	.	.	.	1/	.	.	.	.	.	+/	.	2/+	.	.	17
Poa nemoralis		.	.	.	.	.	.	.	.	.	1	.	2	.	+	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	+	1	+	.	+	1	.	.	1	.	1	1	.	24
Viola reichenbachiana		.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	.	.	+	+	.	.	.	+	.	1	.	+	.	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	19
Anemone nemorosa		.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	r	r	+	.	1	.	.	.	.	.	.	.	1	.	+	.	.	.	.	.	.	.	.	.	17
IV. Ch. *Calluno-Ulicetea*																																																																		
Agrostis capillaris		.	.	.	+	.	.	.	.	3	1	.	2	+	+	+	.	1	.	1	+	+	+	1	+	.	.	1	.	.	.	.	.	.	.	3	3	.	.	.	.	.	.	1	.	.	1	1	2	.	.	.	.	.	.	.	.	3	.	.	.	.	2	.	37
Pohlia nutans		.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	+	+	.	+	+	1	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	21
V. *Artemisietea*																																																																		
Moehringia trinervia		.	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	1	.	+	+	.	.	+	+	.	.	.	+	+	+	+	.	.	.	.	.	.	.	+	.	.	+	+	+	+	+	.	.	+	+	.	+	.	.	1	.	.	38
Mycelis muralis		.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	+	+	+	.	.	.	.	1	1	+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	r	+	.	+	.	.	+	+	.	29
Impatiens parviflora		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	2	.	.	1	.	.	.	.	.	.	.	2	.	1	.	.	+	.	r	.	+	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	1	.	3	.	.	19
VI. Others																																																																		
Quercus robur	a1,a	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	2	4	3	4	4	2	3	4	4	3	.	.	1	.	.	.	.	.	.	.	1	.	.	.	1	.	1	.	.	.	27
Quercus robur	a2	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	2	.	.	1	2	.	+	.	.	1	.	.	.	.	3	.	.	.	.	2	.	.	.	2	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	19
Quercus robur	b;bc^	.	.	+	.	.	+	.	1	1	.	.	.	+	1	+	.	.	.	.	1	+	.	1	2	.	+	.	.	+	+	.	.	.	+	.	.	.	+^	.	.	.	+^	.	.	3	.	+	+	.	.	.	.	.	.	.	.	.	.	.	2	+	.	.	35
Quercus robur	c	.	.	+	.	+	+	.	+	+	/+	+	.	.	+	+	.	.	.	.	+	+	+	+	1	.	.	.	.	+	+	/+	.	.	.	.	+	+	.	.	.	.	.	.	+	1	+	+	+	.	.	.	.	.	.	.	.	.	+	.	+	+	+	+	46
Betula pendula	a1,a	.	.	.	1	.	.	.	.	.	.	.	r	+	.	.	.	.	2	.	.	.	.	.	.	1	.	+	.	.	1	.	.	.	1	1	2	.	.	.	.	.	.	+	3	3	3	3	3	.	.	.	.	.	.	.	.	2	2	.	2	.	+	.	32
Betula pendula	a2	.	.	.	1	.	.	.	.	2	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	1	+	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	17
Betula pendula	b/c	.	.	+/+	+/+	.	.	.	.	2	.	+/	/r	+/	.	+/	.	.	.	.	+/	.	/+	+/	.	.	.	.	.	.	.	.	.	+/+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	/+	.	.	.	.	.	.	.	.	.	.	+/	.	.	.	21
