

Sites of Botanical Interest in Moravia Podyjí National Park

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Fig. 1. [Surroundings of the villages of Havraníky and Popice](#), Podyjí National Park. Section of the map "Podrobná turistická mapa na podkladě vojenské topografické mapy 1 : 50 000" (Klub českých turistů Praha, 1991).



Fig. 2. [Dyje valley near the town of Hardegg](#), Podyjí National Park. Sections of the map "Podrobná turistická mapa na podkladě vojenské topografické mapy 1 : 50 000" (Klub českých turistů Praha, 1991).



Fig. 3. [Dry heathland of the association *Carici humilis-Callunetum* on granite](#) near the village of Havraníky, Podyjí National Park. Photo M. Chytrý, 1999.



Fig. 4. [Pine forest of the association *Cardaminopsio petraeae-Pinetum*](#) on the top of the cliff Liščí skála above the valley of the Dyje River, National Park Podyjí. Photo M. Chytrý, 1992.

Geography

The Czech National Park *Podyjí* is situated in southwestern Moravia between the towns of *Znojmo* and *Vranov nad Dyjí* along the Czech-Austrian border.

Natural conditions

National Park *Podyjí* was established at the southeastern edge of the *Českomoravská vrchovina* Highlands which is mainly formed of crystalline rock. A remarkable landscape element is the 60 to 200 m deep, V-shaped valley of the *Dyje (Thaya)* River. The slopes of the valley are steep and dissected by numerous ravines. Outcrops of hard rock are quite frequent. The valley is surrounded by a landscape of rolling hills. The highest point of the area is *Býččí hora* Hill (536 m) in the western part of the NP, the lowest point (208 m) is the level of the *Dyje* River at the eastern edge of the NP.

The area is built of Proterozoic crystalline rock of the Bohemian Massif. In the eastern part of the NP, it is overlaid by soft Miocene (Upper Tertiary) deposits. Crystalline rock (gneiss, mica schist, granitoids) is mostly acidic, but outcrops of more base-rich bedrock (amphibolite, marble) are also encountered. Predominantly in the eastern part of the area, Quaternary eolian deposits (loess) are found.

In the NP, several soil types are developed, cambisol being the predominant one. On crystalline plateaux and gentle slopes with a thick layer of weathered material or young deposits, orthic luvisols can be found. Outcrops of ancient hard bedrock are covered by shallow rankers and lithosols. In depressions with springs, gleysols can be encountered. Rendzinas developed in patches with marble outcrops. On the bottom of the valley, loamy-sandy fluvial deposits can be found. In the eastern part of the area, chernozems are developed on the fine-grained Tertiary or Quaternary deposits, whereas albic luvisols prevail on Neogene sand and gravel.

The climate in the east of the NP is dry and warm. The mean annual temperature in Znojmo-Kuchařovice is 8.8 °C, with 564 mm the mean annual precipitation. Moving to the northwest, the climate becomes increasingly cooler and wetter. The varied terrain of the river valley generates remarkable mesoclimatic patterns. Whereas the gently undulating landscape, at least in the central and north-western part of the area, has oceanic climatic features without distinct minima or maxima, the climate of the river valley is more continental in character. Most continental are the upper parts of the south-facing slopes that may be considerably warm during the daytime but in clear nights cool off to values lower than elsewhere in the valley. There are two types of temperature inversion in the valley. Inversion due to topographical shading mainly affects the lower parts and foothills of the north-facing slopes. It is most intense during the daytime and limits the height of temperature maxima. This type of inversion supports occurrence of montane plants in these habitats. The second type of inversion, due to cold-air drainage, occurs from time to time during clear and calm nights, and reaches up to 3 °C. Particularly in spring, this inversion may cause a frost injury to sensitive plants, so that some species of oceanic distribution and even *Fagus sylvatica* are probably outcompeted in the valley.

History of botanical research and nature conservation

The flora of the area was studied in detail by Adolf Oborny, a secondary school teacher, in the period 1870-1920. Since then hardly any species new to the region have been found except for a few ones from taxonomically intricate groups. The comprehensive *Flora des Znaimer Kreises* enables a comparison with the current situation.

