OPTIMIZATION OF SUPERCRITICAL FLUID EXTRACTION FOR *MARIPOSA CHRISTIA VESPERTILLONIS* BY USING RESPONSE SURFACE METHODOLOGY

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AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi 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,Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Mariposa Christia vespertillonis (L.) (MCV) Bakh. f. is a plant which commonly known as Mariposa or 'butterfly wing' because of the shape of its leaves is similar to a butterfly in terms of its color and shape. This plant has been known to use as a treatment for many diseases such as tuberculosis, bronchitis, inflamed tonsils, colds, muscle weakness and poor blood circulation. Supercritical Fluid Extraction (SFE) is the technology equipment that can be used for the extraction of MCV leaves. SFE is the process of separating one component from another by using supercritical fluids as the extracting media. The aim of this study is to obtain the most optimum conditions in term of temperature, pressure and particle size in order to achieve the high amount of yield in the MCV plant extract. To obtain the design parameter for each samples, three factor of manipulated parameter was used to evaluate the percentage of yield obtain from the extraction of MCV. The manipulated parameters for this experiment are Temperature (T), Pressure (P) and Particle Size (S). In this study, the ranges of each parameter used are based on previous studies. The range parameters used are: temperature, T (°C): 30, 40, 50, 60, 70, pressure, P (bar): 150, 200, 250, 300, 350, and particle Size, S: 63 μm, 125 μm, 250 μm and 1 mm. To obtain the optimum condition of yield, response surface methodology (RSM) was used. From the design, 20 samples need to be run throughout this experiment. The optimized value from the RSM is 39°C of temperature, 202 bar of the pressure and 0.500 mm of the particle size with the yield is 7.9 %. In order to test the accuracy of the predictive models, two repeated validation run were carried. The result of analysis indicated that the experimental data are not agreement with the predicted values whereas the percentage error is maximum at 14%. The instability of the experimental error as compared to predicted values may be contributed to some noise during measurement of the sample or flaws during the experiment.