

廢稻草回收產醣及產醇之研究

廖靖華¹ 李清華¹ 方信雄² 洪基恩¹

¹大葉大學環境工程學系

51591 彰化縣大村鄉學府路 168 號

²南投縣環境保護局

54001 南投市中興路 660 號

摘要

本研究係採用不同分解產醣方法（包括：傳統水浴法、超音波分解法、微波消化器法、高壓釜法以及超音波法+微波消化器法）來進行廢稻草產醣效果之比較，以選擇出最佳分解產醣法來獲得含醣液體，再透過生物醱酵來將含醣液體產製生質乙醇。根據本研究成果顯示，本研究所得之最佳分解產醣法為高壓釜法，在最佳產醣液產製條件為：0.25M 硝酸、20 分鐘、固液比 0.5g/5ml 下，可獲得 47,272.5 mg L⁻¹ 之醣量。另本研究將此最佳產醣液加入啤酒酵母菌株（*Pichia stipitis* BCRC 21775）來醱酵產醇，其所獲得之生質乙醇量為 375.7 mg L⁻¹。

關鍵詞：廢稻草，醣，微波，高壓釜，生質乙醇

The Production of Sugar and Alcohol from Waste Rice Straw

CHING-HUA LIAO¹, CHING-HWA LEE¹, SHING-SHYONG FANG² and CHI-EN HUNG¹

¹Department of Environmental Engineering, Da-Yeh University

168 University Rd., Dacun, Changhua 51591, Taiwan, R.O.C.

²Environmental Protection Bureau, Nantou County

660 Zhongxing Rd., Nantou 54001, Taiwan, R.O.C.

ABSTRACT

This study adopted various decomposition methods, including the traditional water bath method, ultrasonic method, microwave method, autoclave method, and the ultrasonic + microwave method to decompose waste straw to produce sugar. Thereafter, the produced sugar solution was converted to bioethanol by biological fermentation. Results showed that the optimum decomposition method for the waste straw was autoclave method, and under 47,272.5 mg L⁻¹ of sugar was produced under the optimum operating condition of 0.25M nitric acid, 20 min of decomposition, and a solid-liquid ratio of 0.5g/5ml, and 47,272.5 mg L⁻¹. This optimum sugar solution was further transformed by fermentation to produce 375.7 mg L⁻¹ of bioethanol by adding a beer yeast strain (*Pichia stipitis* BCRC 21775).

Key Words: waste straw, sugar, microwave, autoclave, bio-ethanol