

TITLE: BIOPROSPECTING OF BIOSURFACTANT PRODUCING THERMOPHILIC BACTERIA FROM ANTARCTICA

AUTHORS: ARGENTINO, I. C. V.; SCHULTZ, J.; ROSADO, A. S.

INSTITUTION: FEDERAL UNIVERSITY OF RIO DE JANEIRO, RIO DE JANEIRO, RJ (AV. CARLOS CHAGAS FILHO, 373, SUBSOLO, CEP 21941-902, RIO DE JANEIRO – RJ, BRAZIL)

ABSTRACT:

The Antarctica continent is known for its extreme environment and for being one of Earth's most harsh. This continent presents different habitats, such as Deception Island, an active polar volcano. The environment of this island is unique; it presents continuous geothermal activity, even with 60% of its territory covered by glaciers. The different environmental characteristics presented by this island make it a unique habitat for the study of microorganisms and their biotechnological potential. The present study aimed to realize the bioprospection of bacteria from Deception Island, capable of producing biosurfactants under thermophilic conditions. To perform the screening processes, sediment was collected from geothermal points on Fumarole Bay. Ten strains were selected, including eight Gram-positive bacilli and two Gram-negative bacilli, which had their biosurfactant production screened. In each isolate, the supernatant was obtained by growing in Bushnell-Hass broth, supplemented with 2% crude oil and incubated in a shaker at 55 °C, for seven days, at 180 rpm. The tests carried out to study the production of biosurfactant were: foam production test, hemolysis test, oil displacement test and emulsification test (E24). In the screening assays, nine isolates presented good foam production, and six of these presented positive results in the oil displacement test. Among these, four isolates revealed the best results in the emulsification test (E24), with 50 and 55% of emulsification, and three of these presented halo in the hemolysis test. All three isolates were identified as Gram-positive bacilli. The results show that Deception Island presents thermophilic bacteria with a high potential for biosurfactant production, an innovative information for this environment. Through new analyzes, such as surface tension test and molecular identification of biosurfactant producers, we will be able to better understand the beneficial resources of these microorganisms, as well as their possible applications in bioremediation processes.

Keywords: Deception Island, Polar volcano, Thermophiles, Biosurfactant production, Bioremediation.

Development Agency: National Counsel of Technological and Scientific Development (CNPq), Brazilian Antarctic Program (PROANTAR), PIBIC/CNPq.