

ABSTRACT

BIODEGRADATION OF CELLULOSE IN SOLID STATE FERMENTATION PRE-TREATED RICE STRAW BY *ACTINOMYCETES* AcP-1 AND AcP-7 ISOLATE

By

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Cellulose is primary component of plant cells wall, in which in rice straw the content of reach 34% repectively. Efforts to increase the economic value of rice straw is done by converting the polymer into simple sugars that could be utilized as a transition in the field of biotechnology products. This study was conducted to optimize rice straw pre-treated hydrolysis process and to characterize reducing sugar content that release in process. Two condition in fermentation has been set up, each time of incubation and different pH, to obtain optimum condition fermentation by two isolate actinomycetes AcP-1 and AcP-7. Result of this treatment show that optimum condition were reached at 12nd day fermentation in pH 7,5. Some of chemical parameter which are used as guide to obtain the optimum fermentation condition have reached the peak at this condition. Fermentation by actinomycetes AcP-1 isolat has optimum performance on decreasing of cellulose content was 10,595%, and cellulase activity was 1,164 U mL⁻¹ respectively. On the other hand, fermentation by actinomycetes AcP-7 isolat has optimum performance on decreasing of cellulose content was 10,580%, and cellulase activity was 0,997 U mL⁻¹ respectively. Reducing sugar which analyzed by DNS method shows that hydrolysis by AcP-1 isolate release reducing sugar at 15,134 mg mL⁻¹, and AcP-7 isolate at 14,803 mg mL⁻¹. In addition, retention time of glucose from both of fermentation filtrates was slighty different. Chromatogram from HPLC analyze shows for AcP-1 filtrate the retention time peak at 8,911 minute, however AcP-7 filtrate at 8,911.

Key words : cellulose, reducing sugar, actinomycetes AcP-1 and AcP-7 isolate.