Climate change impact on alpine vascular plants: an arctico-alpine comparison

Context:

Because of arctic amplification (Previdi et al. 2021) and elevation-dependent warming (Pepin et al. 2015), high-latitude and high-elevation ecosystems are both particularly exposed to the impacts of the ongoing climate warming, with rates of temperature increase two to three times higher than on global average. However, the impact of climate change on alpine vascular plants was often studied independently in the Alps (e.g., Matteodo et al. 2013; Lamprecht et al. 2018) or in the Arctic (e.g., Hannah et al. 2016; Kapfer & Grytnes 2017) and rarely studied in both regions with a common method (Gottfried et al. 2012), and this, although some species are common in both regions. The GLORIA monitoring network (www.gloria.ac.at), which sets the same monitoring method at the European scale, is a good opportunity to compare the recent impact (2001-2021) of climate change on respective flora.

Aims of the study:

Quantify the relative velocity of changes of biodiversity between 2-4 arctic regions (Greenland, Iceland and potentially Scandinavia) and 3-4 alpine regions (Val d'Entremont, Swiss National Park, potentially South Tyrol). In parallel to a project comparing soil seed, this project will aim to measure and compare a set of functional traits of arctico-alpine species occurring at multiple sites or the sensitivity to the reconstructed climate warming (from weather stations and soil temperature loggers).

Desired qualifications:

A good fitness for fieldwork and an interest in (geo-)statistics to manage and analyse a large dataset.

Collaborative environment:

This project will be organized with different GLORIA groups in the Alps (S. Wipf, Swiss National Park; C. Rixen, WSL) and the Arctic (S. Rumpf, Uni Basel; S. Heiðmarsson, Iceland). This project will be in collaboration with a student in the master in Behaviour, Evolution and Conservation (Biology).

Keywords: climate change, arctico-alpine flora, biological traits, soil seed bank.

Working place:

Field work in the Alps and potentially in Norway to measure plant traits; laboratory and analyses to define.

References:

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