

## ABSTRACT

### DETERMINATION OF TOTAL ALKALOID CONTENT AND TEST OF ANTIBACTERIAL ACTIVITY OF A COMBINATION OF AVOCADO LEAF FRACTIONS (*Persea americana* Mill.) AND PAPAYA LEAVES (*Carica papaya* L.) AGAINST *Staphylococcus* *aureus* AND *Pseudomonas aeruginosa*

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**Background:** The use of antibiotics to treat bacterial infections is often followed by the incidence of antibiotic resistance which can complicate treatment. This study aims to determine the total alkaloid content and antibacterial activity of a combination of avocado leaf fractions and papaya leaves against *Staphylococcus aureus* and *Pseudomonas aeruginosa* bacteria.

**Methods:** This study used a laboratory experimental design on n-hexane, ethyl acetate, and water fractions with a fraction concentration of 400 mg/mL and a combination of 2:2, 2:1, 1:2, 2:0, and 0:2 (w/w) ratios. Total alkaloid levels were measured using the bromocresol green complex method, while antibacterial activity tests were carried out using the disc diffusion method. Data on total alkaloid levels and inhibition zone diameters were analyzed using the One-Way ANOVA test and the Pearson correlation test.

**Results:** The study produced an ethyl acetate fraction with the highest alkaloid content of 1.937% w/w and showed antibacterial activity against *Staphylococcus aureus* of 7.78 mm and *Pseudomonas aeruginosa* of 7.25 mm. The water fraction with the highest alkaloid content of 0.518% w/w only showed weak inhibition against *Staphylococcus aureus* of 1.67 mm, while the n-hexane fraction with an alkaloid content of 0.982% w/w did not show antibacterial activity. Analysis of the total alkaloid content and inhibition zone diameter data showed differences between fraction variables and there was a relationship between the total alkaloid content and the inhibition zone diameter indicated by a negative correlation coefficient.

**Conclusions:** The single papaya leaf ethyl acetate fraction had better results in terms of total alkaloid content, which was 1.937% w/w. The single avocado leaf ethyl acetate fraction had better results in terms of antibacterial testing on *Staphylococcus aureus* and *Pseudomonas aeruginosa*.

**Key Words:** Antibacterial, Avocado leaf, Papaya leaf, *Staphylococcus aureus*, *Pseudomonas aeruginosa*.

## ABSTRAK

### **PENETAPAN KADAR ALKALOID TOTAL DAN UJI AKTIVITAS ANTIBAKTERI KOMBINASI FRAKSI DAUN ALPUKAT (*Persea americana* Mill.) DAN DAUN PEPAYA (*Carica papaya* L.) TERHADAP *Staphylococcus aureus* DAN *Pseudomonas aeruginosa***

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**Latar Belakang:** Penggunaan antibiotik untuk mengatasi penyakit infeksi bakteri seringkali diikuti dengan adanya kejadian resistensi antibiotik yang dapat mempersulit pengobatan. Penelitian ini bertujuan untuk mengetahui kadar alkaloid total dan aktivitas antibakteri kombinasi fraksi daun alpukat dan daun pepaya terhadap bakteri *Staphylococcus aureus* dan *Pseudomonas aeruginosa*.

**Metode:** Penelitian ini menggunakan desain eksperimental laboratorium pada fraksi n-heksan, etil asetat, dan air dengan konsentrasi fraksi 400 mg/mL dan kombinasi perbandingan 2:2, 2:1, 1:2, 2:0, dan 0:2 (b/b). Kadar alkaloid total diukur menggunakan metode kompleks *bromocresol green*, sedangkan uji aktivitas antibakteri dilakukan dengan metode difusi cakram. Data kadar alkaloid total dan diameter zona hambat dianalisis menggunakan uji *One-Way ANOVA* dan uji korelasi Pearson.

**Hasil:** Pada penelitian dihasilkan fraksi etil asetat dengan kadar alkaloid tertinggi sebesar 1,937 %b/b serta menunjukkan aktivitas antibakteri terhadap *Staphylococcus aureus* sebesar 7,78 mm dan *Pseudomonas aeruginosa* sebesar 7,25 mm. Fraksi air dengan kadar alkaloid tertinggi sebesar 0,518 %b/b hanya menunjukkan daya hambat lemah terhadap *Staphylococcus aureus* sebesar 1,67 mm, sementara fraksi n-heksan dengan kadar alkaloid sebesar 0,982 %b/b, tidak menunjukkan aktivitas antibakteri. Analisis data kadar alkaloid total dan diameter zona hambat menunjukkan adanya perbedaan antar variabel fraksi dan terdapat

hubungan antara kadar alkaloid total dengan diameter zona hambat ditandai dengan nilai koefisien korelasi negatif.

**Kesimpulan:** Fraksi etil asetat daun pepaya tunggal memiliki hasil yang lebih baik dalam hal kadar alkaloid total yaitu sebesar 1,937 %b/b. Adapun fraksi etil asetat daun alpukat tunggal memiliki hasil yang lebih baik dalam hal pengujian antibakteri pada *Staphylococcus aureus* dan *Pseudomonas aeruginosa*.

**Kata Kunci:** Antibakteri, Daun alpukat, Daun pepaya, *Staphylococcus aureus*, *Pseudomonas aeruginosa*.