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Biodegradation of lignocellulosic residues of water hyacinth (Eichhornia crassipes) and response surface methodological approach to optimize bioethanol production using fermenting yeast Pachysolen tannophilus NRRL Y-2460

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Abstract : The objective of this research was to investigate biodegradation of water hyacinth (Eichhornia crassipes) to produce bioethanol using dilute-acid pretreatment (1 % sulfuric acid) results in high hemicellulose decomposition and using yeast (Pachysolen tannophilus) as bioethanol producing strain. A maximum ethanol yield of 1.14 g/L with coefficient, 0.24 g g-1; productivity, 0.015 g l-1h-1 was comparable to predicted value 32.05 g/L obtained by Central Composite Design (CCD). Maximum ethanol yield coefficient was comparable to those obtained through enzymatic saccharification and fermentation of acid hydrolysate using fully equipped fermentor. Although maximum ethanol concentration was low in lab scale, the improvement of lignocellulosic ethanol yield is necessary for large scale production.

Keywords : Acid hydrolysis, Biodegradation, Hemicellulose, Pachysolen tannophilus, Water hyacinth
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