Project Database of ICP Forests

PROJECT DESCRIPTION

PROJECT INFORMATION

Project title:	Evaluation of Masting Behaviour of Birch
Project ID:	221
Contact person:	Susanne Jochner-Oette // susanne.jochner@ku.de

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Objectives

We aim to analyse the fruiting intensity of birch using all available years and sites for this parameter. Most studies dealing with masting only focus on other forest tree species such as oak or beech, but studies on birch are relatively rare. However, this species is also of interest for allergic people and studies on masting might give important information of changes related to climate change. In an ongoing DFG project, we analyse pollen production of birch across Europe (https://www.ku.de/mgf/geographie/landschaftsoekologie/forschung/pollenpals) and supporting information on fruiting intensity might be helpful to explain our results.

Project description "PollenPALS - Biotic and abiotic effects on pollen production and allergenicity of birch and related health impacts"

Although higher temperatures were often found to increase pollen production and allergenicity, several studies reported decreased quantities of pollen and allergen content under warmer conditions. Up to now, little is known about additional biotic and abiotic factors that might alter these pollen characteristics. A remarkable difference is believed to exist in the impact of pollen on human beings depending on the overall production and allergenic potential of pollen. In this study, we focus on the most important allergenic tree species in Northern, Central, and Eastern Europe: birch (Betula spp.). The major novelty is the analysis of biotic and abiotic impacts on pollen of cloned birch individuals free from genetic differences in their natural environment across International Phenological Gardens in Europe. In addition to the investigation of abiotic factors (e.g. air temperature, relative humidity, air pollutants) influencing pollen production and allergen content, we also focus on biotic factors such as virus infections (Cherry leaf roll virus) or the pollen-associated microbiome and the in vivo relevance of the pollen's allergenicity using skin prick tests.

An enhanced knowledge gained by our study allows the prediction of future alterations under climate change conditions in more detail. An interdisciplinary collaboration between scientists of landscape ecology, phytomedicine and environmental medicine shall answer the question of how biotic and abiotic factors impact pollen production and allergenicity and consequently the allergic reactions in patients.

The three universities KU Eichstätt-Ingolstadt, HU Berlin and UNIKA-T of the TUM in Augsburg are all part of the DFG project "Biotic and abiotic effects on pollen production and allergenicity of birch and related health impacts".