

Remarkable dry grassland type/site

In this section, particular grassland communities or grassland sites will be introduced which are from certain point of view interesting for other EDGG members. You are invited to present your favorite grassland associations or those that are attractive in other aspects (their diagnostic species, distribution area, management and conservation), or you can simply present the picture gallery. Remarkable localities of dry grassland habitats can be introduced representing e.g. important research areas, refuges of rare and endangered species or simply places requiring special conservational measures.

In this issue, we will introduce the locality Vrchná hora from south-western part of Slovak Republic. In spite of its high biological value this locality lacks the effective conservation and the maintenance of valuable xerothermophilous communities is thus endangered by commercial activities. This is the reason why the local nature conservationist prepare a project to rescue this locality and search appropriate partners from Germany (see the call in the section Forum).

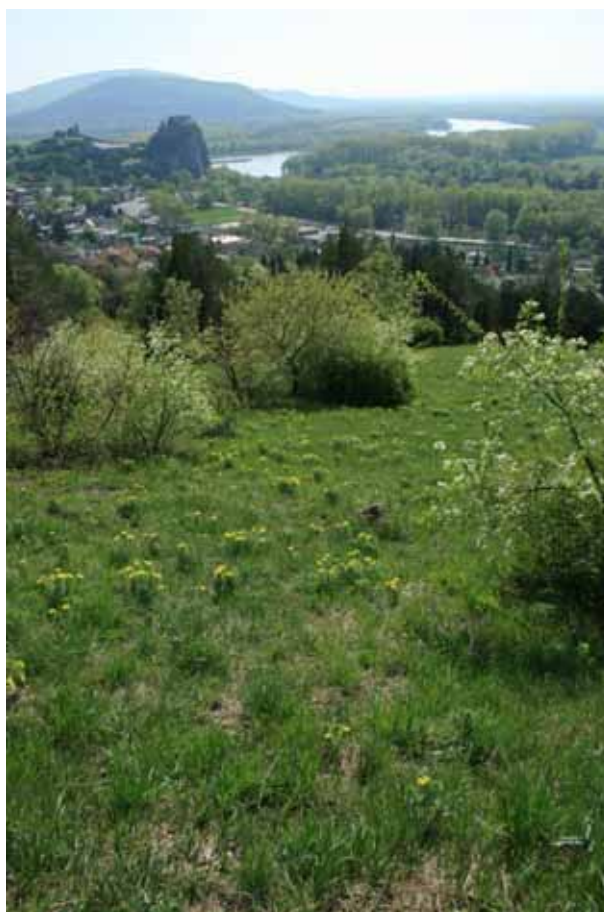
Devínska Kobyla and Sandberg - National Nature Reserve (Slovak Republic)

Devínska Kobyla and Sandberg, a well known botanical, palaeontological and geological locality, is situated near by Bratislava - the capital city of Slovakia. The protected area of National Nature Reserve (NNR) is 102 ha. It represents one of the NATURA 2000 sites and also Important Plant Area.

In term of geology, Devínska Kobyla represents a very interesting territory, remarkable especially for its Neogene fauna from the surrounding of Devínska Nová Ves village. The unique range of the Carpathians begins by the Devín castle rock on the confluence of two rivers Dunaj and Morava on territory of Slovakia.

Southern slopes of NNR are created mainly by grey limestones, dolomites and carbonate breccia. Strata are 160-180 million years old. The top of the hill Devínska Kobyla (514 m) with the same name, which is outside of reserve, is formed by Mesozoic quartzites. The sand pit Sandberg is a Neogene paleontological locality of the European importance. Its territory represents a stratotype locality for stratigraphical substage called "devín". It was discovered by sand mining. Its area is created by rock remains of Neogene Sea that covered the Vienna basin. More than 300 species of fossil organisms (algae, fungi, marine invertebrates and vertebrates, especially mammals) are known from there. Of the terrestrial ones, rare findings of primates *Dryopithecus* sp., occurs only in this locality within Slovakia (Feráková et al., 1997).

The typical feature of Devínska Kobyla and Sandberg is a high flora and also fauna biodiversity, which is affected by its unique position in the valley of the



National Nature Reserve Devínska Kobyla, castle of Devín and Hainburger Berge Mts. Photo: K. Hegedúšová.

river Danube, the heterogeneity of its geological substratum, the specific climatic conditions, anthropic influence and the vicinity of the Malé Karpaty Mts.

