28th Conference Asic 2021
From 28 June to 1 July 2021

Ecophysiological performance of C. arabica L. under agroforestry system (AFS) on Gorongosa mountain, Mozambique

S5-PO-10

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Introduction

Agroforestry system (AFS) management is a growing important tool to fight the impacts of climate changes and global warming, improving microclimate environmental conditions to the plants and, thus, crop sustainability. Optimal shade and higher altitudes can reduce heat impacts and increase coffee bean quality (1).

Materials and Methods

Five-year-old plants of *C. arabica cv*. Costa Rica under rainfed conditions were selected in three level of altitude (650 m, 825 m and 935 m), and three irradiance exposure levels (DS - Deep shade; MS - moderate shade; FS - full sun).

Leaf gas exchanges (net photosynthesis and stomatal conductance), chlorophyl *a* fluorescence were assessed to evaluate the physiological performance/status of the plants.

References:
1) Dubberstein et al. 2018. Climate Resilient Agriculture - . doi:10.5772/intechopen.72374.

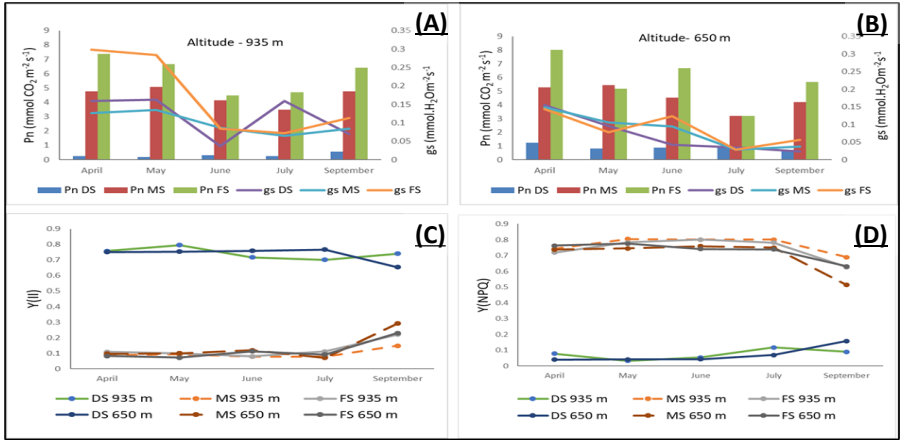

Figure: **(A)** & **(B)** net photosynthesis (P_n) and stomatal conductance (g_s); **(C)** quantum efficiency of electron transport $Y_{(II)}$ associated with photochemical energy use; **(D)** non-photochemical yield associated with photoprotective energy dissipation processes ($Y_{(NPQ)}$).

Results Highlights and Conclusions

- Greater net photosynthesis (P_n) in FS and negatively affected by DS treatment.
- Despite lower $Y_{(II)}$ in FS and MS, the high availability of light energy favors greater P_n in plants under these treatments.
- High altitude did not strongly alters P_n pattern, but usually maintained higher g_s values under FS likely associated to a greater water availability.
- High altitude and MS may promote beans quality (under study).

Acknowledgements:
Funding support by Fundação para a Ciência e a Tecnologia of the Portuguese Government through the grants to C.T. (SFRB/BD/135357/2017) and Instituto Camões