

## Supercritical carbon dioxide (SC-CO<sub>2</sub>) extraction of catechin, epicatechin, rutin and luteolin from spearmint (*Mentha spicata* L.) leaves

### ABSTRACT

In this study, supercritical carbon dioxide (SC-CO<sub>2</sub>) extraction conditions were optimized for the simultaneous separation of four bioactive flavonoids (catechin, CA; epicatechin, EP; rutin, RU; luteolin, LU) contained in spearmint (*Mentha spicata* L.) leaves. SC-CO<sub>2</sub> extraction parameters such as pressure, temperature and dynamic extraction time were optimized by Complete Randomize Design (CRD) full factorial. The optimum condition of SC-CO<sub>2</sub> extraction was achieved at 200 bar, 60°C and 60 min (with 60.566 mg/g extraction yield). Extracted yield at optimum condition was then analyzed by high performance liquid chromatography (HPLC) for quantifying bioactive flavonoid compounds. At optimum conditions, four bioactive flavonoids including (+)-catechin, (-)-epicatechin, rutin and luteolin were detected at high concentration. Luteolin (0.657 mg/g) had the highest concentration among the other detected flavonoids. The results indicated that SC-CO<sub>2</sub> extraction is a promising and alternative process for recovering the bioactive compounds from spearmint leaves.

**Keyword:** Spearmint (*Mentha spicata* L.); Bioactive flavonoid; (+)-Catechin; (-)-Epicatechin; Rutin; Luteolin; Supercritical carbon dioxide (SC-CO<sub>2</sub>) extraction