

Response surface optimisation for the extraction of phenolics and flavonoids from a pink guava puree industrial by-product.

ABSTRACT

Pink guava puree industry produces huge amount of by-products that have potential as sources for polyphenols. Response surface methodology was implemented to optimise the extraction conditions for phenolics (Y1) and flavonoids (Y2) from a by-product of the guava industry. A three-factor inscribed central composite design was employed to determine the effects of three independent variables, namely pH (X1: 2-6), temperature (X2: 40-60 °C) and time (X3: 1-5 h), on the response variables. The corresponding predicted values for phenolics and flavonoids were 336.30 and 427.35 mg 100 g⁻¹, respectively. Predicted values for extraction rates of phenolics agreed well with experiment values; R² of 0.902. However, the model derived for flavonoids extraction was less reliable; R² of 0.983. Increase in time and temperature was found significant in increasing the extraction rate. The optimum conditions for extracting phenolics by ethanolic solvent occurred at a pH of 2 and 60 °C for a 5-h extraction.

Keyword: Extraction; Flavonoids; Phenolics; Psidium guajava by-products; Response surface methodology.