UNIVERSITI TEKNOLOGI MARA

RSM ANALYSIS OF ANTIPYRETIC EXTRACTED FROM AQUILARIA SUBINTEGRA

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ABSTRACT

In this study, the optimization condition for extraction of antipyretic properties known as acetaminophen inside the *Aquilaria Subintegra* leaves was analyze using response surface methodology (RSM). The objective of this study was to determine the optimum condition for extraction of *Aquilaria Subintegra* leaves by using RSM and to investigate the effect of drying temperature on extraction of *Aquilaria Subintegra* leaves. RSM use a series of data to obtain an optimal response with minimal effort. Effect of drying temperature on the for the concentration of extraction on *Aquilaria Subintegra* leaves was studied and the data obtained will be inserted to second-order polynomial equation using multiple regression analysis and analyzed by analysis of variance (ANOVA) to determine the importance of the model. The extraction of the compound on different drying temperature and type of leaves was based on the previous study. Based on the result, the model F-value of 2.75 and Prob>F of 0.1102 indicate that the model is suitable to use. The high value of R^2 which is 0.6623 and smaller value of adjusted R^2 which is 0.4211 was compared to show the model was sufficient. The predicted optimum of drying temperature was 30°C. The predicted value of concentration of the compound on Aquilaria leaves was 2.697 µg/mL and the error calculated was based on the previous study by taking the average value of error on both of the studies which is 2.04%. There is no actual value in this study since there are no validation experiment was run to prove the optimum value. In conclusion, the end results show that the response surface methodology is succeeded in determining the optimum drying temperature of Aquilaria Subintegra.

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CHAPTER 1

INTRODUCTION

1.1   Research Background

Response surface methodology (RSM) is a compilation of statistical and mathematical techniques useful for developing, enhancing and optimizing processes (Raymond & Montgomery, 2002). The main principle of RSM is to use a series of data to obtain an optimal response. There are three types of RSM, the first-order, the second-order, and three-level fractional factorial. RSM also can be used for food analysis to obtain optimum condition for example, modeling for extrusion cooking process (Chauhan & Gupta, 2004). According to Pericin et. al. (2008), by utilizing RSM, information can be obtain with less cost and short time also obtain rapid and efficient development of new products and processes. By using RSM in this research, the optimum condition for extraction of the Aquilaria Subintegra can be obtain.

Aquilaria Subintegra, usually known as "Gaharu", belongs to the Thymelaeceae family. The wood of this plant have a special characteristic which is when infected with fungus, it becomes agarwood. Agarwood is highly aromatic and valuable since it can be used to produce incense, medicine and perfume. This type of plant usually distributed around area Thailand. Currently, it is grown in Malaysia for its artificial agarwood resin production. According to Bahrani et. al. (2014), recent study shows that aquilaria subintegra leaves are effective in the treatment of Alzheimer's disease. The incense produce from this wood aphrodisiac, relievers and sedative which used in cancer treatment particularly thyroid gland cancer (Soepadmo et. al., 2002). They also stated that it can be used as treatment for asthma, diarrhea, abdominal and colics.