

**TITLE:** PURIFICATION AND CHARACTERIZATION OF  $\alpha$ -AMYLASES SECRETED BY *BACILLUS PUMILUS* ISOLATED FROM MARINE WATER SAMPLE

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**ABSTRACT:**

Amylases comprise a group of enzymes which catalyze the hydrolysis of glycosidic bonds of starch, releasing oligosaccharides such as dextrans, maltose and maltotrioses or even glucose. These enzymes presented a high demand on the world enzyme market, given their large spectrum of industrial applications, such as: on beverage, pulp and paper, chemical and pharmaceutical industries. Marine microbial communities are poorly characterized and explored to obtain molecules applied to biotechnological processes, however, represented a potential source for enzymes suitable to harsh industrial processes, such as: salt tolerance, stability and activity in a broad range of pH and temperatures. In the present work, a collection of marine bacteria was screened for starch degradation. Three bacteria displayed activity in solid media containing starch and that presenting the largest degradation halo was chosen for further analysis. Chosen isolate named 101.1 was identified as *Bacillus pumilus*, using the 16SrDNA sequence. *B. pumilus* growth and  $\alpha$ -amylase production were monitored during cultivation in liquid media containing starch as carbon source after 24, 48 and 72 hours at 28°C and 120 rpm. Maximal enzymatic activity and growth was detected after 24 hours. In addition, maximal  $\alpha$ -amylase activity was detected in a pH range from 4 to 9 and temperature at 45°C. Furthermore, it showed activity in higher NaCl concentrations. Activity in a broad pH range and in high concentrations of salt evidence the potential use of  $\alpha$ -amylases produced by *B. pumilus* in industrial processes based on starch hydrolysis. Experiments aiming enzyme purification are under development, in which we detected two amylase isoforms. Further, purified enzymes will be characterized and evaluated aiming their application on biotechnological processes.

**Keywords:** starch, amylase, enzymes, industrial applications, microbiology, marine bacteria

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