

Microwave-assisted extraction of *Vernonia amygdalina* leaf for optimal recovery of total phenolic content

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ABSTRACT

The microwave-assisted extraction conditions for the optimal yield of extracts and total phenolic content (TPC) from *Vernonia amygdalina* leaf were optimized using a face centered central composite design of response surface methodology. The independent parameters were viz: irradiation time (5–15 min), microwave power (400–600 W), temperature (90–110 °C), and feed-to-solvent ratio (1:8–1:12 g/mL). The optimal conditions for highest yield of extract (22.34% w/w) and TPC (102.24 mg GAE/g d.w.) were obtained at irradiation time of 8 min, microwave power of 416 W, temperature of 100 °C, and feed-to-solvent ratio of 1:8 g/mL. The quadratic model significantly ($p < 0.0001$) fitted the experimental data with R^2 values of 0.9664 and 0.9885 for the responses (extraction yield and TPC), respectively. Furthermore, the efficiency of MAE was compared with Soxhlet, it was observed that the yields, antioxidant activity and functional groups from Fourier transform infrared (FTIR) analysis was higher than that of the Soxhlet extract.

KEYWORDS: Total phenolic content; *V. amygdalina*; Extraction; Antioxidant