After 1948 the whole territory was closed to the public being a state border area. The Protected Landscape Area *Podyjí* came into existence in 1978. In the 1980s, research was resumed, and its results were later used as arguments for establishing a national park. This happened in 1991 when the NP *Podyjí* was established on an area of 63 km², covering nearly the whole territory of the former PLA. Particularly valuable sites, formerly nature reserves, e.g. *Hamerské vrásky*, *Havranické vřesoviště*, *Hradištské terasy*, *Kraví hora*, *Popické kopečky*, and *Údolí Dyje*, are now protected under the regulations of the first NP zone (core area). The activities on the Czech side of the border were coordinated with those in Austria. On 1 January 2000, the NP became bilateral through the establishment of the National Park *Thaytal* in adjacent Austria.

Vegetation

The NP *Podyjí* is situated in the transitional area between the mesophilous Central-European (Hercynian) and the thermophilous Pannonian floras. The *Pannonicum* and the *Hercynicum* have long been commonly accepted phytogeographic regions of Central Europe. According to the plant geographic classification suggested by Hermann Meusel, the former is a Province within the Pontic-South Siberian Region, while the latter is a Sub-Province of the Central European Province within the Middle European Region. The boundary generally follows the geological dividing line between the Bohemian Massif in the northwest of the NP (with higher altitudes, lower temperatures, higher precipitation, ancient siliceous bedrock, and a landscape with a patchwork of forest tracks and treeless areas) and the outer depressions of the Carpathians and the Alps in the southeast of the NP (with

lower altitudes, a warmer and drier climate, Tertiary and Quaternary deposits, and a landscape largely deforested since prehistoric times).

The predominant vegetation type of the NP is broad-leaved forest. In its western (Hercynian) part, near the towns of *Vranov nad Dyjí* and *Hardegg*, submontane beech forests (*Melico-Fagetum*, *Carici pilosae-Fagetum*, and *Tilio cordatae-Fagetum*; *Fagion*) are the main types of potential natural vegetation. They are found in the gently undulating landscape at altitudes above 450 m. Hercynian oak-hornbeam forests (*Melampyro nemorosi-Carpinetum*; *Carpinion*) are predominant in the central part of the NP and in the river valleys. Moving to the east towards the region of Pannonian flora, oak-hornbeam forests are replaced by acidophilous oak forests and, on the marginal slope of the Bohemian Massif, by thermophilous oak forests (*Sorbo torminalis-Quercetum*; *Quercion petraeae*). In the outer depressions of the Carpathians which are adjacent to the Bohemian Massif in the east, a mosaic of thermophilous oak forests (*Quercetum pubescenti-roboris*, *Aceri tatarici-Quercion*) and Pannonian oak-hornbeam forests (*Primulo veris-Carpinetum*; *Carpinion*) is supposed to be natural; however, this area is largely deforested.

A remarkable vegetation pattern is encountered in the river valleys. The alluvium is covered by riverine alder forests of the association *Stellario-Alnetum glutinosae* (*Alnion incanae*). Lower slopes support ravine forests (*Aceri-Carpinetum*; *Tilio-Acerion*) in steeper sites and oak-hornbeam forests (*Melampyro nemorosi-Carpinetum*) in gentler sites. South-facing upper slopes are covered by thermophilous oak forests (*Sorbo torminalis-Quercetum* and *Genisto pilosae-Quercetum petraeae*; both *Quercion petraeae*) whereas the slopes of north-facing aspect are the habitat of acidophilous oak forests (*Luzulo albidae-Quercetum*; *Genisto germanicae-Quercion*). On the tops of ridges and cliffs, small stands of pine forests (*Cardaminopsio petraeae-Pinetum*; *Dicrano-Pinion*) are found.

The river valley includes patches of primary treeless habitats on cliffs, rock faces and talus slopes. On south-facing slopes, these are dominated by scrub (*Prunion spinosae*, *Berberidion*) or dry grasslands (*Festucion valesiaca*, *Seslerio-Festucion glaucae*, *Alysso-Festucion pallentis*). North-facing treeless patches are dominated by stands of *Calamagrostis arundinacea* on siliceous bedrock, and by *Sesleria albicans* grassland (*Diantho lumnitzeri-Seslerion*) on marble. Talus slopes are covered with cryptogamic vegetation and, near the forest edges, with species-poor communities of mosses and ferns.

