Extraction of tocopherol-enriched oils from Kalahari melon and roselle seeds by supercritical fluid extraction (SFE-CO2).

ABSTRACT

Tocopherol-enriched oil was extracted by supercritical fluid extraction of carbon dioxide (SFE-CO2) from Kalahari melon and roselle seeds. The SFE-CO2 process was optimised using response surface methodology(RSM) with central composite design (CCD). Three SFE-CO2 parameters namely extracting pressure,extracting temperature, and flow rate of carbon dioxide were examined. The optimal SFE-CO2 conditions were determined and the quadratic response surfaces were drawn from the mathematical models. The optimal SFE-CO2 conditions for the extraction tocopherol-enriched oil from Kalahari melon seeds were: extracting pressure 290 bar, extracting temperature 58 C, and flow rate of carbon dioxide 20 ml/min. The optimum conditions for roselle seeds were extracting pressure 200 bar, extracting temperature 80 C, and flow rate of carbon dioxide 20 ml/min. These optimum conditions yielded tocopherol concentration of 274.74 and 89.75 mg/100 g oil from Kalahari seed and roselle seed, respectively. No significant($P > 0.05$) differences were obtained between the experimental and predicted values.

Keyword: Supercritical fluid extraction (SFE-CO2); Kalahari melon seed oil; Roselle seed oil; Response surface methodology (RSM); Tocopherol concentration.