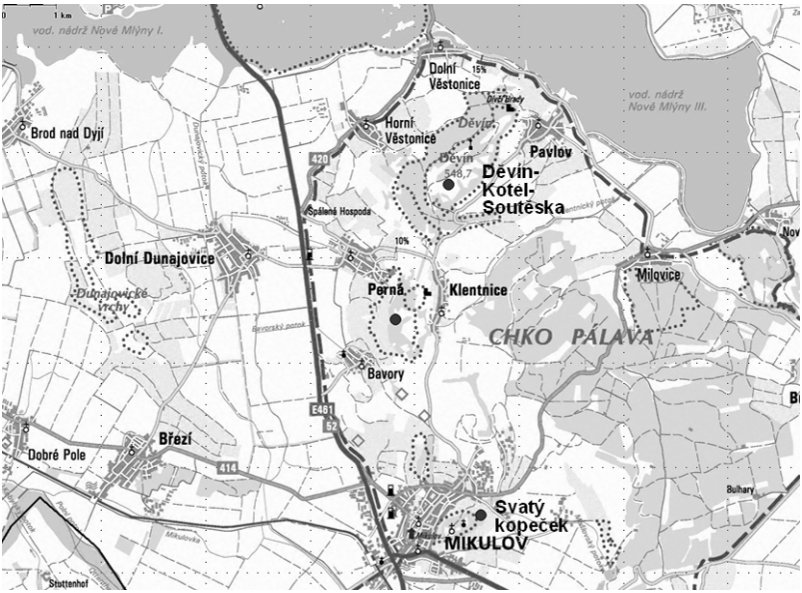
Pavlov Hills: Botanical Excursion Guide

Jiří Danihelka, Vít Grulich & Milan Chytrý

Introduction

The Pavlov Hills (in Czech Pavlovské vrchy, Pálava) is a range of limestone hills in southern Moravia situated between the Dyje River (in German Thaya) and the Czech-Austrian border near the town of Mikulov. Its northernmost point is located about 30 km south of the southern margin of the city of Brno. The area is 11 km long and 2 to 3 km wide. The altitudinal difference between the Dyje River in Pavlov (165 m) and the top of Děvín Hill (554 m) is 389 m. The northernmost hilltop with the ruin of the 14th century castle Děvičky (= Dívčí hrady, Maidenstein) stands out above the village of Pavlov. Southwards, the highest Děvín Hill (554 m) follows, which is separated in the south by the narrow gorge



Pavlov Hills

called Soutěska from Kotelná Hill (462 m). Růžový vrch Hill, with another castle ruin on the top, and Stolová hora Hill (459 m), with a prominent plateau, form the central part of the range. Turold Hill (385 m) and Svatý kopeček Hill (363 m), the latter with a church on its top, surround the town of Mikulov from the north and

the east, respectively. The southernmost Šibeničník Hill (238 m) is situated south of the town near the border with Austria. Schweinbarther Berg, Höhlenstein, and Falkenstein Hills in the adjacent part of Lower Austria belong to the same range.

Geology

The landscape of the Pavlov Hills is strongly modulated, with outcrops and cliffs of pure, hard and white limestone of Upper Jurassic origin, called Ernstbrunn limestone. Sedimentation of Ernstbrunn limestone was preceded by the sedimentation of grey calcareous claystone and clay limestone, called Klentnice layers. The Pavlov Hills are situated at the margin of the flysch zone of the Eastern Alps and Western Carpathians. The flysch beds consist of strongly folded Lower Tertiary claystone, sandstone and conglomerate. During the periods of orogenetic activity in the Tertiary, large blocks of Jurassic and Lower Cretaceous rocks were torn from their Jurassic ground (now situated up to 2 km below the surface), and re-deposited over the younger flysch beds.

In the Lower Badenian period (Upper Tertiary), the Pavlov Hills were surrounded by a warm sea. Pieces of Jurassic rock present in the littoral gravel from that period indicate that limestone may have been already denuded at that time. At 15 Ma BP (before present) a strong subsidence formed the Vienna Basin. During the following 9 Ma, up to 3 km thick layers of maritime and lacustrine sediments were deposited on its bottom.

During the Quaternary, loess and debris, comprising also re-deposited Tertiary clay and fossil soils, were deposited on the footslopes of the Pavlov Hills. A complete sequence of loess sedimentation from the last two glacials and two interglacials, with buried chernozem horizons, can be observed in excavation pits near the village of Dolní Věstonice.

Soils

The prevailing soil types are rendzinas, calcareous pelosols, chernozems, and luvisols. Rendzinas were formed over hard Ernstbrunn limestone; they are shallow and dry, of neutral to moderately alkaline reaction. They are covered mainly with dry grasslands and open thermophilous oak forests. Calcareous pelosols are developed on Mesozoic and Tertiary calcareous clays and mostly covered with forests. Chernozems are found on loess deposits on the foothills of the Pavlov hills. Luvisols occur on moderately inclined hillsides covered with slope deposits or decalcified loess. These soils are deep and have a more balanced water supply; they support mainly oak-hornbeam forests.

Climate

The climate of the Pavlov Hills is subcontinental, summer-warm and dry. The mean annual temperature at Mikulov is 9.5 °C, the mean temperature of the growing season (April-September) is 15.9 °C. The warmest and coldest months are July and December with mean temperatures of 19.4 °C and -1.6 °C,

respectively. Due to its location in the lee of the Bohemian-Moravian Highlands (Českomoravská vrchovina), the area around the Pavlov Hills is one of the driest in the Czech Republic. The mean annual precipitation is 571 mm, of which 367 mm falls in the growing season. Monthly rain sums vary considerably, and long periods of drought are common. Such climate supports the development of forest-steppe vegetation.

Nature conservation

The Pavlov Hills are included in the Protected Landscape Area (PLA) Pálava, which was established in 1976. Ten years later the area became a UNESCO Biosphere Reserve. The particular limestone hills and other valuable sites within the PLA are protected as National Nature Reserves (NNR), Nature Reserves (NR) and Nature Monuments (NM). There are two NNRs (Děvín-Kotel-Soutěska and Tabulová, Růžový vrch a Kočičí kámen), three NRs (Turold, Svatý kopeček and Šibeničník) und three NMs (Kočičí skála, Růžový kopec and Anenský vrch).

Landscape history

The Pavlov Hills and their surroundings are world-famous for a series of Upper Palaeolithic archaeological sites on their foothills, most notably between the villages of Dolní Věstonice and Pavlov. These sites provided a rich source of prehistoric artefacts (especially art) from the settlements of mammoth hunters from the Gravettian period (28–22 ka BP). These artefacts include carved representations of animals, humans and enigmatic engravings, a figure of a young man carved in mammoth ivory, which may represent the first example of portraiture (i.e., representation of an actual person), the earliest examples of ceramics (burned clay) figurines, including the famous Venus of Dolní Věstonice. One of the burials revealed a human female skeleton, ritualistically placed beneath a pair of mammoth scapulae, which is believed to be the first proof of a female shaman.

