SESSION 5: PGPR, Mycorrhizae and Microbial Endophytes

S5-P-01 "Coffee Agroforestry: effects of shade trees on the rhizosphere of *Coffea arabica* established in the rainforest of the Gorongosa Mountain (Mozambique)"
Tapaça IPE, Obieze CC, Marques I, Ramalho JC, Ribeiro-Barros AI

S5-P-02 "Interactions between *Tuber melanosporum*, aromatic plants and associated arbuscular mycorrhizal fungi in intercropping designs"
Barou V, Rincón A, Calvet C, Camprubí A, Parladé J

S5-P-03 "Differences in P uptake mediated by solubilising and non-solubilising phosphate PGPR in wheat plants"
Barquero M, Mazuecos I, Crespo A, Ortiz-Liébana N, Laureano-Marín AM, Brañas J, González-Andrés F

S5-P-04 "Plant growth-promoting traits of maize bacteria isolated from different water regimes"
Sá C, Figueira E, Girbés C, Cardoso P

S5-P-05 "Biotechnological potential of *Pantoea* wheat seed endophytes"
Sanz-Puente I, Redondo S, de la Cruz F, Robledo M

S5-P-06 "The nodule endophytic acetic acid bacterium *Endobacter medicaginis* promotes the growth of alfalfa in acidic soils"
Ramírez-Bahena MH, Menéndez E, Flores-Félix-JD, Mateos PF, Vaca-Igualador L, Velázquez E, **Peix A**

S5-P-07 "Arbuscular mycorrhizas modulate the physiological and transcriptomic responses of tomato plants to heat stress"
Ferrol N, López-Castillo O, Azcón-Aguilar C

S5-P-08 "Evaluating the effect of various bacterial consortia isolated from arid wild legumes on heat stress tolerance of *Pisum sativum*"
Ben Gaied R, Brígido C, Sbissi I, Tarhouni M

S5-P-09 "Optimizing legume nodulation in situations of environmental stress: inoculants with multiresistant endophytes"
Flores-Duarte NJ, Rodríguez-Llorente ID, Pajuelo E, Mateos-Naranjo E, Redondo-Gómez S, Navarro-Torre S

S5-P-10 "Effect of tree canopy and dolomitic limestone application on soil microorganisms and pasture quality in the Montado ecosystem"
Bailote D, Serrano J, Belo A, Rato AE, Ribeiro J, Brito I

S5-P-11 "Response of spore density and root colonization by arbuscular mycorrhizal fungi to the introduction of cover crops in intensive production of maize"
Pereira P, Fareleira P, Videira e Castro I, Barradas A, Nunes AP

S5-P-12 "Arbuscular mycorrhizal fungi as indicators of soil conservation status in dryland degraded area"
Pérez-Redondo M, Jaizme-Vega MJ

S5-P-07
Arbuscular mycorrhizas modulate the physiological and transcriptomic responses of tomato plants to heat stress

Ferrol N, López-Castillo O, Azcón-Aguilar C

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Climate change, entailing shifts in temperature (T), precipitation and atmospheric composition among other factors, represents a moving target for plant adaptation. The widespread distribution of arbuscular mycorrhizal (AM) fungi and their ability to increase plant stress resistance has led to the suggestion that they can be key drivers in increasing plant resilience to climate change. Changes in atmospheric conditions and global and regional climate affect AM functioning, yet the potential role of AM symbioses in mediating plant responses to global change and the underlying mechanisms remain unexplored. This study was aimed at studying the physiological and transcriptomic responses of tomato plants inoculated with *Rhizophagus irregulari*s DAOM 181602 or *Claroideoglomus etunicatum* (isolated from a stressful ecosystem in Spain) to high T (34 °C). Heat stress had a negative effect on plant biomass in all treatments, but to a lower extent in mycorrhizal plants. High T inhibited root colonization by *R. irregularis* but not by *C. etunicatum*. Both AM fungal species mitigated the impact of heat stress on the tomato ionome. Root transcriptome profiles showed significant differential expression of 3909 transcripts under heat stress in non-mycorrhizal roots and of 3363 and 3575 genes in *R. irregularis*- and *C. etunicatum*-colonized roots, respectively. Gene ontology (GO) enrichment analysis revealed that transcripts involved in processes such as “drug metabolism”, “hydrogen peroxide metabolism”, “reactive oxygen species metabolism” and “cofactor catabolism” were influenced by heat stress in all situations. Specific GO processes enriched in non-mycorrhizal roots were related to “transmembrane transport activity”, which could explain the impact of heat stress on their ionome and its mitigation by the AM symbiosis. Specific changes induced in the transcriptome profiles of roots of the different treatments will be further discussed.

Acknowledgements

Project RTI2018-098756-B-I00 funded by MCIN/ AEI /10.13039/501100011033/ and by FEDER Una manera de hacer Europa.

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Book of Abstracts edition: Paula Fareleira, Helena Machado, Isabel Videira e Castro and Ana Paula Alves – INIAV,I.P.
Graphic composition: Ana Paula Alves – INIAV,I.P.
Contact: bemiplant@iniav.pt
Website: https://events.iniav.pt/bemiplant.
Web Design: Ana Paula Alves – INIAV,I.P.

The communications compiled in the present "Book of Abstracts" have been reviewed by the Scientific Committee with a favorable result and were presented in BeMiPlant

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Beneficial Plant-Microbe Interactions

October 17th to 19th, 2022
Oeiras, Portugal