

UNIVERSITI TEKNOLOGI MARA

**MICROBIAL METABOLISM OF ESTRIOL
WITH FILAMENTOUS FUNGI**

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ABSTRACT

Biotransformations is the process by which compounds transformed into other metabolites biologically while microbial transformation means that the compounds transformed into another metabolites biologically by using microorganisms such as fungi. In the present research, *Trichothecium roseum* was used to fermented bioactive steroid, Estriol. The main objective of our research was to observe the microbial transformation of steroidal molecules using filamentous fungi. Compound 1, Estriol was inoculated into *Trichothecium roseum*. The fermentation flask of estriol was then extracted after 3, 6, and 12 days of fermentation period. As a result of fermentation process, the transformed products of estriol have been investigated through TLC and HPLC methods. TLC method showed indication of metabolites production during fermentation while HPLC showed the peaks and retention time of transformed metabolites. Based on the results of TLC and HPLC methods, secondary metabolites were detected after 3, 6, and 12 days of fermentation. However, due to limited time, the characterization of transformed metabolites has not been studied.

CHAPTER 1

1.0INTRODUCTION

1.1.1 History of microbial transformation

On second half of the 19th century, knowledge of the production of chemicals such as alcohols and organic acids through fermentation is relatively recent and the first reports in the literature was appeared (Vasic-Racki, 2006). Lactic acid was probably the first optically active compound to be produced industrially by fermentation (Vasic-Racki, 2006).

In the early stage, microorganism were in food and beverages for making wine and some used yeast for baking bread (Vasic-Racki, 2006). Microorganisms were discovered to modify some compounds by simple, chemically well-defined reactions, which reactions which then further catalysed by enzymes (Liese, Seelbach, & Wandrey, 2006). The process by which compounds were transformed to other metabolites is called biotransformation process.

Around 2000 years BC, the story of microbial biotransformation begins that is closely related with vinegar production (Vasic-Racki, 2006). The oldest and best known example of microbial oxidation was production of vinegar, which can illustrate some of the important developments in the field of biotransformation by living cells (Vasic-Racki, 2006).The discovery of new microscopic life was the starting point for experimental biology as a basis for the development of the biotransformation(Vasic-Racki, 2006).Even today, acetic acid is still known as “vinegar” if it is obtained by oxidative fermentation of ethanol-containing solutions by acetic acid bacteria(Ebner, Sellmer, & Follmann, 1983).