

# ABSTRACT

Dalam Rangka Menunjang Kegiatan Penelitian STRANAS 2014-2016

"Produksi Ethanol Berbahan Dasar Hasil Dekomposisi Biomasa Tandan Kosong Kelapa Sawit oleh Mikroba *Cellulolytic* dan *LignoCellulolytic*"



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Bunch using Extracellular Enzymes from *Aspergillus niger*

and *Trichoderma reesei* for Ethanol Production

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Extracellular enzymes which obtained from 4 days cultivation *Aspergillus niger* and *Trichoderma reesei* on solid state fermentation of oil palm empty fruit bunch (OPEFB) were used for lignocellulosic-rich OPEFB digestion. The enzymes were concentrated using 70% saturated ammonium sulphate, dialysed against 20mM acetate buffer at pH 5 and adjusted one tenth (v/v) from the initial volume with the same buffer. The concentrated enzymes were then used in hydrolysis of powdered OPEFB. Amount of 10.65 mg/ml and 11.47 mg/ml sugars were produced when each concentrated enzyme *A. niger* and *T. reesei* mixed with 2% OPEFB. These hydrolysis were done on 100 ml total volume, incubated at 37°C with 100 rpm shaken for 36 hours. Further, both hydrolyzates results were sterilised and fermented anaerobically using *Saccharomyces cerevisiae* at concentration 0.5mg/ml cells and incubated in 30°C for 24 hours. Colorimetric analysis using QuantiChrom Kit DIET-500 at OD 580nm gave results the alcohol production were 0.86% and 0.92% which were similar with Gas Chromatograph analysis that of 0.83% and 0.93%, respectively.

**Keywords:** extracellular enzymes, hydrolysis, fermentation