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**VALIDASI METODE ANALISA KADAR FLAVONOID TOTAL DAN
AKTIVITAS ANTIOKSIDAN EKSTRAK BUNGA CENGKEH (*Syzygium
aromaticum* (L.) Merr. & L.M.Perry)**

ABSTRAK

Latar Belakang : Indonesia dikenal sebagai negara yang kaya akan tanaman obat, salah satunya adalah cengkeh (*Syzygium aromaticum* L.) yang telah lama dimanfaatkan dalam pengobatan tradisional dan mengandung senyawa bioaktif seperti flavonoid yang berperan sebagai antioksidan.

Tujuan: Penelitian ini bertujuan untuk menganalisis kadar flavonoid ekstrak bunga cengkeh, melakukan validasi metode analisis spektrofotometri berdasarkan kriteria presisi, akurasi, linearitas, LOD, dan LOQ, serta menguji aktivitas antioksidannya.

Metode: Penelitian ini merupakan penelitian eksperimental. Ekstraksi bunga cengkeh dilakukan dengan metode maserasi menggunakan pelarut etanol 96%. Flavonoid diuji secara kualitatif menggunakan uji warna dan uji kuantitatif ditentukan secara spektrofotometri UV-Vis. Validasi metode meliputi uji presisi, akurasi, linearitas, serta penetapan LOD dan LOQ. Aktivitas antioksidan dievaluasi menggunakan metode ABTS. Analisis data dilakukan secara statistik menggunakan SPSS 25.

Hasil: Uji kualitatif flavonoid ekstrak bunga cengkeh dengan reagen H₂SO₄ menunjukkan warna merah. Kadar flavonoid ekstrak bunga cengkeh 1000 ppm sebesar 43,386 mgQE/g. Nilai parameter validasi metode analisa dengan spektrofotometri menunjukkan nilai %RSD 0,978%, %perolehan kembali 100,91%, koefisien korelasi (r) 0,996, LOD 6,74 µg/ml, dan nilai LOQ 20,43 µg/ml. Hasil aktivitas antioksidan ekstrak bunga cengkeh konsentrasi 20, 30, 40, 50, dan 60 ppm memiliki nilai %inhibisi secara berturut-turut sebesar 24,92%, 35,2%, 45,01%, 55,45%, dan 64,33%, dengan nilai IC₅₀ sebesar 45,06 µg/ml.

Kesimpulan: Kadar flavonoid total ekstrak bunga cengkeh sebesar 43,386 mgQE/g. Metode spektrofotometri yang digunakan untuk analisis kadar flavonoid total ekstrak bunga cengkeh telah memenuhi kriteria validasi, berdasarkan parameter linearitas, presisi, akurasi, LOD, dan LOQ. Ekstrak bunga cengkeh menunjukkan aktivitas antioksidan yang sangat kuat.

Kata kunci: Bunga cengkeh, Flavonoid, Antioksidan

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**VALIDATION OF THE METHOD OF ANALYSIS OF TOTAL FLAVONOID
LEVELS AND ANTIOXIDANT ACTIVITY OF CLOVE FLOWER EXTRACT
(*Syzygium aromaticum* (L.) Merr. & L.M.Perry)**

ABSTRACT

Background: Indonesia is known as a country rich in medicinal plants, one of which is cloves (*Syzygium aromaticum* L.) which have long been used in traditional medicine and contain bioactive compounds such as flavonoids that act as antioxidants. **Objective:** This study aims to analyze the flavonoid content of clove flower extract, validate spectrophotometric analysis methods based on the criteria of precision, accuracy, linearity, LOD, and LOQ, and test their antioxidant activity.

Methods: This study is an experimental study. Clove extraction is carried out by maceration method using 96% ethanol solvent. Flavonoids are qualitatively tested using color assays and quantitative assays are determined by UV-Vis spectrophotometry. Method validation includes precision, accuracy, linearity, and determination of LOD and LOQ. Antioxidant activity was evaluated using the ABTS method. Data analysis was carried out statistically using SPSS 25.

Results: Qualitative test of flavonoids of clove flower extract with H_2SO_4 reagent showed a red color. The flavonoid content of 1000 ppm clove flower extract was 43.386 mgQE/g. The value of the validation parameter of the analysis method by spectrophotometry showed a value of %RSD 0.978%, %regain of 100.91%, correlation coefficient (*r*) of 0.996, LOD of 6.74 mg/L, and a LOQ value of 20.43 mg/L. The results of antioxidant activity of clove flower extract concentrations of 20, 30, 40, 50, and 60 ppm had %inhibition values of 24.92%, 35.2%, 45.01%, 55.45%, and 64.33%, with an IC50 value of 45.1 µg/ml.

Conclusion: The total flavonoid content of clove flower extract was 43.386 mgQE/g. The spectrophotometry method used for the analysis of the total flavonoid content of clove flower extract has met the validation criteria, based on the parameters of linearity, precision, accuracy, LOD, and LOQ. Clove flower extract shows very strong antioxidant activity

Keywords: Clove flower, Flavonoids, Antioxidants