

2nd World Biotechnology Congress

December 04-05, 2017 | Sao Paulo, Brazil

Cellulase and xylanase activities of *Xanthomonas axonopodis* pv. *manihotis* (Xam) strains collected from different regions of Colombia

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Statement of the problem: Microorganisms are an important source of plant cell wall-degrading enzymes. This is especially true for plant pathogenic bacteria because the production of plant cell wall-degrading enzymes is practically a prerequisite for pathogenesis. Recent studies characterized the activity of the enzymes produced by different bacteria, and their utilization in industrial processes, including the degradation of lignocellulosic biomass for biofuel production. Currently, the sources to obtain biofuel are not renewable, and the diversity of enzymes produced by native endogenous bacteria is becoming more important. Thus, we propose to analyze the carboxymethyl cellulase (CMC_e) and xylanase activities of the cassava pathogen, *Xanthomonas axonopodis* (Xam) strains collected from different regions of cassava production in Colombia.

Methodology & Theoretical Orientation: We performed a screening of the enzymatic activity of 660 Xam strains maintained at the Natural History museum collection of the Universidad de Los Andes. The hydrolytic activity was determined using 0.2% Congo red and identifying clear halos. Strains showing statistically significant differences and the highest coefficient estimates were selected and individually analyzed for their hydrolytic activity.

Findings: A total of 34 out of 660 Xam strains showed significant differences, and the higher coefficient estimate of CMC_e activity. The highest ranges of carboxymethyl cellulose degradation ranged from 6.269 to 4.992 cm² in area, and the lowest between 1.71 and 0.445 cm². A total of 46 out of 660 Xam strains showed significant differences and highest coefficient estimates of the xylanase activity. The highest ranges of Xylan degradation ranged from 0.3375 to 0.267 cm² in area, and the lowest between 0.2096 to 0.2 cm². Differences in Xam hydrolytic activity were analyzed and related at the molecular level.

Conclusion & Significance: This study is an important approach to increase the knowledge on plant hydrolytic activity. We intend to discuss the possible use of these enzymes in biotechnological processes.

Biography

Leidy Yanira Rache is a Ph.D. student in the Department of Microbiology and Immunology, Universidad de los Andes, Bogotá, Colombia. She has a B.S. in Microbiology from the same university. Her research focuses on the pesticide degrading capabilities of bacteria. Currently, she is studying the population genetic diversity and cellulolytic activity of *Xanthomonas axonopodis* pv. *manihotis* from different regions in Colombia. The aims of the study are to propose control strategies to the blight caused by the bacteria, and to promote research for knowledge of not only native Xam species but also other native pathogenic bacteria in Colombia.

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