

ABSTRACT

ANTIBACTERIAL ACTIVITY TEST OF A COMBINATION OF ETHYL ACETATE EXTRACTS FROM THE LEAF OF CUCUMBER (*Cucumis sativus* L.) AND HONEY AGAINST *Cutibacterium acnes*

JONATHAN FARREL PANGGABEAN

Background: *Cutibacterium acnes* infection is the most common cause of *acne vulgaris* and skin infections. The treatment for *Cutibacterium acnes* infections typically involves the use of antibiotics. The incidence of antibiotic resistance continues to rise; therefore, the need for alternative treatments using plant-based materials such as the leaf extract of *Cucumis sativus* L. is necessary.

Objective: To determine the antibacterial effect of combination from n-hexane of *Cutibacterium acnes* leaf and honey against *Cutibacterium acnes*

Methods: The research design is a laboratory experimental study using the wall diffusion method on Mueller Hinton Agar. There are 10 groups, including a positive control with clindamycin, a negative control with distilled water, n-hexane extracts at concentrations of 25%, 50%, 75%, and 100%, and with honey as combination. Each group was tested in 4 repetitions. The data were obtained by measuring the diameter of the inhibition zone formed around the wells. The data were analyzed using One-Way ANOVA or the Kruskal-Wallis test.

Results: The ethyl acetate extract of cucumber leaves (*Cucumis sativus* L.) in combination with honey exhibited antibacterial activity against *Cutibacterium acnes*, as indicated by inhibition zone diameters at concentrations P1, P2, P3, P4, P5, P6, P7, and P8 of 2.87 mm, 4.27 mm, 6.10 mm, 7.57 mm, 4.60 mm, 6.70 mm, 8.43 mm, and 9.53 mm, respectively. These results can be classified as weak to moderate antibacterial activity. The positive control (K⁺) showed an inhibition zone of 36.3 mm, indicating very strong antibacterial activity, whereas the negative control (K⁻) showed no inhibition zone.

Conclusions: : The ethyl acetate extract of cucumber leaves (*Cucumis sativus* L.) in combination with honey has been shown to exhibit antibacterial activity against the Gram-positive bacterium *Cutibacterium acnes*. However, the antibacterial effectiveness of the cucumber leaf extract is weaker than that of clindamycin, which is used as the standard antibacterial agent against the growth of *Cutibacterium acnes*.

Keywords: *Cucumis sativus* L., Antibacterial, *Cutibacterium acnes*,

ABSTRAK

UJI AKTIVITAS ANTIBAKTERI KOMBINASI EKSTRAK ETIL ASETAT DAUN MENTIMUN (*Cucumis sativus L.*) DAN MADU TERHADAP BAKTERI *Cutibacterium acnes*

Oleh

JONATHAN FARREL PANGGABEAN

Latar Belakang: Infeksi *Cutibacterium acnes* adalah penyebab paling umum dari *acne vulgaris* dan infeksi kulit. Pengobatan untuk infeksi *Cutibacterium acnes* biasanya melibatkan penggunaan antibiotik. Insiden resistensi antibiotik terus meningkat; oleh karena itu, diperlukan alternatif pengobatan menggunakan bahan berbasis tanaman seperti ekstrak daun *Cucumis sativus L.*

Tujuan: Untuk menentukan efek antibakteri dari kombinasi ekstrak etil asetat daun *Cutibacterium acnes* dan madu terhadap *Cutibacterium acnes*.

Metode: Desain penelitian adalah studi eksperimental laboratorium yang menggunakan metode difusi dinding pada *Mueller Hinton Agar*. Terdapat 10 kelompok, termasuk kontrol positif dengan klindamisin, kontrol negatif dengan air distilasi, ekstrak etil asetat pada konsentrasi 25%, 50%, 75%, dan 100%, serta dengan madu sebagai kombinasi. Setiap kelompok diuji dalam 4 repetisi. Data diperoleh dengan mengukur diameter zona inhibisi yang terbentuk di sekitar sumur. Data dianalisis menggunakan One-Way ANOVA atau uji Kruskal-Wallis.

Hasil: Ekstrak etil asetat daun mentimun (*Cucumis sativus L.*) dengan kombinasi madu memiliki aktivitas antibakteri terhadap bakteri *Cutibacterium acnes* dengan diameter zona hambat pada konsentrasi P1, P2, P3, P4, P5, P6, P7, dan P8 ialah sebesar 2,87 mm; 4,27 mm; 6,10 mm; 7,57 mm; 4,60 mm; 6,70 mm; 8,43 mm; dan 9,53 mm, dapat digolongkan sebagai antibakteri lemah dan sedang. Pada K+ sebesar 36,3 mm tergolong antibakteri sangat kuat dan K- tidak terdapat zona hambat.

Kesimpulan: Ekstrak etil asetat daun mentimun (*Cucumis sativus L.*) kombinasi madu terbukti memiliki aktivitas antibakteri terhadap bakteri Gram positif *Cutibacterium acnes*. Efektivitas antibakteri ekstrak daun mentimun lebih lemah dibandingkan dengan klindamisin sebagai antibakteri standar terhadap pertumbuhan bakteri *Cutibacterium acnes*.

Kata Kunci: *Cucumis sativus L.*, Antibakteri, *Cutibacterium acnes*,