SUPPLEMENTATION OF BARLEY STRAW WITH CARBON AND NITROGEN SOURCE FOR THE PRODUCCIÓN OF LIGNOCELLULOSIC ACTIVITIES FROM *Trametes polyzona*

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Introduction. Barley (*Hordeum vulgare L.*) is one of the most important cereals for human consumption, while barley straw is considered an agro waste that affects the environment [3]. Nowadays biotechnological methods are applied to approach the mass of this waste that could be used as a substrate for ligninolytic fungi to obtain enzymes as laccase, cellulose and xylanse or sugars for the generation of high value-added products such as biofuels, prebiotics, and others. [1, 2]. The addition of carbon or nitrogen source can increase the activities of one or more lignocellulosic enzymes.

The propose of this work is to study the ligninocellulosic activities of *Trametes polyzona* using barley straw as sole carbon source and supplemented with glucose as carbon source or peptone as nitrogen source.

Methodology.
It was made a solid state fermentation (SSF) using barley straw as substrate to grow *T. polyzona*. The inoculum was prepared with mycelia previously grow in PDA during 7 days at 28°C and we evaluated three different mediums, Ramesh Chand salts: i) without supplementation ii) with glucose 2% and iii) with Peptone 2%. The SSF was performed at 28°C and 75% moisture during 7 days. Every 24h, a sample was taken and analyzed laccase [4]. cellulose and xylanase activities [5]. and total protein by the Bradford method.

Results. *T. polyzona* was able to use the barley straw as support and carbon source as well as production of extracellular enzymes xylanase, cellulase and laccase. Addition of glucose as carbon source repressed the xylanase and cellulose activities agai nst the addition of peptone as nitrogen source (data not shown). The laccase activity was higher when carbon and nitrogen source was supplemented and it was produced one day before (Fig. 1). In the quantification of protein in the three different medium were similar behavior. (data not shown).

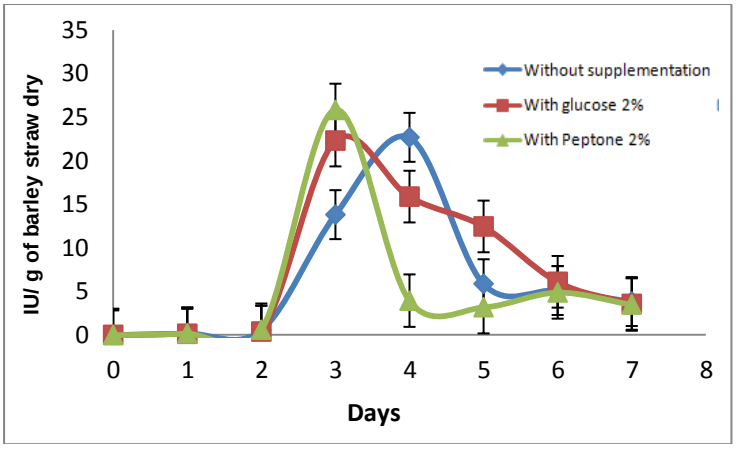

Fig. 1 Laccase activity produced from *T. polyzona* grown in barley straw

Conclusions. The addition of Ramesh Chand salts supplemented with Peptone 2% increase the xylanase, cellulose and laccase activities from *T. polyzona* growed in barley straw.

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References.

1. Molina; C. J.L 1989 “La cebada” Editorial Mundi Prensa. Madrod España.
2. Dávila, G. y Vázquez –Duhalt, R. 2006. Enzimas ligninolíticas fúngicas para fines ambientales.
3. Diorio, L.A., F. Forchiassini V.L Papanutti y D.V. Sueldo. 2003. Actividad enzimática de diferentes tipos de residuos orgánicos por Saccobolus Saccoboloides. Rev. Iberoam. Micol. 20:11-15
4. Jaouani, A., Guill´en, F., Penninckx, M. J., Martínez, A. T., Martíinez, M. J., (2005) Role of *Pycnoporus coccineus* laccase in the degradation of aromatic compounds in olive oil mill wastewater. Enzyme and Microbial Technology 36 (1): 478–486.
5. Miller, G.L., Blum, R., Glannon, W.E., Burton, A.L., (1960). Measurement of carboxymethylcellulase activity. Analytical Biochemistry. 1(2): 127–132.