Secondary treeless vegetation is mainly found in the border area of the NP and in the adjacent landscape. In the western and central part, *Arrhenatherion* and *Calthion* meadows are predominant types. *Arrhenatherion* meadows are also found in the *Dyje* floodplain in deforested sites. The river is fringed by *Phalaridion arundinaceae* riverine reeds with *Phalaris arundinacea* and *Carex buekii*. The largely deforested marginal slope of the Bohemian Massif is well-known for its extensive dry heathland (*Genistion pilosae* with thermophilous and continental species) and acidophilous grasslands (*Koelerio-Phleion phleoidis*). The area of the Carpathian outer depressions is dominated by arable land and vineyards, and the most striking type of semi-natural vegetation there is the *Convolvulo-Agropyron* grassland in road verges on loess.

Flora

On the marginal slope of the Bohemian Massif a remarkable transitional zone between the *Hercynicum* and the *Pannonicum* is found, situated in a deforested area on siliceous bedrock. It shares species of both phytogeographic regions. Pannonian and Continental species of steppe and ruderal habitats on loess and of subhalophilous sites, e.g. *Alcea biennis*, *Carex hordeistichos*, *Kochia prostrata* (only in Austria), *Peucedanum alsaticum*, *Salvia austriaca* (only in Austria), *Scabiosa canescens*, *Sclerochloa dura*, *Scorzonera cana*, and *Seseli hippomarathrum*, are present in the eastern part of the NP. Some thermophilous elements, e.g. *Aconitum anthora*, *Aurinia saxatilis*, *Bromus squarrosus*, *Cruciata pedemontana*, *Dictamnus albus*, *Iris variegata*, *Minuartia fastigiata*, *Stipa dasyphylla*, *S. pulcherrima*, and *Veratrum nigrum*, are confined to rock outcrops in the river valleys which are surrounded by mesophilous vegetation. On marble, *Gentiana cruciata*, *Inula ensifolia*, *Orchis militaris*, and *O. purpurea* join this group. Montane species, such as *Aconitum variegatum*, *Dentaria enneaphyllos*, *Geranium sylvaticum* (only in Austria), *Hordelymus europaeus*, *Lunaria rediviva*, *Lycopodium clavatum*, *Melampyrum sylvaticum*, *Petasites albus*, *Poa chaixii* (only in Austria), *Prenanthes purpurea*, *Ranunculus platanifolius* (only in Austria), and *Thalictrum aquilegifolium*, can be

mostly found in the river valleys in the western part of the NP where topographical shading controls temperature. Quite remarkable is the presence of perialpine species which indicate phytogeographical relationship to the Alps. This species group is represented by *Bupthalmum salicifolium*, *Bupleurum longifolium* (now only in Austria), *Cyclamen purpurascens*, *Euphorbia angulata*, *Laserpitium latifolium* (only in Austria), *Polygala amara*, *Sesleria varia*, and *Thesium alpinum* (only in Austria). The Siberian (taiga) element, here near its south-western distribution limit, is represented by *Carex pediformis* and *Cimicifuga europaea*.

Macromycetes

The National Park *Podyji/Thayatal* was mycologically studied by F. Kotlaba (Institute of Botany, Průhonice), Z. Pouzar (National Museum, Prague), and P. Vampola (Jihlava) in the 1980s, but mycological research was intensified in the 1990s (V. Antonín and A. Vágner, Moravian Museum, Brno). In total, 828 macromycete taxa have so far been recorded (Antonín & Vágner 2001).

Sites worth visiting

Heathland near the villages of Popice and Havraníky

The gentle slopes of the Bohemian Massif, formed of granitoids, are covered here by Tertiary deposits, mainly sandstone, the depth of which cover increases towards the west. During the Pleistocene, calcareous loess was deposited here, filling up some depressions between the outcrops of crystalline rock.

A mosaic of thermophilous oak forests and oak-hornbeam forests represents the potential natural vegetation. However, after the area had been deforested, the soil was eroded so that secondary succession is very slow or even blocked. Thermophilous acidophilous grasslands of the alliance *Koelerio-Phleion phleoidis* and heathland of the alliance *Genistion pilosae* developed here as the semi-natural vegetation, encompassing also small patches of pioneer communities of the association *Gageo-Veronicetum (Arabidopsis)* on shallow soils adjacent to rock outcrops. The heathland was grazed by sheep approximately until the end of the 19th century and then largely abandoned. In the 1990s, the competitively strong grass *Arrhenatherum elatius* expanded in the area, probably due to increased atmospheric nitrogen deposition. The shallow valleys used to support patches of wet *Calthion* meadows, most of which have been destroyed. *Carex cespitosa*, *Cirsium canum*, and *Iris sibirica* occurred here until recently.

