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# Optimization of Microwave-Assisted Extraction of Essential Oil from Vietnamese Basil (*Ocimum basilicum* L.) Using Response Surface Methodology

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**Abstract:** Basil plant is a common source for linalool and estragole. However, it has been showed that the chemical composition of basil varies considerably depending on many factors including method of extraction, cultivar of the plant or geographical location. In this study, we attempted to extract essential oil from Vietnamese basil and analyze the chemical composition of the obtained oil using gas chromatography–mass spectrometry (GC-MS). The extraction method of choice was microwave-assisted hydro-distillation (MAHD) and the process was optimized with Response Surface Methodology (RSM) with regard to four experimental parameters including raw material size, raw material to water ratio, extraction time and microwave power. The results showed that ground basil leaves, when extracted with optimal conditions of water-to-material ratio of 3.2:1, extraction time of 97 (min) and microwave power of 430 (W), gave the actual essential oil yield of 0.6%. Regarding ANOVA results of the quadratic model, high determination coefficient ( $R^2 = 0.9077$ ), significant F-value of 10.92 and the  $p$ -value of less than 0.05 indicate that this model is significant between experimental and predicted variables, and should be fixed. In addition, GC-MS analysis revealed that major components of Vietnamese Basil were Estragole (87.869%),  $\alpha$ -Bergamotene (2.922%),  $\tau$ -Cadinol (2.770%), and Linalool (1.347%).

**Keywords:** Basil (*Ocimum basilicum* L.); microwave-assisted extraction; response surface methodology; yield and composition of essential oils