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COURSE OF ECOLOGY IN NATURE. EDUCATIONAL PATHS IN ARBORETUM OF BRAMA MORAWSKA IN RACIBÓRZ

Aleksandra RUSIN, Paweł KOJS, Wiesław WŁOCH, Jan DUDA

Botanical Garden – Center for Biological Diversity Conservation of the Polish Academy of Sciences, Prawdziwka St. 2, 02-973 Warsaw, Poland

SUMMARY

In the Arboretum of Brama Morawska there are two educational paths: the ecological and the dendrological path, each 2,5 km long. Educational paths in Arboretum are unique due to their location in the municipal forest "Obora", which was never deforested or destroyed in its history by intensive forest management. Many natural forest communities are well preserved in this area. Rich biodiversity is associated with close vicinity of Moravian Gate (Brama Morawska), which is a natural path of migration of plants and animals, and the mild climate of Racibórz. Visitors can be acquainted with different plant communities, observe life strategies of different species and relations between them. Visits to Arboretum allow getting skills of identifying more then 500 plant species, among them 100 trees and shrubs growing in our climate and introduced by man.

INTRODUCTION

Educational paths in Arboretum of Brama Morawska are unique due to their location in the municipal forest "Obora", which was never deforested or destroyed in its history by intensive forest management. Many natural forest communities are well preserved in this area (Kuczyńska, Fabiszewski 1962, Kuczyńska, 1973, Kuczyńska 1974, Duda 1993, Jendrzejczyk 1994). Rich biodiversity is associated with close vicinity of Moravian Gate (Brama Morawska), which is a natural path of migration of plants and animals. During walks along the paths visitors can admire great richness of natural flora vegetating in the mild climate of Racibórz and observe different plant communities occurring in the diverse terrain.

In the Arboretum of Brama Morawska there are two educational paths: the ecological path and the dendrological path, each 2,5 km long (Fig. 1). Stroll along the ecological path familarizes the visitors with different plant communities, starting with ruderal communities along the railway, communities at boundaries between fields or meadows and the forest, and different types of forest: hornbeam-oak forest, river carrs, mixed decidous forest and woods composed of trees of foreign origin. In the area of Arboretum more than 100 woody species occur (Duda, et al. 2001). Dendrological path allows getting skills of identifying trees and shrubs growing in our climate, as well as woody species introduced by man.

Regular visits to Arboretum may be an attractive supplement to biology courses. Schoolchildren can observe changes of nature occurring in different seasons of the year in the same place, observe life strategies of different species and relations between them. We can find out the knowledge about nature in many ways: during biology or geography courses, from books and in classrooms or simply by observation of natural phenomena during excursions and walks. Courses held in nature engage all the senses, making thereby the process of learning more effective.

Places worth seeing along the ecological path. The ecological path starts at the car park and leads to the North, along the railway. Visitors can get the knowledge about ruderal communities. Species forming this community are resistant to high concentration of salts and different xenobiotics. Their habitat requirements are low. Many nitrophilic species (nitrophytes) can be found at this place. There is an intersting formation i.e. the deep gorge of antropogenic origin, cutting the slope. The for-

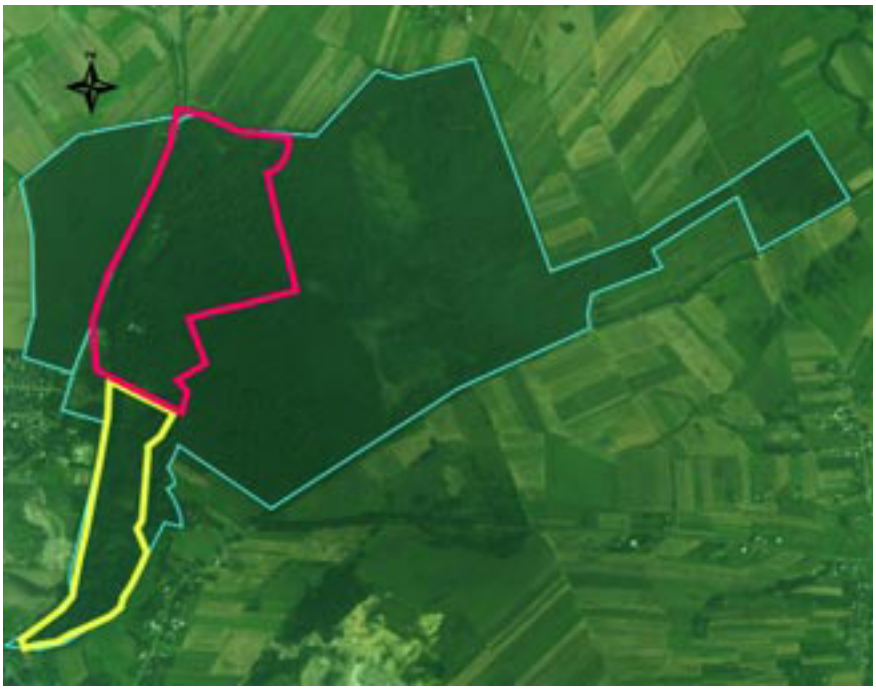

Fig. 1. Airplane photograph of Arboretum of Moravian Gate (outlined with blue line) with educational paths: ecological path marked with red line, dendrological path marked with yellow line.

est is separated from open area by a dense belt made of bushes and young trees (among them *Prunus spinosa, Cornus sanguinea, Rosa canina*), which effectively stops strong winds, protecting the interior of the forest. This community is a shelter for many animal species. Plenty of insects feed on the pollen and nectar during flowering season, and in the late summer and autumn birds and small mammals find abundance of fruits there.

