iberian PLANT BIOLOGY 2023

Braga Portugal
9-12 July

XVIII Portuguese Spanish Congress of Plant Biology

XXV Meeting of the Spanish Society of Plant Biology

BOOK OF ABSTRACTS

Portuguese Society of Plant Biology

Spanish Society of Plant Biology

PS1-26

Phosphorus-iron crosstalk in the arbuscular mycorrhizal symbiosis

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Phosphorus (P) and iron (Fe) are two essential nutrients for plant growth and development. Both elements are abundant in most soils, but poorly available to plants. Recent evidence shows that P availability can affect plant Fe homeostasis and vice versa, but the regulatory mechanisms involved in the P-Fe signalling crosstalk are still poorly characterized. To cope with P or Fe deficiency, plants have evolved a suit of adaptive strategies oriented towards increasing acquisition and use efficiency of these elements. A widespread strategy engaged by plants to overcome nutrient deficiencies is the formation of a mutualistic symbiotic interaction, referred as arbuscular mycorrhiza, with some soil-borne fungi belonging to the subphylum Glomeromycotina within the phylum Mucoromycota. Arbuscular mycorrhizal fungi are obligate biotrophs that colonize the root cortex and develop an external mycelium that overgrows the rhizosphere. This hyphal network represents, therefore, an adaptation strategy to increase the supply of mineral nutrients to the plant. The contribution of the AM symbiosis to plant P uptake has been extensively studied. However, very little is known about its contribution to Fe nutrition and on the interactive effects of P and Fe in the symbiosis. Here, using the *Solanum lycopersicum*-*Rhizophagus irregularis* mycorrhizal system, we analysed the effect of different Pi and Fe regimes on plant performance and physiology as well as on P- and Fe-deficiency related signalling by analysing the expression of key genes regulating Pi and Fe starvation signalling. Both P and Fe fertilization impacted plant performance, but the effects we modulated by the mycorrhizal status of the plant. The role of AM in the regulation of the P-Fe interplay will be presented.

Acknowledgements
This work was supported by grant PID2021-1255210B-I00 funded by MCIN/AEI/ 10.13039/501100011033 and by "ERDF A way of making Europe", by the "European Union".