In 1991 palynologists E. Rybníčková and K. Rybníček analysed a peat sediment from the nearby Bulhary site, dated to around 26 ka BP. Besides indicators of steppe (*Artemisia*, *Chenopodiaceae*, *Ephedra* and *Plantago* cf. *media*) and tundra (*Betula nana*) they found a surprisingly abundant tree pollen, including drought- and cold-adapted species such as *Pinus cembra*, *P. sylvestris*, *Larix* and *Betula pendula*, but also moisture-demanding species such as Picea, Alnus and rarely also some broad-leaved deciduous trees. This was the first evidence of the full-glacial forests in eastern-central Europe, which was later confirmed by new data from Hungary and Slovak, Polish and Czech Carpathians. Based on the analogy with contemporary landscapes of continental southern Siberia, we can imagine the landscape of the Gravettian mammoth hunters as a forest-steppe with steppic grasslands on the loess plains and southern slopes, *Picea-Alnus* woodland in the river floodplains, *Pinus cembra-P. sylvestris-Larix-Betula* woodland on north-facing slopes and patches of Betula nana tundra in colder and wetter places. This

interpretation is supported by the fossil mollusc faunas found in the Quaternary sediments on the foothills of the Pavlov Hills.

Due to lack of peat deposits in the dry area of southern Moravia, Holocene history of the Pavlov Hills can be reconstructed mainly based on the malacozoological evidence. It indicates that loess sedimentation was followed by spread of some warm-demanding continental species in the Late Glacial. In the Early Holocene, the area was covered by forest-steppe. At the beginning of the Atlanticum (8 ka BP) there was a sudden increase in precipitation which supported spread of mesic forests. However, Neolithic farmers colonized the area at approximately 7.5 ka BP and started a large-scale deforestation of the surrounding lowland areas, including the Pavlov Hills. The area has been permanently settled by humans ever since, with a remarkable peak in the Bronze Age, when settlements were built also on the hilltops. Although patches of mesic deciduous forest were always present on the hills, particularly on the north-facing slope of Děvín Hill, several species of molluscs and plants typical of such forests are missing there, because they failed to immigrate through the surrounding deforested landscape. Steppes in the Pavlov Hills are primary in the sense that they represent a direct continuation of the Pleistocene continental steppes. At the same time, they are secondary in many places, because they spread to the areas deforested by humans since the Neolithic.

Vegetation

The Pavlov Hills are situated in the Pannonian phytogeographical region, which reaches its north-western limit in Lower Austria and southern Moravia. This region represents the westernmost extremity of the continuous zone of the Euro-Siberian forest-steppe, which extends through the Danube valley and Pannonian Basin up to the southern fringes of the Western Carpathians, eastern fringes of the Eastern Alps, and south-eastern edge of the Bohemian Massif. The following description of vegetation mainly concerns Děvín Hill (National Nature Reserve Děvín-Kotel-Soutěska), the highest and largest of the Pavlov Hills, which harbours most of the natural and semi-natural vegetation types found in the area.

Forests

Natural vegetation of the lower hillsides of the Pavlov Hills is Pannonian oak-hornbeam forest of the association *Primulo veris-Carpinetum* (alliance *Carpinion betuli*). The main tree species are *Quercus petraea* and *Carpinus betulus*, accompanied by *Acer campestre*, *Tilia cordata* and *T. platyphyllos*. The shrub layer is well developed and rich in species, including *Cornus mas*, *Euonymus verrucosa*, *Ligustrum vulgare* and *Staphylea pinnata*. The herb layer includes *Campanula persicifolia*, *C. rapunculoides*, *Festuca heterophylla*, *Melittis melissophyllum*, *Primula veris* and *Viola mirabilis*.

Upwards, on sites with soils still deep and moist enough to support more or less closed canopy, oak-hornbeam forests are replaced by thermophilous oak forests of the association *Corno-Quercetum* (alliance *Quercion pubescenti-petraeae*).

Dominant trees are *Quercus petraea* and *Q. pubescens*. The shrub layer is usually luxuriant, consisting of thermophilous shrubs such as *Cornus mas*, *Ligustrum vulgare* and *Viburnum lantana*. The herb layer contains thermophilous species *Lithospermum purpurocaeruleum*, *Tanacetum corymbosum* and *Teucrium chamaedrys*, along with nutrient-demanding species of mesic forests, such as *Alliaria petiolata* and *Geum urbanum*.

The steep upper slopes with limestone outcrops support open stands of thermophilous oak forests classified as *Pruno mahaleb-Quercetum pubescentis* (alliance *Quercion pubescenti-petraeae*). Their tree and shrub layers can be hardly separated, as *Quercus pubescens* trees are usually low and bushy, and shrubs, e.g. *Cornus mas*, *Viburnum lantana* and *Ligustrum vulgare*, are numerous and vigorously growing. In the ground layer, many species of thermophilous forest fringes are present, such as *Dictamnus albus*, *Geranium sanguineum* and *Vincetoxicum hirundinaria*, as well as dry grassland species such as *Aster amellus*, *Carex humilis*, *Festuca rupicola*, *Inula ensifolia* and *Stachys recta*. At a finer scale, shrub association *Violo hirtae-Cornetum maris* (*Berberidion*) and herbaceous fringe communities of the alliance *Geranion sanguinei* can be distinguished here, along with different types of dry grasslands.

On the north-facing slopes of Děvín Hill, two types of broad-leaved ravine forest (alliance *Tilio-Acerion*) occur. The first one, *Aceri-Carpinetum betuli*, is more widespread and includes stands with *Tilia platyphyllos*, *Carpinus betulus* and *Acer pseudoplatanus*. It is confined to sites with well developed, moderately humid soils. The shrub layer is scarce due to the closed canopy and high densities of mouflon. The herb layer contains *Alliaria petiolata*, *Asarum europaeum*, *Campanula trachelium*, *Lathyrus vernus* and *Pulmonaria officinalis*; in early summer, they are overgrown by tall stands of *Aconitum lycoctonum*. Upwards, at the foot and ledges of limestone cliffs, this type of ravine forest is replaced by patches of *Seslerio albicantis-Tilietum cordatae*. This relict community, here with *Tilia platyphyllos* as the dominant tree, harbours several species of *Sesleria* grasslands, such as *Anthericum ramosum*, *Bupleurum falcatum*, *Erysimum odoratum*, *Hylotelephium maximum*, *Sesleria caerulea* and *Vincetoxicum hirundinaria*.

Most forests of the Pavlov Hills used to be coppiced in the past, but this traditional management has been abandoned since the mid 20th century. Overgrown coppices have developed closed canopy which led to retreat of light-demanding species and spread of mesophilous forest herbs. The game preserve for bezoar goat (*Capra aegagrus*) and mouflon existed on Děvín Hill until 1996.

