CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME III

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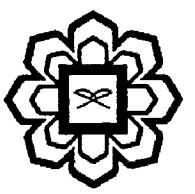

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CHAPTER 32

SCREENING OF FUNGI ON SOLID STATE BIOCONVERSION OF OIL PALM EMPTY FRUIT BUNCH FOR PRODUCTION OF CELLULASE

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ABSTRACT

Five potential strain of fungi (*Trichoderma reesei* RUT C-30 (ATCC 56765, USA; *Trichoderma harzanarium* (SCahmT 105); *Trichoderma harzianum* (isolated by UPM); *Penicillium* 1 (isolated from sewage treatment plant);*Penicillium 2* (isolated from empty fruit bunch) were screened for production of cellulase using solid state bioconversion of oil palm empty fruit bunch. Hydrolytic activities of strains were tested on carboxymethylcellulose (CMC) agar. Strain *Penicillium* 2 (P 2) showed the highest radius of hydrolytic activity of 1.2 cm. This was followed by *T. reesei* RUT C-30 (RUT C-30) and isolated *Penicillium* 1 (P 1) with radius clearance of 1.0 and 0.9 cm, respectively. These strains of culture (1x 10^7 spores/ml) were seeded in oil palm empty fruit bunch (70% moisture) supplemented with 1N of potassium dihydrogen phosphate and 1N of potassium hydrogen phosphate in shake flask experiment which was fermented for 8 days at 30°C for production of cellulase. Result obtained indicate *T. reesei* RUT C-30 produce the highest CMCase (1.831 U/gds) at day 6 of fermentation. For FPase *Trichoderma harzianum* gave high production (0.156 U/gds at 4 days fermentation. *Penicillium* 1 produced the highest β-glucosidase of 2.361 U/gds at day 2fermentation.

Keywords: Cellulase, Oil Palm Empty Fruit Bunch, Fungi

INTRODUCTION

Cellulase enzymes (endoglucanase (CMCase), exoglucanase (FPase) and β-glucosidase) are important industrial enzymes and widely used in many industrial applications in various industries such as paper and pulp, food, textile, biofuel and detergent industry. The productions of these enzymes using raw media are getting expensive. Alternative ways of producing the commercial enzymes using cheaply available raw materials such as oil palm empty fruit bunch (OPEFB) offer an alternative method to overcome the problem. Solid state bioconversion of OPEFB offers a better solution to this problem. Our study is focus on screening of potential fungi that can be used in bioconversion of OPEFB for