

Acetic acid buffer as extraction medium for free and bound phenolics from dried blackcurrant (*Ribes nigrum* L.) skins

ABSTRACT

The aim of this study was to investigate the effects of different solvent and extraction temperatures on the free and bound phenolic compounds and antioxidant activity of dried blackcurrant skins (DBS). Apart from acetic acid buffer solution, different solvent systems, including water, methanol, and mixtures of methanol/water, were also employed and the effects of solvent and temperature (30 and 50 °C) on the free and bound forms of anthocyanins, hydroxycinnamic acids, and flavonols yield were assessed. The results showed that among all solvents, acetic acid buffer resulted in the highest free anthocyanin content ($1,712.3 \pm 56.1$ mg/100 g) ($P < 0.05$) after 2 hr extraction at 50 °C from DBS, while lower amounts of bound anthocyanins and anthocyanidins were detected after acid hydrolysis. Acetic acid buffer extracts exhibited the highest free hydroxycinnamic acid content (268.0 ± 4.5 mg/100 g), total phenolic content (3702.2 ± 259.3 mg GAE/100 g), and DPPH activity ($60.7 \pm 2.0\%$ of inhibition). However, their free flavonol content was slightly lower (60.2 ± 0.8 mg/100 g) compared to 100% methanol at 30 and 50 °C (71.4 ± 1.5 mg/100 g and 71.5 ± 6.2 mg/100 g, respectively). Two-way ANOVA indicated interactions between solvent and temperature ($P < 0.05$), which suggested that the relationship between solvent and phenolic compounds depends on the extraction temperature.

Keyword: Acetic acid buffer; Anthocyanins; Antioxidant activity; Dried blackcurrant skins; HPLC