INTISARI

Response Surface Methodology (RSM) dengan menggunakan rancangan desain *Central Composite Design* diterapkan dalam penelitian ini untuk mengoptimasi kondisi ekstraksi pada daun randu sehingga menghasilkan respon yaitu kadar flavonoid total (Y, %b/b ER) dalam jumlah yang optimal. Variabel faktor dan *range* level faktor ditentukan dengan melakukan uji pendahuluan *single factor experiment* terhadap masing-masing faktor yaitu konsentrasi etanol (57,6-96%), ukuran serbuk (30-70 mesh) dan rasio serbuk-solven (1:18-1:38 g/mL). Percobaan orde kedua dilakukan mengikuti rancangan desain *Central Composite Design* (CCD) dengan variabel yang digunakan yaitu ukuran serbuk (X_1) 50 mesh dan rasio (X_2) 1:30 g/mL sebagai *center point* (kode 0). Model yang signifikan yaitu model kuadratik ($p < 0,05$) dengan nilai koefisien determinasi (R^2) sebesar 0,9699. Persamaan model orde kedua yang dihasilkan adalah $Y_1 = 0{,}73 + 0{,}004268X_1 + 0{,}024X_2 - 0{,}042X_1^2 - 0{,}030X_2^2$. Kondisi ekstraksi optimal yang dihasilkan untuk respon flavonoid total yaitu pada komposisi etanol 96%, ukuran serbuk 49,50 mesh dan rasio serbuk-solven 1:31,62 g/mL dengan kadar flavonoid total prediksi yang dihasilkan sebesar 0,7383 %b/b ER, sedangkan kadar flavonoid total hasil verifikasi model yaitu 0,7458±0,020 %b/b ER. Hasil verifikasi dengan uji *one sample t-test* menunjukkan bahwa hasil prediksi model tidak berbeda bermakna terhadap nilai sebenarnya, sehingga dapat dikatakan bahwa model sudah memadai.

Kata kunci: *Response surface methodology* (RSM),*Central composite design* (CCD), daun randu (*Ceiba pentadra leaf.*), flavonoid total, ukuran serbuk, rasio serbuk-solven, komposisi solven.

ABSTRACT

Respone Surface Methodology (RSM) in conjunction with Central Composite Design (CCD) was performed in this study to optimize the extraction condition of flavonoid from Randu (*Ceiba pentandra* Gaertn.) leaves in order to provide the optimum response of total flavonoid (Y, %b/b ER). Ethanol consentration (57,6-96%), particle size (30-70 mesh) and rasio of solid to liquid (1:18-1:38 g/mL) were selected as independent variables and their range values were selected based on the result of the preliminary experimental by single factor experiment. The Central Composite Design was adopted in the second-order experiment which the selected independent variables were particle size (X_1) and rasio of solid to liquid (X_2) at level 50 mesh and 1:30 g/mL as the center point, respectively. Result showed that the quadratic model was significant ($p<0,05$) with $R^2 = 0,9699$ and resulting the second-order polinomial relationship as $Y_1 = 0,73 + 0,004268X_1 + 0,024X_2 - 0,042X_1^2 - 0,030X_2^2$. The optimal conditions for extraction of total flavonoid contents (TFC) in Randu leaves were found to be at ethanol consentration of 96%, particle size of 49,50 mesh and ratio of solid to liquid at 1:301,62 g/mL. Under the optimal conditions, the experimental maximum value of TFC was 0,7458 %b/b ER. *One sample t-test*'s result showed that experimental value was well in close agreement with value predicted by model (0,7383 %b/b ER), thus indicating suitability of the model employed and the success of response surface methodology in optimizing the extraction conditions.

Key words: Response surface methodology (RSM), Central composite design (CCD), *Ceiba pentandra* leaves, total flavonoid, particle size, ethanol consentration, rasio of solid to liquid