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EFFECT OF SOAKING ON GAHARU ESSENTIAL OIL USING MICROWAVE ASSISTED EXTRACTION

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ABSTRACT

The extraction of oil can be done using hydrodistillation, steam distillation and supercritical fluid extraction (SFE). However, for this experiment hydrodistillation method is chosen because it is the simplest method but required long time to extract the oil. The objective of this study is to identify the effect of soaking towards the essential oil yield using microwave assisted extraction. The essential oil then will be analyse using gas chromatography-mass spectrometer (GC-MS). The gaharu will be soaked with distilled water at 2,5 and 7 days and will be extracted using MAE. The power of the microwave is constant at 540 W and the temperature is 94.5^0C. The time taken for the experiment to run is 12 hours. A total of 3 major compounds which are benzaldehyde, cyclopentane acetic acid and ethanone were identified from the four sample of gaharu residue. The soaking process for 7 days shows the highest amount of component compared to other soaking for 2 and 5 days. This result shows, the cell has expanded and finally damage, thus releasing the content of the soaking water.

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CHAPTER ONE

INTRODUCTION

1.1 Background Study

Agarwood, the resinous heartwood from the Aquilaria species (*Thymelaeaceae*), also called eaglewood, gaharu, jinko, aloes wood, pokok karas or oud in different cultures (Yang et al., 2016). It is called gaharu in Malaysia and Indonesia, jinko in Japan, agar in India (from Sanskrit aguru), chenhsiang or chenxiang in China, kritsana noi in Thailand and oud in the Middle East. Previously at least in Malay language the gaharu referred to heavy fragrant wood. However, current practice use gaharu as the generic term to refer to both the tree and its resin, similar to term agarwood (Zuhanis, Hashim, Kerr, & Abbas, 2016).

Gaharu can be divided into several grades in the market such as super grade A, grade A, B, C and D. The higher quality of the gaharu wood can be recognized by its colour. The dark colour of the wood and the strong aroma released upon burning its chips quality incense. However, there is very little information on the quality of different grades on how the essential oils can be produced (Liu, Wei, & Lyu, 2017).

Commercially in Malaysia, gaharu essential oil obtained from the hydro-distillation process. The main advantage of this method are it can be generally out using a simple equipment and the easiest way. Using distillation method, the gaharu is mixed directly with water and the process extraction of oil is carried. This method involved long duration of extraction times, hence ineffective of energy usage. Thus, this process need to be improve to give better quality, yield and less energy usage need to be studied.

Essential oil of gaharu can be extracted by several methods which include hydro-distillation (usually using water or steam), supercritical fluid extraction (SFE), solvent extraction are used for essential oil recovery (Milojevi, Radosavljevi, Pavi, & Veljkovi, 2013). These extraction methods will be further discussed in the literature review.