

The optimization of anthocyanin pigment extraction from butterfly pea (*Clitoria ternatea* L.) petal using response surface methodology

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Abstract

The Box-Behnken experimental design with Response Surface Methodology has been used to optimize extraction of anthocyanin from butterfly pea (*Clitoria ternatea* L.) petal. The extraction process was conducted in the dark by using water-HCl at pH 4.5 as solvent. The ratio of fresh petal to water was 4:1 (w/v). The optimum process was defined as a set of extraction factors by using highest volume, anthocyanin and total phenolic content as the selected parameters. The three factors evaluated were blanching time (0 to 12 min), extraction temperature (30 to 60°C) and extraction time (30 to 120 min). All factors had significant effect to extract volume by following a reduced 2-factor interaction model, while total anthocyanin and total phenolic contents were affected by following a reduced quadratic model. Based on the models, the optimum extraction process was 6 min blanching time followed by 30 min extraction time at 60°C. The color stability test of butterfly pea petal extract was conducted at pH 1 for 28 days. At this pH anthocyanin predominantly consists of the flavylium cation, the most stable form of anthocyanin in aqueous systems. This stability test showed that the extract stored at 4°C was more stable than at room temperature with 100% stability compared to 86% stability respectively.