UNIVERSITI TEKNOLOGI MARA

EFFECT OF IRRADIATION MICROWAVE POWER ON BIOACTIVE COMPOUND OF ESSENTIAL OIL FROM INDIGENOUS HERB, *PHYSALIS ANGULATA L.* USING SOLVENT FREE MICROWAVE EXTRACTION

MUHAMMAD FAIZ BIN A RAZAK

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ABSTRACT

Physalis angulata L. is an herbal plant from the Solanaceae plant family and it have been used mainly in the medical purpose. The demand for a natural source to replace the usage of synthetic source for antibiotic. The antibiotic come from the bioactive components of the plant is obtained by using extraction process and irradiation microwave power is one of the affecting factors to the composition of the extracted product. The objective of this study is to investigate the effect of different irradiation power and extraction time on the bioactive compound. The essential oils from *Physalis angulata L.* was extracted by using Solvent Free Microwave Extraction (SFME). The essential oil of *Physalis angulata L.* was obtained with five differences power (270W, 360W, 450W, 540W, 630W) of irradiation power using a domestic microwave oven with wave frequency of 2.45GHz. The result from GC-MS show the present of 23 compound in the essential oil and the suitable irradiation microwave power for the extraction is 450W with the extraction yield of 0.4787%. These results indicated that the used of high irradiation microwave power more than the suitable value will affect the yield of *Physalis angulata L.* essential oil.

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CHAPTER ONE
INTRODUCTION

1.1 Research Background

Plant especially herbal plants have been used to treat many infectious diseases since very ancient times. Scientific investigations that have been done on the plant materials clearly demonstrated the therapeutic efficacy of the plants over time. Nowadays, numerous countries utilized the full benefit of the plants to treat diverse illnesses counting irresistible infections of the respiratory, gastrointestinal, urinary and biliary systems. Although significant advance has been made in microbiological inquire about and within the control of numerous infections caused by irresistible living beings such as microscopic organisms, repetitive scourges due to drug-resistant microscopic organisms as well as the appearance of modern bacterial pathogenic strains request the revelation of unused anti-microbial. The investigations of restorative medicinal plants utilizing wilderness innovations is presently being reevaluated to be an attainable approach for finding the novel bioactive agents to unravel far reaching open wellbeing issues and widespread public health problems (Sharma, Flores-Vallejo, Cardoso-Taketa, & Villarreal, 2017). Opposite to the manufactured drugs, antimicrobials of plant origin are not associated with numerous side impacts and have an enormous restorative potential to mend numerous infectious illnesses. In spite of the fact that hundreds of plant species have been tried for their antimicrobial properties, the vast larger part have not been enough assessed. Global researches have appeared that all diverse parts of the plants which include; stem, root, bloom, barks leaves, etc. have antimicrobial property (Johnson, Wesely, Kavitha, & Uma, 2011). The antibacterial activities of essential oils from distinctive medicinal plants against microorganisms have been described by numerous analysts. It is well-known that secondary metabolites are combined uniquely in particular plant species (Noshad, Hojjati, & Alizadeh Behbahani, 2018). In the processing of bioactive constituents from plant materials, extraction methods play a vital part where it can affect many factors such as cost and yield. Percolation, heat refluxing, Maceration, continuous-stirring, supercritical extraction, Soxhlet extraction, accelerated solvent extraction microwave-assisted extraction, enzyme-assisted extraction, ultrasound-assisted extraction is the example of most commonly utilized methods used in industry for the recovery of the bioactive compounds from the herbal plants. All these methods that have been used has a few advantages and disadvantages where it will affect the selection of extraction methods. Soxhlet extraction, percolation, Maceration, and continuous-stirring