Optimization of supercritical CO2 extraction of Anastatica hierochuntica.

ABSTRACT

Response surface methodology (RSM) was applied to optimize the variables affecting the supercritical carbon dioxide (SC-CO2) extraction of non-polar compounds from Anastatica hierochuntica using the Central Composite Design technique (CCD). Independent variables were temperature (32–46 °C) and pressure (22–46 MPa). Dependent variables were the percentage of the content of hexadecanoic acid, 9,12-octadecadienoic acid, heneicosane and heptacosane. Pressure was the most significant parameter that affected the content of the compounds. The hexadecanoic and 9,12-octadecadienoic content decreased while heneicosane and heptacosane increased with pressure. A number of choices can be run either at low pressure and low temperature or at low pressure and high temperature in order to optimize extraction of the selected compounds. Extraction either at low temperature (33 °C) and low pressure (25.6 MPa), or at high temperature (42 °C) and low pressure (22.0 MPa) maximized the yield of hexadecanoic, 9,12-octedecanoic, heneicosane and heptacosane.

Keyword: Supercritical carbon dioxide; Anastatica hierochuntica; Optimization; Central composite design; Response surface methodology.