TITLE: CELLULASE AND XYLANASE ACTIVITIES FROM ACTINOMYCETES ISOLATED FROM CAATINGA REGION, BRAZIL

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ABSTRACT:
Microorganisms represent a significant part of the biomass at terrestrial biosphere. Their contribution to technological processes is increasing, especially in the production of biofuels, drugs and biopolymers. Enzymes like cellulases and xylanases can easily be applied in the hydrolysis of lignocellulosic biomass, especially sugarcane, specifically using bagasse fibers and other residues from the plant processing. These enzymes can be highly efficient in improvement of the cellulosic ethanol. Thus, the development and optimization of enzyme preparations are being required as a form to access the sugars from lignocellulose fibers, as raw material for bioethanol production. In this sense, high-throughput screenings, as well alternative microbiological sources are essential to get efficient enzyme systems, that can be applied in these biotechnological processes. In this study twenty two (22) actinobacteria were isolated from soil samples at Brazilian caatinga. They were evaluated about their abilities to produce cellulases and xylanases using a high throughput screening provided by the commercial kits: AZO-CM-Cellulose S-ACMC 04/07 (Megazyme®) and AZO-XYLAN (Birchwood) - S-AXBL 10/07 (Megazyme®), respectively. Among the 22 evaluated strains, six (6) of them were selected about their cellulolytic activity P5-2 (6.34 U/mL); P8-44 (5.07 U/ml); P5-53 (4.90 U/ml), P5-100 (4.85 U/ml); P8-38 (4.74 U/mL) and P8-109 (4.66 U/mL). About the xylanolytic abilities, it was possible to select five isolates: P5-53 (79.91 U/mL), P5-54 (79.14 U/mL), P5-2 (62.11 U/mL), P5-75 (58.52 U/mL) and P5-77 (55.59 U/mL). In the present study, the cellulolytic activity of the investigated actinomycete strains ranged values between 3,255 ± 0,004 and 6,355 ± 0,017 U/mL, with emphasis for the isolate P5-2, which showed the better result. The maximum xylanase activity was reached for the isolate P5-54 (79.14 U/mL), with xylanase activity ranged values between 79,908 ± 0,328 and 2,376 ± 0,033 U/mL. Analyzes are still in progress, evaluating more strains obtained from the same environment, as a form to increase the number of candidates for use in bioethanol production improvement.

Keywords: Actinomycetes, Screenings, Caatinga, Bioethanol

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