

## Conclusions

The studies presented focus on the historical and ecological traits corresponding with the successful invasion process of alien woody plants in Central Europe. In regard to invasion biology, woody plant species are among the most problematic plant life forms and constitute a high proportion of the World's worst invasive species. The irreversible changes in ecosystems often caused by invasion of these species constitute one good reason for study. The second is the large amount of data available, especially on human influence and activity (such as the intensity of planting, residence time). The reason for studying alien woody species is also reflected in their ambivalence: on the one hand, the group is represented by the most serious invasive species, while on the other hand, there is still strong pressure to plant these species for timber, food and ornamental purposes.

The native woody flora of the Czech Republic contains about 280 species. The exact number of alien woody species is not known. Based on different approaches and datasets, it has been estimated to be in the order of 4,300 species. Exact data is available for a representative sample of frequently-planted alien woody species that contains 1,691 species. An estimated 128 alien species have escaped from cultivation, of which about 17 are currently invasive in the Czech Republic. What factors influence success in the invasion process? Why are these 17 species invasive and the remaining 1,674 species are not? Is it possible to predict which species will be invasive and which will not be? What roles do human activity and species traits play in the invasion process? These are only some of the questions to which we tried to find answers. To attempt to answer these questions, a large number of woody species and their traits were tested and analysed. The main results could be interpreted as follows: success during the invasion process not only depends on a species' biological and ecological traits, but human influence also plays a very important role. This role can be presented as propagule pressure *sensu lato*. It means early introduction, repeated planting in a wide range of conditions, in gardens and parks as well as in the open landscape. The example of forest engineering shows how important this role can be. Moreover, strong propagule pressure and long residential time can compensate for the lack of ecological adaptation of a species to the conditions in the new area. For its successful escape from cultivation, intensive planting, ideally in a wide range of conditions, are entirely sufficient. Those species that have been planted for a long time are even more successful.

Data is available for about 1,691 alien woody species planted in the Czech Republic, however, only a negligible percentage of this group invade natural ecosystems. It is very difficult to predict which species will be invasive because of the disproportion in numbers in both groups. The results of testing risk assessment schemes proved that prediction is nonetheless possible. The most successful model yielded an overall accuracy of 85.5%, which represents quite a high success rate in the field of risk assessment modelling. The question is how high would the accuracy be if the propagule pressure and residential time variables were included in the calculation?

Although human factors were found to influence the results greatly, the importance of species traits was also not negligible. The comparisons of alien and native woody congeners showed a strong correlation between both groups. It was demonstrated that the alien species escaping from cultivation are more similar in their traits to native species than to aliens that have never escaped. In a general sense, this result contributes to the discussion about the validity of Darwin's naturalization hypothesis. In a particular sense, the result is only part of a mosaic composed of other previous results. The full mosaic can be presented as a memorandum for landscape protection and nature conservation as well as for forestry and ornamental gardening: human activity very strongly facilitates the escape, naturalization and invasion of alien woody species. The impact of these species on the occupied habitats is often irreversible. Naturalized alien woody species compete for space and nutrients with native species, compete for niches occupied by native species (aliens do not colonise unoccupied niches as Darwin's hypothesis suggests). The planting of alien species with

similar bio-ecological traits to native ones necessarily leads to eradication of our native, and not only woody, flora. Although a few successful risk assessment schemes exist, their accuracy of prediction is not absolute and there is still the probability, however low, that strong transformer species that have been introduced and planted will escape and finally invade natural habitats.