

ABSTRAK

Kapulaga merupakan salah satu tanaman rempah di Indonesia yang menghasilkan minyak atsiri dengan nilai ekonomi tinggi. Minyak atsiri yang terkandung dalam biji kapulaga dapat diekstrak dengan metode *Ultrasonic Assisted Extraction – Hydrodistillation* (UAE – HD). Minyak atsiri biji kapulaga diketahui memiliki aktivitas antibakteri sehingga dapat dikembangkan untuk formulasi sediaan topikal agar lebih mudah untuk diaplikasikan. Nanokrim merupakan bentuk sediaan yang terbuat dari fase minyak dan fase air dengan tambahan surfaktan sebagai emulgator. Penelitian ini bertujuan untuk memberikan informasi mengenai potensi antibakteri minyak atsiri biji kapulaga sebelum dan sesudah menjadi sediaan nanokrim serta pengaruh variasi *Hydrophile-Lipophile Balance / HLB* (10, 11, dan 12) dan konsentrasi minyak (2,5%; 5%; 7%; 10%; dan 15%) terhadap karakteristik nanokrim. Hasil analisa *Gas Chromatography–Mass Spectrometry* (GC-MS) minyak atsiri biji kapulaga menunjukkan kadar 1,8-cineol sebesar 73,67%. Nanokrim dibuat dengan variasi HLB 10 (F1), HLB 11 (F2) dan HLB 12 (F3) serta variasi konsentrasi minyak atsiri biji kapulaga (2,5%; 5%; 7%; 10%; dan 15%). Formula tersebut terdiri dari F1(2,5%), F2(2,5%), F3(2,5%), F1(5%), F2(5%), F3(5%), F1(7%), F2(7%), F3(7%), F1(10%), F2(10%), F3(10%), F1(15%), F2(15%), F3(15%). Hasil uji antibakteri minyak atsiri biji kapulaga dan nanokrim menunjukkan diameter zona hambat yaitu 6,03 – 10,26 mm terhadap bakteri *E. coli* sedangkan terhadap *S. aureus* yaitu 11,13 – 15,23 mm dan 6,43 – 11,47 mm. Hasil analisa ukuran partikel dan zeta potensial nanokrim yaitu 114,3 – 341,53 nm dan 73,43 – 94,70 mV. Hasil uji organoleptik nanokrim memiliki bau khas yang semakin kuat seiring meningkatnya konsentrasi minyak atsiri biji kapulaga yang ditambahkan. Tingkat kekentalan nanokrim meningkat seiring menurunnya konsentrasi minyak atsiri biji kapulaga yang ditambahkan. Hasil uji pH menunjukkan rentang 4,30 – 6,45. Hasil pengukuran daya sebar yaitu rentang 5,1 – 6,9 cm. Viskositas nanokrim yaitu rentang 5210 – 6910 cP.

Kata kunci: antibakteri, HLB, kapulaga, nanokrim.

ABSTRACT

Cardamom is one of the spice plants in Indonesia that produces essential oils. The essential oil contained in cardamom seeds can be extracted using the *Ultrasonic Assisted Extraction – Hydrodistillation* (UAE – HD) method. Cardamom seed essential oil is known to have antibacterial activity so that it can be developed for topical formulations to make it easier to apply. Nanocream is a dosage form made from an oil phase and a water phase with the addition of a surfactant as an emulsifier. This study aims to provide information about the antibacterial potential of cardamom seed essential oil before and after becoming a nanocream preparation and the effect of variations in *Hydrophile-Lipophile Balance* / HLB (10, 11, and 12) and oil concentration (2.5%; 5%; 7%; 10%; and 15%) on the characteristics of the nanocream. The results of the *Gas Chromatography–Mass Spectrometry* (GC- MS) analysis of cardamom seed essential oil showed 1,8-cineol levels of 73.67%. The nanocream formula was made with variations of HLB 10 (F1), HLB 11 (F2) and HLB 12 (F3) as well as variations in the concentration of cardamom seed essential oil (2.5%; 5%; 7%; 10%; and 15%). The formula consists of F1(2.5%), F2(2.5%), F3(2.5%), F1(5%), F2(5%), F3(5%), F1(7%), F2(7%), F3(7%), F1(10%), F2(10%), F3(10%), F1(15%), F2(15%), F3(15%). The results of the antibacterial test of cardamom seed essential oil and nanocream showed that the diameter of the inhibition zone was 6.03 – 10.26 mm against *E. coli bacteria* while against *S. aureus* that was 11.13 – 15.23 mm and 6.43 – 11.47 mm. The results of PSA analysis of particle size and zeta potential of nanocream were 114.3 – 341.53 nm and 73.43 – 94.70 mV. The results of the organoleptic test of the nanocream had a distinctive odor that got stronger as the concentration of cardamom seed essential oil was added. The viscosity of the nanocream increased as the concentration of cardamom seed essential oil decreased. The pH test results showed a range of 4.30 – 6.45. The results of the spread power measurement are in the range of 5.1 – 6.9 cm. The viscosity of the nano cream is in the range of 5210 – 6910 cP.

Keywords: antibacterial, cardamom, HLB, nanocream