

Title:

AdapTest evolutionary experiment: Testing rapid plant adaptation across broad climatic conditions

Abstract:

The biosphere is impacted by rapid anthropogenic climate change, causing drastic consequences for global biodiversity. Many plant species may fail to track rapid climatic shifts through dispersion and colonization of new suitable areas, potentially leading to extinctions. However, some populations may develop adaptive evolutionary responses to new local conditions, increasing their chances of persistence. While the scientific community has made progress in understanding this process, it remains unclear whether **evolutionary adaptation to different climates can occur rapidly enough** to outpace environmental changes.

In this talk, I will present the framework and experimental design of the ongoing AdapTest project, an **integrative evolutionary experiment** that aims to test the ability of plant populations to rapidly adapt to novel climatic conditions. Although the potential of **experimental evolution approaches** like *Evolve and Resequence* experiments to study adaptive evolution is well recognized, applications are generally limited to controlled *ex-situ* studies which limits our capability to understand rapid adaptive processes under natural conditions across broad climatic ranges. To foster an understanding of rapid adaptation, **AdapTest project combines *evolve and resequence* experiments under field conditions followed by an experimental test of rapid local adaptation** to the contrasting environments by measuring the fitness of the evolved lineages in their respective home and away conditions (coordinated distributed *in situ* reciprocal sowing experiment).