Grasslands

Dry grasslands of the Pavlov Hills have always attracted botanists, and formal phytosociological descriptions of their most important types were already done by Zlatník (1928) and most notably by Klika (1931). In phytosociological terms, they belong to the class of Euro-Siberian steppes, *Festuco-Brometea*. The stands of *Festuco valesiacae-Stipetum capillatae* (alliance *Festucion valesiacae*) represent a type of continental steppe. They are associated with very dry places with

moderately developed soil. Besides the name-giving species, they contain *Bothriochloa ischaemum*, *Centaurea stoebe*, *Festuca rupicola* and *Stipa pulcherrima*. The association *Poo badensis-Festucetum pallentis* (alliance *Bromo pannonici-Festucion pallentis*) is related to submediterranean grasslands of southern Europe and limestone or dolomite grasslands of the fringes of the Alps and Carpathians, although it contains several species of continental steppe as well. It occupies more extreme habitats with shallow soils of limestone outcrops. Several succulent *Crassulaceae*, such as *Jovibarba globifera*, *Sedum acre* and *S. album*, are confined to these places, together with *Allium flavum*, *Campanula sibirica*, *Festuca pallens*, *Iris pumila*, *Poa badensis* and *Teucrium montanum*. Short-living spring therophytes, such as *Arabis auriculata*, *Cerastium pumilum* agg., *Erophila spathulata* and *Holosteum umbellatum*, are typical of both types of dry grassland. The north- and west-facing rocky slopes support *Sesleria caerulea* grasslands of the association *Minuartio setaceae-Seslerietum caeruleae* (alliance *Diantho lumnitzeri-Seslerion*). These are related to *Sesleria* grasslands which occur on limestones of the montane and subalpine belt of the Alps and the Carpathians. It is supposed that in the Pleistocene full-glacial periods these grasslands occupied lowland mesic sites on base-rich soils, but they retreated due to spread of other vegetation types in the Holocene. Currently they are restricted to high-altitudinal limestone areas in the Alps and the Carpathians and to a few lowland sites such as the Pavlov Hills. They harbour several relict or dealpine species, e.g. *Arenaria grandiflora*, *Biscutella laevigata* subsp. *varia*, *Dianthus lumnitzeri*, *Saxifraga paniculata* and *Tephroseris integrifolia*.

Dry grassland types described above are natural in many places, but at some sites they developed due to deforestation and grazing. There are also other grassland types of secondary origin in the Pavlov Hills which are of high interest for biodiversity conservation. For example, deep soils on loess and other soft sediments on the foothills support semi-dry grasslands with *Bromus erectus* and *Brachypodium pinnatum* (*Polygalo majoris-Brachypodietum pinnati*, alliance *Cirsio-Brachypodion pinnati*). Some of these grasslands developed on abandoned fields, and during few decades they became very rich in species and attained a high conservation value.

Other examples of remarkable plant communities of the Pavlov Hills include xeric shrub communities (alliances *Berberidion* and *Prunion spinosae*), weed communities of calcareous soils (alliance *Caucalidion lappulae*) and communities of fallow land (*Dauco-Picridetum*, alliance *Dauco-Melilotion*).

Flora

The Pavlov Hills have, due to their geographic position at the northeastern edge of Pannonia, a very remarkable flora. Steppe and rock habitats harbour two major plant groups with contrasting distribution ranges: (1) “eastern” species, i.e. those with Pannonian, Pontic-Pannonian, or Continental distribution ranges, and (2) “southern” species, i.e. mainly those with Submediterranean distribution ranges. Several species of the first group reach their western distribution limits in southern Moravia, while those of the second group grow here near their northern

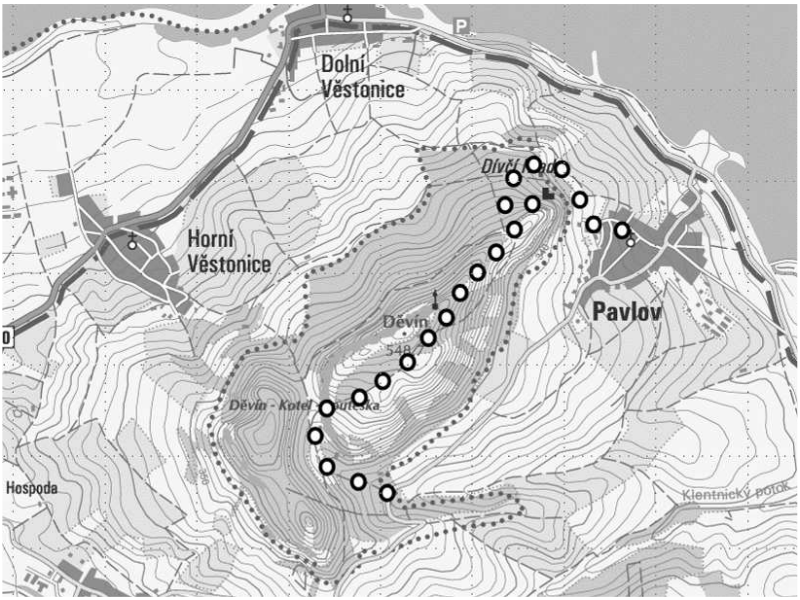
distribution limits. Continental species are represented, among others, by *Adonis vernalis*, *Astragalus austriacus*, *Carex stenophylla*, *Helictotrichon desertorum*, *Peucedanum alsaticum*, *Phlomis tuberosa*, *Stipa pennata* s. str., *Thalictrum foetidum* and *Viola ambigua*; they may be considered relicts of late Pleistocene and early Holocene continental steppe. *Cytisus procumbens*, *Iris pumila*, *Jurinea mollis*, *Linum hirsutum* and *Medicago prostrata* are Pontic-Pannonian or Pannonian species. The group of species with Submediterranean distribution ranges includes *Ficaria calthifolia*, *Fumana procumbens*, *Globularia bisnagarica*, *Linum tenuifolium*, *Lithospermum purpurocaeruleum*, *Minuartia fastigiata*, *M. setacea*, *Orlaya grandiflora*, *Parietaria officinalis*, *Quercus pubescens*, *Salvia aethiopis*, *Stipa pulcherrima*, *Teucrium montanum*, *Trinia glauca* and *Viola kitaibeliana*, the latter known in the Czech Republic only from the castle ruin Děvičky on Děvín Hill. *Stipa eriocaulis*, in the Czech Republic growing only on Svatý kopeček Hill above the town of Mikulov, also belongs to this group. Central European species are represented by *Viola tricolor* subsp. *saxatilis* and by species of broad-leaved deciduous forests, such as *Aconitum lycoctonum*, *Corydalis pumila* and *Hepatica nobilis*. *Dianthus lumnitzeri*, protected under the EU Habitats Directive, is endemic to western Pannonia. It occurs in southern Moravia (only in the Pavlov Hills), Lower Austria, south-western Slovakia and northern Hungary. The rocks of Děvín Hill harbour *Arenaria grandiflora* at the northernmost point of its distribution range.

National Nature Reserve Děvín-Kotel-Soutěska

The National Nature Reserve Děvín-Kotel-Soutěska is situated in the northernmost part of the Pavlov Hills between the villages of Pavlov, Dolní Věstonice, Horní Věstonice, Perná and Klentnice. It includes Děvín Hill (Maidenberg in German; 554 m) in the north-east and Kotelná Hill (also Obora Hill; 462), separated by the narrow and deep gorge Soutěska. On the northernmost hilltop of Děvín there is a ruin of the medieval castle Děvičky (in German Maidenstein). The hills are built mainly of hard and white Ernstbrunn limestone, forming spectacular cliffs above the Soutěska gorge, above the north-western slopes of Děvín Hill and on the western slope of Kotelná Hill.

The nature reserve, established in 1946, is 381 ha large. Its vegetation has been basically described above in the characteristics of vegetation of the Pavlov Hills as a whole. Flora of the reserve consist of 643 species, recorded in 1992–2004(–2007) and listed in Appendix 1.

