

Application of Arbuscular Mycorrhizal Fungi as Biologically Based Strategy for Mitigation of Adverse Impact of Salt Stress on Wheat

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Abstract : Salinity poses a significant challenge to wheat production, necessitating the exploration of strategies to mitigate its adverse effects. The present investigation aims to study the impact of arbuscular mycorrhizal fungi (AMF) application to improve plant tolerance in terms of growth, carbohydrate, photosynthetic characteristics, and antioxidant enzyme activities under salt stress conditions. So, a randomized complete block design with five replications was employed comprising various treatments of AMF application under salinity stress (200mM), and control samples were used for each treatment. The obtained results demonstrated significantly that AMF used in this study showed beneficial impacts in all parameters used as sensitive monitor for relation of plant-salt microbe interaction. The root colonization by AMF showed the highest plant growth criteria, relative water content, soluble sugar, starch, and total non-structural carbohydrates under both control and salinity stress conditions. Moreover, the application of AMF-treated plants showed the highest soluble protein concentration and activity in leaves and antioxidant enzymes (catalase, superoxide dismutase, guaiacol peroxidase). These findings highlight the potential impact of AMF application as a biologically based strategy to manage the mitigation of salt stress on wheat, which increases the availability of many salt marsh habitats for sustainable agriculture of such strategy crops.

Keywords : arbuscular mycorrhizal fungi, salt stress, plant growth criteria, soluble protein, antioxidant enzymes, wheat plant

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