KUALITAS DAN AKTIVITAS ANTIBAKTERI TIGA JENIS MINYAK ATSIRI EKALIPTUS TERHADAP BAKTERI *Escherichia coli*

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INTISARI

Ekaliptus merupakan salah satu tanaman penghasil minyak atsiri yang memiliki banyak manfaat. Salah satu potensi pemanfaatannya sebagai antibakteri alami. Penelitian ini bertujuan untuk mengetahui sifat fisiko-kimia dan komponen kimia, serta pengaruh konsentrasi dan jenis minyak atsiri *Eucalyptus urograndis, Eucalyptus camaldulensis, Eucalyptus citriodora* sebagai antibakteri terhadap bakteri *Escherichia coli.*

Minyak ekaliptus diekstrak dengan destilasi kukus selama 6 jam. Minyak ekaliptus diuji sifat fisiko-kimia berdasarkan SNI 3954-2014 dan dianalisis dengan *one way ANOVA.* Uji komposisi kimia menggunakan alat GC-MS (*Gas Chromatography-Mass Spectrometry*) yang dianalisis secara deskriptif. Aktivitas antibakteri minyak ekaliptus diuji dengan metode Kirby-Bauer yang dianalisis dengan *two way ANOVA.*

Hasil penelitian menunjukkan bahwa rendemen minyak *Eucalyptus urograndis, Eucalyptus camaldulensis,* dan *Eucalyptus citriodora* masing–masing 0,26%, 0,51%, dan 0,59%. Hasil pengujian kualitas minyak *Eucalyptus urograndis, Eucalyptus camaldulensis, Eucalyptus citriodora* masing–masing memiliki warna jernih kekuningan dan bau khas ekaliptus, bobot jenis 0,905 ; 0,919 ; 0,900, putaran optis $-0,8^0$; $-1,2^0$; $-0,63^0$, indeks bias 1,463 ; 1,474 ; 1,458, dan kelarutan alkohol 1:1 keruh. Minyak *Eucalyptus urograndis* dan *Eucalyptus camaldulensis* mengandung 12 dan 26 senyawa kimia dengan senyawa utama serupa yaitu *Eucalyptol, D-limonene, α-pinene.* Minyak *Eucalyptus citriodora* mengandung 22 senyawa kimia dengan senyawa utama *Citronellal, Isopulegol, Dihydrocarveol.* Minyak *Eucalyptus urograndis* dan *Eucalyptus camaldulensis* memiliki aktivitas antibakteri terhadap *Escherichia coli* pada konsentrasi 25%,50%, 75% dengan konsentrasi minyak 75% memberikan efektivitas terbesar yaitu 74,61% dan 82,16%, sedangkan minyak *Eucalyptus citriodora* tidak memiliki aktivitas antibakteri terhadap *Escherichia coli.*

Kata Kunci : minyak atsiri ekaliptus, sifat fisiko-kimia, komponen kimia, antibakteri

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QUALITY AND ANTIBACTERIAL ACTIVITY OF THREE SPECIES OF EUCALYPTUS ESSENTIAL OILS AGAINST *Escherichia coli* BACTERIA

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ABSTRACT

Eucalyptus is one of the essential oil-producing plants that have many benefits. One of its potential benefit is as a natural antibacterial. This study aims to determine physico-chemical properties, chemical components, as well as the interaction between essential oils concentration and eucalypt species such as *Eucalyptus urograndis*, *Eucalyptus camaldulensis*, *Eucalyptus citriodora* as antibacterial against *Escherichia coli*.

Eucalyptus oil was extracted by water steam distillation method for 6 hours. Eucalyptus oil was tested for physico-chemical properties based on SNI 3954-2014 and analyzed by one way ANOVA. Chemical composition test conducted with GC-MS (Gas Chromatography-Mass Spectrometry) which was analyzed descriptively. Antibacterial activity of eucalyptus oil tested by Kirby-Bauer method which was analyzed by two way ANOVA.

The results showed that oil yield of *Eucalyptus urograndis*, *Eucalyptus camaldulensis*, and *Eucalyptus citriodora* respectively are 0.26%, 0.51%, and 0.59%. Physico-chemical properties of *Eucalyptus urograndis*, *Eucalyptus camaldulensis*, *Eucalyptus citriodora* oils respectively are clear to yellow colored, had distinctive eucalyptus odor, specific gravity of 0.905; 0.919 ; 0.900, optical rotation of -0.80 ; -1.20 ; -0.630, refractive index of 1.463 ; 1.474 ; 1.458, and miscibility in 80% ethanol with ratio 1:1 is turbid. *Eucalyptus urograndis* and *Eucalyptus camaldulensis* oils contains 12 and 26 chemical compounds with similar major compounds namely *Eucalyptol, D-limonene, α-pinene*. *Eucalyptus citriodora* oil contains 22 chemical compounds with major compounds such as *Citronellal, Isopulegol, Dihydrocarveol*. *Eucalyptus urograndis* and *Eucalyptus camaldulensis* oils have antibacterial activity against *Escherichia coli* at 25%, 50%, 75% oil concentration with 75% concentration gave the greatest effectiveness, were 74.61% and 82.16% while *Eucalyptus citriodora* oil was not have antibacterial activity against *Escherichia coli*.

Key Words : eucalyptus essential oil, physico-chemical characteristic, chemical composition, antibacterial

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