The heathland vegetation comprises an unusual combination of plant geographic elements, all being more or less xerophilous. Pannonian species are rather well represented in the heathland communities of the area. Some of them, such as *Cytisus procumbens*, *Iris pumila*, *Linaria genistifolia*, *Pulsatilla grandis*, and *Saxifraga bulbifera*, approach their western distribution limits here. Acidophilous heathland species, some of them with sub-Atlantic distribution ranges, form another distinct group of plants: it includes *Armeria vulgaris* subsp. *vulgaris*, *Calluna vulgaris*, *Gagea bohémica*, *Scleranthus perennis*, *Sedum reflexum*, *Veronica dillenii*, and *V. verna*. Psammophytes, such as *Corynephorus canescens*, *Filago minima*, and *Vulpia myuros*, are confined to granite outcrops and associated sandy weathering products. *Avenella flexuosa*, *Danthonia decumbens*, *Nardus stricta*, and *Sambucus racemosa* are typical Hercynian elements. *Biscutella laevigata* subsp. *varia* and *Cotoneaster integerrimus* have perialpine distribution ranges.

The endangered species *Helichrysum arenarium*, *Melampyrum arvense*, and *Orchis morio* still form large populations in the area to be visited.

Heathland management

Heathlands are an Atlantic vegetation type, which becomes gradually rare in the more continental climate of dry areas in Central Europe. Being a secondary vegetation, they require regular disturbance to prevent succession into scrub or woodland. The heathlands in the area were grazed by sheep in the 19th century, but no other details on the traditional management are known. In the 20th century the

land was largely abandoned. In the 1990s, some parts of the heathland area were covered with open scrub, woodlots of *Betula pendula* and *Pinus sylvestris*, and the strongly competitive grasses *Arrhenatherum elatius* and *Calamagrostis epigejos* started to expand. In 1992 a series of management experiments started to test the suitability of selected management practices used in West-European heathlands for the rather dry, continental, and species-rich heathlands in *Podyjí* NP.

The management practices tested were burning, sod-cutting with vegetation and topsoil removal, and cutting of the above-ground biomass. Burning appeared successful regeneration of *Calluna vulgaris*. Dense heathlands, which contain a large amount of woody biomass, support medium-intensity fire which destroys moss mats and litter. On bare ground *Calluna* regeneration by seed can take place, in addition to vegetative regrowth. On the contrary, in open heathlands with patches of herbaceous vegetation, low-intensity fires, which do not denude soil, are typical. Almost all *Calluna* regeneration is vegetative in this case, and regrowth is slower.

Heathland recovery after sod-cutting depends on whether or not *Calluna* seed germination occurs in the plot. With germination, the community develops towards heathland; without towards grassland. Cutting promotes a striking increase in grass cover, which is followed by a slow recovery of *Calluna*.

All of these management practices result in an increased species richness of vascular plants, bryophytes, and lichens which are natural constituents of the community. The number of species in experimental plots peaks 3-4 years after the disturbance. The highest increase in species richness is in the sod-cut plots, where species germinate on an exposed mineral soil.

The experiments suggest, that a proper nature conservation management system of heathland could be based on sheep grazing combined with rotational sod-cutting or burning of restricted patches.

However, a serious threat to the biodiversity of the heathlands is the rapid expansion of *Arrhenatherum elatius* which started only in the mid 1990s. Spreading of this grass is probably caused by a nutrient accumulation due to long-time abandonment combined with increased atmospheric nitrogen deposition. Research into this phenomenon started only recently. The NP authorities are trying to stop this expansion by sheep grazing, mowing, and litter removing, but so far the results are unsatisfactory.

