PLANT GROWTH PROMOTING PROPERTIES OF ACTINOMYCETES FROM *DESCHAMPSIA ANTARCTICA* E. DESV. RHIZOSPHERE (GALINDEZ ISLAND, ANTARCTICA)

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Today, humanity is confronted with the problem of climate change, which is especially affecting agriculture. Researches in the field of increasing plants' resistance to adverse conditions aim to solve this problem. Studying of the symbiotic actinomycetes from the rhizosphere of plants growing in cold climates, such as Antarctica, will help us to learn more about plant adaptation to nutrients shortages and low temperatures, and then apply it to cultivated plants.

The aim of this work was to investigate the ability of strains isolated from the *Deschampsia antarctica* E. Desv. rhizosphere to atmospheric nitrogen fixation and syntheses of phytostimulant substances.

A total of 43 isolates were isolated from *D. antarctica* rhizosphere of Galindez Island, Antarctica. To evaluate the ability of isolates to produce plant growth-promoting molecules we conducted screening of potential phosphate-mobilizing actinomycetes, indole-3-acetic (IAA) acid and siderophores producers. We applied a qualitative reaction to IAA using the Salkowski reagent and found 11 producers (25.6%) of this auxin in the *D. antarctica* rhizosphere. The level of phytohormone synthesis, determined calorimetrically, ranged from 21.0 to 62.5 μg/ml. 62.7% of isolates were able to synthesize siderophores - small peptide molecules that can provide chelating of Fe^{3+} ions in plant-accessible form. 14.1% of isolates were solubilized phosphates. Two isolates of actinomycetes had all the potential PGP properties. In another experiment, we analyzed the ability of isolates to capture atmospheric nitrogen. Fixation of atmospheric nitrogen by rhizosphere symbionts increases the content of water-soluble forms of nitrogen in the soil, which can be actively metabolized by plants. Isolates were grown on nitrogen-free medium for 14 days. 16 isolates (37%) have shown the ability to grow in the absence of nitrogen; respectively they are able to fix it from the atmosphere. As result of the experiments 11 strains with the most significant levels of PGP expression were selected for further study of their plant growth-promoting properties.