Phenotypic and Metabolomic Responses of *Fragaria vesca* to Varied Environmental Conditions: Insights from the PlantCline Project

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Climate change poses a significant threat to plant species, potentially altering their distribution and physiological processes. The European project PlantCline seeks to understand these impacts through a collaborative scientific effort to enhance our knowledge about plant resilience and adaptation, focusing on the model organism *Fragaria vesca*. This abstract outline a comprehensive study of 16 *F. vesca* genotypes, strategically selected to represent a significant sampling of latitudinal gradients across Europe. Grown in various common gardens throughout the continent, these plants were exposed to differing environmental conditions and a controlled drought scenario, offering the possibility of additional comparisons. Phenotypic measurements were taken from these plants, and leaf samples were harvested to analyse primary metabolites using Gas Chromatography coupled to Mass Spectrometry technique (GC-MS). The data derived from this study aims to determine the genotypes' capacity to respond to environmental changes, thereby providing insights into their potential plasticity in the face of climatic shifts.

Preliminary results indicate that the different genotypes exhibit varying degrees of response to environmental changes, suggesting diverse levels of phenotypic plasticity. These findings have profound implications for understanding how plant species may cope with the ongoing challenges imposed by climate change. They also offer valuable information for conservation strategies and agricultural practices, as identifying

genotypes with higher plasticity could inform the selection of species more likely to thrive in changing climates.

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