



OBTAINING OF OLIGOSACCHARIDES FRACTIONS BY SELECTIVE PRECIPITATION OF MUCILAGE OF *Opuntia streptacantha*

Reyes-Reyes, M., Salazar-Montoya, J.A., Rodríguez- Páez, L., Méndez-Castrejón, M. P., Ramos-Ramírez, E G. Department of Biotechnology and Bioengineering. CINVESTAV-IPN. Av. IPN 2508.14-740. Zip Code 07360. Mexico, D.F. Email: eramos@cinvestav.mx

Key words: Selective precipitation (SP), non-digestible oligosaccharides (NDO), Degree of polymerization (DP).

Introduction. There are several methods for separation of carbohydrates of high and low molecular weight, within those found the selective precipitation (SP) method which it is based on differences in solubility that present the compounds as well as their composition and molecular weight (WM) (1). Several studies performed for the separation of carbohydrates by SP indicate that these methods can be utilized in the preparation and purification of non-digestible oligosaccharides (NDO), which are of interest in human nutrition for its prebiotic potential. In this method have been employed different solvents, and when ethanol is used as main solvent the obtained yields are higher (2). The aim of this study was to obtain an oligosaccharide fraction (OF) less than 1000 Da, from sample of hydrolyzed mucilage of *Opuntia streptacantha* (OS) using the PS methodology.

Methods. The OF generated from this hydrolyzed mucilage was separated by gel permeation chromatography (GPC), and analyzed by quantifying of Total sugars (3) along the elution. Subsequently, the OF of interest was isolated using ethanol concentration gradients from 0% to 95%. The OF obtained was analyzed by HPLC and was determined its DP (4).

Results. GPC analysis indicated that the hydrolyzed showed several fractions with molecular weights lower and higher than 1000 Da. By applying the gradient of 0% to 70% precipitated compounds with MW higher than 1000 Da, and ethanol gradients higher only precipitated a minor fraction of OF1. The PD was determined to OF1, which was close to 5. Figure 1 shows the chromatogram obtained by HPLC to the fraction OF1, where it was observed that this fraction is also constituted by three different fractions. The values obtained of the DP are within those reported for compounds with prebiotic activity, for example, some xilo-oligosaccharides (DP=2-4) and oligosaccharides derived from soybean (DP=3-4) (5).

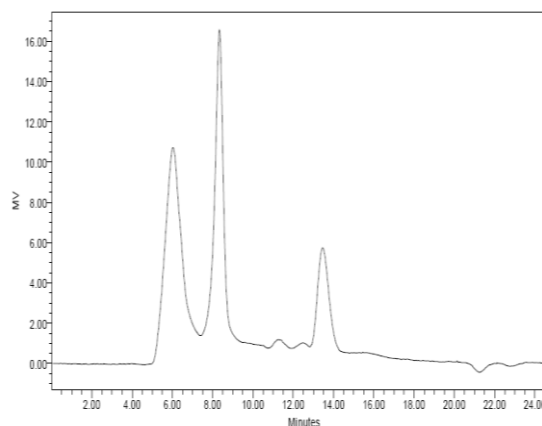


Fig.1 .Chromatogram of FO1 using a HPLC method.

Conclusions. It was found that oligosaccharides can be separated using the SP method with ethanol. HPLC analysis indicated that the sample is a complex mixture of sugars which requires additional separation process. The extraction with ethanol gradients can help the separation of molecular weights.

Acknowledgements. The authors thank CONACYT for the scholarship No.3067 awarded to MRR.

References.

- 1.- Izydorczyk, M. (2005).In: Cui, S. W. (2005).Food Carbohydrates: *Chemistry, Physical Properties, and Applications*. Ed. Taylor & Francis Group. pp. 289-296
- 2.- Swennen, K., Courtin, C. M., Van der Bruggen., B., Vandecasteele, C., Delcour, J. A. (2005). *Carbohydr. Polym.* 62, 283-292.
- 3.- Miller, G. L. (1959). *Anal.Chem.* 31:426-428.
- 4.- Greenwood, C. T. (1976). Starch. *Advances in Cereals Science and Technology*. Vol. 3. Editor Pomeranz, Y. pp: 234.
- 5.- Blaut, M. (2002). *Eur. J. Nutr.* 41(Suppl 1): 1/11-1/16.