ABSTRACT

EFFECT OF CELLULOSE ENZYME CONCENTRATION AND INCUBATION TIME ON BAGGASE REDUCING SUGAR CONCENTRATION

By

Rini Septiyani[1], Sutikno[2], Murhadi[2]

Baggase, solid by product of sugar cane industries, contains high lignocellulose. The lignocelluloses consist of 46.0% cellulose, 21.6% hemicellulose and 20.4% lignin. Baggase can be used as raw materials of bioethanol production. Before fermenting into bioethanol, the baggase needs to submerge into base solution in order to dissolve lignin component. After filtering the solution, the residues (cellulose and hemicelluloses) are hydrolyzed with celullase enzyme into reduced sugar.

The objective of this research was to study effects of enzyme concentrations and incubation times on reduced sugar concentration of baggase. Baggase was submersed in 1 M NaOH solution at 121^{o}C for 15 minutes for degrading lignin component. After filtering the solution, residues were dried up to constant weight. The residues were hydrolyzed into reduced sugar with celullase enzymes at concentrations of 0, 5, 10, and 15 FPUs for 0, 6, 12, 18, and 24 hours at a shaking of 100 rpm, a pH of 4.8, and at a temperature of 50^{o}C. At the end of incubation times, filtrate was taken and reduced sugar concentration was measured. Data of reduced sugar concentrations were processed and presented in table and graphic, and then discussed descriptively. Research results indicated that the higher concentration and the higher incubation time of enzymes resulted in the higher concentration of reduced sugar. The best treatment was occurred at a combination of 10 FPU enzyme concentration and 18 hour enzyme incubation. The treatment provided a reduced sugar concentration of 14,07 mg/mL.

Keywords : Baggase, lignocellulose, cellulose enzyme, reducing sugar

1) Alumni Jurusan Teknologi Hasil Pertanian, Fakultas Pertanian, Universitas Lampung.
2) Dosen Jurusan Teknologi Hasil Pertanian, Fakultas Pertanian, Universitas Lampung.