



## SUGAR ASSIMILATION PROFILE OF *Candida glabrata* FOR ALCOHOL PRODUCTION IN SYNTHETIC MEDIUM

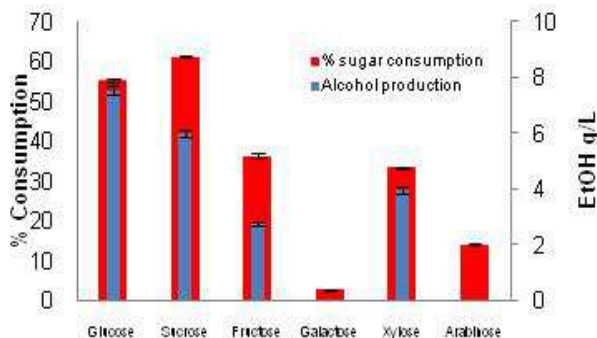
Raziel Estrada-Martínez, Neith Pacheco, Tania González, Ma. de los Ángeles Sánchez, Juan Morales, Ingrid Rodríguez-Buenfil  
Centro de Investigación y de Asistencia en Tecnología y Diseño del Estado de Jalisco, A.C., Unidad sureste. Mérida Yucatán, CP 97070  
E-mail: raziel\_em@hotmail.com

**Keywords:** *Candida glabrata*, assimilation profile, ethanol.

**Introduction.** Lignocellulosic biomass is a viable option for microbial fermentation and bioethanol production, due to its low cost and worldwide abundance (1). The Hydrolysis of this biomass releases a variety of sugars that not all the microorganisms are able to assimilate. The aim of this study was to obtain the sugars assimilation profile of *Candida glabrata* in synthetic medium.

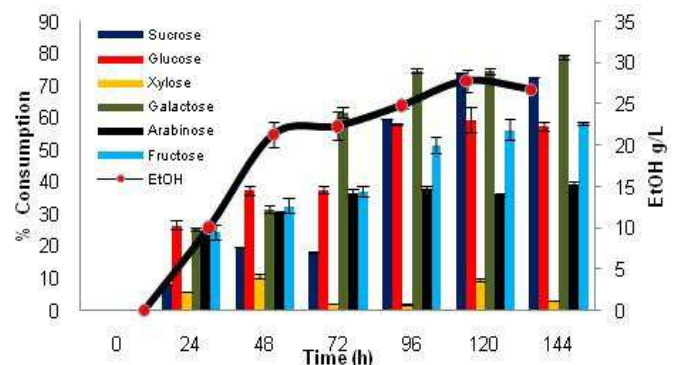
**Methods.** *Candida glabrata* strain isolated from Yucatán wild termite was used. Minimal medium with salts of nitrogen, phosphorus, trace elements and as a sole carbon source: glucose, fructose, galactose, arabinose, xylose, rhamnose or sucrose and the mixture thereof to obtain a medium with 28.2 g of carbon were evaluated (2). The sugar mixture was monitored by HPLC according to the methodology reported elsewhere using a Thermo Scientific Equipment (3).

**Results.** The assimilation profile of the sugars tested individually is shown in Figure 1, the strain was able to assimilate primarily sucrose, glucose, fructose, xylose and arabinose and a lesser proportion galactose, rhamnose was not assimilated by this strain. The highest consumption percentage was 61.17% obtained by sucrose. The maximum alcohol production was 7.54 g/L of ethanol obtained by glucose as a carbon source.



**Fig.1** Individual fermentation of different sugars by *Candida glabrata*

During fermentation of the sugars mixture (Fig.2), the strain *Candida glabrata* showed a different behavior, where the largest consumption percentage was obtained at 48h with 37.5% of glucose, at 96h galactose consumption stands with 74.88%. At 144h it is observed that the highest consumption was obtained by galactose, sucrose and in similar proportion for glucose and fructose. The xylose and arabinose were stable over fermentation time. The maximum concentration of the alcohol was obtained at 120h with 27.8 g/L.



**Fig. 2** Fermentation of a mixture of different sugars by *Candida glabrata*

**Conclusions.** The strain used showed the ability to ferment glucose, sucrose, fructose, xylose, galactose and in low proportion arabinose. The assimilation percentage of these sugars varies if they are present individually or in a mixture in the medium. The best results in alcohol production were obtained in the mixture from sucrose, galactose, glucose, and fructose at 120h of fermentation.

**Acknowledgements.** Authors thank CONACyT for project founding FOMIX 2011-C09-169165 and master scholarship granted to Raziel Estrada Martínez.

### References.

- Bai F. W., Anderson W. A. and Moo-Young M. (2008). *Biotechnology Advances*. 26: 89-105.
- Wikins M. and Widmer W. (2005). *Proc. Fla. State Hort. Soc.* 118: 419-422.
- Singh H., Vadlani P., Brijwani K., Bhargav V. and Tumadu R. (2010). *Process Biochemistry*. 45: 1299-1306