

UNIVERSITI TEKNOLOGI MARA

**EXTRACTION OF ESSENTIAL OIL FROM
INDIGENOUS HERB
PHYSALIS MINIMA L. USING MICROWAVE
ASSISTED EXTRACTION**

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ABSTRACT

Essential oil is a kind of remedy that is originated from various part of plants. One of them is *Physalis Minima L.* that is beneficial to human health yet been ignored by Malaysian. There are few research related to the extraction of essential oil from *Physalis Minima L.* However, most of these research use soxhlet extraction method. This method is associated with issues related to hazard when using petroleum-based solvent. Thus, microwave assisted extraction is proposed to be used as it should be a greener extraction technique. The objective of this research is to study the effect of extraction time, liquid-to-solid ratio and microwave power to the extraction yield of oil from *Physalis minima L.* using microwave assisted extraction (MAE). Three parameters were investigated in this study namely extraction time, liquid-to-solid ratio and microwave power. The optimum condition of MAE of *Physalis minima L.* are 12 minutes for duration of extraction time, 12 mL/g for liquid-to-solid ratio and 630 for microwave power. The maximum yield of essential oil at this optimum condition are 21 %. The essential oil at this optimum condition were analyzed by using GC-MS. The highest constituent was 4,5-Dichloro-ortho-phenylenediamine (24.0657), Diethyl Phthalate (24.0864) and Phthalic acid, ethyl 2-pentyl ester (24.0914) with percentage of 4.0970 %. Based on research, it can be concluded that *Physalis minima L.* has some health beneficial as the isolated component is confirmed to exhibits beneficial health like antimicrobial, anticancer and anti-toxic agent.

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CHAPTER ONE

INTRODUCTION

1.1 Research Background

According to Harisingh (2005), essential oil can be defined as parts of plants that produces volatile and aromatic oil. Previous research shows that essential oil can be used as antioxidant, anti-cancer and anti-inflammatory (Dhifi et al., 2016). Essential oil from *Haplophyllum tuberculatum* can even produce cytotoxicity activity against lung and liver cancer cells. These curing ability is a good opportunity to be further discovered. Among various plant in this world *Physalis minima* L. is one plant that have big potential to formed essential oil and use as remedy.

Physalis Minima L., is a kind of an annual herb that is traditionally used in India and China as remedy (Norhanizan et al., 2014). In Malaysia, this herb is known as “*Letup kelambu*”. “Letup” is malay words that describe “pop” sound that can be formed when the fruit is popped on hand. This plant can usually be found at roadsides, near grass, on the field or besides drain. In Malaysia, the herb is usually treated as plant that need to be cut down due to believing that this plant will be competitor to other agricultural plant for sunlight, nutrient, water and space (Firdaus, 2017). Some of the *Physalis minima* L. that is found in Hulu Bernam, Selangor and Teluk Intan, Perak had also been poisoned. This proves that Malaysian do not know about the benefits of this plant to their health. Some potential medical health of *Physalis minima* L. is it can be used as antimalarial, anti-inflammatory, analgesic and antipyretic, antibacterial, anti-ulcer, cytotoxic, antifertility and antidiabetic agent (Chothani and Vaghasiya, 2012). Thus, as a chemical engineer, it can be considered uneconomic to unleash something that is good for our health. Therefore, in order to harness the benefits of *Physalis minima* L., extraction method need to take place.

Actually, some research had been done by previous researchers on the benefits of *Physlis minima* L. to human health. However, most of the researcher had used either solvent extraction (Azlan & Marziah, 2015; Karpagasundari & Kulothungan, 2015; Khan