

## INTISARI

Minyak atsiri memiliki kandungan senyawa organik aktif yang disebut terpena/terpenoid yang menyebabkan minyak atsiri memiliki aroma dan bau khas. Aroma yang kuat tersebut menyebabkan minyak atsiri banyak digunakan sebagai bahan baku untuk industri parfum, bahan pewangi (*frangrances*), aroma makanan (*flavor*), farmasi, dan kecantikan kosmetika. Disamping itu, minyak asiri memiliki berbagai kemampuan seperti antiinflamasi, antiseptik/antibakteri, antioksidan, perangsang selera makan, karminatif, deodoran, ekspektoran, insektisida, dan sebagainya. Kegunaan dan fungsi dari setiap minyak atsiri berbeda beda sehingga hal ini mendorong dikombinasikannya beberapa minyak atsiri (*blended essential oils*) untuk menghasilkan komposisi dan fungsi tertentu, salah satunya sebagai produk farmaka minyak oles dengan manfaat antibakteri dan antioksidan. Penelitian ini bertujuan untuk mengetahui dan membandingkan karakteristik, kandungan senyawa, kemampuan antibakteri, dan kemampuan antioksidan minyak kayu putih, minyak kenanga, minyak nilam, dan *blended essential oil* (4:5:1) dari ketiga komoditas tersebut.

Pada penelitian ini, minyak atsiri didapatkan melalui proses destilasi uap air kemudian dilakukan pencampuran sesuai dengan teori *blending by notes* dengan komposisi minyak kayu putih, kenanga, dan nilam (4:5:1). Kemudian minyak dibandingkan karakteristiknya dengan standar SNI berdasarkan parameter indeks bias, bobot jenis, dan warna. Uji kandungan senyawa dalam minyak atsiri kayu putih, kenanga, nilam dan minyak campuran diukur menggunakan alat *GC-MS* (*Gas chromatography-mass spectrometry*). Pengujian antibakteri dengan *Well Diffusion Method* atau Metode Difusi Sumuran dan pembuatan media uji dengan metode *spread plate* menggunakan MHA (Medium Hilton Agar). Penentuan aktivitas antioksidan dengan metode DPPH (*1,1-diphenyl-2-picrylhydrazyl*) dengan 3 variasi konsentrasi : 1000ppm, 500ppm, dan 100ppm.

Hasil penelitian menunjukkan karakteristik ketiga minyak atsiri yang sesuai dengan SNI. Kandungan senyawa kimia utama pada minyak kayu putih tersusun oleh 1,8 *Cineol* sebanyak 66,64%, minyak kenanga tersusun oleh *trans-Caryophyllene* sebanyak 28,96% dan minyak nilam tersusun oleh senyawa utama *Patchouli alcohol* sebanyak 54,3%. Kandungan senyawa kimia utama dari minyak campuran (*blended essential oils*) diantaranya yaitu *trans-Caryophyllen* (32,53%), 17,5% *cineol* 8,42%, *alpha Humulene* 1,4,8-*Cycloundecatriene* 6,68%, *Farnesene* 1,3,6,10-*Dodecatetraene* 6,02%, *Germacrene D* 1,6-*Cyclodecadiene* 4,4%, dan *Patchouli alcohol* sebanyak 4,17%. Minyak kayu putih, minyak kenanga, minyak nilam dan *blended essential oils* memiliki aktivitas antibakteri yang berbeda signifikan terhadap *Staphylococcus aureus* dan *Escherichia coli* namun memiliki efek antagonisme. Pada uji aktivitas antioksidan *blended essential oils* memiliki aktivitas sinergisme dengan nilai  $IC_{50}$  minyak kayu putih adalah sebesar 593.4 ppm, minyak kenanga sebesar 14766.82 ppm, minyak nilam sebesar 31,83 ppm, dan *blended essential oils* sebesar 144,51 ppm.

**Katakunci** : Antibakteri, Antioksidan, *Blended Essential Oils*, Minyak Atsiri

## ABSTRACT

Essential oils contain active organic compounds called terpenes/terpenoids which cause essential oils to have a distinctive aroma and smell. This strong aroma causes essential oils to be widely used as raw materials for the perfume industry, fragrances, food flavors, pharmaceuticals, and cosmetic beauty. In addition, essential oils have various abilities such as anti-inflammatory, antiseptic/antibacterial, antioxidant, appetite stimulant, carminative, deodorant, expectorant, insecticide, etc. The uses and functions of each essential oil are different so this encourages the combination of several essential oils (blended essential oils) to produce certain compositions and functions, one of which is as a pharmaceutical product of topical oil with antibacterial and antioxidant benefits. This study aims to find out and compare the characteristics, compound content, antibacterial ability, and antioxidant ability of cajuput oil, ylang-ylang oil, patchouli oil, and blended essential oil (4:5:1) of these three commodities.

In this study, essential oils were obtained through a steam distillation process and then mixed according to the blending by notes theory with the composition of cajuput, ylang-ylang, and patchouli oils (4:5:1). Then the oil is compared with the SNI standard-based on the parameters of refractive index, density, and color. The test of compound content in eucalyptus essential oils, cananga (ylang-ylang) oil, patchouli oil, and blended essential oils was measured using the GC-MS (Gas chromatography-mass spectrometry) tool. Antibacterial testing with the Well Diffusion Method or Well Diffusion Method and the manufacture of test media by the spread plate method using MHA (Medium Hilton Agar). Determination of antioxidant activity by DPPH method (1,1-diphenyl-2-picrylhydrazyl) with 3 concentration variations: 1000ppm, 500ppm, and 100ppm.

The results of the study show the characteristics of the three essential oils that are following SNI. The main chemical compound content in cajuput oil is composed of 1.8 Cineol as much as 66.64%, ylang ylang oil is composed of trans-caryophyllene as much as 28.96%, and patchouli oil is composed of the main compound Patchouli alcohol as much as 54.3%. The main chemical compound content of blended essential oils includes trans-Caryophyllene (32.53%), 17.5% cineol 8.42%, alpha Humulene 1,4,8-Cycloundecatriene 6.68%, Farnesene 1,3,6,10-Dodecatetraene 6.02%, Germacrene D 1,6-Cyclodecadiene 4.4%, and Patchouli alcohol as much as 4.17%. Cajuput oil, ylang-ylang oil, patchouli oil, and blended essential oils have significantly different antibacterial activity against *Staphylococcus aureus* and *Escherichia coli* but have antagonistic effects. In the antioxidant activity test, blended essential oils had synergism activity with an IC<sub>50</sub> value of cajuput oil of 593.4 ppm, ylang ylang oil of 14766.82 ppm, patchouli oil of 31.83 ppm, and blended essential oils of 144.51 ppm.

**Keywords :** Antibacterial, Antioxidant, Blended Essential Oils, Essential Oil