

**TITLE:** PHOSPHATE SOLUBILIZATION BY ANTARCTIC BACTERIA AT DIFFERENT TEMPERATURES

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**ABSTRACT:**

Phosphorus exists in nature in a variety of organic and inorganic forms. Most soils contain sources of insoluble inorganic phosphates, which are inaccessible to plants unless solubilised. Phosphate solubilizing microorganisms convert these insoluble phosphates into soluble forms mainly through acidification processes. The objective of this study was to evaluate the potential of twelve isolates of bacteria isolated from Antarctic lichens for the solubilization of phosphate at different temperatures. The bacterial isolates were previously evaluated for the ability to solubilize phosphate at 15 °C, and then tested at different temperatures (15, 20, 25, 30, 35 e 40 °C). the analysis was performed in NBRIP culture medium (*National Botanical Research Institute's phosphate growth* medium) the bacterial inocula were standardized at 10<sup>7</sup> cells per mL. To verify the ability of the isolates to solubilize the phosphate, the halo formation (solubilization) around the colony was used as criterion. Of the twelve inoculated microorganisms, four presented positive activities 11.LB15 and 17.BL15 (isolated from *Caloplaca regalis*), 4.LB30 (from *Cladonia metacorallifera*) and 1.LB34 (from *Usnea auratiacoater*), in four different temperatures (15, 20, 25 e 30 °C), and no isolates showed solubilization activity in 35 e 40 °C. The highest production corresponded to the isolate 11.LB15 isolated from *Caloplaca regalis* with expressive solubilization from 96 to 168h after incubation producing halos of up to 17, 19, 16 and 12 mm at temperatures of 15, 20, 25 e 30 °C respectively. Thus, the results suggest that four Antarctic bacteria presented biotechnological potential in solubilizing the phosphate in different temperatures highlighting the isolated 11.LB15, which presented solubilization at four temperatures, of the six evaluated.

**Keywords:** Antarctica, lichens, phosphate solubilization

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