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Historical parks and invasive woody plants

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The problem of spread of allochthonous plant species that endanger and change the natural composition of phytocoenoses by their vitality and marked competitive properties becomes unbearable. Latest studies of spread help to make the border of new settled localities more precise, the growing trend of invasions is recorded because the neophytes fill in the vacated areas in consequence of reaction to changing conditions of biotope under the influence of anthropogenic activities as well as global climatic changes. We classify the invasions to a cultural landscape in a different way than in natural landscape in which their entering the natural phytocoenoses endangers biodiversity and balance in natural landscape.

Sources of diasporas of introduced woody plants are areas arranged as parks, historical parks, arboreta and botanical gardens. Biotopes that are marked by anthropogenic activity caused the change of species composition, and in case of forest stands diminished the area for natural reproduction of commercial tree species. Black locust (*Robinia pseudoacacia* L.), which was brought from North America in 1603, represents a separate chapter in introduction of woody plants. It naturalized in new conditions and became a typical invasive tree species that occupied large areas (approx. 1300 ha) and today it creates extensive forest stands in floodplain forests and park stands. Many introduced woody plants found suitable conditions for pollination, fertilization and development of germinating seeds and thereby for natural reproduction (MAGIC, 1997). Invasive species are characteristic by their vitality, fast growth, and resistance to frost, drought and pests. Invasive species are those species that have the ability to spread naturally and drive the original species out of the area. They behave similarly also in cultural park communities.

It is a way of behaviour of species in new conditions. We recorded more than 400 historical parks and ornamental gardens in Slovakia. Their biological substance is created by cultural phytocoenoses that were arranged after projects, realized by cultural planting; that have besides great biological also an aesthetic and architectural value. And as they were drafted artificially it is necessary to control their growth – development steadily so they fulfil their programme functions. Any natural seeding or invasive taxa are foreign elements and they must be removed from stands continuously. It is done within the process of maintenance and reconstruction as well. If the maintenance of parks is neglected or less intensive, the invasions are more numerous, and local invasions pass to global invasions.

If we understand biodiversity as biological diversity of natural ecosystems from which is derived their greater resistance and stability then we try naturally to provide similar situation also in case of composition of cultural phytocenoses in parks. The risk of invasion of undesirable taxa was always connected with introduction; it becomes evident mainly with invasive taxa. Historical assortments of woody plants used for planting the historical parks are often the only source of knowledge as far as the introduction of woody plants in the area of Slovakia is concerned; and it is also necessary to follow the invasions in connection with introduction into different conditions. The largest concentration of invasive species is in villages and towns, in garden settlements and in those localities with historical parks and arboreta that is naturally related to introduction as well as invasion.

Within the management of spread recording of invasive species it is necessary to elaborate principles of their observation, gradual limitation and liquidation. Intensive and specialist maintenance of historical parks shall prevent the changes of autochthonous gene pool of neighbouring free landscape in consequence of invasions. Frequent cut of meadow areas and intensive maintenance of park stands together with their reconstruction and sanitation slow down the invasions and they provide prosperity of park stands in general.

The most frequent invasive taxa to historical parks

Robinia pseudoacacia L.
Falope japonica HOUTT.
Syringa vulgaris L.
Negundo aceroides L.
*Fraxinus americana*L.
Fraxinus pensylvanica MARSH.
Juglans regia L.
Caragana arborescens LAM.
*Lycium barbarum*L.
Ailanthus altisima (MILL.)SWINGLE
Rhus typhina L.
Prunus serotina EHRH.
Pinus nigra ARNOLD.
Pinus strobus L.
Celtis occidentalis L.

Deforestation in Slovakia made it easier for winged seeds of introduced woody plants to spread from alleys along roads in towns and villages, windbreaks, gardens and parks. Problems with introduced species invading into

natural and cultural ecosystems are mentioned also in the Treaty on Biodiversity that was passed in 1992 and Slovakia adopted it also. The treaty calls for prevention of introduction of invasive species, for destruction of their invaded species that endanger natural and cultural ecosystems. In the case of historical parks appropriate management of specialist maintenance and reconstructions can influence significantly the spread of invasions.