Quercus petraea [Q. x *rosacea* ^]	a1,a	.	4^	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	4	.	.	.	.	.	.	.	2^	.	.	.	.	.	.	.	1^	.	.	.	.	3	5	5	5	5^	4^	.	.	.	1	2	.	.	.	.	24
Quercus petraea	a2	.	.	.	2	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	8
Quercus petraea [Q. x *rosacea*^]	b/c	/+	/1^	.	3/1	.	.	/+	.	.	.	.	/r	2/+	.	.	.	.	/+	.	.	.	.	.	.	.	.	1/	.	/+	.	.	+/	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2/2	/+	/1	/+	/+^	/+^	.	.	.	/+	+	.	.	.	.	29
Frangula alnus	b	2	.	+	+	1	+	.	+	.	.	+	.	+	.	+	2	.	.	.	.	+	.	1	.	.	1	.	.	.	.	.	1	+	1	1	+	.	+	.	2	.	+	3	3	4	3	3	3	.	.	.	.	.	+	.	.	.	.	1	1	.	1	+	51
Frangula alnus	c	+	.	.	.	1	.	.	.	.	.	.	.	.	.	+	.	.	1	.	+	+	.	.	.	.	.	.	+	.	.	.	.	+	+	1	+	+	+	.	+	.	.	+	.	1	+	+	+	.	.	.	.	.	+	r	r	.	.	.	+	.	+	.	38
Sorbus aucuparia	a^;a2	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	1^	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+^	.	.	+	+	8
Sorbus aucuparia	b	.	.	.	+	.	.	.	.	.	+	.	.	2	+	+	4	.	.	.	+	+	.	2	+	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	1	.	1	.	1	+	.	.	.	.	.	.	.	.	.	.	+	.	+	1	.	33
Sorbus aucuparia	c	.	.	+	+	+	+	.	.	+	.	.	r	+	+	+	.	.	1	.	+	+	+	+	+	.	+	.	.	+	+	.	+	+	+	.	+	.	+	.	+	.	.	+	+	+	.	.	.	.	+	.	+	.	r	+	+	.	+	.	+	.	+	1	57
Padus serotina	b-/c	.	.	.	/+	.	.	.	.	.	.	.	.	+/+	.	.	.	.	.	.	.	.	.	4/	.	.	.	.	.	.	.	.	.	.	+/	.	+/+	.	.	.	.	.	.	1/	.	.	/+	/+	+/+	.	/1	.	.	.	.	/r	/+	.	.	.	.	.	1/	.	21
Dryopteris carthusiana		1	1	+	.	+	+	+	.	+	+	.	r	+	+	1	1	.	+	.	.	+	.	+	.	+	.	.	.	.	+	.	+	.	+	+	.	.	.	1	+	.	.	1	+	1	+	+	+	.	.	.	.	.	+	+	+	2	+	.	.	+	+	+	59
Rubus idaeus		+	.	.	+	.	+	.	.	+	+	+	.	+	.	2	+	.	.	.	+	+	+	+	2	+	.	2	.	+	+	.	+	+	.	+	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	r	1	1	+	2	1	.	.	.	46
Deschampsia flexuosa		.	.	3	3	.	.	2	2	1	1	4	3	.	+	.	2	.	.	.	.	.	.	.	2	.	2	1	.	.	.	+	.	.	1	.	.	.	.	1	.	.	.	2	2	.	2	2	2	.	.	.	.	.	4	2	1	.	.	+	.	+	2	.	43
Oxalis acetosella		1	.	+	.	.	+	.	.	.	.	.	.	.	.	+	+	.	1	.	+	1	.	.	+	+	.	.	+	+	+	.	2	+	+	.	.	.	.	.	1	.	+	+	+	1	.	2	1	.	.	.	.	.	.	+	.	.	+	.	.	.	.	1	41
Calamagrostis epigejos		.	.	+	1	.	.	.	.	1	2	+	1	4	4	3	3	4	4	1	+	.	2	1	1	.	.	.	.	.	.	.	.	.	.	.	2	.	.	+	.	.	.	1	2	.	3	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	4	.	40
Luzula pilosa		+	1	+	.	+	.	.	.	.	+	+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	+	.	2	.	.	+	1	1	.	.	.	.	.	1	.	.	+	.	.	+	.	1	1	1	.	+	.	+	+	.	.	.	+	.	.	.	.	+	38
Maianthemum bifolium		2	.	+	.	+	.	.	.	.	+	1	.	.	.	+	.	.	.	.	+	+	.	.	.	.	+	.	.	.	+	.	1	2	.	.	.	.	+	.	1	.	.	.	+	2	.	1	.	.	.	1	.	.	+	+	.	.	.	.	.	.	.	.	32
