I CONGRESS ON SCIENCE, BIODIVERSITY AND SUSTAINABILITY

21-22 October 2019. UFMG, Belo Horizonte, Brazil.

INOCULATION WITH PLANT GROWTH PROMOTING BACTERIA ENHANCES DROUGHT STRESS TOLERANCE IN MAIZE PLANTS

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Plant growth promoting bacteria are a sustainable alternative to minimize the effects of drought that can trigger physiological disturbances compromising maize productivity. The aim of this work was to evaluate the effect of two *Bacillus* strains inoculation on maize seedlings grown in nutrient solution with drought stress induced with polyethylene glycol (PEG). Maize seeds were disinfested, germinated and transplanted to a floating system with nutrient solution for seven days. The seedling roots were incubated with two *Bacillus* strains separately, B116 and B119, from Collection of Multifunctional Microorganisms of Embrapa Milho e Sorgo at 10^7 colony forming units mL^{-1} for six hours and transferred to the nutrient solution for another seven days. Drought stress was induced by 10% PEG 6000 for three days. Then the root system was separated from the shoot, photographed and several root traits were quantified. Seedlings inoculated with the bacterial strain B119 in the absence of PEG presented superfine root volume significantly higher than the plants inoculated with the bacterial strain B116 and the non-inoculated control ($p<0.05$). Under drought stress, seedlings inoculated with both strains increased surface area of thicker roots and root dry weight compared to non-inoculated control. In addition, seedling inoculation with bacterial strain B119 generated a significant increase in the volume of thicker roots compared to non-inoculated control, and there was no reduction of the SPAD (Soil Plant Analysis Development) index. The root remodeling led to a lower total dry weight loss and revealed that these bacteria strains are promising plant bioinoculants, as they promoted increased tolerance to drought stress.

Financial support: Embrapa, CNPq and Unifemm