Dynamics of photosynthetic pigments of elite genotypes of *Coffea arabica* L. undergoing drought in interaction with enhanced air [CO_2]

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INTRODUCTION

Drought impair photosynthetic components of coffee plants. In the context of expected climate change scenarios, we explored the impact of drought, in interaction with elevated air [CO_2], on leaf pigments in cropped *C. arabica* L. genotypes.

MATERIAL AND METHODS

Plants from *C. arabica* L. *cvs*: **G**eisha **3, Mar**sellesa, and their **Hy**brid

400/700 µL [CO_2] L^{-1} (**aCO_2/eCO_2**)

Well-**W**atered (**WW**), **M**ild **W**ater **D**eficit, **S**evere **W**ater **D**eficit, **Rec**overy 14 days period

Photosynthetic pigment content was assessed in chloroplasts extracts [1].

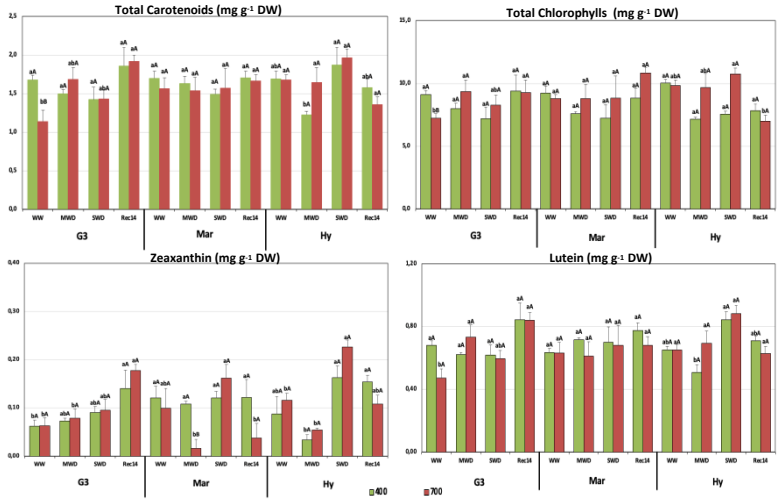

Figure 1. Leaf pigments concentration (Total carotenoids; Total chlorophylss (a + b); Total zeaxanthin and Total lutein). For each parameter, the mean values +/- SE (n = 4 plants) followed by different letters express significant differences between CO_2 treatments for each water treatment (a, b), or between water treatment for the same CO_2 treatment (A, B), always separately for each genotype, where a > b and A > B.

RESULTS AND DISCUSSION

Drought reduced the total content of carotenoids and chlorophylls in aCO_2 in all genotypes (except Hy, SWD), but usually showed a mitigated impact under eCO_2. Zeaxanthin increased in all genotypes in SWD, greater under eCO_2 than aCO_2 in Mar and Hy. Regardless of CO_2, only Hy (SWD) showed greater lutein values as compared with their WW plants. By Rec14, the total content of chlorophylls and carotenoids decreased in Hy under both CO_2, contrasting with the other genotypes.

CONCLUSIONS

Results pointed that eCO_2 may contribute to a better status of the photosynthetic apparatus of plants under SWD, thus improving energy dissipation mechanisms. By Rec14, different recovery after SWD was observed among the genotypes. These findings can be useful for selection of genotypes with greater tolerance and performance under unfavorable climatic conditions.

Reference: 1. Ramalho J.C. et al.1997. Physiol. Plant, 101(1), 229-39, doi: 10.1111/j.1399-3054.1997.tb01841.

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