Impact of alien and native woody plants on vegetation and soil: two sides of the same coin?

The project is based on cooperation between the W. Szafer Institute of Botany of the Polish Academy of Sciences, University of Silesia in Katowice and the Institute of Botany of the Czech Academy of Sciences.

There is an ongoing debate whether introduced alien invasive species impose a greater threat to biodiversity than native species that are spreading in current, transformed landscapes. This question is important for local managers, nature protection, and a variety of stakeholders. Interestingly, there are few robust datasets for a range of dominant alien and native species that could reveal whether the effects (impacts) these two groups have on biodiversity differ. For trees, no such study is available, and our project aims at closing this gap.

Trees and shrubs often act as ecosystem engineers, they have impacts on light conditions, the structure of vegetation, and co-occurring species. Their canopies serve as habitats for other organisms like birds, herptiles, or insects. Additionally, many tree species are important economic commodities in forestry, which makes them rather controversial if we consider their negative impact on biodiversity and ecosystems.

This project is a follow-up of the previous project successfully completed by the Czech partner on "Ecological impacts of alien and native plants on vegetation: does origin matter?" where the impact of alien and native dominant herbaceous plant species on soil and vegetation was addressed. With the knowledge gained from that project, we will focus on trees and shrubs and their impact on the activity of soil biota and litter decomposition. Researchers generally examine distinct and often small sets of impact measures depending on their interest in the population, community, or ecosystem consequences of invasions. The new project focuses on vegetation (species composition and diversity), soil biological activity, microclimate, litter decomposition, and availability of light and nutrients under native and alien trees and shrubs that are common in Central Europe, still widely used in forestry or ornamental plantings (e.g., *Robinia*, *Symphoricarpos*), but also those that after being initially introduced spread mainly spontaneously (e.g., *Acer negundo*, *Ailanthus altissima*, *Prunus serotina*). Individual alien and native species were selected according to their characteristics (growth form, clonality, moisture and nutrient requirements, leaf litter accumulation). Each species will be compared with the most similar species of the opposite group, i.e., native vs. alien.

The studies of soil and vegetation will be performed in both countries (PL, CZE), which will allow us to obtain results at a large geographical scale. The expected outcomes of the project will be primarily scientific publications reporting impacts of alien and native woody plants on vegetation and ecosystem functioning. Because the project is based on original field data that will be collected during the whole project duration, the papers resulting from this research will be mainly prepared after the third vegetation season. The results will be useful for stakeholders in forestry and for nature conservation managers.