The effect of phosphate-solubilizing rhizobacteria on *Zea mays* growth on P-deficient soils

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P-deficiency in soils is a limiting factor for plant growth. Several phosphate-solubilizing rhizobacteria (PSB) were used to enhance growth of *Zea mays* growing in a P-deficient soil. Strains were screened for their ability to solubilize P and to produce plant growth promoting (PGP) substances. The best-P solubilizing strains *Rhodococcus* sp. EC35, *Pseudomonas* sp. EAV and *Arthrobacter nicotinovorans* EAPAA were inoculated in maize growing in P-deficient soils without P fertilization and amended with soluble (KH_2PO_4) and insoluble P ($Ca_3(PO_4)_2$). Results showed that PSB significantly enhanced *Z. mays* biomass production in all P-treatments. Without P fertilization, bacterial inoculation increased plant dry biomass by ca. 20%, while under soluble P conditions the enhancement was higher. *Pseudomonas* sp. EAV was the strain that better performed improving root and shoot biomass by 104% and 60%, respectively. In soils amended with insoluble P, plant biomass was also positive influenced by bacterial inoculation. Plant growth enhancement seems to be related not only to P-solubilization but also to other PGP traits, such as IAA and ACC-deaminase. This work shows that PSB may be used as bioinoculants and consequently constitute an attractive alternative to the phosphatic fertilizers amendments used to improve crop production.

Keywords: Phosphate-solubilizing bacteria; Plant growth promotion; P solubilization;

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