

**PROJECT TITLE**

Understanding Drought Adaptation in Mentha: A Combined Metabolomics and Gene expression Approach

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**CONSORTIUM**

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# SUMMARY OF THE REPORT

Drought stress is a major limitation for Mentha production, affecting biomass, essential oil content, and overall yield. To address this challenge, a combined phenotypic and molecular study was conducted using the APPP-A platform at the Leibniz Institute of Plant Genetics and Crop Plant Research.

Within two interconnected projects (MenthaDro and MENTHA-OMICS), a large panel of Mentha genotypes was first screened under controlled drought conditions using high-throughput phenotyping. Based on these results, contrasting genotypes (drought-tolerant and drought-sensitive) were selected for deeper molecular investigation.

The second phase focused on uncovering the biochemical and genetic mechanisms underlying drought tolerance through metabolomic and transcriptomic analyses. This integrated approach enabled the identification of key traits, metabolites, and genes associated with drought resilience, providing valuable insights for future Mentha breeding programs.