

## Optimization of supercritical carbon dioxide extraction of bioactive flavonoid compounds from spearmint (*Mentha spicata* L.) leaves by using response surface methodology

### Abstract:

The bioactive flavonoid compounds of spearmint (*Mentha spicata* L.) leaves were obtained by using supercritical carbon dioxide (SC-CO<sub>2</sub>) extraction. Extraction was carried out according to face-centred central composite design, and independent variables were pressure (100, 200 and 300 bar), temperature (40, 50 and 60 °C) and co-solvent amount (3, 6 and 9 g/min). The extraction process was optimized by using response surface methodology for the highest crude extraction yield of bioactive flavonoid compounds. The optimal conditions were identified as 209.39 bar pressure, 50.00 °C temperature and 7.39 g/min co-solvent amount. The obtained extract under optimum SC-CO<sub>2</sub> condition was analysed by high-performance liquid chromatography. Seven bioactive flavonoids including catechin, epicatechin, rutin, luteolin, myricetin, apigenin and naringenin were identified as major compounds. The results of quantification showed that spearmint leaves are potential source of antioxidant compounds.