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GROWTH PROMOTIONAL TRAITS OF THREE PGPR: POSSIBLE USES FOR PHYTOREMEDIATION OF DEGRADED SOILS

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ABSTRACT

Maize is a fast-growing and high yield crop with both energy value and remediation potential. Plant growth promoting rhizobacteria (PGPR) are a biological tool available to enhance plant establishment in degraded or depleted environments such as the case of saline soils or heavy-metal contaminated land. Although PGPR are able to produce metabolites such as siderophores, HCN and ammonia, or solubilize nutrients such as phosphate, these beneficial traits for the plant may be influenced by exposure to excessive levels of such contaminants. In this study, three PGPR *(Pseudomonas fluorescens, Ralstonia eutropha* and *Cryseobacterium humi)* were screened for those traits in the presence of different levels of Cd and Zn, and also to different salinization conditions. Their ability to influence maize germination and root and shoot elongation was also analyzed.

Results showed that the level of exposure generally affected the ability of the tested strains to produce plant growth promoting substances. However, dissimilar sensibilities in the behavior of the different strains were observed when exposed to similar stress conditions. These differences were also noticeable in the plant development, with the tested PGPR generally positively influencing the analyzed parameters.

Results suggest that PGPR can be exploited to promote stress relief of maize when grown in degraded land. Such knowledge may provide a new insight concerning the advantages of such biotechnologically based tools for phytoremediation.

Keywords: *soil salinization, metal contaminated land, maize, plant growth promoting rhizobacteria*

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