

PENGARUH CARA PENGERINGAN DAUN SIRIH HIJAU (*Piper betle* L) TERHADAP PERTUMBUHAN BAKTERI *Escherichia coli* ATCC 25922 DENGAN METODE DIFUSI SUMURAN

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INTISARI

Latar Belakang: Infeksi bakteri, khususnya oleh *Escherichia coli*, masih menjadi permasalahan kesehatan yang cukup tinggi di Indonesia. Penggunaan antibiotik yang tidak tepat dapat menyebabkan resistensi, sehingga diperlukan alternatif antibakteri berbasis bahan alam. Daun sirih hijau (*Piper betle* L) diketahui mengandung senyawa flavonoid, tanin, dan saponin yang memiliki potensi antibakteri. Salah satu faktor yang mempengaruhi efektivitas antibakteri tersebut adalah cara pengeringan simplisia sebelum diekstraksi.

Tujuan Penelitian: Mengetahui pengaruh cara pengeringan daun sirih hijau (*Piper betle* L) terhadap pertumbuhan bakteri *Escherichia coli* ATCC 25922 dengan metode difusi sumuran

Metode Penelitian: Daun sirih hijau dikeringkan dengan menggunakan tiga cara yang berbeda, yaitu Oven (O), Sinar Matahari Langsung (SML), Sinar Matahari Tidak Langsung (SMTL). Daun sirih hijau yang sudah kering diserbuk dan diekstraksi menggunakan metode *Ultrasound Assisted Extraction* (UAE) dengan pelarut etanol 70%. Ekstrak yang diperoleh diuji skrining fitokimia dan aktivitas antibakterinya menggunakan metode difusi sumuran pada berbagai konsentrasi (10%, 15%, 20%, 25%, dan 30%) untuk kontrol positif klindamisin 1% dan kontrol negatif akuades. Zona hambat diukur sebagai indikator daya antibakteri.

Hasil Penelitian: Hasil skrining fitokimia menunjukkan bahwa semua ekstrak dari tiga cara pengeringan mengandung alkaloid, flavonoid, tanin, dan saponin. Hasil uji antibakteri menunjukkan bahwa ekstrak yang diperoleh dengan cara pengeringan O 10% (9,79 mm) kategori sedang, 15% (10,97 mm) kategori kuat, 20% (11,68 mm) kategori kuat, 25% (12,32 mm) kategori kuat, dan 30% (12,61 mm), pengeringan SML konsentrasi 10% (10,72 mm) kategori kuat, 15% (11,64 mm) kategori kuat, 25% (12,50 mm) kategori kuat, dan 30% (12,77 mm), pengeringan SMTL konsentrasi 10% (10,60 mm) kategori kuat, 15% (12,25 mm) kategori kuat, 20% (12,29 mm) kategori kuat, 25% (12,95 mm) kategori kuat, dan 30% (13,36 mm) kategori kuat.

Kesimpulan: Cara pengeringan daun sirih hijau (*Piper betle* L) berpengaruh terhadap pertumbuhan *Escherichia coli* ATCC 25922 yang ditunjukkan melalui hasil uji aktivitas antibakteri menggunakan metode difusi sumuran

Kata Kunci: Pengaruh Pengeringan, Antibakteri, Daun Sirih Hijau, *Escherichia coli* ATCC 25922, Difusi Sumuran.

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THE EFFECT OF DRYING METHOD OF GREEN BETEL LEAF (*Piper betle* L) ON THE GROWTH OF *Escherichia coli* ATCC 25922 BACTERIA USING THE WELL DIFFUSION METHOD.

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ABSTRACT

Background: Bacterial infections, particularly those caused by *Escherichia coli*, remain a significant health problem in Indonesia. Inappropriate antibiotic use can lead to resistance, necessitating the need for natural antibacterial alternatives. Green betel leaf (*Piper betle* L), it is known to contain flavonoids, tannins, and saponins, which have antibacterial potential. One factor influencing this antibacterial effectiveness is the drying method of the medicinal plant before extraction.

Research Objective: To determine the effect of drying methods green betel leaf (*Piper betle* L) against bacterial growth *Escherichia coli* ATCC 25922 by the well diffusion method.

Research Methods: Green betel leaf dried using three different methods, namely Oven (O), Direct Sunlight (SML), Indirect Sunlight (SMTL). Green Betel Leaf The dried extracts were powdered and extracted using the *Ultrasound Assisted Extraction* (UAE) method with 70% ethanol solvent. The obtained extracts were tested for phytochemical screening and antibacterial activity using the well diffusion method at various concentrations (10%, 15%, 20%, 25%, and 30%) for the positive control of 1% clindamycin and the negative control of aquadest. The inhibition zone was measured as an indicator of antibacterial power.

Research Results: Phytochemical screening results showed that all extracts from the three drying methods contained alkaloids, flavonoids, tannins, and saponins. The results of the antibacterial test showed that the extract obtained by drying O concentration of 10% (9.79 mm) was in the medium category, 15% (10.97 mm) was in the strong category, 20% (11.68 mm) was in the strong category, 25% (12.32 mm) was in the strong category, and 30% (12.61 mm), drying SML concentration of 10% (10.72 mm) was in the strong category, 15% (11.64 mm) was in the strong category, 25% (12.50 mm) was in the strong category, and 30% (12.77 mm), drying SMTL concentration of 10% (10.60 mm) was in the strong category, 15% (12.25 mm) was in the strong category, 20% (12.29 mm) was in the strong category, 25% (12.95 mm) was in the strong category, and 30% (13.36 mm) was in the strong category.

Conclusion: Drying method green betel leaf (*Piper betle* L) has an effect on the growth of *Escherichia coli* ATCC 25922 as shown by the results of antibacterial activity tests using the well diffusion method.

Keywords: Effect of drying, antibacterial, green betel leaf, *Escherichia coli* ATCC 25922, well diffusion.

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