Remarkable species of vascular plants

Agrimonia eupatoria

Agrostis vinealis

Achillea collina

Achillea setacea

Allium flavum

Anthriscus cerefolium subsp. *trichosperma*

Arabidopsis thaliana

Aristolochia clematitis

Armeria vulgaris

Arrhenatherum elatius

Artemisia campestris

Asparagus officinalis

Asperula cynanchica

Aster linosyris

Avenella flexuosa

Avenula pratensis

Berteroa incana

Biscutella laevigata subsp. *varia*

Bromus tectorum

Calluna vulgaris

Cardaria draba

Carex humilis

Carex supina

Carlina vulgaris

Centaurea stoebe

Cerastium glutinosum

Chamaecytisus ratisbonensis

Chondrilla juncea

Conium maculatum

Cotoneaster integerrimus

Cytisus procumbens

Cytisus scoparius

Danthonia decumbens

Dianthus carthusianorum

Dianthus deltoides

Echium vulgare

Elytrigia intermedia

Erodium cicutarium

Euphorbia cyparissias

Euphorbia virgata

Festuca ovina

Festuca pallens

Festuca pseudovinia

Festuca valesiaca

Ficaria vernalis

Filago arvensis

Filago minima

Filipendula vulgaris

Fragaria viridis

Frangula alnus

Gagea bohemica
Gagea pusilla
Gagea villosa
Galium valdepilosum
Genista pilosa
Genistella sagittalis
Helichrysum arenarium
Hieracium umbellatum
Hypochoeris maculata
Hypochoeris radicata
Inula britannica
Iris pumila
Jasione montana
Jovibarba globifera
Koeleria macrantha
Linaria genistifolia
Luzula campestris
Lychnis viscaria
Melampyrum arvense
Melica transsilvanica
Mercurialis annua
Myosotis ramosissima
Myosotis stricta
Nardus stricta
Odontites vernus subsp. *serotinus*
Onopordon acanthium
Orphantha lutea
Petrorhagia prolifera
Phleum phleoides
Picris hieracioides
Pilosella echioides
Plantago media
Poa bulbosa
Polygonatum odoratum
Potentilla arenaria
Prunus fruticosa
Pseudolysimachion spicatum
Pulsatilla grandis
Ranunculus bulbosus
Rhinanthus minor
Rosa gallica
Rosa jundzillii
Rosa pimpinellifolia
Rosa rubiginosa

Remarkable macromycetes

Agaricus macrosporus (F.H. Moller et
 Jul. Schöff.) Pilát
A. porphyrizon P.D. Orton
Arrhenia spathulata (Fr.) Redhead
Bovista polymorpha (Vittad.) Kreisel
B. tomentosa (Vittad.) Quél.; an old
 collection, not confirmed during the
 recent field research
Camarophyllus niveus (Scop.) P.
 Karst.
C. pratensis (Pers.) P. Kumm.
Clavaria argillacea Pers.
Clavulinopsis corniculata (Fr.) Corner
Clitocybe agrestis Harmaja

Rumex acetosella
Salvia nemorosa
Salvia pratensis
Sanguisorba minor
Saxifraga bulbifera
Saxifraga granulata
Scabiosa canescens
Scabiosa ochroleuca
Scleranthus perennis
Scleranthus polycarpus
Scorzonera cana
Sedum acre
Sedum reflexum
Sedum sexangulare
Senecio jacobaea
Seseli annuum
Seseli hippomarathrum
Seseli osseum
Silene otites
Sisymbrium altissimum
Stachys recta
Stipa capillata
Stipa joannis
Taraxacum sp. e sect. *Erythrosperma*
Teucrium chamaedrys
Thlaspi perfoliatum
Thymus praecox
Trifolium alpestre
Trifolium arvense
Trifolium campestre
Trifolium montanum
Trifolium retusum
Valerianella locusta
Verbascum lychnitis
Verbascum phoeniceum
Veronica dillenii
Veronica prostrata
Veronica triphyllos
Veronica verna
Veronica vindobonensis
Vicia pannonica subsp. *striata*
Vincetoxicum hirsutinaria
Viola canina

C. amarescens Harmaja
Conocybe ambigua Watling
Entoloma papillatum (Bres.) Dennis
E. sericeum (Bull.) Quél.
E. serrulatum (Fr.) Hesler
Galerina atkinsoniana A.H. Sm.
G. laevis (Pers.) Singer
G. pumila (Pers.) Singer
G. vittiformis (Fr.) Singer
Hygrocybe ceracea (Wulfen) P. Karst.
Hygrophorus aureus (Arrh.) Fr.
H. hypothejus (Fr.) Fr.
Inermisia fusispora (Berk.) Rifai
Lactarius deliciosus Fr.

