LIGNOCELLULOSIC ENZYMES PRODUCTION BY BASIDIOMYCETES FUNGUS USING STRAW EXTRACT

Macías González S.[1], Valdéz Castro L.[2], Ramírez Castillo, M. L.[2], Anducho Reyes, M.A.[1], Mercado Flores, Y.[1], Téllez-Jurado, A.[1]

[1] Laboratorio de Microbiología Molecular, Universidad Politécnica de Pachuca, Carretera Pachuca – Ciudad Sahagún km 20, Zempoala, Hidalgo, CP. 43830. [2] Universidad Politécnica de Puebla. E-mail: choko_10zeus@hotmail.com

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Introduction:

Lignocellulosic residues, such as straw barley, are an organic renewable matter source that, by hydrolysis, can be transformed into industrial interest products. These residues are mainly composed by three polymers: hemicellulose, cellulose and lignin. There are microorganisms able to oxidate and hydrolyze these polymers through the secretion of lignocellulosic enzymes as laccases, cellulases and xylanases, being the white-rot basidiomycetes fungus the most important [1].

The purpose of this project is to carry out an enzyme production study by basidiomycetes fungus isolated from "Parque Nacional El Chico" using barley straw extract as the substrate.

Methods:

The microorganisms used were the strains CB-PNC-012 y CB-PNC-007, isolated from "Parque Nacional El Chico". They were propagated in PDA medium at 28°C, which was used to make a preinoculum to carry out the production on barley straw extract (Obtained adding hot water at the straw by 30 min) at 28°C and 165 rpm. An extracellular sample was taken every 24 h for 5 days and the cellulase and xylanase activity [2], laccase activity [3] and total protein [4] were analyzed.

Results:

The tested strains were able to use barley straw extract as sole carbon source and they showed xylanase, cellulose and laccase activity (Figure 1). We could observe that the strain CB-PNC-012 has the maximum production with 89.35 UA/mL for cellulase, 79.70 UA/mL for xylanase and 13.64 mUA/mL for laccase. While the strain CB-PNC-007 has 15.46 UA/mL for cellulase, 43.08 UA/mL for xylanase y 63.88 UA/mL for laccase.

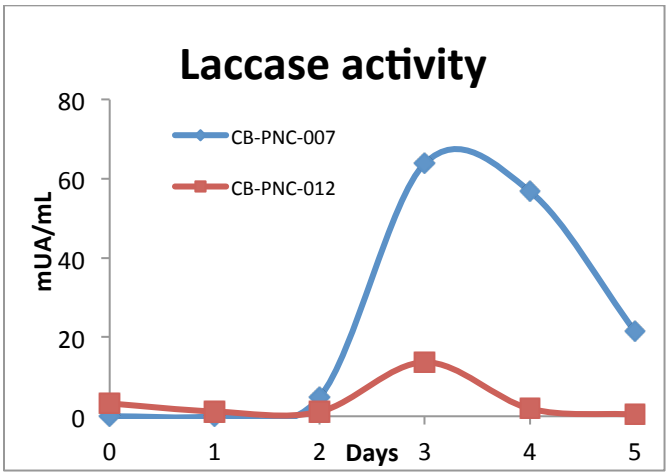

Figure 1: Laccase activity of strains CB-PNC-012 y CB-PNC-007 grown on straw extract

Conclusion:

The use of barley straw extract as the substrate for the grown of basidiomycetes fungus, strains CB-PNC-012 y CB-PNC-007, showed lignocellulosic enzyme activities.

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