

THESIS

**FORMULATION OF GEL COMBINING BILIMBI WULUH EXTRACT
(*Averrhoa bilimbi* L) AND LIME JUICE (*Citrus aurantifolia* S.) ON THE
INHIBITION OF *Staphylococcus aureus***



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THESIS

To fulfill some requirements
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ABSTRAK

FORMULASI GEL KOMBINASI EKSTRAK BUAH BELIMBING

WULUH (*Averrhoa bilimbi* L) dan AIR PERASAN JERUK NIPIS (*Citrus aurantifolia* S.) TERHADAP PENGHAMBATAN *Staphylococcus aureus*

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Penggunaan antibiotik seperti tetrasiklin, eritromisin dan klindamisin mengakibatkan resistensi terhadap antibiotik serta iritasi kulit, sehingga diperlukan alternatif pengobatan yang lebih aman dengan menggunakan bahan alami seperti buah belimbing wuluh (*Averrhoa bilimbi* L.) dan air perasan jeruk nipis (*Citrus aurantifolia* S.) yang mengandung flavonoid, alkaloid, tanin dan saponin sebagai antibakteri. Penelitian ini bertujuan untuk mengetahui evaluasi karakteristik fisik sediaan gel kombinasi ekstrak buah belimbing wuluh (*Averrhoa bilimbi* L) dan air perasan jeruk nipis (*Citrus aurantifolia* s.) serta menguji aktivitas antibakterinya terhadap *Staphylococcus aureus*. Penelitian ini menggunakan metode eksperimental laboratorium dengan formulasi sediaan gel dalam lima variasi kombinasi konsentrasi ekstrak buah belimbing wuluh dan air perasan jeruk nipis yang sama yaitu 12%, 9%, 6%, 3%, dan 0%. Hasil penelitian menunjukkan bahwa sediaan gel kombinasi ekstrak buah belimbing wuluh (*Averrhoa bilimbi* L) dan air perasan jeruk nipis (*Citrus aurantifolia* S.) memiliki potensi aktivitas antibakteri pada formula 1 dengan konsentrasi ekstrak buah belimbing wuluh 12% menghasilkan zona hambat paling besar yaitu 11,25 mm yang hampir setara dengan kontrol positif. Penelitian terhadap ekstrak buah belimbing wuluh dan air perasan jeruk nipis yang memiliki aktivitas antibakteri dapat dimanfaatkan secara baik untuk memenuhi kebutuhan sehari-hari.

Kata Kunci: Bakteri, belimbing wuluh, gel, jeruk nipis.

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ABSTRACT

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The use of antibiotics such as tetracycline, erythromycin, and clindamycin has resulted in antibiotic resistance and skin irritation. Therefore, a safer alternative treatment using natural ingredients such as bilimbi fruit (*Averrhoa bilimbi* L.) and lime juice (*Citrus aurantifolia* S.) is needed. These ingredients contain flavonoids, alkaloids, tannins, and saponins, which act as antibacterial agents. This study aimed to evaluate the physical characteristics of the gel formulation combining bilimbi fruit extract and lime juice, as well as to test its antibacterial activity against *Staphylococcus aureus*. This research used an experimental laboratory method with gel formulations in five variations of equal concentration combinations of bilimbi fruit extract and lime juice, namely 12%, 9%, 6%, 3%, and 0%. The results showed that the gel formulation combining bilimbi fruit extract (*Averrhoa bilimbi* L.) and lime juice (*Citrus aurantifolia* S.) exhibited antibacterial potential, with Formula 1 containing 12% bilimbi fruit extract producing the largest inhibition zone of 11.25 mm, which was nearly equivalent to the positive control. The study on bilimbi fruit extract and lime juice, which possess antibacterial activity, can be effectively utilized for daily needs.

Keywords: *Bacteria, bilimbi wuluh, gel, lime.*

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VALIDITY SHEET

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It is hereby stated that the thesis with the title:

FORMULATION OF GEL COMBINING BILIMBI WULUH EXTRACT (*Averrhoa bilimbi* L) AND LIME JUICE (*Citrus aurantifolia* S.) ON THE INHIBITION OF *Staphylococcus aureus*

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I sincerely declare that the research contained in this thesis is my own work and does not belong to anyone else. This thesis has never been published before, except for some parts with original references.

If in the future it is found that this work is plagiarism, I am ready to be given administrative and academic sanctions.

Ponorogo, 26th February 2025

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Ponorogo, February 28 2025

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