UNIVERSITI TEKNOLOGI MARA

FUNGI-MEDIATED METABOLISM OF 11α-ACETOXYPROGSTERONE

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ABSTRACT

The main objective of this research is to observe the biological transformation of steroidal molecule, 11α-acetoxyprogesterone by using different fungal cultures. *Trichothecium roseum* and *Mucor plumbeus* were used in the transformation of 11α-acetoxyprogesterone and the production of metabolites were identified. Both small and large scale processes were conducted for both fungal strains to identify the potential metabolites of 11α-acetoxyprogesterone. Small scale process was conducted to find out at which fermentation period both fungi produce the highest number of metabolites since different fungi may need different fermentation period to transform 11α-acetoxyprogesterone the best. Four different fermentation periods were used in our research which was 3, 6, 9 and 12 days respectively. Thin layer chromatography (TLC) was conducted for small scale process to identify the fermentation period with the highest number of metabolites. Then, fermentation period with the highest number of metabolites was proceeded with large scale process and analyzed by using high performance liquid chromatography (HPLC) method. TLC and HPLC results for both *Trichothecium roseum* as well as *Mucor plumbeus* were compared in order to find out the production of metabolites by different fungi under the same condition (media condition, temperature). However, HPLC for the *Mucor plumbeus* was not performed due to time limitation.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

A lot of researches and studies have been conducted especially in the pharmaceutical field in order to discover new therapeutic compounds which can be used as an agent in treating diseases. Chemical synthesis and biotransformation are the two ways to synthesize new derivatives. Biotransformation is a biological procedure in which a compound is transformed into a reversible compound, catalyzed by catalytic enzymes obtained from the natural sources for example fungi.

Steroids are highly employed compounds in microbial transformation process. The production of steroids as well as hormones by microbial transformation was triggered in 1950 and it was employed in large scale industrial processes since that year (Lin *et al.*, 2009). This is because steroids are involved in many physiological activities and for that reason, over 300 steroid based drugs has been approved. Other than that, steroids are highly employed in microbial transformation because steroidal compounds side chain cleavage is an important pathway to obtain steroid intermediates which has been reported in some fungi includes *Fusarium* sp, *Mucor* sp and *Penicilium* sp. (Lin *et al.*, 2009).