

ABSTRACT

The common method used to extract the beneficial contents of the plant was by using the extraction technique. *Physalis Minima* Linn or known as “Pokok Letup” in Malaysia was categorized as a medicinal plant by many region and country especially in India. This plant contain several phytochemical that been beneficial to human health. In this study, the type of extraction method used was hydrodistillation extraction technique. In order to achieve the first objective, to identify the phytochemical content in this plant, the GC-MS analysis was done and for the second objective, to study the parameter that affected the extraction yield, three parameter had been manipulated which are pre-treatment power, that varies from 180W to 540W (180W, 270W, 360W, 450W and 540W), next parameter was extraction time. The extraction time was varied from 30min to 150min (30min, 60min, 90min, 120min and 150min) and the last parameter was pre-treatment time that varies from 30s to 120s (30s, 60s, 90s and 120s). The result obtained from this study, four compound had been identified from GC-MS analysis which were diethyl phthalate (5.296%) which inhibits the color and odor of the oils besides that carry the anti-fertility element, next compound was aristolene (1.063%) which inhibits the cytotoxic of the plant, the third compound was ibuprofen (0.994%) inhibits the anti-inflammatory element and the last compound was Cyclononasiloxane, Octadecamethyl- (0.127%). For the extraction oil yield, for the first parameter, which was effect of pre-treatment power, the highest yield was 27.6% at 540W and the lowest was 19.5% at 180W. Next, for the effect of extraction time, the highest yield was 24.4% at 150min extraction time and lowest at 30min extraction time which yield was 4%. For the effect of pre-treatment time, the highest yield was 21.3% which was at 60s of pre-treatment time and lowest yield was 18.3% at 30s pre-treatment time. So, the optimum parameter for this study was pre-treatment power of 540W, 60s of pre-treatment time and 150min of extraction time.

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CHAPTER 1

INTRODUCTION

1.1 Summary

Physalis Minima Linn or known as “Pokok Letup” in Malaysia which is categorized as indigenous herb plant will be collected in Perak. After the collection, the plant will be washed and dried at room temperature. After the plant had been dried completely, the plant will be cut into the small size (desired size) and ready to use. Before start the extraction, the plant will undergo the pre-treatment by using microwave at several power and time. After that, the plant was moved to the Clevenger apparatus for the hydrodistillation extraction process. The extracted oil will be collected and purified by using rotary evaporator. The purified oil will be analyzed by using GC-MS to identified the compounds exist. The extraction oil yield was recorded and compared for each parameter.

1.2 Research Background

Physalis Minima has been classified as herb and act as a medicinal plant in many country likes India and China. This plant consists of several bioactive compounds which can cure some disease such as stomach pain, constipation, gastric trouble and some others disease. There are some bioactive compound contain in this plant. The bioactive compounds are methanol, alcoholic, methanolic, ethanolic and chloroform which carry their special behavior and medical health advantage.

Extraction technique is used to extract the essential oil from the plant. In this study, the type of extraction used is hydrodistillation by using Clevenger apparatus. Before the extraction take place, the sample will undergo microwave pre-treatment for a certain period

of time before the hydrodistillation take place. The extracted oil of the plant is being analyzed by using Gas Chromatograph – Mass Spectrometer (GC-MS).

Each analysis had own function and specialty in determining the bioactive compound in the extracted oil. GC-MS analysis is used in order to analyze the collected essential oil from the experiment. GC-MS is used for the compound identification in the extract. In recent study, by GC-MS there are thirty one (31) chemical constituents that had been identified (Karpagansundari and Kulothungan, 2014).

1.3 Problem Statement

There are several useful plants in Malaysia that has been considered as grasses by Malaysian due to the lack of knowledge and information regarding the plant. *Physalis Minima* Linn is classified as one of the useful plant or known as herb that can be found in many areas in Malaysia. Many studies had been conducted on the extraction of *Physalis Minima* Linn. As many people believe that this plant contains bioactive compound that can treat some disease likes stomach pain. Most of the study related to this plant was being conducted in India and China as they think medicinal herbs can treat some of their illness. There is little published data on the extraction of this plant in Malaysia. Due to the lack of knowledge and information from Malaysian, some analysis should be done to prove the bioactive compound exist in the plant is very beneficial to human health. To date, many studies prefer to use organic solvent for the extraction of essential oil. The organic solvent can give hazardous effect to human as they may be contaminated in the extracted oil or hydrosol or residue. In order to decrease the hazardous effect, the organic solvent was change to distilled water as a solvent for the extraction.