PROJECT: Clonal-saffron

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PROJECT TITLE

Identical genomes but different properties – the saffron clone as model for epigenetics of environmental adaptation

CONSORTIUM

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SUMMARY OF THE REPORT

Saffron crocus (*Crocus sativus*) is a clonal line with limited genetic diversity. However, saffron accessions from different geographic locations exhibit phenotypic variations, potentially also including response to abiotic stresses. So far, we do not understand the (epi)genetic basis of this phenotypic variability and explore this in the framework of our DFG project (433081887). Through this DPPN Access 2.0 project, two accessions of saffron crocus (*Crocus sativus*) were grown under drought and wet conditions and their suitability for imaging via the "Screen House" phenotyping platform at the Forschungszentrum Jülich was assessed.

Hence, the intended aim of this project was to serve as a pilot study to help us determine the most suitable conditions for phenotyping in saffron to ensure compatibility with the phenotyping platform and optimize data acquisition for a subsequent large-scale experiment.

In total, two accessions of saffron crocus from Germany and the Netherlands grown under drought conditions (50% Field Capacity), were compared with their respective controls (100% FC). Every week, the projected leaf area (PLA) was measured for all plants.

Based on the PLA measurements, the results revealed that the Dutch accession generally performed better compared to the German accession. The Dutch plants maintained a higher overall PLA throughout the experiment. By integrating this phenotypic data with the currently running methylation analysis, the study's final aim is to identify epigenetic markers of saffron's environmental resilience, paving the way for stress-resilient cultivation.

Due to the morphology of the leaves, variability in vitality and germination times of the saffron plants, no further phenotypic traits were measured by the Screen House. Therefore, no subsequent experiment has been started so far.