

**Environmental determinants of the ecological success of invasive species:  
*Prunus serotina*, *Quercus rubra* and *Robinia pseudoacacia***

Invasive species of trees and shrubs are one of the major threats to biological diversity worldwide. Despite numerous studies on their chorology, ecology and impacts, still there is a little known about determinants of its spread. For that reason, I aimed to assess the determinants of invasive trees and shrubs natural regeneration ecological success. As a model species I chose *Prunus serotina* Ehrh., *Quercus rubra* L. and *Robinia pseudoacacia* L. – the most frequent alien tree species in European forest ecosystems. I hypothesized that: (1) propagule pressure will be the most important predictor of natural regeneration of studied species ecological success, (2) higher frequency and size of disturbance will facilitate natural regeneration of studied species, and (3) biomass allocation and specific leaf area of studied species will be responsive to environmental factors – soil fertility and light availability. The study was conducted in Wielkopolski National Park (W Poland), in the set of 378 permanent plots, observed for three years.

The biomass of seedlings and saplings of the studied species was the mostly affected by factors describing propagule pressure – proximity and quantity of parental trees. Disturbance indices revealed the low correlation with biomass and density of studied species natural regeneration. Functional traits of the studied species weakly responded to environmental gradients – the differences among the species studied were higher than intraspecific variability.

The study revealed that propagule pressure is a crucial factor determining spread of invasive trees and shrubs. Moreover, studied invasive species benefit from functional difference from their native competitors. Due to acquisitive strategy *P. serotina* and *R. pseudoacacia* have higher biomass allocation into foliage and higher specific leaf area than *Q. rubra*. In contrast, conservative *Q. rubra* invests more in roots and has higher overall biomass. These two strategies, connected with different ecological optima of species studied, allow for ecological success in different types of forest ecosystems. For that reason, efficient management of invasive woody species needs targeting both on propagule pressure and invaded ecosystems properties.