

UNIVERSITI TEKNOLOGI MARA MALAYSIA

**SELECTION OF FUNGI FOR
BIOTRANSFORMATION OF LUPEOL**

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ABSTRACT

Biotransformation is a process in which specific modifications occur on the compound by using microorganisms as biocatalysts. In this study, the main process involved was biotransformation. Fungi were used as the microorganisms which responsible to perform the process. There are many advantages in performing biotransformation, one of them is to obtain products with a lot of benefits to human health while it helps to reduce cost by removing the needs for isolation, purification and stabilization of pure enzymes. In this study, lupeol was used as the substrate. Six fungi were used to help in biotransformation which includes *Absidia coerulea*, *Beauveria bassiana*, *Cunnighamella elegans*, *Penicillium lapidosum*, *Trichothecium roseum* and *Verticillium lecanii*. The fermentation of the lupeol with the fungi after 4 days and 8 days may produce useful secondary metabolites. The extracts of the fermented lupeol with fungi were then subjected to High Performance Liquid Chromatography (HPLC) with Diode Array Detector (DAD) at 220 nm to identify the presence of any new compounds. The peaks of the extracts in the chromatograms were compared with lupeol and negative controls chromatograms. As a result, the HPLC profiles of only *Cunnighamella elegans* and *Verticillium lecanii* showed transformation of lupeol.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Biotransformation using fungi is a significant process to obtain useful metabolites. It is the substitute mechanism with a great potential for the development of maintainable technologies for the production of chemical and drugs, which is the green chemistry. In addition, fungi as a whole cell system used in biotransformation and natural product isolation has been one of the most studied system (Borges et al., 2009). Biotransformation can also decrease environmental effect caused by the by-product of chemical production process (Luo et al., 2014)

Due to the squalene epoxide arrangement, pentacyclic triterpenes are produced. They have a wide spectrum of biological activities that are useful in medicine (Chaturvedi, Bhui, & Shukla, 2008). Lupeol is a natural-occurring triterpene that can be found in many fruits, vegetables and several medicinal plant (Saleem et al., 2001). Hence, lupeol is the selected compound to undergo biotransformation due to its various uses in medical world. (Muffler et al., 2011). Lupeol has solubility issue. It is proven that