

Influence of Aeration and Metal Ions on Xylose Bioconversion from Water Hyacinth Hydrolysate into Xylitol by *Debaryomyces hansenii* (poster presentation) - International Conference on Medicinal Chemistry and Timmerman Award 2013 Universitas Indonesia, 28 -29th October 2013

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Abstrak

ABSTRACT

Xylitol is a five-carbon polyol sugar. It has many healthy benefits and is widely used in food, pharmaceutical, and healthcare. Natural sources with abundant carbon such as lignocellulose can be used for xylitol production. One of the potential sources with high prevalence in Indonesia is water hyacinth. It is known as weeds and has not been fully utilized by people. The aim of this research was the utilization of water hyacinth which contains hemicellulose as a substrate in the bioconversion of xylose into xylitol by yeast cells *Debaryomyces hansenii*. Stages of processing include the optimization of water hyacinth hydrolysis using autohydrolysis method and optimization of fermentation conditions. Xylose and xylitol were determined by HPLC with RI detector and LiChrosorb® NH2 (4 mm x 125,00 mm, 5µm) column. Acetonitrile-water (90:10, v/v) was used as a solvent. 20 µL sample volume was injected at flow rate of 1.0 mL/min and room temperature. The results showed that optimum conditions for the acquisition of xylose were obtained through autohydrolysis methods for 75 minutes with 1:15 water hyacinth and water ratio and posthydrolysis for 45 min using 4% sulfuric acid. Xylose concentration in hydrolyzate obtained was 25.55 g/L. The optimum fermentation condition for xylitol production was achieved by four day cultivation, limited aeration condition, and addition of metal ions $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$ 0.01%. The yield of xylitol obtained using those conditions was 77.43 %.