

## Invasive behavior of plants in the South-West of Slovakia

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The species composition, space structure and physiognomy of the vegetation in the Southwestern Slovakia are significantly modified due to man's activities (agriculture, transportation etc.) and expansion of mainly Northern American and Asian allochthonous plant species. Non-native species have expanded here since the late Neolithic and Eneolithic and at the present time the most expanding are the neophyte taxa of *Ailanthus altissima*, *Aster novi-belgii* agg., *Fallopia japonica* and *F. x bohemica*, *Helianthus tuberosus*, *Lycium barbarum*, *Impatiens glandulifera*, *I. parviflora*, *Negundo aceroides*, *Robinia pseudacacia*, *Solidago canadensis*, *Solidago gigantea* and *Stenactis annua*. During our research (1997-2004) we have found that the occurrence of invasive plant species was most abundant near ecological corridors, mainly along watercourses, roads and railways. On the river-banks the nitrophilous high-herb plant communities of *Senecionion fluviatilis* alliance were usually invaded by non-native plants but the regularly mown meadow communities (particularly of *Arrhenatherion* alliance) were relatively resistant against the invasive species.

In the interest territory a presence of plants species dragged to this territory has been surveyed and taxonomically exactly defined. The invasive process has been documented and reconstructed pursuant to the field research and by evaluating the literature data. Basic characteristics and manifestations of the plants conditioning their invasive behavior were determined, especially the formation of dia-spores, biomass allocation, settlement in the new area (penetrating into the original plant communities) and respond to the limiting factors of the environment (competition, herbivory, diseases, pests). For a causal interpretation of the invasive behavior we used autecological, population-ecological and physiological-ecological methods. The relationship between the species and the environmental variables was analyzed by method of Canonical Correspondence Analysis (Canoco, ver. 4.5 and CanoDraw for Windows, ver. 4). In the frame of the case study we have observed population dynamics of the invasive *Helianthus tuberosus* species at various densities as well as under the flood stress.

The whole course of invasions is very dynamic and therefore its research appears to be a long-lasting process. A re-recording of invasive plant species populations will have to be repeated in regular intervals in order to obtain data suitable for prediction of their further expansion. We expect also other changes in the species composition of the domestic phytocenoses, also due to the expansion of new invasive species. In the future we will aim at the study of functioning of ecological corridors in order to get a better knowledge about the inter-specific competition at the local level and especially at the research of allelopathic relations of invasive plant species.