Lepiota alba (Bres.) Sacc.; a typical and common fungus
Lycoperdon lividum Pers.
Macrolepiota rhacodes var. *bohemica* (Wichanský) Bellú et Lanzoni
Marasmius anomalus Lasch
Melanoleuca brevipes (Bull.) Pat.
M. heterocystidiosa (Beller et Bon) Bon
Mycena aetites (Fr.) Quél.
M. ammoniaca (Fr.) Quél.
M. avenacea (Fr.) Quél.

M. leptcephala (Pers.) Gillet
M. pseudopicta (J.E. Lange) Kühner
Omphalina griseopallida (Desm.) Quél.
Pseudoclitocybe expallens (Pers.) M.M. Moser
Psilocybe montana (Pers.) P. Kumm.
Rhodocybe popinalis (Fr.) Singer
Russula coerulea Fr.
Tephrocybe anthracophila (Lasch) P.D. Orton
T. atrata (Fr.) Donk

Dyje valley near Hardegg

The site worth visiting includes the surroundings of the *Hardegg* vantagepoint (*Hardeggská vyhlídka*) and the slope opposite the town of *Hardegg* (*Hardeggská stráň*). It is situated in the region where the *Dyje* River valley deeply cuts through different layers of *Moravikum* rock series. Various sorts of rock, such as marble and amphibolite on the one hand, and acidic orthogneiss on the other, control the local distribution pattern of plant species and vegetation types.

This part of the area is very rich in species. During a detailed grid mapping of the flora, more than 600 vascular plant species per 1' × 0.6' square (about 1.2 km²) were recorded in the area visited. This number is even more striking when we consider the low human influence in the area. Arable fields and ruderal habitats are almost absent, and even in the past no settlements other than the Austrian town of *Hardegg* existed here.

The plateau above the valley is covered by Hercynian oak-hornbeam forests (*Melampyro nemorosi-Carpinetum*) with *Dentaria bulbifera*, *Hepatica nobilis*, and *Stellaria holostea* in the herb layer, accompanied by perialpidic species *Carex pilosa* and *Cyclamen purpurascens*. *Abies alba* is remarkable here not only for its presence but also for its natural regeneration. In a stand of an oak-hornbeam forest over a marble outcrop, *Cypripedium calceolus* grows together with *Corallorhiza trifida*, *Daphne mezereum*, *Euphorbia angulata*, and *Hierochloë australis*.

The south-facing slopes with outcrops of amphibolite and amphibolitic gneiss support thermophilous oak forests of the association *Sorbo torminalis-Quercetum* with acidophilous species *Agrostis vinealis*, *Avenella flexuosa*, and *Festuca ovina* in the undergrowth. Acidophilous dry grasslands of the alliance *Alysso-Festucion pallentis* are confined to the gneiss outcrops. *Gagea bohemica* and *Veronica dillenii* occur here on rock edges and narrow terraces. On marble, acidophilous oak forests are replaced by basiphilous ones, represented here by the associations *Corno-Quercetum* and *Pruno mahaleb-Quercetum pubescentis*; *Quercus pubescens* is, however, absent from this part of the valley due to its isolated location outside the Pannonian region. In open places, forest edge communities of the alliance *Geranion sanguinei* with *Bupthalmum salicifolium*, *Dictamnus albus*, *Geranium sanguineum*, *Inula hirta*, and *Peucedanum cervaria* are found, together with the dry grasslands of the alliance *Festucion valesiaca* including *Carex humilis*, *Festuca valesiaca*, *Inula ensifolia*, *Orchis militaris*, *Polygala major*, and *Stipa joannis*. Grasslands dominated by *Sesleria albicans*, accompanied by *Aster amellus* and *Hypochoeris maculata*, occur rarely on west-facing slopes. Pioneer communities of the alliance *Cerastion pumili* with terophytes, such as *Arabis auriculata*, *Saxifraga tridactylites*, and *Veronica praecox*, are limited to marble outcrops. Among scattered shrubs, *Sorbus hardeggensis* occurs here. This recently described hybridogenous apomictic species is derived from a crossing between *S. aria* s. l. and *S. torminalis*.

The species composition of most forest stands is nearly natural. Plantations of Scots pine (*Pinus sylvestris*), Norwegian spruce (*Picea abies*) and European larch (*Larix decidua*) will be gradually replaced by autochthonous tree species according to the management plan of the NP. Rock vegetation, thermophilous oak forests, their thermophilous fringes and dry grasslands require no management in the area. The bottom of the *Dyje* River valley used to be farmed. It was covered mainly with *Arrhenatherion* meadows but also with strips of arable land. They have been regrassed since the mid-1990s. The meadows will be preserved here as a valuable component of the cultural landscape.

