

ABSTRACT

DETERMINATION OF TOTAL PHENOLIC CONTENTS, TOTAL FLAVONOID CONTENTS, AND ANTIOXIDANT ACTIVITY OF COMBINATION OF AVOCADO LEAF (*Persea americana* Mill.) AND PAPAYA LEAVES (*Carica papaya* L.) FRACTIONS

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Background: Degenerative diseases are often associated with free radicals because they damage cells and can be treated with antioxidant therapy. Avocado leaves and papaya leaves are medicinal plants that contain phenolic and flavonoid compounds that can be developed as antioxidants. This study aims to determine the total phenolic content and total flavonoid content as well as the antioxidant activity of a combination of n-hexane, ethyl acetate, and aquadest fractions from avocado leaves (*Persea americana* Mill.) and papaya leaves (*Carica papaya* L.).

Methods: The combination fraction of avocado and papaya leaves with a ratio of 1:1, 1:2, 2:1, 2:0, and 0:2 with a total weight of the thick fraction of 50 mg (%w/w) was tested for total phenolic content (mg GAE/g extract) using the *folin-ciocalteu* method, total flavonoid content (mg QE/g extract) using the aluminum chloride colorimetric method, and antioxidant activity ($\mu\text{g/ml}$) using the DPPH (2,2-diphenyl-1-picrylhydrazyl) method. *One-way ANOVA* or *Kruskal-wallis* statistical tests and *Pearson* or *Spearman* correlation tests with a 95% confidence level were used for data analysis in this study.

Results: The highest total phenolic content of the n-hexane fraction, ethyl acetate fraction, and aquadest fraction was found in the combination of 1:2, 1:2, and 2:0 (986.429; 5764.359; and 1429.286 mg GAE/g extract). The highest total flavonoid content of the n-hexane fraction, ethyl acetate fraction, and aquadest fraction was found in the combination of 2:0 with values of 926.250; 3201.250; and 1197.083 mg QE/g extract. The strongest antioxidant activity of the n-hexane, ethyl acetate, and aquadest fractions was obtained in the combination ratios of 2:0, 2:1, and 1:1 (86.805; 28.287; and 69.991 $\mu\text{g/ml}$). All test results have significant differences between the combination comparisons. There is a negative correlation with a range of -1 to 1 between total phenolic content and total flavonoid content with antioxidant activity in avocado leaves and papaya leaves.

Conclusion: The combination of n-hexane, ethyl, and aquades fractions of avocado and papaya leaves has a total phenolic and flavonoid content and there is a negative correlation with the antioxidant activity produced.

Keywords: Avocado leaf, papaya leaves, fraction, total phenolic, total flavonoid, antioxidant

ABSTRAK

PENENTUAN KADAR FENOLIK TOTAL, KADAR FLAVONOID TOTAL, DAN UJI AKTIVITAS ANTIOKSIDAN DARI KOMBINASI FRAKSI DAUN ALPUKAT (*Persea americana* Mill.) DAN DAUN PEPAYA (*Carica papaya* L.)

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Latar Belakang: Penyakit degeneratif sering dikaitkan dengan radikal bebas karena merusak sel dan dapat diatasi dengan terapi antioksidan. Daun alpukat dan daun pepaya merupakan tanaman obat yang mengandung senyawa fenolik dan flavonoid yang dapat dikembangkan sebagai antioksidan. Penelitian ini bertujuan untuk menentukan kadar fenolik total dan kadar flavonoid total serta aktivitas antioksidan dari kombinasi fraksi n-heksan, etil asetat, dan aquades dari daun alpukat (*Persea americana* Mill.) dan daun pepaya (*Carica papaya* L.).

Metode: Fraksi kombinasi daun alpukat dan daun pepaya dengan perbandingan 1:1, 1:2, 2:1, 2:0, dan 0:2 dengan total berat fraksi kental 50 mg (%b/b) dilakukan uji kadar fenolik total (mg GAE/g ekstrak) dengan metode *folin-ciocalteu*, kadar flavonoid total (mg QE/g ekstrak) dengan metode kolorimetri aluminium klorida, dan aktivitas antioksidan ($\mu\text{g/ml}$) dengan metode DPPH (2,2-diphenyl-1-picrylhydrazyl). Uji statistik *one-way ANOVA* atau *Kruskal-wallis* serta uji korelasi *Pearson* atau *Spearman* dengan taraf kepercayaan 95% digunakan untuk analisis data dalam penelitian ini.

Hasil: Kadar fenolik total fraksi n-heksan, fraksi etil asetat, dan fraksi aquades tertinggi ditemukan pada kombinasi 1:2, 1:2, dan 2:0 (986,429; 5764,359; dan 1429,286 mg GAE/g ekstrak). Kadar flavonoid total fraksi n-heksan, fraksi etil asetat, dan fraksi aquades tertinggi ditemukan pada kombinasi 2:0 dengan nilai sebesar 926,250; 3201,250; dan 1197,083 mg QE/g ekstrak. Aktivitas antioksidan terkuat dari fraksi n-heksan, etil asetat, dan aquades diperoleh pada perbandingan kombinasi 2:0, 2:1, dan 1:1 (86,805; 28,287; dan 69,991 $\mu\text{g/ml}$). Semua hasil pengujian memiliki perbedaan yang signifikan antar perbandingan kombinasinya. Terdapat korelasi yang bernilai negatif dengan rentang -1 hingga 1 antara kadar fenolik total dan kadar flavonoid total dengan aktivitas antioksidan yang ada pada daun alpukat dan daun pepaya.

Kesimpulan: Kombinasi fraksi n-heksan, etil, dan aquades daun alpukat dan daun pepaya memiliki kadar fenolik dan flavonoid total serta terdapat korelasi negatif dengan aktivitas antioksidan yang dihasilkan.

Kata Kunci: daun alpukat, daun pepaya, fraksi, fenolik total, flavonoid total, antioksidan