Rubus sp.		.	.	+	.	.	.	.	.	+	.	+	r	.	1	.	1	.	.	.	5	5	.	+	.	.	+	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	.	.	.	1	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	27
Convallaria majalis		.	1	.	.	.	+	.	.	.	.	.	+	.	.	.	.	5	3	3	.	.	.	+	.	+	+	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	1	.	.	.	.	.	.	.	+	+	3	.	+	.	.	.	.	.	.	.	.	25
Rumex acetosella		.	.	.	1	.	+	+	.	.	.	+	.	.	+	+	.	.	.	.	.	.	+	+	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	24
Lysimachia vulgaris		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	+	+	.	.	1	.	+	.	+	1	.	.	.	.	.	.	.	.	.	.	.	1	+	.	+	19
Molinia caerulea		+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	2	.	.	.	2	3	.	.	.	.	.	.	.	.	+	.	.	.	.	.	4	.	.	+	16

Sporadic species: I.: *Betula pubescens* subsp. *pubescens* a2 63(1), b 63, c 16; *Dicranum polysetum* 22; *D. scoparium* 26,27,35,36,51; *Dryopteris dilatata* 13,16,63(1); *Galium rotundifolium* 31; *Hylocomium splendens* 25; *Juniperus communis* b 35, c 18(1),31; *Orthilia secunda* 28(2); *Pyrola minor* 28(1); *Rubus saxatilis* 2(1),19; *Trientalis europaea* 10(2),11(1),20; *Vaccinium vitis-idaea* 7(1),18; **II.:** *Aulacomnium androgynum* 38,51; *Carex pilulifera* 4(1),38(r),43(1),49,57; *Dicranella heteromalla* 23(1),58; *Festuca ovina* 20,24(3), 25,27,28(1),30; *Hieracium lachenalii* 2,3,8,10,28,31; *H. umbellatum* 18; *Luzula pallescens* 8; **III.:** *Acer platanoides* c 8,28; *A. pseudoplatanus* a2 9, b 9,14(2),24, c 14,41,50(r),58; *Atrichum undulatum* 31; *Brachypodium sylvaticum* 8,19,27(1),34,36(r); *Dryopteris filix-mas* 6,13,26,52; *Equisetum sylvaticum* 23; *Festuca gigantea* 15,22; *Hedera helix* 32,58(1); *Lathyrus niger* 2; *Malus sylvestris* c 29,38; *Melica nutans* 2,7,8,44(1),51,61; *M. uniflora* 6; *Milium effusum* 20,37(1); *Padus avium* b 16(1),23,61(1), c 43,63; *Sanicula europaea* 48; *Stellaria holostea* 1(1),5,33; *Ulmus laevis* a1 43(2), b 43(1); *U. minor* b 15, c 15,19,25; *Viola riviniana* 27,29,55(r),56(r); **IV.:** *Calluna vulgaris* 8; *Carex ovalis* 10,24; *C. pallescens* 4,20,22,38; *Danthonia decumbens* 20; *Hieracium pilosella* 22; *Hypericum maculatum* 44; *Luzula multiflora* 8(1),24,49,50(r),62; *Polytrichum juniperinum* 47,48(1),49; *Potentilla erecta* 45,60; *Scorzonera humilis* 49,51(r); *Solidago virgaurea* s.s. 44,49,50; *Veronica officinalis* 7,22,24,30; *Viola canina* 35; **V.:** *Alliaria petiolata* 55(r),61; *Chelidonium majus* 23,61(1); *Fallopia dumetorum* 18,43,46,61(1); *Galeopsis pubescens* 