According to the phytogeographical division of Slovakia (Futák, 1980) Devínska Kobyla belongs to the region *Pannonicum*, subregion *Eupannonicum* with close phytogeographic relationship to the Hundsheimer hills in Austria. The original vegetation was formed by oak-hornbeam forests, xerothermophilous oak forests with *Quercus pubescens* on a steep slopes with a limestone base and rocky grasslands, which are conserved in spite of anthropic influence (vineyards, orchards, grazing, burning of grasslands, afforestation by non-native trees e.g. *Pinus nigra*, *Fraxinus ornus*).

The present vegetation forms mosaic of rocky and dry grassland – steppe communities along with sub-Mediterranean xerothermophilous oak woods *Corno-Quercetum*, *Dictamno-Sorbetum* and *Pruno mahaleb-Quercetum pubescentis*. Altogether two thirds of the NNR are covered by forests communities. On the northern slopes beech forests as *Melico uniflorae-Fagetum* and fragments of *Carici pilosae-Fagetum* and *Carici albae-Fagetum* are developed. *Fagus sylvatica* reaches here the lowest altitudes in the Western Carpathians Mts. On screens there are stands with *Tilia cordata* and *Acer campestre*, which belong to



Campanula sibirica, Devínska Kobyla, Slovakia. Photo: K. Hegedúšová.



Scorzonera austriaca, Devínska Kobyla, Slovakia. Photo: K. Hegedúšová.

the alliance *Tilio-Acerion*. The most frequently occurring community is *Carici pilosae-Carpinetum* with characteristic spring aspect created by *Galantus nivalis*, later replaced by *Corydalis cava*. From the non-native trees *Robinia pseudoacacia* and *Syringa vulgaris* are most common.

The prevailing vegetation types of the most xerophilous dry grasslands communities on a steep slopes and open sands with shallowest substrat are colline calcareous grasslands belonging to the association *Poo badensis-Festucetum pallentis*. The dominating grass is *Festuca pallens*, which is accompanied by *Fumana procumbens*, *Linum tenuifolium*, *Potentilla arenaria* and *Scorzonera austriaca*. Community *Festuco pallentis-Caricetum humilis* inhabits gentle slopes. *Carex humilis* is dominant there along with numerous chamaephytes and ephemeral therophytes such as *Allysum montanum*, *Globularia punctata*, *Thymus praecox*, *Teucryum montanum*, *T. chamaedrys*, *Jurinea mollis*, *Helianthemum nummularium*. On the rocky and moderately deep soils stands with *Stipa capillata* and *Festuca vallesiaca* are developed belonging to the association *Festuco vallesiaca-Stipetum capillatae*. It is dominated by tussock grass *Koeleria macrantha* accompanied by *Bothriochloa ischaemum*, *Potentilla arenaria*, *Allium flavum* and *Tithymalus cyparissias*.

The stands with famous spring aspect created by *Adonis vernalis* belong to the association *Polygalo majoris-Brachypodietum pinnati* dominated by *Peucedanum cervaria*, *Inula ensifolia*, *Bromus erectus* or *Brachypodium pinnatum*. *Stipa joannis* and *S. pulcherima* are common there. On the southern slopes forest steppes are developed, which contain small islands of steppe, low trees and shrubs such as *Quercus pubescens*, *Q. cerris*, *Ulmus minor*, *Berberis vulgaris*, *Cornus mas*, *Crataegus monogyna*, *Euonymus verucosa*, *R. rubiginosa*, *Juniperus communis* and *Cerasus mahaleb*.



Ophrys apifera, Devínska Kobyla, Slovakia. Photo: D. Senko.

