

**COMPARISON BETWEEN HYDRODISTILLATION AND
SUPERCRITICAL FLUID EXTRACTION USING *CURCUMA LONGA*
AS SOURCE OF ESSENTIAL OIL**

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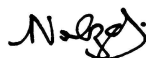
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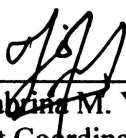
This Final Year Project Report entitled “**Comparison Between Hydrodistillation and Supercritical Fluid Extraction using *Curcuma longa* as Source of Essential Oil**” was submitted by Zsa Zsa bt Mohd Nasir in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Applied Chemistry, in the Faculty of Applied Sciences, and was approved by



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ABSTRACT

VARIOUS METHODS OF EXTRACTION OF ESSENTIAL OIL FROM CURCUMA LONGA

Attention is drawn to the use of new and clean alternative methods for the isolation of essential oils from plants. Turmeric oil was extracted from the rhizome of turmeric (*Curcuma longa*) with supercritical carbon dioxide method and a conventional method (hydrodistillation). The two methods were compared based on time of extraction, identification of major compound, cleanliness of essential oil obtained and oil yield. For hydrodistillation method, the rhizome of *Curcuma longa* gave a light yellow oil with 1.4% of oil yield on a fresh weight basis. For SFE method, extraction rate was measured as a function of pressure and temperature. The optimum condition for maximum yield of oil from this experiment was at a pressure of 200 bar with 1.7% oil yield. At constant pressure, the extraction efficiency decreased with increased in temperature and at constant temperature, the extraction rate was increased together with pressure due to the change in solubility of essential oil. The two methods successful in identifying the major compound in *Curcuma longa*, that is ar-turmerone. The difference was the time taken to extract the major compound. SFE method was faster than the conventional method. The number of compounds extracted from SFE method were fewer compared to hydrodistillation method due to reduction in the amount of water in SFE method reduces degradation of compound by hydrolysis, trans-esterification or oxidation and oil extracted is clean from solvent. The experimental results indicated that the turmeric oil could be efficiently extracted by SFE.