SACCHARIFICATION PROCESS OF *Eichhornia crassipes* WITH COMBINATION OF BACTERIA, FUNGUS AND YEAST

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ABSTRACT

Water hyacinth (*Eichhornia crassipes*) is a weeds in aqueous ecosystems that growth fastly. But, this plant has a high cellulose, hemicellulose and lignin content, so it can be used as a raw material to make a bioethanol. The high lignin content cause some special treatment to make a bioethanol from *E. crassipes*. The first treatment is breaking the chain of lignin. The next step is hydrolysing by using the acid-base and microorganism. This research is focus to increased the efficiency of glucose production in saccharification process by combinating the bacteria, fungus and yeast.

The pretreatment process is by cutting up the *E. crassipes* 2 cm x 2 cm big. A half is to dry in the sun for 48 hours to make a powder and a half left is to formed juice. After that, we heat up and sterilization by using the autoclave and then inoculating the *Phanerochaete chrysosporium* fungus. The hydrolysis process is using the acid H\textsubscript{2}SO\textsubscript{4} 0,25% (v/v) 12 mL and neutralized with base NaOH 1 mL. After that, inoculating the *P. chrysosporium* fungus. The saccharification process is by admitting the *Aspergillus niger* and *Trichoderma viride* fungus, *Saccharomyces cereviceae* yeast, 0,25mL/reactor and 0,5 mL/reactor of microorganism M-16.

The result show that the reactor with 0,5 mL/sample of microorganism M-16 with 42 hours incubation time was the fastest 0,174 mg/hr.g and the biggest 7,33 mg/g of glucose production.

Keywords: *Aspergillus niger*, bioethanol, M-16, *Saccharomyces cereviceae*, Saccharification, *Trichoderma viride*. 

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iii
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