Human impact on the ecosystems of Děvín Hill has been very long. In the Upper Palaeolithic Gravettian Period, there were human settlements on lower slopes of the hill. A fortified settlement was established in the northeast of the hilltop in the Upper Bronze Age. The castle Děvičky, built in late-Romanic and early-Gothic style, was first mentioned in written documents in the early 13th century. In the 14th century, another castle, known as Neuhaus or Domus nova, was established in the northern part of Kotel Hill. Small limestone quarries existed at several places.



National Nature Reserve Děvín-Kotel-Soutěska; dots indicate the excursion route

Nature Reserve Svatý kopeček

Svatý kopeček (363 m; Heiliger Berg in German) is flanking the town of Mikulov from the east. The hill, elongated roughly from the northeast to the southwest, is formed of white and hard Jurassic limestone. Its northwestern part was destroyed by the quarrying of limestone, lasting from 1816 to the early 1970s.

On the northwestern slopes of the hill, fragments of chasmophytic vegetation with *Aurinia saxatilis* subsp. *arduini* and *Thalictrum foetidum* are developed. The steep west-facing slope above the town of Mikulov is covered by *Sesleria caerulea* grasslands of the association *Minuartio setaceae-Seslerietum caeruleae*, harbouring a small population of *Pulsatilla grandis*. South- and southeast-facing slopes of Svatý kopeček support a patchy mosaic of dry grasslands of the associations *Poo badensis-Festucetum pallentis* and *Koelerio macranthae-Stipetum joannis*, the latter containing large stands of *Stipa pulcherrima* and *S. eriocaulis*. In mid-April, stands of flowering *Iris pumila* may be observed along the tourist trail, followed by another iris, *I. humilis* subsp. *arenaria* two weeks later. *Prunus mahaleb* and *Crataegus monogyna* are dominant species of dense shrubberies on the southeast-facing slope.

The forest stands on the hill are mainly secondary, with *Fraxinus excelsior*, *Quercus robur* and *Acer platanoides* as dominant species. Also *Pinus nigra* was planted here at the turn of the 19th century or somewhat later, as was *Syringa*

vulgaris, introduced here by the Scenic Improvement Society ("Verschönerungsverein") and now encroaching large patches on the west-facing slope. Further invasive trees are *Robinia pseudacacia* and *Ailanthus altissima*, both spreading mainly on the east-facing slope. The thermophilous oak forests of the association *Corno-Quercetum* survived only as a small stand in the northeastern part of the reserve.

The flora of the reserve includes about 407 species and hybrids of vascular plants, recorded here in 1992–2004 (Appendix 2). Svatý kopeček is one of the most species-rich sites for the genera *Orobanche* (s. lat.) and *Viola* in the Czech Republic, supporting seven species of the former, and eleven species and five hybrids of the latter. The most remarkable species of these genera are *Orobanche arenaria*, *O. artemisiae-campestris* and *Viola ambigua*. Due to the geographic location above the western edge of the town of Mikulov and strong human influence, the proportion of alien species is very large.

The fifteen Stations of the Cross along the path to the hilltop were established in 1626–1723. The white Baroque pilgrimage Church of St. Sebastian and the neighbouring campanile on the flat top were built in the 17th century. By construction of these buildings catholic church tried to support the Counter-Reformation and to break up the old pagan belief that the hill summit was the meeting point of witches, as documented by the original German name of the hill – Tanzberg (Hill of Dances). From the top of Svatý kopeček there is a nice view of the medieval town of Mikulov, dominated by a chateau, built in the 17th century on the fundaments of the original gothic castle by Cardinal Franz von Dietrichstein, Bishop of Olomouc and Governor of Moravia. Since 1946, Svatý kopeček has been protected as nature reserve.

References

Čtyroký P., Havlíček P., Stráník Z. & Pálenský P. (1995): Geologická a přírodovědná mapa CHKO a BR Pálava. Geologische und naturwissenschaftliche Karte des Landschaftsschutzgebietes (CHKO) und des Biosphärenreservats (BR) Pálava. 1 : 25000. – Český geologický ústav, Praha.

Danihelka J. & Šumberová K. (2004): O rozšíření některých cévnatých rostlin na nejjižnější Moravě II. [On the distribution of some vascular plants in southernmost Moravia II]. – Příroda (Praha) 21: 117–192.

Horák J. (1969): Waldtypen der Pavlovské kopce (Pollauer Berge). – Přírod. Pr. Úst. Čs. Akad. Věd Brno 3 (1969)/7: 1–40.

Klika J. (1931): Studien über die xerotherme Vegetation Mitteleuropas I. Die Pollauer Berge im südlichen Mähren. – Beih. Bot. Cbl., Ser. B, 47: 343–398.

Ložek V. (1957): Jak vypadaly Pavlovské vrchy v interglaciálu [The landscape of the Pavlov Hills during the interglacial]. – Ochr. Přír. 12: 285–288.

Podpěra J. (1912): Über das Vorkommen des *Avenastrum desertorum* (Less.) Podp. in Mähren. – Österr. Bot. Z. 62: 249–252.

Podpěra J. (1928): Die Vegetationsverhältnisse im Gebiete der Pollauer Berge. Ein Beitrag zur Pflanzengeographie Mährens. – Acta Bot. Bohem. 6–7: 77–132.

Rybníčková E. & Rybníček K. (1991) The environment of the Pavlovian – palaeoecological results from Bulhary, South Moravia. – In: Kovar-Eder J. (ed.), Palaeovegetational development in Europe and regions relevant to its palaeofloristic evolution, pp. 73–79, Museum of Natural History, Vienna.

Šmarda J. (1975): Rostlinná společenstva skalnaté lesostepi Pavlovských kopců na Moravě (ČSSR) [Plant communities of the rocky forest-steppe in the Pavlov Hills in Moravia]. – Čs. Ochr. Prír. 14 (1974): 5–58.

Šuk V. (1956): Květena Mikulovska [Flora of the Mikulov region]. – In: Hosák L., Valoušek B. & Šuk V. [eds], Mikulovsko, pp. 97–139, Mikulov.

Toman M. (1976): Materiál k fytocenologii společenstev třídy *Festuco-Brometea* na Pavlovských kopcích (jižní Morava) [Materials on phytosociology of the communities of the Festuco-Brometea class in the Pavlov Hills (southern Moravia)]. – Zborn. Pedag. Fak. Prešov Univ. Šafárika Košice 14: 127–134.

Unar J. (2004): Xerotermní vegetace Pavlovských vrchů [Xero-thermophilous vegetation of the Pavlov Hills]. – Sborn. Přírod. Kl. Uherské Hradiště, Suppl. 11: 1–140.

Vašátko J. (1979): Geobiocenózy Pavlovských vrchů a okolí [Geobiocoenoses of the Pavlov Hills and of their surroundings]. – Stud. ČSAV 1979/10: 1–93.

Vašátko J. & Ložek V. (1973): Der holozäne Bodenkomplex von Pavlov und seine Bedeutung für die Landschaftsgeschichte des südmährischen Tschernosemgebiets. – Zpr. Geogr. Úst. ČSAV 10/7: 1–10.

Zlatník A. (1928): Études écologiques et sociologiques sur le *Sesleria coerulea* et le *Seslerion calcarie* en Tchécoslovaquie. – Rozpr. Král. Čes. Společ. Nauk, cl. 2, ser. nova, 8/1: 1–116.

