mICROPe

INTERNATIONAL SYMPOSIUM

MICROBE-ASSISTED CROP PRODUCTION – OPPORTUNITIES, CHALLENGES & NEEDS

JULY 11 – 14, 2022

SCHLOSS SCHÖNBRUNN - ORANGERIE, APOTHEKERTRAKT
VIENNA, AUSTRIA

ABSTRACTBOOK 2022

ÖGMBT

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PS1-S1-PP10 Inocula size and salinity stress impact PGPR outcomes on maize plants

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Freshwater availability is an increasing problem for agriculture worldwide. Therefore, the use of saline water for crop irrigation is becoming a frequently used alternative, which can impact the yield of glycophytic crops such as maize. A promising strategy to attenuate the effects of salt on crop productivity could be the application of plant growth-promoting bacteria (PGPR). These bacteria can mitigate ion imbalances, improving the growth and nutritional status of maize plants, although these effects can depend upon the dose applied. This work aimed at evaluating the application of seven increasing inocula sizes of four PGPR - *Cupriavidus necator* 1C2, *Chryseobacterium humi* ECP37, *Pseudomonas fluorescens* S3X, and *Pseudomonas reactans* EDP28 - in maize growth under freshwater and saline water (5g NaCl/L) irrigation. Maize biomass, ion, and nutrient content were modeled in response to the different doses of bioinocula applied and the quality of the irrigation water. The impacts of the different treatments on some soil parameters, such as pH and electrical conductivity, were also assessed. Results showed that globally PGPR mitigated the effects of saline water irrigation in maize plants. However, the inoculum size produced a beneficial effect different for each strain, with some showing a better performance with shorter sizes. In addition, it was also observed that the beneficial effects were higher in plants growing under saline water irrigation. However, the inocula size(s) that produced the best outcomes under this condition did not correspond to the most benefited plants under freshwater irrigation. This study highlights the probability of inocula produce unpredicted effects on plants, which depend upon the number of cells applied and the imposed stress conditions.