This area is very rich in interesting and rare fungi.

Remarkable species of vascular plants

Abies alba
Acer campestre
Aconitum anthora
Adoxa moschatellina
Agrostis vinealis
Achillea nobilis
Achillea pannonica
Ajuga genevensis
Allium flavum
Allium senescens subsp. *montanum*
Alnus glutinosa
Alyssum alyssoides
Anemone ranunculoides
Anemone sylvestris
Anthemis tinctoria
Anthericum ramosum
Arabis brassica
Artemisia campestris
Asarum europaeum
Asparagus officinalis
Asperula cynanchica
Asplenium ruta-muraria
Asplenium septentrionale
Aster amellus
Aster linosyris
Aurinia saxatilis
Avenella flexuosa
Batrachium fluitans
Berberis vulgaris
Brachypodium pinnatum
Bromus benekenii
Buphthalmum salicifolium
Bupleurum falcatum
Calamagrostis arundinacea
Campanula persicifolia
Cardaminopsis arenosa
Carex brizoides
Carex buekii
Carex flacca
Carex humilis
Carex michelii
Carex montana
Carex pilosa
Carex supina
Carpinus betulus
Centaurea scabiosa
Centaurea stoebe
Centaurea triumfettii
Cerastium pumilum
Cerastium semidecandrum
Chamaecytisus ratisbonensis
Clematis recta
Convallaria majalis
Corallorhiza trifida
Cornus mas
Corydalis solida
Cotoneaster integerrimus
Crepis praemorsa
Cyclamen purpurascens
Cypripedium calceolus
Dactylis polygama
Daphne mezereum
Dentaria bulbifera
Dictamnus albus
Echium vulgare
Eryngium campestre
Euonymus europaea
Euonymus verrucosa
Euphorbia angulata
Euphorbia cyparissias
Euphorbia dulcis
Euphorbia epithymoides
Fagus sylvatica
Festuca ovina
Festuca pallens
Festuca valesiaca
Gagea bohemica
Gagea minima
Galanthus nivalis
Galeopsis speciosa
Galium glaucum
Galium odoratum
Galium sylvaticum
Galium valdepilosum
Genista germanica
Genista pilosa
Gentiana cruciata
Geranium phaeum
Geranium sanguineum
Glechoma hirsuta
Helianthemum grandiflorum subsp. *obscurum*
Hepatica nobilis
Hesperis sylvestris
Hieracium umbellatum
Hierochloë australis
Hypericum montanum
Hypochoeris maculata
Inula salicina
Inula conyza
Inula ensifolia
Inula ensifolia × *I. germanica*
Inula hirta
Inula oculus-christi
Iris variegata
Isopyrum thalictroides
Juniperus communis
Knautia drymeia
Lactuca quercina
Lactuca viminea
Lappula squarrosa
Lathyrus vernus
Ligustrum vulgare
Lilium martagon
Linaria genistifolia
Lonicera xylosteum

Loranthus europaeus
Luzula divulgata
Luzula luzuloides
Lychnis viscaria
Maianthemum bifolium
Medicago falcata
Melampyrum nemorosum
Melica ciliata
Melica picta
Melica uniflora
Melittis melissophyllum
Mercurialis perennis
Milium effusum
Minuartia fastigiata
Neottia nidus-avis
Omphalodes scorpioides
Orchis militaris
Orchis purpurea
Origanum vulgare
Orobanche lutea
Phalaris arundinacea
Phleum phleoides
Phyteuma spicatum
Pilosella echioides
Pinus sylvestris
Poa bulbosa
Poa nemoralis
Polygala major
Polygonatum multiflorum
Polygonatum odoratum
Potentilla arenaria
Potentilla recta
Primula elatior
Primula veris
Prunus fruticosa
Prunus mahaleb
Pseudolysimachion spicatum
Pulsatilla grandis
Pulsatilla pratensis subsp. *bohemica*
Quercus petraea
Quercus robur
Ranunculus bulbosus
Rumex acetosella
Rumex aquaticus
Salix fragilis
Salvia glutinosa
Salvia pratensis
Sanicula europaea
Saxifraga tridactylites
Scabiosa ochroleuca

Remarkable macromycetes

Antrodia albida (Fr.) Donk
Artomyces pyxidatus (Fr.) Jülich
Athelia alnicola (Bourdot et Galzin)
 Jülich
A. decipiens (Höhn. et Litsch.) J.
 Erikss.
A. epiphylla Pers.
A. salicum Pers.

