

## Co-inoculation of two phosphate solubilizing bacteria and their effect on growth of tomato plants

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### ABSTRACT

Plant growth promotion traits, i. e. indoleacetic acid (IAA), ammonia, siderophore and hydrogen cyanide (HCN) production were assessed in two phosphate solubilizing bacterial (PSB) isolates (*Pantoea agglomerans* DSM3493 and *Burkholderia anthina* R4183) and their effect on growth and nutrient uptake of tomato plants was investigated with a pot experiment conducted under green house conditions. The pots were arranged in a completely randomized block design with three replications (each having two seedlings) per treatment. The experimental plan was based on eight treatments i.e. (1) Soil without TCP (tri calcium phosphate) and bacteria inoculation (control), (2) Soil + TCP, (3) Soil + *Pantoea agglomerans* (4) Soil + *Pantoea agglomerans* + TCP, (5) Soil + *Burkholderia anthina*, (6) Soil + *Burkholderia anthina* + TCP, (7) Soil + *Pantoea agglomerans* + *Burkholderia anthina*, (8) Soil + *Pantoea agglomerans* + *Burkholderia anthina* +TCP. Both strains showed positive responses for all the tested plant growth promotion traits. However, IAA production was comparatively lower (10 and 7.5  $\mu\text{g/ml}$  for *Pantoea agglomerans* and *Burkholderia anthina* respectively) than the other traits. Under green house conditions, both strains remarkably enhanced plant height, root length, shoot and root dry weight, phosphorous uptake from shoot and root and soil available phosphorous compared to the control. The increases were higher in combined inoculation of PSB with TCP. Furthermore, the most pronounced beneficial effect on growth and nutrient uptake of tomato plants was observed in the co-inoculation of the two strains with TCP. Therefore, the strains showed great potential to be developed as biofertilizers to enhance soil fertility and plant growth. However, their performance under field conditions should be assessed before recommending

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