

Essential Oil from *Cinnamomum Cassia* Bark Through Hydrodistillation and Advanced Microwave Assisted Hydrodistillation

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ABSTRACT

The increasing demand for essential oil necessitates the use of advanced techniques for its extraction. In this study, volatile oils were extracted from *Cinnamomum cassia* bark through microwave assisted hydrodistillation (MAHD) and conventional hydrodistillation (HD) methods. Effects of pre-treatment and morphological changes to cinnamon bark powder before and after extraction were observed through Scanning Electron Microscopy (SEM). After extraction, Fourier Transform Infrared Spectroscopy (FTIR) analysis revealed close similarities in compounds of the oil extracted through HD and MAHD. Gas Chromatography–Mass Spectrometry (GC–MS) revealed that MAHD produced 9% higher oxygenated compounds than HD. Furthermore, MAHD was found to be more energy saving and environmental friendly, reducing the overall carbon dioxide emission from HD by 59%. In addition, cytotoxicity studies revealed that essential oil obtained through MAHD showed lower lethal concentration 50 (LC₅₀) value of 51.2 mg/L compared with HD (68.9 mg/L). Therefore, MAHD technique is very suitable for obtaining volatile oils from *C. cassia* bark and the oil obtained can offer great pharmaceutical benefits.

KEYWORDS: Cinnamomum cassia bark; Extraction techniques; Gas-chromatography mass–spectrometry; Scanning electron microscopy; Fourier transforms infrared spectroscopy; Cytotoxicity

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