
Optimization of polyphenol extraction from *Hibiscus rosa-sinensis* flowers

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Edible flowers of *Hibiscus rosa-sinensis* have been identified with various phenolic compounds which are capable of combatting oxidative stress. However, different extraction parameters greatly influence the quantity as well as the composition of bioactive compounds extracted from them. Thus, effective extraction of phenolic compounds is important to efficiently utilize these flowers. The present study aims to make use of central composite design, to investigate the effects of extraction parameters on the three response variables; total phenolic content, total anthocyanin content and antioxidant activity. Four independent variables including solid:liquid ratio, ethanol concentration, temperature and time were studied for the simultaneous optimization to maximize the response variables. Solid-liquid extraction technique was used for the extraction process. A two level four factor central composite design, with 31 experimental runs were performed and mathematical models were generated. The ability of the models to predict the studied responses is reflected by p values for lack of fit ($p > 0.05$). The optimum extraction parameters generated were 24.0 % ethanol, 1:40 solid to liquid ratio, extraction temperature 44 °C and time 41 minutes. The experimental values obtained for the response variables under the generated optimum conditions confirmed the validity of the proposed second order polynomial model. The results demonstrated the application of feasible process parameters for the extraction of phenolics from *Hibiscus rosa-sinensis* flowers and effective utilization of these flowers in food as well as pharmaceutical industry.

Keywords: *Hibiscus rosa-sinensis*, Optimization, Phenolics, Response surface method

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