9,55(r),56,58; *G. tetrahit* 15,23,26,34,37,50(1),51,52,60; *Galium aparine* 23,61(2); *Geranium robertianum* 7,39,50,52,59,61; *Glechoma hederacea* 59(2); *Humulus lupulus* 23,61; *Lamium maculatum* 7; *Linaria vulgaris* 17(2),25; *Rubus caesius* 32,33,61; *Tanacetum vulgare* 19(2); *Urtica dioica* 59(2); **VI.:** *Abies alba* b 25; *Achillea millefolium* 59(1); *Agrostis gigantea* 42; *Alnus glutinosa* a 35,57(4), a2 29; *Anthericum ramosum* 50(r); *Anthoxanthum odoratum* 4,8(1),11,14,35(2),42,45,49,50(2),57(1),59; *Armeria maritima* 24; *Arrhenatherum elatius* 7,23,24,44; *Athyrium filix-femina* 26,39,63(1); *Brachytheciastrum velutinum* 63(1); *Brachythecium rutabulum* 55(1),57(2); *Calamagrostis canescens* 47; *Campanula rotundifolia* 7; *Carex acutiformis* 23; *C. brizoides* 38(3),42(5); *C. hirta* 12,25(r),29,35(1); *C. nigra* 45; *Chamaenerion angustifolium* 13,14,16,23,26,43,63; *Colutea arborescens* b 27; *Crataegus laevigata* b 20; *C. monogyna* b 8,25, bc 38; *Dactylis glomerata* 6,15,29,49; *Deschampsia caespitosa* 38,57(1),63; *Euonymus europaea* b 9; *Fallopia convolvulus* 52,55,56(1),57(1); *Festuca rubra* s.s. 36(1),42,49; *Fragaria vesca* 22,29,35; *Galium mollugo* 22,29; *G. verum* 17,35; *Hieracium murorum* 9,27(1),50,54; *Holcus lanatus* 27; *Hypericum perforatum* 4,11,22,24; *Hypnum cupressiforme* 38,60; *Ilex aquifolium* c 9; *Juncus effusus* 42,57(1); *Larix decidua subsp. decidua* a1 7(1),26(1),62(2),63(4), a2 21(1),62,63(1), b 47; *Peucedanum oreoselinum* 17(1),19; *Plagiomnium affine* 19,35,46(1),55(2); *P. ellipticum* 24(1); *P. rostratum* 29,60; *Plagiothecium cavifolium* 1; *Plagiothecium ruthei* 36; *Plantago lanceolata* 7; *Poa angustifolia* 35; *P. palustris* 44(1); *P. pratensis* 42; *Polygonatum odoratum* 19(r),28,44,54,62; *Populus tremula* a 45(1),59(1), a1 13(1),45(1), a2 13(1), b 8,23,36, c 5,8,13,45,63; *Prunus spinosa* b 36; *Pyrus communis* a 36(2),38, c 50(r); *Quercus rubra* a 7, a2 29, b 29,45(1); *Ranunculus acris* s.s. 7; *R. repens* 27; *Robinia pseudacacia* a1 23(1),60(1),61(4), a2 23(1),61(2), b 23,61(2), c 23,61; *Rubus plicatus* 4(1),13; *R. sprengelii* 44(2),55,56; *Salix purpurea* c 25; *Sambucus nigra* b 62, c 23,25; *S. racemosa* b 20,21; *Sciuro-hypnum oedipodium* 57(1); *Sedum maximum* 17; *Senecio ovatus* 59; *Silene nutans* subsp. *nutans* 11; *Stellaria graminea* 42,59; *S. media* 4,9,13,24,27,34,58,59; *Thuidium philibertii* 42; *Veronica chamaedrys* 30,37,46(1); *V. hederifolia* 23,39,48,61(1); *Vincetoxicum hirundinaria* 17(r),19(1).