Appendix 1. Vascular plants of the National Nature Reserve Děvín-Kotel-Soutěska. Alien species are marked by (al.)

Acer campestre
Acer platanoides
Acer pseudoplatanus
Acinos arvensis
Aconitum lycoctonum subsp. *lycoctonum*
Adonis aestivalis
Adonis vernalis
Adoxa moschatellina
Aegopodium podagraria
Aesculus hippocastanum (al.)
Aethusa cynapium s. lat.
Agrimonia eupatoria
Agrostis gigantea
Achillea collina
Achillea pannonica
Ailanthus altissima (al.)
Ajuga genevensis
Ajuga chamaepitys
Ajuga reptans
Alliaria petiolata
Allium angulosum
Allium flavum
Allium oleraceum
Allium scorodoprasum
Allium senescens subsp. *montanum*
Alopecurus pratensis
Alyssum alyssoides
Alyssum montanum
Amaranthus powellii
Amaranthus retroflexus
Anagallis foemina
Androsace elongata
Anemone nemorosa

Anemone ranunculoides
Anemone sylvestris
Anthericum ramosum
Anthriscus cerefolium subsp. *trichosperma*
Anthriscus sylvestris
Anthyllis vulneraria
Arabis auriculata
Arabis glabra
Arabis hirsuta
Arabis sagittata
Arabis turrita
Arctium lappa
Arctium tomentosum
Arenaria grandiflora
Arenaria serpyllifolia
Armoracia rusticana (al.)
Arrhenatherum elatius
Artemisia absinthium
Artemisia campestris
Artemisia vulgaris
Arum cylindraceum
Asarum europaeum
Asparagus officinalis
Asperula cynanchica
Asplenium ruta-muraria
Asplenium trichomanes
Aster amellus
Aster lanceolatus
Aster linosyris
Astragalus austriacus
Astragalus cicer
Astragalus glycyphyllos
Astragalus onobrychis
Atriplex oblongifolia
Atriplex patula
Atriplex sagittata
Aurinia saxatilis subsp. *arduini*
Avenula pratensis
Avenula pubescens
Ballota nigra subsp. *nigra*
Barbarea stricta
Barbarea vulgaris subsp. *vulgaris*
Bellis perennis
Berberis vulgaris
Berteroa incana
Betonica officinalis
Betula pendula
Bidens frondosa
Biscutella laevigata subsp. *varia*
Bothriochloa ischaemum
Botrychium lunaria
Brachypodium pinnatum
Brachypodium sylvaticum
Briza media
Bromus benekenii
Bromus erectus
Bromus hordeaceus subsp. *hordeaceus*
Bromus inermis
Bromus japonicus
Bromus sterilis
Bromus tectorum
Bryonia alba
Bupleurum falcatum
Calamagrostis epigejos
Camelina microcarpa
Campanula bononiensis
Campanula glomerata
Campanula persicifolia
Campanula rapunculoides
Campanula sibirica
Campanula trachelium
Cannabis ruderalis
Capsella bursa-pastoris
Cardamine impatiens
Carduus acanthoides
Carduus crispus
Carduus nutans
Carex caryophyllea
Carex contigua
Carex digitata
Carex humilis
Carex michelii
Carex montana
Carex muricata
Carex pilosa
Carex praecox
Carex supina
Carex sylvatica
Carlina acaulis subsp. *acaulis*
Carlina biebersteinii

Carpinus betulus
Carum carvi
Caucalis platycarpos
Centaurea jacea subsp. *angustifolia*
Centaurea scabiosa
Centaurea stoebe
Centaurea triumfettii subsp. *axillaris*
Cephalanthera damasonium
Cephalanthera rubra
Cerastium arvense
Cerastium glutinosum
Cerastium holosteoides subsp. *triviale*
Cerastium pumilum
Cerastium semidecandrum
Cerinthe minor
Chaerophyllum bulbosum
Chaerophyllum temulum
Chamaecytisus ratisbonensis
Chamaecytisus virescens
Chelidonium majus
Chenopodium album
Chenopodium hybridum
Chenopodium opulifolium
Chenopodium polyspermum
Chenopodium pumilio
Chondrilla juncea
Cichorium intybus
Cirsium arvense
Cirsium vulgare
Clematis recta
Clematis vitalba
Clinopodium vulgare
Colchicum autumnale
Conium maculatum
Consolida regalis
Convallaria majalis
Convolvulus arvensis
Conyza canadensis
Cornus mas
Cornus sanguinea
Corydalis cava
Corydalis intermedia
Corydalis pumila
Corylus avellana
Cotoneaster integerrimus
Crataegus laevigata
Crataegus monogyna
Crepis biennis
Crepis foetida subsp. *rhoeadifolia*
Crepis praemorsa
Cuscuta epithymum
Cuscuta europaea
Cyclamen purpurascens
Cynoglossum officinale
Cytisus nigricans
Cytisus procumbens
Dactylis glomerata
Dactylis polygama
Datura stramonium
Daucus carota subsp. *carota*
Dentaria bulbifera
Dentaria enneaphyllos
Descurainia sophia
Dianthus lumnitzeri
Dianthus pontederae
Dictamnus albus
Digitalis grandiflora
Dipsacus laciniatus
Dorycnium germanicum
Dryopteris filix-mas
Echinops sphaerocephalus
Echium vulgare
Elymus caninus
Elytrigia intermedia
Elytrigia repens
Epilobium montanum
Epilobium roseum
Epipactis helleborine
Epipactis microphylla
Erigeron podolicus
Erigeron serotinus
Erodium cicutarium
Erophila spathulata
Eryngium campestre
Erysimum durum
Erysimum cheiranthoides
Erysimum odoratum
Euonymus europaea
Euonymus verrucosa
Eupatorium cannabinum

Euphorbia amygdaloides
Euphorbia cyparissias
Euphorbia epithymoides
Euphorbia esula
Euphorbia exigua
Euphorbia falcata
Euphorbia helioscopia
Euphorbia waldsteinii
Euphrasia stricta
Euphrasia tatarica
Falcaria vulgaris
Fallopia dumetorum
Festuca arundinacea
Festuca gigantea
Festuca heterophylla
Festuca pallens
Festuca pratensis
Festuca rubra
Festuca rupicola
Festuca valesiaca
Ficaria calthifolia
Ficaria verna subsp. *bulbifera*
Filipendula vulgaris
Fragaria moschata
Fragaria vesca
Fragaria viridis
Fraxinus excelsior
Fumana procumbens
Fumaria schleicheri
Fumaria vaillantii
Gagea lutea
Gagea minima
Gagea pusilla
Gagea villosa
Galanthus nivalis
Galeobdolon montanum
Galeopsis angustifolia
Galeopsis pubescens
Galinsoga parviflora
Galium album subsp. *album*
Galium album subsp. *pycnotrichum*
Galium aparine
Galium austriacum
Galium boreale subsp. *boreale*
Galium glaucum
Galium mollugo agg.
Galium odoratum
Galium spurium
Galium sylvaticum
Galium verum
Genista tinctoria
Gentiana cruciata
Geranium columbinum
Geranium divaricatum
Geranium pratense
Geranium pusillum
Geranium pyrenaicum
Geranium robertianum
Geranium sanguineum
Geum urbanum
Glechoma hederacea
Glechoma hirsuta
Globularia bisnagarica
Hedera helix
Helianthemum grandiflorum subsp. *obscurum*
Helianthus tuberosus
Hemerocallis sp. (al.)
Hepatica nobilis
Heracleum sphondylium
Hesperis sylvestris
Hesperis tristis
Hieracium bauhini
Hieracium bifidum
Hieracium brachiatum (*H. bauhini – H. pilosella*)
Hieracium cymosum
Hieracium densiflorum (*H. bauhini – H. cymosum*)
Hieracium lachenalii
Hieracium murorum
Hieracium pilosella
Hieracium pilosellinum (*H. densiflorum/zizianum < H. pilosella*)
Hieracium racemosum
Hieracium rothianum (*H. echioides > H. pilosella*)
Hieracium sabaudum
Hieracium umbellatum
Holosteum umbellatum
Hordelymus europaeus