Scleranthus perennis
Scrophularia umbrosa
Sedum album
Sedum reflexum
Senecio germanicus
Seseli libanotis
Seseli osseum
Sesleria albicans
Silene nutans
Sisymbrium strictissimum
Sorbus aria agg.
Sorbus hardwegensis
Sorbus torminalis
Stachys recta
Stellaria holostea
Stellaria nemorum
Stipa capillata
Stipa dasyphylla
Stipa joannis
Stipa pulcherrima
Symphytum tuberosum
Tanacetum corymbosum
Taxus baccata
Teucrium chamaedrys
Thesium linophyllum
Thlaspi caerulescens
Thlaspi perfoliatum
Thymus praecox
Tilia cordata
Tilia platyphyllos
Trifolium alpestre
Trifolium montanum
Ulmus glabra
Ulmus laevis
Vaccinium myrtillus
Verbascum chaixii subsp. *austriacum*
Verbascum nigrum
Veronica dillenii
Veronica praecox
Veronica prostrata
Veronica teucrium
Veronica vindobonensis
Viburnum lantana
Vicia sylvatica
Vicia tenuifolia
Vincetoxicum hirundinaria
Viola mirabilis
Viola tricolor subsp. *saxatilis*
Viscum laxum

Biscogniauxia cinereolilacina (J.H.
 Mill.) Pouzar; a very rare fungus with
 less than ten localities in the Czech
 Republic
B. marginata (Fr.) Pouzar
B. nummularia (Bull.) Kuntze
B. simplicior Pouzar; a very rare
 fungus found only on Rhamnus with

seven localities in the Czech Republic
Buglossoporus pulvinus (Pers.) Donk
Cantharellus pallens Pilát
Ceriporia excelsa (S. Lundell)
 Parmasto
Ceriporiopsis aneirinus (Sommerf.)
 Domaňski
Confertobasidium olivaceoalbum
 (Bourdot et Galzin) Jülich
Grandinia barba-jovis (Fr.) Jülich
G. breviseta (P. Karst.) Jülich
G. verruculosa (J. Erikss. et Hjortstam)
 Jülich
Gymnopus fusipes (Bull.) Gray
Hymenochaete subfuliginosa (Bourdot
 et Galzin) Hruby
Hyphoderma mutatum (Peck) Donk
H. praetermissum (P. Karst.) J. Erikss.
H. setigerum (Fr.) Donk
Hypochnicium geogenium (Bres.) J.
 Erikss.
Chlorosplenium aeruginascens
 (Nyland.) P. Karst.; found forming
 carpophores here
Inonotus dryophilus (Berk.) Murrill
Junghuhnia separabilima (Pouzar)
 Ryvarden
Lactarius porninsis Rolland
Lepiota fulvella Rea

Leucogyrophana pinastri (Fr.) Ginns et
 Weresub
L. pseudomollusca (Parmasto)
 Parmasto
Macrolepiota konradii (Huijsman ex
 P.D. Orton) M. M. Moser
Marasmius torquescens QuéL.
Meruliopsis taxicola (Pers.) Boud.
Nectria episphaeria (Tode) Fr.
N. peziza (Tode) Fr.
Pachykytospora tuberculosa (Fr.) Kotl.
 et Pouzar
Pezicula livida (Berk. et Broome)
 Rehm
Phellinus hartigii (Allesch. et Schnell)
 Bondartsev
P. punctatus (P. Karst.) Pilát
Pleurotus calyptratus (Lindbl.) Sacc.
Pluteus alborugosus Kühner
Scytinostroma galactinum (Fr.) Donk
Sistotrema hirschii (Donk) Donk
Skeletocutis subincarnata (Peck) Jean
 Keller; probably the first find ever in
 Moravia
Tomentella ruttneri Litsch.
Trechispora cohaerens (Schwein.)
 Jülich et Stalpers
Tulasnella eichleriana Bres.
T. violacea (J. Olsen) Jülich

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Note

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