In the northern face of the forest *Prunus spinosa*, which is light demanding plant, is replaced by shadow-tolerating species such as *Sambucus nigra, Corylus avellana*. Many trees growing at the boundary of the forest exhibit heliotropism – boughs and large branches are bent down to reach the light. At the northern boundary of the forest there is a picturesque view of agricultural landscape. Behind the chessboard of fields a dark spot of forest "Łężczok" (the Reserve of Nature) is visible. Unfortunately for a few years the landscape has been cut by a new power line. This place should be used to explain the reasons for which natural or partially natural landscapes should be protected. Legal regulations of landscape conservation should be described during the excursion in this place. In the amandment of the Act of Nature Conservation there is the notation concerning landscape conservation. Sustainable development requires preservation of appropriate proportions of forests, meadows, agricultural fields and human estates. Natural or partially natural lanscapes should be protected from large investments such as highways or power lines contruction.

In the northern part of the Arboretum there occurs mono-species forest made of 30 years old oaks *Quercus rubra*. Under mature trees there is no undergrowth and plants of floor covering, which formerly were abundant. This species has been introduced from North America. In the autumn the seedlings of red oak outgrow the thick layer of leaves, which are decomposed for a very long time. At both sides of the Lilly Stream there are very fertile and humid habitats, with shallow but not stagnating ground water. The riverside forest is composed

of ash, alder, oak, lime and maple (Fig. 2). Undergrowth is formed by dense bushes. One can admire perennial plants flowering in the spring, and disappering after the foliage fully develops. Among them there are *Corydalis solida, Gagea lutea, Anemone nemorosa, Mercurialis perennis*. After the foliage develops *Impatiens noli tangere and Astrantia major* start to bloom.

The main type of forest in the Arboretum is deciduous oak-hornbeam forest with dominating oaks (*Q. robur, Q. petrea*), lime (*Tilia cordata*), hornbeam (*Carpinus betulus*), ash (*Fraxinus excelsior*) and maple (*Acer pseudoplatanus*) (Fig. 3). The undergrowth is formed by hazel (*Corylus avellana*), *Cornus sanguinea, Euonymus europeus, Sambucus nigra*. The floor covering is very rich and colorful. There occur *Corydalis cava, Pulmonaria obscura, Primula elatior, Anemone nemorosa*. Large fields of bear garlic, *Allium ursinum* give off a strong smell in the spring. Later, visitors can find *Convallaria maialis, Gallium schultesii* and *Lilium martagon*. At a higher location of Arboretum the woods are formed of 150-year-old *Pinus silvestris* and *Quercus petraea*. *Betula verrucosa, Tilia cordata* and *Quercus robur* are less abundant and form together with *Pinus silvestris* and *Quercus petraea* a community called acid oak forest. This community, formerly commonly present, nowadays, due to antropogenical changes is more like the continental mixed coniferous forest.

Fig. 2. Riverside forest with ash and alder at the Lilly Stream.

Fig. 3. Oak – hornbeam forest in the central part of Arboretum.

There is also a small unit where an artificial coniferous forest occurs, composed of 80-year-old *Picea excelsa, Larix europea, Pinus silvestris, Pseudotsuga manzesii P. glauca and Pinus strobus*. The three latter introduced species are rather rare in silesian forests.

The next stop is located at the spring of Horsetail Stream, where a large field (several ares) of the giant horsetail *Equisetum telmateia* occurs (Fig. 4). This most impressive representative of *Equisetaceae* is legally protected in Poland. At this stand it reaches the height of 1.5 m.

It is worth stopping at the bank of the Fern Stream and explaining the shape of the river

Fig. 4. Large field of giant horsetail Equisetum telmateia at the Horsetail stream.

bed or the association between different wood species and the level of ground water. In the lowest place of the slope there occurs Alnus glutinosa, which tolerates high ground water level, then gradually Fraxinus excelsior takes over, whereas at the top of the slope *Carpinus betulus and Quercus robur* dominate. This observation helps to strengthen our understanding of habit requirements of different species.

Another interesting worth seeing place is a small meadow placed inside the forest. It is rich in meadow saffrons *Colchicum autumnale*. Nowadays the area covered with meadow communities is shrinking rapidly, and they are becoming rare. In our climate meadows are secondary communities, which originated after grubbing out or burning forests. After fields were abandoned meadow communities developed. This meadow was not mowed and the secondary succession began.

SHORT DESCRIPTION OF DENDROLOGICAL PATH

Walks along the dendrological path are an excellent tool for teaching plant systematics. In the area of Arboretum 541 vascular plant species belonging to 81 families occur. Among them there is a hundred species representation of woody plants (59 tree species, 41 shrub species). Most of them can be met along the dendrological path. After often walks in Arboretum visitors should be able to recognize plant species, understand the association between their occurrance and the quality of habitat. Teaching plant systematics during the excursions should be accompanied by interesting stories about historical usage of plants. Special attention should be paid to medicinal plants and traditional products derived from them, such as herbal drinks, plant extracts, tinctures and liquers.

In the area of Arboretum there are 21 species legally protected in Poland. We should draw the attention of visitors to different forms of nature conservation which are executed in Poland, with special emphasis on conservation of endangared species *in situ*, i.e. in their natural habitat.

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