**The impact of alien tree species – red oak (*Quercus rubra* L.) on soil physicochemical properties, soil**

**microbial communities and forest vegetation.**

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The biological invasions are one of the most important element of global change related to human activity. Invasions are among major causes of biodiversity decrease worldwide and economic losses.

One of the most widespread and best-regenerating alien tree species in Europe is a Northern American species – red oak (*Quercus rubra* L.), which was introduced into European forests in the XVII century. Red oak has the status of an invasive plant in the Polish flora, causing serious changes in ecosystems. Some traits of this species, for example, rapid acclimatization, high productivity and a wide range of tolerance to environmental conditions cause that the introduction of red oak to forest cultivation is controversial. Recent research has shown that *Q. rubra* can change soil properties and processes. Comprehensive evaluation of the magnitude, direction and mechanisms of changes brought about by alien *Q. rubra* in soil may be significant for conservation biology as the changes induced by *Q. rubra* may drive the forest ecosystem towards a no-return threshold for the restoration of the original forests.

The aim of this project is assessment of the influence of alien *Q. rubra* on soil physicochemical and microbial properties in comparison to native communities in field conditions and native *Q. robur* in a pot experiment. Collected leaves will be characterized in respect of concentrations of elemental nutrients (C, N, Ca, Mg, K, P) and phenolic compounds, namely total phenolics, condensed tannins and selected specific phenolic compounds (catechin, epicatechin, gallic acid) in order to assess the quality and quantity of compounds supplied to the soil through litterfall. Evaluation of the influence of *Q. rubra* on soil will be possible through analyzes of the above listed chemical parameters along with pH, and element availability in soil. Additionally, composition and functions of microbial communities will be characterized by measurements of the soil respiration, activity of selected soil enzymes, which participate in the decomposition of dead organic matter, as well as bacterial and fungal biomass and community composition using analysis of fatty acids extracted from their cell membranes.