

Extraction of kaemferol from moringa oliefera using CO₂ supercritical fluid extraction: a green technology

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ABSTRACT

Moringa has been used for centuries due to its medicinal properties and health benefits. Moringa oliefera is called a tree of miracle because every part of the tree has medicinal properties. Kaemferol is a non-polar dietary flavonoid found in Moringa oliefera leaf. Kaemferol have wide range of pharmacological activities like antioxidant, anti-inflammatory, antimicrobial, anticancer, cardioprotective, neuroprotective, antidiabetic, anti-osteoporotic, estrogenic/antiestrogenic, anxiolytic, analgesic and antiallergic activities. Due to its thermolabile nature people are facing challenges to extract it from natural sources at high temperature. Nonpolar nature of kaemferol is one of the challenges to extract it with hot water. As per available literatures a selective extraction for Kaemferol from Moringa oliefera based on CO₂ supercritical fluid extraction may formulate by selecting Temperature (40 °C to 80 °C), Pressure (10 MPa to 30 MPa), Extraction time (60 min to 150 min). The kaempferol yield increased with the decreasing temperature and pressure and increasing the time of supercritical CO₂ extraction process. It turned out that extraction of Kaemferol was strongly affected by Pressure (bar) and the extraction time (minute). 11 g/kg Kaemferol yield was extracted from tea seed cake. 52.92 mg/kg kaemferol was extracted from Cuscuta reflexa. 1700 mg/kg of kaemferol was extracted from Moringa oliefera with conventional method (hot water extraction) which may be increased with CO₂ supercritical extraction process. As kaemferol have high value pharmacological and food applications it has high demand in market. The method of extraction of kaemferol from Moringa oliefera using CO₂ supercritical process is novel and may be the cost effective.

Keywords: Optimization; Moringa oliefera; Kaemferol; CO₂ supercritical fluid extraction

