

**APPLICATION OF MAIZE AND EFFICIENT RHIZOSPHERIC  
MICROORGANISMS FOR THE REMEDIATION OF SALINE SOILS**

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**ABSTRACT**

Soil salinity is a serious problem causing loss of fertility, as plants facing salt stress suffer alterations in physiology that adversely affects its growth.

This work aimed to evaluate the effectiveness of combinations of microorganisms for the recovery of crop productivity in soils affected by different levels of salinity (0, 2.5 and 5 gNaCl.kg<sup>-1</sup>). The strategy relied on the culture in greenhouse conditions of a high value food and energetic crop (maize) inoculated with soil plant growth promoting microbiota – an arbuscular mycorrhizal fungi (*Rhizophagus irregularis*), a rhizobacteria (*Pseudomonas reactans*) and a bacterial endophyte (*Pantoea ananatis*).

Plant biomass was assessed at harvest and differences between treatments were analysed. As the work also aimed to relate the effects of bioinoculation to alterations in plant response to salt stress, further parameters were assessed. Elevated salt levels induce ionic stress, with consequent nutrient imbalance; therefore, levels of Na, K and Ca were determined in plant tissues.

As salt is also a major stress to soil organisms, rhizosphere samples were analysed to follow up of microbiota survival by molecular biology techniques (DGGE), assessing the effect of soil salinity at the different tested levels on the inoculated soil microorganisms persistence and relationship with the existing community.

The collected information allowed understanding the effects of the applied biologically based treatments in the quality of the tested saline soils, on the dynamics of the present microbiota and on maize growth, focusing on the further development of cropping strategies for saline soils, grounded on sustainable agriculture practices.

**Keywords:** *salinization, maize, arbuscular mycorrhizal fungi, plant growth promoting rhizobacteria, plant growth promoting endophytic bacteria*

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