

Universitas Ngudi Waluyo
Program Studi Farmasi, Fakultas Kesehatan
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Elsa Putri Lestari
052211005

Validasi Metode dan Penetapan Kadar Vitamin C dalam Berbagai Sediaan Bit (*Beta Vulgaris L*) Menggunakan Metode Spektrofotometri UV

ABSTRAK

Latar belakang : Buah bit (*Beta vulgaris L*) merupakan salah satu buah yang mengandung vitamin C. Vitamin C merupakan senyawa yang tidak stabil, karena itu kadar vitamin C dapat berkurang oleh beberapa faktor salah satunya perlakuan. Perlakuan dapat berupa suhu, penyimpanan dan pengolahan. Tujuan penelitian ini untuk mengetahui kriteria validasi metode secara spektrofotometri UV sudah memenuhi kriteria atau belum serta mengetahui kadar vitamin C dalam buah bit berdasarkan perbedaan bentuk sediaan.

Metode : Penelitian dilakukan dengan eksperimental laboratorium, dilakukan validasi metode dengan parameter yaitu linieritas, presisi, batas deteksi (LOD) dan batas kuantitas (LOQ), serta akurasi, kemudian dilanjutkan dengan penetapan kadar vitamin C secara kuantitatif dengan metode spektrofotometri UV.

Hasil: Validasi metode uji linieritas menghasilkan nilai $r=0,9993$. LOD sebesar 0,4469 ppm, LOQ sebedar 1,4896 ppm, uji presisi (%RSD) 0,406% dan uji akurasi %recovery pada penambahan baku 6 ppm, 8 ppm dan 10 ppm berturut-turut sebesar 96,24% ; 97,35% ; 97,59%. Panjang gelombang maksimum yaitu pada panjang gelombang 267 nm dengan persamaan regresi linier $y = 0,0553x + 0,1349$ diperoleh kadar vitamin C pada sampel sari, rebusan dan ekstrak berturut-turut sebesar $4,348 \pm 0,027$ mg/100g ; $3,455 \pm 0,046$ mg/100g ; $37,75 \pm 0,28$ mg/100g. Hasil uji *One-Way Anova* menunjukkan terdapat perbedaan signifikan pada kadar vitamin C seluruh sampel. Hasil uji lanjut *Post Hoc LSD* menunjukkan perbedaan signifikan terdapat pada kelompok sampel ekstrak.

Simpulan : Hasil validasi metode analisis kadar vitamin C dalam sampel buah bit menggunakan metode spektrofotometri UV memenuhi persyaratan. Kadar vitamin C pada sampel sari, rebusan dan ekstrak berturut-turut sebesar 4.348 ± 0.027 mg / 100g ; 3.455 ± 0.046 mg/100g ; $37,75 \pm 0.28$ mg/100g. Analisis statistik menunjukkan perbedaan signifikan terdapat pada kelompok sampel ekstrak.

Kata kunci : Vitamin C, Buah bit, spektrofotometri UV-Vis, validasi metode

Ngudi Waluyo University
Pharmacy Studi Program, Faculty of Health
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Elsa Putri Lestari
052211005

Method Validation and Determination of Vitamin C Levels in Various Beetroot Preparations (*Beta Vulgaris L*) Using UV Spectrophotometry Method

ABSTRACT

Background : Beetroot (*Beta vulgaris L*) is one of the fruits that contain vitamin C. Vitamin C is an unstable compound, therefore vitamin C levels can be reduced by several factors, one of which is treatment. Treatment can be temperature, storage, and processing. The purpose of this study is to determine whether the criteria for validation of the method by UV spectrophotometry has met the criteria or not and determine the levels of vitamin C in beets based on differences in dosage forms.

Methods : The research was conducted with laboratory experiments, method validation was carried out with parameters, namely linearity, precision, detection limit (LOD), and quantity limit (LOQ), as well as accuracy, then continued with quantitative determination of vitamin C levels with UV spectrophotometry method.

Result : Validation of the linearity test method yields a value of $r=0.9993$. LOD of 0.4469 ppm, LOQ of 1.4896 ppm, precision test (%RSD) of 0.406% and accuracy test of %recovery in the addition of 6 ppm, 8 ppm and 10 ppm respectively of 96.24%; 97,35% ; 97,59%. The maximum wavelength is at a wavelength of 267 nm with a linear regression equation $y = 0.0553x + 0.1349$, obtained vitamin C levels in samples of juice, decoction and extract respectively of 4.348 ± 0.027 mg / 100g ; 3.455 ± 0.046 mg/100g ; $37,75 \pm 0.28$ mg/100g. The results of the One-Way Anova test showed a significant difference in vitamin C levels throughout the sample. The results of the Post Hoc LSD follow-up test showed significant differences in the extract sample group.

Conclusion : The validation results of the analysis method of vitamin C levels in beet samples using the UV spectrophotometry method meet the requirements. Vitamin C levels in samples of juice, decoction and extract respectively amounted to $4,348 \pm 0.027$ mg / 100g; $3,455 \pm 0.046$ mg/100g ; 37.75 ± 0.28 mg/100g. Statistical analysis showed significant differences in the sample group of extracts.

Keywords : Vitamin C, Beetroot, UV-Vis spectrophotometry, method validation