

ABSTRACT

IN VITRO EVALUATION OF TOTAL PHENOLIC, FLAVONOID, AND TANNIN CONTENTS AND ANTIOXIDANT OF COMBINED EXTRACTS OF BINAHONG LEAVES (*Anredera cordifolia*) AND BAY LEAVES (*Syzigium polyanthum*)

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Background: Binahong leaves and bay leaves are known to contain phenolic compounds, flavonoids, and tannins, which have the potential to be developed as natural antioxidant sources. This study aimed to determine the total phenolic, flavonoid, and tannin contents, as well as the antioxidant activity of combined 70% ethanol and ethyl acetate extracts of binahong and bay leaves.

Methods: Combined extracts of binahong and bay leaves were prepared at ratios of 1:1, 1:2, 2:1, 2:0, and 0:2 %w/w, with a total concentrated extract weight of 100 mg. Total phenolic content (mg GAE/g extract) was determined using the Folin–Ciocalteu method, total flavonoid content (mg QE/g extract) was analyzed using the aluminum chloride colorimetric method, and total tannin content (mg GAE/g extract) was determined using the gelatin precipitation method. Antioxidant activity ($\mu\text{g/mL}$) was evaluated using the DPPH (2,2-diphenyl-1-picrylhydrazyl) method. Data analysis was performed using one-way ANOVA and Spearman correlation tests with a significance level of 0.05.

Results: The highest total phenolic content in both the 70% ethanol and ethyl acetate extracts was obtained in the 0:2 combination. The highest total flavonoid content was observed in the 1:1 and 0:2 combinations, while the highest total tannin content in both extracts was found in the 1:2 combination. The strongest antioxidant activity in the 70% ethanol and ethyl acetate extracts was observed in the 0:2 and 1:2 combinations. All test results showed significant differences among extract combinations. A negative correlation was observed between total phenolic, flavonoid, and tannin contents and antioxidant activity, except for the ethyl acetate extract in the flavonoid assay, which showed a positive correlation.

Conclusions: : The combination of 70% ethanol and ethyl acetate extracts of binahong and bay leaves exhibited high total phenolic, flavonoid, and tannin

contents, and showed a negative correlation with antioxidant activity, except for the ethyl acetate extract in the flavonoid assay.

Keywords: binahong leaves, bay leaves, extract, total phenolics, total flavonoids, total tannins, antioxidant

ABSTRAK

EVALUASI *IN VITRO* KANDUNGAN FENOLIK, FLAVONOID, DAN TANIN TOTAL SERTA AKTIVITAS ANTIOKSIDAN KOMBINASI EKSTRAK DAUN BINAHONG (*Anredera cordifolia*) DAN DAUN SALAM (*Syzygium polyanthum*)

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Latar Belakang: Daun binahong dan daun salam diketahui mengandung senyawa fenolik, flavonoid, dan tanin yang berpotensi sebagai sumber antioksidan alami. Penelitian ini bertujuan menentukan kadar total fenolik, flavonoid, tanin, serta aktivitas antioksidan dari kombinasi ekstrak etanol 70% dan etil asetat daun binahong dan daun salam.

Metode: Ekstrak kombinasi daun binahong dan daun salam dibuat dengan perbandingan 1:1, 1:2, 2:1, 2:0, dan 0:2 %b/b dengan total berat ekstrak kental 100 mg. Penentuan kadar fenolik total (mg GAE/g ekstrak) dilakukan menggunakan metode *Folin-Ciocalteu*, kadar flavonoid total (mg QE/g ekstrak) dengan metode kolorimetri aluminium klorida, dan kadar tanin total (mg GAE/g ekstrak) menggunakan metode presipitasi gelatin. Aktivitas antioksidan ($\mu\text{g/mL}$) menggunakan metode DPPH (*2,2-diphenyl-1-picrylhydrazyl*). Analisis data dilakukan menggunakan uji statistik *one-way ANOVA* dan uji korelasi *Spearman* dengan nilai signifikansi 0,05.

Hasil: Kadar fenolik total tertinggi pada ekstrak etanol 70% dan etil asetat diperoleh pada kombinasi 0:2. Kadar flavonoid total tertinggi pada kombinasi 1:1 dan 0:2, sedangkan kadar tanin total tertinggi pada kedua ekstrak dengan kombinasi 1:2. Aktivitas antioksidan paling kuat pada ekstrak etanol 70% dan etil asetat pada kombinasi 0:2 dan 1:2. Seluruh hasil pengujian menunjukkan perbedaan yang signifikan antar kombinasi ekstrak. Terdapat korelasi negatif antara kadar total fenolik, flavonoid, dan tanin terhadap aktivitas antioksidan, kecuali pada ekstrak etil asetat uji flavonoid yang menunjukkan korelasi positif.

Kesimpulan: Kombinasi ekstrak etanol 70% dan etil daun binahong dan daun salam memiliki kadar total fenolik, flavonoid, dan tanin yang termasuk rentang tinggi, serta terdapat korelasi negatif dengan aktivitas antioksidan yang dihasilkan

kecuali pada ekstrak etil asetat dari uji kadar flavonoid.

Kata Kunci: daun binahong, daun salam, ekstrak, fenolik total, flavonoid total, tanin total, antioksidan