

TITLE: BACTERIA ISOLATED FROM ANTARCTIC LICHENS AS SOURCE OF PROTEASES

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ABSTRACT:

Antarctica is a continent with extreme environmental conditions such as negative temperatures, high winds, frozen and oligotrophic soils, low precipitation, low water availability and high UV radiation. Existing forms of life in Antarctica, including microorganisms, have developed forms of adaptation as a strategy to survive these extreme conditions and are therefore called extremophile organisms. This plasticity from the biochemical and molecular point of view can be very interesting for the development of new molecules with potential applications in the biotechnology industry. The objective of this study was to prospect the production of proteases from bacteria isolated from Antarctic lichens. For this, 36 samples of lichens collected during the Brazilian Expeditions to the Antarctic Continent (OPERANTAR XXXV e XXXVI). A total of 130 bacteria isolated were submitted to protease prospection tests in nutrient agar supplemented with milk (10%). The bacterial cell count was standardized at 10^7 in a spectrophotometer at 600 nm and 10 μ L of this inoculum was grown in solid medium. The plates were incubated for 7 days at 15 °C and the presence of hydrolysis halo around the colony was then observed as indicative of protease production. A total of 14 proteases were confirmed during enzymatic screening, among which: 3 isolates of bacteria were isolated from lichen *Xanthoria candelaria*; followed by 2 of lichen *Usnea aurantiacoatra*; 2 of lichen *Sphaerophorus globosus*; 2 of lichen *Caloplaca regalis*; 2 of lichen *Mastodia tessellata*; 2 of lichen *Lecania brialmontii*; and 1 of lichen *Cladonia metacorallifera*. With the positive result for 14 proteases, these results corroborate recent studies which demonstrate that Antarctic bacteria may be a promising source of protease, as well as confirms that lichens may be a promising substrate for microorganisms with biotechnological potential.

Keywords: biotechnology, enzymes, lichen, hydrolases, protease

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