Communities *Prunetum fruticosae* with *Cerasus fruticosa*, *Rosetum pimpinellifoliae* and Pannonian fringe vegetation *Geranio sanguinei-Dictamnenum albae*, *Peucedanetum cervariae* represent extrazonal vegetation dependent on edaphic condition and human activities, too. The most common species are *Geranium sanguineum*, *Dictamnus albus*, *Centaurea triumfettii*, *Anemone sylvestris* and *Tephrosia integrifolia*. These stands are very species-rich and visually attractive, especially *Geranio sanguinei-Dictamnenum albae*. *Clematis recta*, *Iris variegata*, *Pyrethrum corymbosum* from the species of wood-steppe stands should be mentioned. On a limestone rocks grows *Rhamnus saxatilis* ssp. *saxatilis*. NNR is the unique and the only locality of this species in Slovakia. The *Poa bulbosa* communities of the open sands influenced by atrophic factors are most common in the part Sandberg. The critical endangered species *Peucedanum arenarium* occurs only here and nowhere else in Slovakia along with *Gypsophila paniculata* which is on the verge of extinction. Another species with occurrence only in the NNR Devínska Kobyla are *Artemisia austriaca*, *Conryngia austriaca*, *Ononis pussila*, *Orobancha artemisiae-campestris* and *O. teucrii*

In the species composition of vegetation in NNR Devínska Kobyla xerothermophilous and calciphilous elements dominate. All of the communities host a lot of endangered and rare species. Altogether, more than 1100 vascular plant species were recorded here, 25 of them are protected by law, 376 are threatened and 33 categorized as critically endangered (CR), endan-

gered (EN) and vulnerable (VU). 10 species are in category extinct (EX). To mention at least some of them: **CR** – *Himantoglossum adriaticum*, *Minuartia glaucina*, *Ononis pussila*, *Ophrys apifera*, *O. holoserica*, *O. sphagodes*, *Peucedanum arenarium* ssp. *arenarium*, *Viola ambigua*, **EN** – *Anacamptis pyramidalis*, *Bupleurum affine*, *Chrysopogon gryllus*, *Gypsophila paniculata*, *Medicago monspeliaca*, *Orchis tridentata* ssp. *tridentata*, *O. ustulata* ssp. *ustulata*, *Orobancha gracilis*, *Rhamnus saxatilis* ssp. *saxatilis*, *Silene conica*, *Stipa pulcherrima*, *Vinca herbacea* and **VU** – *Adonis vernalis*, *Cerasus fruticosa*, *Dictamnus albus*, *Fumana procumbens*, *Iris pumila*, *I. variegata*, *Lotus borbasii*, *Ophrys insectifera*, *Orchis morio*, *Pulsatilla grandis*, *P. pratensis* ssp. *nigricans*, *Scorzonera purpurea*, *Smyrniium perfoliatum*, *Stipa joannis*. This area is important also by representation of cryptogams, there are 110 registered lichen species, 100 bryophyte species and 331 fungi. Speciality of NNR is occurrence of various species and crossbreeds of the genus *Viola*.

The present state of vegetation on the Devínska Kobyla NNR is conditioned predominantly by succession. The extensively used pastures have arisen more than 2000 years ago during the Roman colonization. During the state afforestation programme many non-native species were planted, mostly *Pinus nigra*. Due to the changed soils pH many rare and endangered species. That's why volunteers and conservationists partially removed this trees from the most valuable parts of NNR. Now, the absence of grazing resulted in spreading of competitively strong grasses such as *Bromus erectus*, *Arrhenatherum elatius* and shrubs *Crataegus* sp., *Rosa* sp. div. and *Prunus spinosa*.

References

- Feráková V. et al., 1997: Flóra, geológia a paleontológia Devínskej Kobyly [Flora, geology and paleontology of Devínska Kobyla. In Slovak with English summary.] Apop, Bratislava, 190 p.
- Feráková V., Maglocký Š. & Marhold K. (2001): Červený zoznam papraďorastov a semenných rastlín Slovenska (december 2001). [Red list of ferns and vascular plants of Slovakia. In Slovak with English abstract.] In: Baláž D., Marhold K. & Urban P. (eds.), Červený zoznam rastlín a živočíchov Slovenska. Ochrana prírody, 20 (Suppl.): 44 – 77, Banská Bystrica.
- Futák J., 1980: Fytogeografické členenie 1: 1 000 000. – In: Bertová L. (ed.), Flóra Slovenska IV/1. Veda SAV, Bratislava, pp. 418–420.

Katarína Hegedúšová, Bratislava, Slovak Republic
e-mail: katarina.hegedusova@savba.sk