ABSTRACT

BIO-PRETREATMENT OPTIMIZATION IN RICE STRAW SOLID STATE FERMENTATION BY *ACTINOMYCETES* AcP-1 AND AcP-7 ISOLATE

By

MAJID RIMBANI

Rice straw waste is most abundant ligno-cellulosic biomass in Indonesia. 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 reduce the lignin content in rice straw in which hemicellulose and cellulose hydrolysis in order to be more effective. 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 reach at 15^{th} day fermentation and 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 APPL was 33,2 mg g^{-1} substrate, decrease of lignin content was 7,15 %, decrease of cellulose content was 10,4 %, ligninase activity 1,05 UmL^{-1} xylanase activity was 0,58 UmL^{-1}, and cellulase activity was 0,77 UmL^{-1} respectively. On the other hand, fermentation by *Actinomycetes* AcP-7 isolat has optimum performance on APPL was 35,8 mg g^{-1} substrate, decrease of lignin content was 8,66 %, decrease of cellulose content was 10,91 %, ligninase activity 0,71 U mL^{-1} xylanase activity was 0,48 U mL^{-1}, and cellulase activity was 0,63 U mL^{-1} respectively.

Key words: ligno-cellulosic, bio-pretreatment, *Actinomycetes* AcP-1 and AcP-7 isolate.