INFLUENCE OF PRETRATMENT TYPE OF *Agave atrovirens* FIBERS IN THE DEGRADATION BY *Trichoderma* STRAINS

Naivy Nava*, Miguel Medina-Morales**, Cristóbal N. Aguilar;

[1]Food Research Department, Universidad Autónoma de Coahuila, Saltillo, Coahuila, México.
*nync6@hotmail.com **mike_medina2x4@hotmail.com

Key words: Agave, Trichoderma spp., Pretreatment.

Introduction. Approximately 75% of the Agave species are in Mexico, which is considered point of origin of the Agave genus. The lignocellulosic content of the Agave plants, can be found in leaves and can be a potential source of diverse materials. For this purpose different procedures have been developed depending of final product. This products are used in pharmacy, chemistry and biomaterials[1]. One of the methods to access to this material is by fungi like *Trichoderma spp*. They are able to produce cellulases, which are a group of enzymes that are composed by endoglucanases, exoglucanases and β- glucosidases[2] which are used to depolymerize cellulose. This work has like objective to determine if *Trichoderma* can use agave fibers as carbon source and to determine which strain is capable to degrade this substrate and the production of enzymatic activity.

Methods. The Agave leaves were treated with two methods: dry autoclaved and NaOH hydrolysis. Four different strains of *Trichoderma were used:* T2-31, T2-11, T1-04 and TM, and solid state fermentation was carried out using Mandels medium for 84 hours at 30°C. Growth measurement and endoglucanase and β-glucosidase activity were determined.

Results. The fastest growth was registered by the strain T2-31**,** as well as the highest enzyme activity. In the Fig 1, is shown that T2-31 present a wider and faster growth and also in sporulation time, being this at 48 hours of fermentation. The T2-11 strain growth slightly slower than T2-31. T1-04 and TM were growing slower that the last 2 strains and sporulation was seen at 72 hours. All of the strains could growth using the fibers treated with dry autoclaved, while the NaOH treatment does not show growth in any strain. There were differences in growth speed and the presence of activity among the strains in the systems with positive growth.

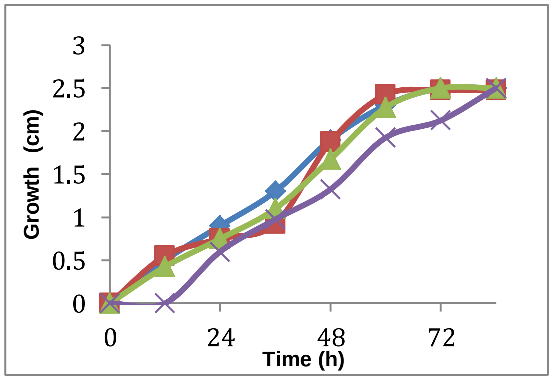

Fig 1. Radial growth of four different strains of *Trichoderma* using Agave fibers as substrate. ◆ T2-31, ■ T1-04, ▲ T2-11, X TM

Table 1. Enzyme activity of the four strains of *Trichoderma* spp. (+ means activity enzyme and - means null activity).

	Enzyme activity	
	Endoglucanase	β-glucosidase
T2-31	+	+
T1-04	-	+
T2-11	-	+
TM	+	+

Conclusions. The best growth and enzyme activity were presented by T2-31, so it is the strain that can perform a better degradation of the Agave fibers as carbon source.

Acknowledgements. We would like to thank CONACyT for the scholarship given.

References.

1. Ruiz H., Ruzene D., Macieira F., Vicente A.,. (2011). Development and characterization of an environmentally friendly process sequence (Autohydrolysis and organosolv) for wheat straw delignification. Applied Biochem. Biotechnol. 164:629.
2. Fang, H., Zhao C., Song X. (2010). Optimization of enzymatic hydrolysis of steam-exploded corn stover by two approaches: Response surface methodology or using cellulase from mixed cultures of Trichoderma reesei RUT-C30 and Aspergillus niger NL02. Biores. Technol., 101: 4111-4119.