

ANALISIS KOMPONEN MINYAK ATSIRI KULIT JERUK PURUT (*Citrus hystrix*) HASIL DESTILASI UAP DAN DESTILASI AIR SERTA UJI AKTIVITAS ANTIBAKTERINYA

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INTISARI

Minyak atsiri kulit jeruk purut (*Citrus hystrix*) diketahui memiliki aktivitas antibakteri terhadap berbagai bakteri patogen. Penelitian ini bertujuan untuk menganalisis komponen kimia dan membandingkan aktivitas antibakteri minyak atsiri kulit jeruk purut yang diperoleh melalui destilasi uap dan destilasi air. Minyak atsiri diisolasi dari kulit jeruk purut segar, kemudian dianalisis menggunakan kromatografi gas–spektrometri massa (GC-MS) dan diuji aktivitas antibakterinya terhadap *Escherichia coli* (*E. coli*) dan *Staphylococcus aureus* (*S. aureus*) menggunakan metode difusi cakram.

Hasil menunjukkan bahwa rendemen minyak atsiri hasil destilasi uap sebesar 0,16%, sedangkan destilasi air sebesar 1,05%. Analisis GC-MS mengidentifikasi empat komponen utama, yaitu β -pinene, limonena, terpineol, dan sitronelol. Uji aktivitas antibakteri menunjukkan bahwa minyak atsiri hasil destilasi uap memiliki daya hambat terhadap *E. coli* sebesar 4,9 mm, sedangkan destilasi air sebesar 0,8 mm. Kedua sampel tidak menunjukkan aktivitas terhadap *S. aureus*. Berdasarkan hasil tersebut, minyak atsiri kulit jeruk purut hasil destilasi air memberikan rendemen lebih tinggi dengan komponen utama yang serupa, serta berpotensi dikembangkan sebagai agen antibakteri alami.

Kata kunci: minyak atsiri, *Citrus hystrix*, GC-MS, antibakteri, destilasi.

CHEMICAL COMPONENT ANALYSIS OF KAFFIR LIME (*Citrus hystrix*) PEEL ESSENTIAL OIL PRODUCED BY STEAM AND WATER DISTILLATION AND ITS ANTIBACTERIAL ACTIVITY

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ABSTRACT

Kaffir lime (*Citrus hystrix*) peel essential oil is known to exhibit antibacterial properties against several pathogenic bacteria. This study aimed to analyze the chemical composition and compare the antibacterial activity of essential oils obtained by steam distillation and hydrodistillation methods. The essential oils were extracted from fresh kaffir lime peel, analyzed using gas chromatography–mass spectrometry (GC–MS), and evaluated for antibacterial activity against *Escherichia coli* (*E. coli*) and *Staphylococcus aureus* (*S. aureus*) using the disk diffusion method.

The results showed that the yield of essential oil obtained by steam distillation was 0.16%, while hydrodistillation produced 1.05%. GC–MS analysis identified four major components β -pinene, limonene, terpineol, and citronellol as dominant constituents. Antibacterial testing using the disc diffusion method showed inhibition zones of 4.9 mm against *E. coli* for steam-distilled oil and 0.8 mm for water-distilled oil, while no inhibition was observed against *S. aureus*. Overall, the hydrodistilled oil provided a higher yield with similar major components and demonstrated potential as a natural antibacterial agent.

Keywords: essential oil, *Citrus hystrix*, GC-MS, antibacterial, distillation.