Quantitative analysis and recovery optimisation of flavonoids and anthocyanins in sugar-making process of sugarcane industry

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Abstract

Considering the possible comprehensive utilisation of bioactive constituents in the sugarcane industry, the flavonoids and anthocyanins in raw juice and various intermediate products within the sugar-making process were first analysed by HPLC-UV/DAD. The analysis was intended to reveal their distribution across the whole production chain. As their contents decreased during sugar production, a new strategy was developed and optimised to recover flavonoids and anthocyanins from raw juice using A D141-type macroporous adsorptive resin for enrichment. The optimum process parameters were feeding with a pH value of 5.21, weight ratio of resin to crude sample of 20 (w/w), followed by adding 30% ethanol 3.57 times the column volume for anthocyanins with a flow rate of 1.69 bed volumes/h, then 100% ethanol 4.00 times the column volume for flavonoids with a flow rate of 2.36 bed volumes/h. Upon employing this method, an increase in efficiency was realised.

Keywords

Flavonoids; Anthocyanins; Sugarcane industry; Quantitative analysis; Recovery and separation; RSM

Figures and tables from this article:

Fig. 1.
HPLC chromatogram and representative DAD/UV-Vis spectra of flavonoids (350 nm) and anthocyanins (520 nm) of the raw juice (a1, a2), pre-heating sample (b1, b2), main heating sample (c1, c2), filter (d1, d2), filter mud (e1, e2), pre-heating sample (f1, f2), evaporation sample (g1, g2).