TITLE: PHOSPHATE SOLUBILIZATION BY MICROORGANISMS ISOLATED FROM ANTARCTIC LICHENS

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ABSTRACT:
Antarctica is the most remote and inhospitable continent, possessing the coldest and driest climate known on planet Earth. Microorganisms play a key role in increasing soil phosphorus availability for plants and phosphorus-solubilizing activity is considered to be the most important among the multiple properties of the soil microorganisms. The aim of this study was to evaluate the potential of microorganisms isolated from Antarctic lichens for phosphate solubilization. Lichen samples from the Antarctic environment were collected on the islands of the South Shetland archipelago. A total of 30 samples of lichens from the Antarctic environment were previously collected and identified as belonging to genres, *Usnea, Xanthoria, Sphaerophorus, Xanthoria, Mastodia, Caloplaca, Umbilicaria, Lecania, Rhizocarpon* e *Cladonia*. Reactivation of the isolates was done using two culture media: Yeast Malt Agar media (YMA) for yeast, and Nutrient Agar for bacteria, for the verification of the phosphate solubilization capacity was used the NBRIP medium (National Botanical Research Institute's phosphate growth *medium*). Before inoculation of the microorganisms in the NBRIP medium, these were standardized at 10^7 cells per mL. To verify the ability of the isolates to solubilize phosphate, a halo formation (solubilization) around the colony was used as criterion. From the total of 153 yeasts evaluated, 49 (32.02%) were positive for phosphate solubilization and the halo diameter varied from 8.0 mm for the isolate 8.L3 and 28.0 mm for the isolate N.L1 at 21 days after incubation at 15.0 °C. From the total of 153 bacteria evaluated, 70 (45.7%) were positive for phosphate solubilization the largest halo for bacteria was the isolate 17.LB15 with 54.0 mm, followed by 2.LB4 with 33.0 mm. These results, demonstrating the biotechnological potential of these microorganisms in the solubilization of phosphate in solid culture medium.

Keywords: Antarctica, yeast, bacteria, NBRIP, lichens

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