Hordeum murinum
Humulus lupulus
Hylotelephium maximum
Hyoscyamus niger
Hypericum hirsutum
Hypericum montanum
Hypericum perforatum
Impatiens parviflora
Inula britannica
Inula conyza
Inula ensifolia
Inula hirta
Inula oculus-christi
Inula salicina subsp. *salicina*
Inula ×stricta (= *I. ensifolia* × *I. salicina*)
Iris graminea
Iris humilis subsp. *arenaria*
Iris pumila
Iris variegata
Isatis tinctoria subsp. *tinctoria*
Isopyrum thalictroides
Jovibarba globifera subsp. *hirta*
Juglans regia (al.)
Jurinea mollis
Kickxia spuria
Knautia arvensis
Knautia ×posoniensis (= *K. arvensis* × *K. kitaibelii*)
Koeleria macrantha
Lactuca quercina
Lactuca serriola
Lactuca viminea
Lamium album
Lamium amplexicaule
Lamium maculatum
Lamium purpureum
Lappula squarrosa
Lapsana communis
Larix decidua (al.)
Lathraea squamaria
Lathyrus latifolius
Lathyrus niger
Lathyrus pratensis
Lathyrus tuberosus
Lathyrus vernus
Lavatera thuringiaca
Leontodon hispidus
Leonurus cardiaca var. cardiaca
Leonurus marrubiastrum
Lepidium campestre
Leucanthemum vulgare subsp. *vulgare*
Libanotis pyrenaica
Ligustrum vulgare
Lilium martagon
Limodorum abortivum
Linaria genistifolia
Linaria vulgaris
Linum catharticum
Linum hirsutum
Linum tenuifolium
Lithospermum arvense
Lithospermum officinale
Lithospermum purpurocaeruleum
Lolium perenne
Lonicera xylosteum
Loranthus europaeus
Lotus borbasii
Lotus corniculatus
Lycopus europaeus
Lysimachia nummularia
Malus domestica (al.)
Malus sylvestris
Malva alcea
Medicago falcata
Medicago lupulina
Medicago minima
Medicago prostrata
Medicago sativa (al.)
Medicago ×varia (= *M. falcata* × *M. sativa*)
Melampyrum arvense
Melampyrum cristatum
Melampyrum nemorosum
Melampyrum pratense
Melica ciliata
Melica nutans
Melica picta
Melica transsilvanica
Melica uniflora
Melilotus alba

Melilotus officinalis
Melittis melissophyllum
Mentha longifolia
Mercurialis perennis
Milium effusum
Minuartia fastigiata
Minuartia setacea
Moehringia trinervia
Muscari comosum
Muscari neglectum
Muscari tenuiflorum
Mycelis muralis
Myosotis arvensis
Myosotis ramosissima
Myosotis stricta
Myosoton aquaticum
Neottia nidus-avis
Nepeta cataria
Nepeta nuda
Nigella arvensis
Odontites vernus subsp. *serotinus*
Oenanthe aquatica
Omphalodes scorpioides
Onobrychis arenaria
Ononis spinosa
Onopordum acanthium
Orchis militaris
Orchis purpurea
Origanum vulgare
Orlaya grandiflora
Ornithogalum kochii
Orobanche alba subsp. *alba*
Orobanche alba subsp. *major*
Orobanche caryophyllacea
Orobanche elatior
Orobanche lutea
Orobanche picridis
Orobanche purpurea
Orthantha lutea
Oxytropis pilosa
Papaver confine
Papaver maculosum subsp. *austromoravicum*
Papaver rhoeas
Parietaria officinalis
Pastinaca sativa subsp. *sativa*
Persicaria hydropiper
Peucedanum alsaticum
Peucedanum cervaria
Phalaris arundinacea
Phleum phleoides
Phleum pratense
Phlomis tuberosa
Picea abies (al.)
Picris hieracioides
Pimpinella major
Pimpinella saxifraga subsp. *nigra*
Pinus nigra (al.)
Pinus sylvestris (al.)
Plantago lanceolata
Plantago major
Plantago media
Plantago uliginosa
Poa angustifolia
Poa annua
Poa badensis
Poa bulbosa
Poa compressa
Poa nemoralis
Poa pratensis
Poa trivialis
Polygala major
Polygonatum multiflorum
Polygonatum odoratum
Polygonum aviculare s. lat.
Populus alba
Populus tremula
Populus ×canadensis (al.)
Potentilla arenaria
Potentilla argentea
Potentilla heptaphylla
Potentilla inclinata
Potentilla recta
Potentilla reptans
Primula veris
Prunella vulgaris
Prunus avium
Prunus cerasifera
Prunus domestica
Prunus fruticosa
Prunus mahaleb
Prunus spinosa

Prunus ×eminens (*P. fruticosa* × *P. cerasus*)
Pseudotsuga menziesii (al.)
Pulmonaria officinalis
Pulsatilla grandis
Pyrus pyraster
Quercus cerris (al.)
Quercus petraea
Quercus pubescens
Quercus robur
Ranunculus illyricus
Ranunculus polyanthemos
Ranunculus repens
Rapistrum perenne
Reseda lutea
Reseda luteola
Rhamnus cathartica
Robinia pseudacacia (al.)
Rosa agrestis
Rosa canina
Rosa dumalis subsp. *subcanina*
Rosa gallica
Rosa spinosissima
Rubus armeniacus (al.)
Rubus caesius
Rumex acetosa
Rumex crispus
Rumex obtusifolius
Salvia nemorosa
Salvia pratensis
Salvia verticillata
Sambucus nigra
Sanguisorba minor
Saxifraga paniculata
Saxifraga tridactylites
Scabiosa canescens
Scabiosa ochroleuca
Scorzonera austriaca
Scorzonera cana
Scorzonera hispanica
Scrophularia nodosa
Securigera varia
Sedum acre
Sedum album
Sedum spurium
Senecio jacobaea
Senecio viscosus
Serratula tinctoria
Seseli annuum
Seseli hippomarathrum
Seseli osseum
Sesleria albicans
Setaria pumila
Setaria viridis
Sherardia arvensis
Silene latifolia
Silene noctiflora
Silene nutans
Silene otites
Silene vulgaris subsp. *antelopum*
Silene vulgaris subsp. *vulgaris*
Sinapis arvensis
Sisymbrium altissimum
Sisymbrium loeselii
Sisymbrium orientale
Sisymbrium strictissimum
Solanum nigrum
Solidago virgaurea subsp. *virgaurea*
Sonchus asper
Sonchus oleraceus
Sorbus aria
Sorbus aucuparia (al.)
Sorbus danubialis
Sorbus domestica
Sorbus torminalis
Stachys annua
Stachys germanica
Stachys palustris
Stachys recta
Staphylea pinnata
Stellaria media
Stellaria pallida
Stipa capillata
Stipa pennata s. str.
Stipa pulcherrima
Symphytum officinale
Syringa vulgaris (al.)
Tanacetum corymbosum subsp. *corymbosum*
Tanacetum vulgare
Taraxacum erythrospermum

