

Title: EXTRACELLULAR ENZYMES OF BIOTECHNOLOGICAL INTEREST PRODUCED BY AMAZON ACTINOBACTERIA RHIZOSPHERIC

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Abstract:

The soil represents one of the most diversified habitats for microorganisms, which establish important role in the biochemical cycles of nature. The actinobacteria are found with greater abundance in rhizospheric soil. This group of bacteria is widely studied due their potential biotechnological production of several compounds for pharmaceutical and industrial application, including antibiotics and enzymes. Enzymes as catalase, esterase, protease, amylase and pectinase are biological catalysts of high importance in biotechnological processes. This study aimed to evaluate the production of extracellular enzymes for 2 actinobacteria strains of isolated rhizosphere of *Aniba parviflora syn fragrans* (Macacaporanga) from Amazon. To evaluate the catalase production, the strains were inoculated in NB medium and incubated at 30°C for 10 days, and subsequently the revelation was made with hydrogen peroxide (H₂O₂). The production of esterase was evaluated from the inoculation of the strains in the Sierra medium containing Tween 20 for 7 days at 30°C and thereafter for 48 hours at 4°C. The proteolytic activity was analyzed by the degradation of casein and gelatin. The production of caseinase was analyzed after cultivation of the strains in a medium containing milk powder to 30°C for 14 days. The degradation of gelatin was evaluated in culture medium containing 12% gelatin after incubation for 20 days at 30°C followed by 24 h at 4°C. The production of amylase and pectinase was observed in starch agar medium for 10 days at 30°C and amid TSA with citrus pectin for 7 days, respectively, followed by revelation with Iodine solution. The studied strains of actinobacteria produces enzymes catalase, caseinase, amylase and pectinase. However, no strain produces gelatinase and only the strain MPO8 produces esterase. The presence of amylase in actinobacteria is commonly observed in species of *Nocardia* and *Streptomyces*, whose production of these enzymes and catalase play an important role in promoting growth and control of phytopathogens. The production of esterase is a typical feature of many microorganisms and is essential in the synthesis of some clinically important drugs. The pectinase is very important in maintaining the ecological balance due to their ability to decompose and recycling of plant residues. Thus, it became clear that these species of Actinobacteria is capable to producing enzymes of high industrial interest.

Keywords: Actinobacteria, biotechnology, enzyme activity