PENGARUH UMUR PANEN TERHADAP RENDEMEN, KOMPOSISI, DAN AKTIVITAS ANTIBAKTERI MINYAK ATSIRI KEMANGI *(Ocimum basilicum L.)* TERHADAP *Staphylococcus aureus* DAN *Escherichia coli*

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INTISARI

Minyak atsiri yang berasal dari tanaman kemangi (*Ocimum basilicum* L.) memiliki potensi besar sebagai agen antibakteri alami, namun kualitas dan aktivitas biologisnya sangat dipengaruhi oleh fase pertumbuhan tanaman. Penelitian ini bertujuan untuk menentukan pengaruh variasi umur panen terhadap rendemen dan profil komposisi senyawa kimia minyak atsiri kemangi, serta mengevaluasi aktivitas antibakterinya terhadap bakteri *Staphylococcus aureus* dan *Escherichia coli*. Dalam penelitian ini, tanaman dipanen pada variasi umur minggu ke-10, 12, 14, 16, 18, dan 20 yang merepresentasikan fase vegetatif, fase generatif awal (berbunga), dan fase generatif akhir (pasca berbunga). Minyak atsiri diisolasi menggunakan metode distilasi air, kemudian profil kimianya dianalisis menggunakan instrumentasi *Gas Chromatography-Mass Spectrometry* (GC-MS), dan aktivitas antibakterinya diuji menggunakan metode difusi cakram dengan konsentrasi 10%.

Hasil penelitian menunjukkan bahwa rendemen minyak atsiri mengalami peningkatan seiring bertambahnya usia tanaman dengan perolehan tertinggi pada fase berbunga, yaitu minggu ke-14 (1,07%) dan minggu ke-16 (1,39%). Analisis GC-MS mengidentifikasi sitral (neral dan geranial) sebagai senyawa dominan pada fase optimum tersebut. Uji aktivitas antibakteri juga menunjukkan bahwa minyak dari fase berbunga memiliki daya hambat terkuat, di mana aktivitas terhadap bakteri Gram positif *S. aureus* tergolong kategori kuat (13,0 dan 15,8 mm), sedangkan pada Gram negatif *E. coli* (6,60 dan 7,90 mm) tergolong kategori sedang. Berdasarkan hasil tersebut, disimpulkan bahwa umur panen berpengaruh terhadap kualitas minyak, dengan fase berbunga (minggu ke-16) sebagai waktu panen paling optimal untuk memperoleh rendemen tertinggi, komposisi terbaik, dan aktivitas antibakteri yang maksimal.

Kata kunci: aktivitas antibakteri, kemangi, komposisi senyawa kimia, minyak atsiri, umur panen.

EFFECT OF HARVEST AGE VARIATIONS ON THE YIELD, COMPOSITION, AND ITS ANTIBACTERIAL ACTIVITY OF BASIL (Ocimum basilicum L.) ESSENTIAL OIL AGAINST Staphylococcus aureus AND Escherichia coli

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ABSTRACT

Essential oil derived from basil (*Ocimum basilicum* L.) has considerable potential as a natural antibacterial agent; however, its quality and biological activity are strongly influenced by the plant's growth stage. This study aimed to determine the effect of harvest age variation on the yield and chemical composition profile of basil essential oil, as well as to evaluate its antibacterial activity against *Staphylococcus aureus* and *Escherichia coli*. In this study, basil plants were harvested at 10, 12, 14, 16, 18, and 20 weeks, representing the vegetative, early generative (flowering), and late generative (post-bloom) stages. Essential oil was isolated using the water distillation, its chemical profile was analyzed by Gas Chromatography–Mass Spectrometry (GC–MS), and antibacterial activity was assessed using the disc diffusion method at a concentration of 10%.

The results showed that essential oil yield increased with plant age, reaching the highest values during the flowering stage, particularly at week 14 (1.07%) and week 16 (1.39%). GC–MS analysis identified citral (neral and geranial) as the dominant compounds at this optimal phase. Antibacterial assays demonstrated that essential oil obtained during the flowering stage exhibited the strongest inhibitory activity, categorized as strong (13.0 and 15.8 mm) against the Gram-positive bacterium *S. aureus* and medium (6.60 and 7.90 mm) against the Gram-negative bacterium *E. coli*. Based on these findings, it can be concluded that harvest age significantly affects essential oil quality, with the flowering stage (week 16) being the most optimal harvest time to obtain the highest yield, favorable chemical composition, and maximum antibacterial activity.

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Keywords: antibacterial activity, basil, chemical composition, essential oil, harvesting age.