Taraxacum parnassicum
Taraxacum sect. *Ruderalia*
Taraxacum serotinum
Taxus baccata
Tephroseris integrifolia
Teucrium chamaedrys
Teucrium montanum
Thalictrum flavum
Thalictrum minus
Thesium dollineri
Thesium linophyllon
Thlaspi arvense
Thlaspi perfoliatum
Thuja occidentalis (al.)
Thuja plicata (al.)
Thymelaea passerina
Thymus glabrescens
Thymus pannonicus
Thymus praecox
Tilia cordata
Tilia platyphyllos
Torilis arvensis
Torilis japonica
Tragopogon dubius
Tragopogon orientalis
Trifolium alpestre
Trifolium arvense
Trifolium campestre
Trifolium dubium
Trifolium montanum
Trifolium pratense
Trifolium repens
Tripleurospermum inodorum
Ulmus glabra
Ulmus laevis
Ulmus minor
Urtica dioica
Valeriana stolonifera subsp. *angustifolia*
Valerianella locusta
Verbascum blattaria
Verbascum chaixii subsp. *austriacum*
Verbascum lychnitis
Veronica arvensis
Veronica chamaedrys s. str.
Veronica persica
Veronica polita
Veronica praecox
Veronica prostrata
Veronica sublobata
Veronica teucrium
Veronica triloba
Veronica vindobonensis
Viburnum lantana
Vicia angustifolia
Vicia cracca
Vicia dumetorum
Vicia hirsuta
Vicia pisiformis
Vicia tenuifolia
Vicia tetrasperma
Vinca minor
Vincetoxicum hirundinaria
Viola ambigua
Viola arvensis
Viola hirta
Viola kitaibeliana
Viola mirabilis
Viola odorata
Viola reichenbachiana
Viola rupestris
Viola suavis
Viola tricolor subsp. *saxatilis*
Viola ×*scabra* (= *V. hirta* × *V. odorata*)
Viola ×*vindobonensis* (= *V. odorata* × *V.suavis*)
Viscum album subsp. *album*
Vitis sp. (al.)

Appendix 2. Vascular plants of the Nature Reserve Svatý kopeček. Alien species, mainly planted trees and shrubs, and rather recent garden escapees, are marked by (al.).

Acer campestre
Acer negundo
Acer platanoides
Acer pseudoplatanus
Acinos arvensis
Aesculus hippocastanum (al.)
Agrimonia eupatoria
Achillea collina
Achillea pannonica
Ailanthus altissima (al.)
Ajuga genevensis
Ajuga chamaepitys
Alliaria petiolata
Allium flavum
Allium oleraceum
Allium rotundum
Allium scorodoprasum
Allium senescens subsp. *montanum*
Alyssum alyssoides
Alyssum montanum
Anemone ranunculoides
Anthericum ramosum
Anthriscus caucalis
Anthriscus cerefolium subsp. *trichosperma*
Anthriscus sylvestris
Anthyllis vulneraria
Arabis auriculata
Arabis glabra
Arabis hirsuta
Arabis sagittata
Arctium lappa
Arenaria serpyllifolia
Arrhenatherum elatius
Artemisia absinthium
Artemisia campestris
Artemisia vulgaris
Asparagus officinalis
Asperula cynanchica
Asplenium ruta-muraria
Asplenium trichomanes
Aster amellus
Aster linosyris
Astragalus austriacus
Astragalus onobrychis
Atriplex oblongifolia
Atriplex patula
Aurinia saxatilis subsp. *arduini*
Avenula pratensis subsp. *hirtifolia*
Avenula pubescens
Ballota nigra subsp. *nigra*
Berberis vulgaris
Berteroa incana
Betonica officinalis
Bothriochloa ischaemum
Brachypodium pinnatum
Brachypodium sylvaticum
Bromus benekenii
Bromus erectus
Bromus inermis
Bromus japonicus
Bromus sterilis
Bromus tectorum
Bryonia alba
Bupleurum falcatum
Calamagrostis epigejos
Camelina microcarpa
Campanula bononiensis
Campanula persicifolia
Campanula rapunculoides
Campanula sibirica
Campanula trachelium
Capsella bursa-pastoris
Carduus acanthoides
Carduus crispus
Carduus nutans
Carex contigua
Carex humilis
Carex michelii
Carex montana
Carex muricata s. str.
Carex supina
Carlina biebersteinii
Carpinus betulus

Caucalis platycarpos
Centaurea scabiosa
Centaurea stoebe
Centaurea triumfettii subsp. *axillaris*
Cephalanthera damasonium
Cerastium glutinosum
Cerastium pumilum
Cerastium semidecandrum
Cerastium tomentosum (al.)
Chaerophyllum temulum
Chelidonium majus
Chenopodium album
Chenopodium strictum
Chondrilla juncea
Cichorium intybus
Cirsium vulgare
Clematis recta
Clematis vitalba
Clinopodium vulgare
Consolida regalis
Convallaria majalis
Convolvulus arvensis
Conyza canadensis
Cornus mas
Cornus sanguinea subsp. *sanguinea*
Cotoneaster integerrimus
Crataegus laevigata
Crataegus monogyna
Crataegus ×*fallacina* (= *C. monogyna* × *C. praemonticola*)
Crataegus ×*media* (= *C. monogyna* × *C. laevigata*)
Cuscuta epithymum
Cymbalaria muralis (al.)
Cynoglossum officinale
Cytisus procumbens
Dactylis glomerata
Dactylis polygama
Daucus carota subsp. *carota*
Descurainia sophia
Dianthus pontederae
Dictamnus albus
Digitalis grandiflora
Diplotaxis tenuifolia
Dorycnium germanicum
Echium vulgare
Elymus caninus
Elytrigia intermedia
Elytrigia repens
Epipactis helleborine
Erigeron acris agg.
Erigeron annuus
Erodium cicutarium
Erophila spathulata
Eryngium campestre
Erysimum diffusum
Euonymus europaea
Euonymus verrucosa
Euphorbia cyparissias
Falcaria vulgaris
Fallopia dumetorum
Festuca pallens
Festuca pseudovina
Festuca rupicola
Festuca valesiaca
Fragaria moschata
Fragaria vesca
Fragaria viridis
Fraxinus excelsior
Fumana procumbens
Fumaria vaillantii
Gagea pratensis
Gagea transversalis
Gagea pusilla
Galanthus nivalis
Galium album subsp. *album*
Galium album subsp. *pycnotrichum*
Galium aparine
Galium glaucum
Galium odoratum
Galium verum
Geranium pusillum
Geranium robertianum
Geranium sanguineum
Geum urbanum
Glechoma hederacea
Globularia bisnagarica
Hedera helix
Helianthemum grandiflorum subsp. *obscurum*
Heracleum sphondylium

