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Coffea spp. Responses to Superimposed Elevated [CO_2] and Drought in View of Higher Acclimation Capability

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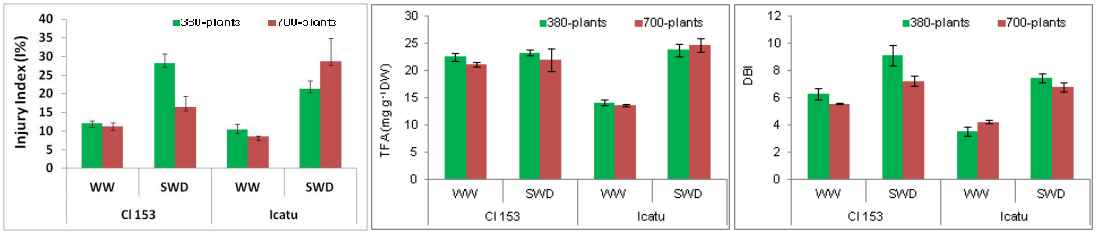
BREEDCAFS

Introduction

Membranes are crucial in plant acclimation responses. Protoplasmic integrity and chloroplast membranes lipid composition were assessed in leaves of *C. arabica* L. cv. Icatu and *C. canephora* cv. Conilon Clone 153 subjected to soil water stress and elevated air [CO_2].

Materials and Methods

Seven-year-old plants grown under controlled RH, temperature, photoperiod, irradiance and CO_2 (380 or 700 µL L^{-1}) were well-watered (WW) or subjected to severe water deficit (SWD). Protoplasmic tolerance was evaluated by electrolyte leakage and expressed as an injury index (I%). Changes in chloroplast lipids were assessed by GC-FID.



Results:

Under drought, I% values increased in 380-plants of both genotypes and in Icatu-700, while values were stable in CL153-700 plants. As regards lipid content, total fatty acids (TFA) increased with drought in Icatu, remaining stable in CL153 plants. Main changes in lipid unsaturation (DBI) were observed in response to drought (Icatu) or to high CO_2 (CL153).

Conclusion/Perspectives: Stable I% values in CL153-700 under drought suggested that elevated air [CO_2] enhanced protoplasmic tolerance. Differences in lipids unsaturation under high CO_2 may also contribute to better CL153 acclimation to water stress.

References:
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