

**SUPERCRITICAL FLUID EXTRACTION OF
MARIPOSA CHRISTIA VESPERTILLIONIS USING
CARBON DIOXIDE**

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**BACHELOR OF CHEMICAL ENGINEERING
(ENVIRONMENT) WITH HONOURS**

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AUTHOR'S DECLARATION

I declare that the work in the report was carried out in accordance with the regulation of University Technology MARA. It is original and is the results of my own, unless otherwise indicated or acknowledge as reference work.

I, hereby acknowledge that I have been supplied with the Academic Rules and Regulations, University Technology MARA, regulating the conduct of my study and research.

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We declared that we read this report and in our point of view this thesis is qualified in terms of scope and quality for the purpose of awarding the Bachelor of Chemical Engineering (Environment) with Honours.

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ABSTRACT

The objectives of this study were to investigate the effect of different parameters on supercritical fluid extraction of *Mariposa Christia Vespertillonis* (MCV) leaves and to analyse the compounds in the extracted sample leaves using Liquid Chromatography Mass Spectrometer (LCMS). The MCV leaves were purchased from the local supplier then brought to Research Laboratory of UiTM Pulau Pinang for further process. Before drying process, the MCV leaves were cleaned and washed. The MCV leaves were underwent drying process and dried at 35°C constantly for 48 hours in the oven. After that, the sample was grinded and sieved into five different sizes. 5 grams of each sample was weighed before running into SFE machine. The samples were covered by thin cloth before being put into the vessel of SFE. The extraction process took place in the SFE machine. The extraction time was one hour with 10-minute time interval. The rotary evaporator was used in the next step to get the real mass of the extracted sample by separating the ethanol from the extraction. It was weighed first before running the rotary evaporator. After being separated from the ethanol, the sample was weighed again. After getting the real mass or weight of the pure extracted sample, it was undergone further analysis using LCMS. From the LCMS analysis, the active anti-cancer component in the sample had been determined. The operating parameters effects such as temperature, pressure, and particle size on the extraction yield had been studied. When the temperature was increased from 40°C to 50°C, the extraction yield will increased and decreased in extraction yield after 50°C. The optimum extraction yield was 1.41 % at 50°C. For the effect of pressure, the trend of the extraction yield was directly proportional with the pressure. As the pressure increased, the extraction yield also increased. The optimum extraction yield was 0.12 % at 375 bar. Meanwhile, when the particle size decreased, the extraction yield increased. The optimum extraction yield was 0.16 % at 63 µm. From the analysis using LCMS, the active compound found in the extracted MCV was Zerumbone. The active compound of Zerumbone showed that it had the potential to inhibit the cancer cell lines. Various studies also showed that Zerumbone can be an alternative for anti-inflammatory and anti-cancer agent.