Hieracium murorum
Hieracium pilosella
Hieracium rothianum
Hieracium sabaudum
Hieracium umbellatum
Holosteum umbellatum
Hordeum murinum
Hylotelephium maximum
Hypericum hirsutum
Hypericum montanum
Hypericum perforatum
Impatiens parviflora
Inula conyza
Inula ensifolia
Inula hirta
Inula oculus-christi
Iris humilis subsp. *arenaria*
Iris pumila
Isopyrum thalictroides
Jovibarba globifera subsp. *hirta*
Juglans regia (al.)
Jurinea mollis
Koeleria macrantha
Laburnum anagyroides
Lactuca quercina
Lactuca serriola
Lactuca viminea
Lamium album
Lamium amplexicaule
Lamium maculatum
Lamium purpureum
Lapsana communis
Larix decidua (al.)
Lavatera thuringiaca
Leontodon hispidus
Lepidium campestre
Ligustrum vulgare
Linaria genistifolia
Linaria vulgaris
Linum tenuifolium
Lithospermum purpurocaeruleum
Lolium perenne
Lonicera caprifolium
Loranthus europaeus
Lotus borbasii
Lotus corniculatus
Lycium barbarum
Mahonia aquifolium (al.)
Medicago falcata
Medicago lupulina
Medicago minima
Medicago sativa (al.)
Medicago ×varia (= *M. falcata* × *M. sativa*)
Melampyrum arvense
Melica altissima (al.?)
Melica ciliata
Melica uniflora
Melilotus officinalis
Mercurialis perennis
Minuartia fastigiata
Minuartia setacea
Moehringia trinervia
Muscari neglectum
Muscari tenuiflorum
Myosotis ramosissima
Narcissus pseudonarcissus (al.)
Nonea pulla
Onobrychis viciifolia
Origanum vulgare
Ornithogalum kochii
Orobanche alba subsp. *alba*
Orobanche alsatica
Orobnache arenaria
Orobanche artemisiae-campestris
Orobanche caryophyllacea
Orobanche elatior
Orobanche lutea
Orthantha lutea
Oxytropis pilosa
Papaver maculosum subsp. *austromoravicum*
Parthenocissus inserta
Pastinaca sativa subsp. *sativa*
Petrorhagia prolifera
Peucedanum alsaticum
Phleum phleoides
Picris hieracioides
Pimpinella saxifraga subsp. *nigra*
Pinus nigra (al.)
Pinus sylvestris (al.)
Plantago lanceolata

Plantago major
Plantago media
Platycladus orientalis (al.)
Poa angustifolia
Poa annua
Poa badensis
Poa bulbosa
Poa compressa
Poa nemoralis
Polygonatum multiflorum
Polygonatum odoratum
Polygonum aviculare s. lat.
Populus alba
Potentilla arenaria
Potentilla argentea
Potentilla heptaphylla
Potentilla inclinata
Potentilla recta
Primula veris
Prunus avium
Prunus cerasifera (al.)
Prunus fruticosa
Prunus mahaleb subsp. *simonkaii*
Prunus spinosa
Prunus ×*eminens* (= *P. fruticosa* × *P. cerasus*)
Pseudolysimachion spicatum
Pulmonaria officinalis
Pulsatilla grandis
Pyrus pyraster
Quercus cerris (al.)
Quercus petraea
Quercus pubescens
Quercus robur
Ranunculus auricomus agg.
Ranunculus illyricus
Ranunculus polyanthemos
Reseda lutea
Rhamnus cathartica
Ribes rubrum
Ribes uva-crispa
Robinia pseudacacia (al.)
Rosa canina subsp. *canina*
Rosa canina subsp. *corymbifera*
Rosa pimpinellifolia
Rubus caesius
Rumex patientia
Salix caprea
Salvia officinalis (al.)
Salvia pratensis
Salvia verticillata
Sambucus nigra
Sanguisorba minor
Saponaria officinalis
Saxifraga tridactylites
Scabiosa ochroleuca
Scilla sibirica
Scorzonera austriaca
Scorzonera cana
Scrophularia nodosa
Securigera varia
Sedum acre
Sedum album
Sedum spurium
Senecio jacobaea
Seseli annuum
Seseli hippomarathrum
Seseli osseum
Sesleria albicans
Setaria viridis
Silene latifolia subsp. *alba*
Silene nutans
Silene otites
Silene vulgaris subsp. *antelopum*
Silene vulgaris subsp. *vulgaris*
Sisymbrium orientale
Solidago canadensis (al.)
Solidago virgaurea subsp. *virgaurea*
Sorbus torminalis
Stachys recta
Staphylea pinnata
Stellaria media
Stipa capillata
Stipa eriocaulis
Stipa pennata s. str.
Stipa pulcherrima
Syringa vulgaris
Tanacetum corymbosum subsp. *corymbosum*
Taraxacum sect. *Erythrosperma*
Taraxacum sect. *Ruderalia*

Taxus baccata
Teucrium chamaedrys
Teucrium montanum
Thalictrum foetidum
Thalictrum minus
Thesium linophyllon
Thlaspi perfoliatum
Thymus glabrescens
Thymus praecox
Tilia platyphyllos
Torilis arvensis
Torilis japonica
Tragopogon dubius
Tragopogon orientalis
Trifolium alpestre
Trifolium arvense
Trifolium pratense
Trifolium repens
Trifolium rubens
Tulipa ×*gesnerana* (al.)
Ulmus glabra
Ulmus minor
Urtica dioica
Valeriana stolonifera subsp. *angustifolia*
Valerianella locusta
Verbascum chaixii subsp. *austriacum*
Verbascum lychnitis
Verbascum phoeniceum
Verbascum ×*pseudolychnitis* (= *V. chaixii* subsp. *austriacum* × *V. lychnitis*)
Veronica arvensis
Veronica polita
Veronica praecox
Veronica prostrata
Veronica sublobata
Veronica teucrium
Veronica vindobonensis
Viburnum lantana
Vicia tenuifolia
Vinca minor
Vincetoxicum hirundinaria
Viola ambigua
Viola arvensis
Viola collina
Viola hirta
Viola mirabilis
Viola odorata
Viola reichenbachiana
Viola riviniana
Viola rupestris
Viola suavis
Viola tricolor subsp. *saxatilis*
Viola ×*haynaldii* (= *V. ambigua* × *V. suavis*)
Viola ×*hungarica* (= *V. ambigua* × *V. odorata*)
Viola ×*kerneri* (= *V. hirta* × *V. suavis*)
Viola ×*scabra* (= *V. hirta* × *V. odorata*)
Viola ×*vindobonensis* (= *V. odorata* × *V. suavis*)
Vitis sp. (al.)

17th International Workshop European Vegetation Survey
Using phytosociological data to address ecological questions

1-5 May 2008, Masaryk University, Brno, Czech Republic
Abstracts and Excursion Guides

Edited by
Milan Chytrý

Excursion Guides by
Jiří Danihelka, Milan Chytrý, Jan Roleček & Vít Grulich

Published by Masaryk University, Brno
1st edition, 2008
Serial number Př-4/08-02/58
Printed by www.knihovnicka.cz, Tribun EU s. r. o.

ISBN 978-80-210-4585-9