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Poster Communication Abstract – 5.13

ARABIDOPSIS THALIANA GROWTH PROMOTION AND SALT STRESS TOLERANCE BY THE PGPR BEIJERINCKIA FLUMINENSIS

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The growth of agricultural production needs to feed the population collides with the decrease in available land, due to the competition for spaces, to soil pollution and to other phenomenon associated with the global warming like desertification and salinization. Soil salinity affect approximately 7% of the earth land and 20% of the arable areas and turns about 1-2-% of agronomically useful lands into unproductive ones every year, mostly in arid and semi-arid regions. The use of PGPRs is widely accepted as a promising tool for a more sustainable agricultural production and to increase plant biotic and abiotic stresses resistance. The bacterial strain Pvr_9, homologous to *Beijerinckia fluminensis*, isolated from the roots of an arsenic hyperaccumulating fern *Pteris vittata* has showed different PGPR *in vitro* activities (Antenozio et al., 2020). In addition, *A. thaliana* plants inoculated with Pvr_9 resulted in an increased rosette area and primary root length (Giannelli et al., 2022). Based on what observed about Pvr_9 characteristics, we shifted our attention on Pvr_9 ability to confer *A. thaliana* salt stress tolerance. Reduction of the projected rosette area, inhibition of the primary root length, proline and total soluble sugar production have been investigated on plants grown on MS ½ X + 1% sucrose inoculated and not inoculated with Pvr_9, and subjected to 150 mM NaCl treatment. Plants grown on salted medium without Pvr_9 showed a 30% inhibition of the primary root length, while the bacterial application reduces the inhibition of the primary root growth to around 5%. In addition, the projected leaf area was significantly less influenced by the salt in plants subjected to Pvr_9 application. In addition, the total content of proline and soluble sugars, were found to be less in plant inoculated with Pvr_9. Real time PCR analysis was also performed to test the modulation of the expression of some genes involved in the salt stress

response in *Arabidopsis*. SOS1, NHX1 were found to be up regulated in plants treated with Pvr_9, while HKT1, MYB1, MYB 52, MYB 73, MYB 96 were down regulated in the stressed plants inoculated with Pvr_9, especially in the roots. To understand if ionic uptake was influenced by the Pvr_9 presence, the content of Na, K, Fe, P, and Ca was evualted. Since the ionic content does not vary between treatments, Pvr_9 could act by reducing the salt stress rather than by inhibiting the uptake of Na at the root level. To test this hypothesis, stress hormone contents such as ABA and SA in leaves and roots are evaluating by LC-MS analyses.