

Development of Ultrasound-assisted Extraction Conditions for the Optimal Yield of Phenolic Compounds and Antioxidant Properties from Lemon Myrtle (*Backhousia Citriodora*) Leaves

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Background: Lemon myrtle (*Backhousia citriodora*), is native to Australia and has a significant value as an aromatic herb and folk medicine. Recently, it has shown potential applications in the food, pharmaceutical, and cosmetic industries.

Objective: This study was designed to identify the most suitable safe solvent for the extraction of phenolic compounds and antioxidant properties from lemon myrtle leaves and then apply response surface methodology

(RSM) to develop the optimal conditions (time, temperature, and sonication power) for the extraction of phenolic compounds and antioxidant properties from lemon myrtle using ultrasonic-assisted extraction (UAE).

Methods: Five different solvents *viz* water, acetone, ethanol, acetone: water (50:50), and ethanol: water (50:50) were tested for extraction efficiency of phenolic compounds and antioxidant properties from dried lemon myrtle leaves. A three-level three-factor Box-Behnken design was employed to elucidate the effect of sonication time, extraction temperature, and sonication power on the yields of total phenolics, antioxidant capacities, and major individual compounds (gallic acid and hesperetin).

Results: The results showed that solvents have a significant impact on the extraction efficiency of bioactive compounds and antioxidant properties from lemon myrtle, and 50% acetone is the best solvent. Mathematical models were reliable for the prediction of optimal extraction conditions and the optimal conditions for the extraction of phenolic compounds and antioxidant capacity, as well as gallic acid and hesperetin are 50 min, 60°C and sonication power of 250 W.

Conclusion: These optimal conditions and 50% acetone in water (as solvent) are recommended to extract phenolic compounds and antioxidant capacity from lemon myrtle leaves as a functional food ingredient.

Keywords: Lemon myrtle, extraction, ultrasound, optimization, antioxidant, phenolic compound, gallic acid, hesperetin.