TITLE: INORGANIC PHOSPHATE SOLUBILIZATION AND TOLERANCE TO SALINITY BY BACTERIA OF THE GENUS PANTOEA

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Abstract:

Phosphorus is an important nutrient, integral component of plant cells. It is present in the soil often in the insoluble form and cannot be readily used. Some microorganisms have the capacity to solubilize the phosphate and it provides plants and promoting plant growththus reducing the use of chemical fertilizers and consequent reduction of environmental degradation. In this sense, the objective of this paper was evaluate the ability of solubilization of inorganic phosphate in vitro under different concentrations of NaCl by bacterial strains of the genus Pantoea. Four root endophytic bacteria strains of the genus Pantoea, isolated from plants of sugarcane grown in the State of Pernambuco (UAGC972, UAGC975, UAGC976 and UAGC978) were analyzed. The bacteria were inoculated in solid culture medium containing insoluble calcium phosphate and different concentrations of sodium chloride, 0.0, 1.0, 2.5 and 5.0%, and incubated at 28° C for 120 h. The experiment was conducted in triplicate and the presence of translucent halo around the bacterial colonies indicates the phosphate solubilization. It has been estimated the rate of solubilization, the relation of the average diameter of the solubilization halo and the average diameter of the colony halo. The data were subjected to analysis of averages by Scott-Knott test ($p < 0.05$), through the SISVAR statistical software version 5.3. It was observed that under normal conditions, in the absence of salt, all strains showed ability to solubilize inorganic phosphate, with the strains UAGC975, UAGC976 and UAGC978 getting featured. There was no significant difference on the bacteria at a concentration of 1%, however at concentration of 2.5% three bacteria were able to solubilize phosphate, showing a statistical superiority when compared to the UAGC972 strain. The 5% concentration of NaCl influence negatively, inhibiting phosphate solubilization. Results show that the strains have growth-promoting characteristics, including in saline soils.

Keywords: halotolerant bacteria, sodium chloride, plant bacteria interaction, plant growth promotion.

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