

ABSTRAK

Tanaman kayu putih (*Melaleuca leucadendra* L.) merupakan salah satu jenis tanaman penghasil minyak atsiri yang dapat dimanfaatkan sebagai antibakteri dengan senyawa utamanya yaitu senyawa 1,8-sineol. Penelitian ini bertujuan untuk menguji aktivitas antibakteri minyak atsiri kayu putih terhadap *Bacillus subtilis* menggunakan metode difusi sumuran dengan konsentrasi sampel 2,5%, 5%, 7,5%, 10%, 12,5%, 15%. Kemudian, minyak atsiri kayu putih diformulasikan ke dalam gel *hand sanitizer* dengan optimasi *hydroxypropyl methylcellulose* dan gliserin menggunakan metode desain faktorial yang dianalisis dengan *Design Expert Version 13.0.5.0X64*. Parameter sifat fisik meliputi organoleptis, homogenitas, pH, daya sebar dan viskositas. Stabilitas fisik dilakukan dengan metode *freeze and thaw*.

Hasil aktivitas antibakteri sedang ditunjukkan oleh konsentrasi 12,5-15% dan digunakan konsentrasi 12,5% untuk semua formula gel. *Hydroxypropyl methylcellulose* memberikan efek dominan terhadap peningkatan viskositas dengan kontribusi 99,799%, *hydroxypropyl methylcellulose* dan gliserin berkontribusi terhadap daya sebar sebesar 96,004% dan 2,634%. Hasil komposisi optimum adalah formula A dengan 3 gram *hydroxypropyl methylcellulose* dan 13,5gram gliserin dan formula AB dengan 3 gram *hydroxypropyl methylcellulose* dan 16,5 gram gliserin.

Kata Kunci : minyak atsiri kayu putih, gel *hand sanitizer*, *hydroxypropyl methylcellulose*, gliserin, desain faktorial

ABSTRACT

Eucalyptus (*Melaleuca leucadendra* L.) is a type of essential oil-producing plant that can be used as an antibacterial with the main compound being 1,8-cineol. This study aimed to test the antibacterial activity of eucalyptus essential oil against *Bacillus subtilis* using the well diffusion method with sample concentrations of 2.5%, 5%, 7.5%, 10%, 12.5%, 15%. Then, eucalyptus essential oil was formulated into a hand sanitizer gel with optimization of hydroxypropyl methylcellulose and glycerin using a factorial design method which was analyzed by *Design Expert Version 13.0.5.0X64*. Parameters of physical properties included organoleptic, homogeneity, pH, dispersion and viscosity. Physical stability was carried out using the freeze and thaw method.

The results of moderate antibacterial activity with a concentration of 12.5-15% and a concentration of 12.5% were used for all gel formulas. Hydroxypropyl methylcellulose gave a dominant effect on increasing viscosity with a contribution of 99.799%, hydroxypropyl methylcellulose and glycerin contributed to the spreadability of 96.004% and 2.634%, respectively. The optimum composition results were formula A with 3 grams of hydroxypropyl methylcellulose and 13.5 grams of glycerin and formula AB with 3 grams of hydroxypropyl methylcellulose and 16.5 grams of glycerin.

Keywords: eucalyptus essential oil, hand sanitizer gel, hydroxypropyl methylcellulose, glycerin, factorial design