



Universität
Basel

Research Project

LEAFISOTRENDS: Long-term physiological responses of herbaceous plant species from contrasting functional groups and environments to centennial climate change

Third-party funded project

Project title LEAFISOTRENDS: Long-term physiological responses of herbaceous plant species from contrasting functional groups and environments to centennial climate change

Principal Investigator(s) [Kahmen, Ansgar](#) ;

Co-Investigator(s) [Moreno Gutierrez, Cristina](#) ;

Organisation / Research unit

Departement Umweltwissenschaften / Physiological Plant Ecology (Kahmen)

Department

Project start 01.01.2015

Probable end 31.12.2016

Status Completed

The proposed project is aimed at assessing long-term physiological responses of herbaceous plant species from diverse functional groups and environments to changes in climate that have occurred during the last centuries in Switzerland. Leaf oxygen and carbon isotopic compositions will be analyzed for a large number of specimens from the unique herbaria hold at the University of Basel, which cover 600'000 specimens collected mostly in Switzerland since the 17th century. Plant physiological responses to climate change could influence global carbon and water cycles and could ultimately drive changes in plant communities' distribution and biodiversity. Plant physiological responses may be species specific and their magnitude was found to decrease with time, indicating possible long-term processes of acclimation and adaptation in plants and urging the need to assess the long-term responses of plants to climate change. The isotopic analysis of archive plant material offers the exceptional opportunity to reconstruct the physiological activity of plants over long time periods. The carbon isotopic composition of plants is a good proxy of leaf-level intrinsic water use efficiency and leaf oxygen isotopic composition can provide a time-integrated indication of leaf stomatal conductance during the growing season. Previous studies with similar objectives largely focused on the isotopic analyses of tree rings. Contrastingly, the isotopic analysis of herbarium samples allows to assess the long-term physiological response to climate change of a large range of different plant species from different environments. As caution was raised recently about the interpretation of the isotopic composition of plant material under certain circumstances, selected target species will be grown in climate controlled growth chambers in order to calibrate the physiological interpretation of variations in leaf isotopic composition with changes in climate and plant physiology.

Financed by

Commission of the European Union

Add publication

Add documents

Specify cooperation partners