

INTISARI

Luka akut pada gingiva berpotensi untuk terinfeksi *Streptococcus sanguinis* dan meningkatkan risiko endokarditis. Agen antimikroba seperti disinfektan, antiseptik, dan antibiotik digunakan untuk mencegah infeksi bakteri namun berpotensi menyebabkan efek samping dan resistensi. Pandan wangi, cengkeh, dan kitosan dikombinasikan sebagai nanospray untuk meningkatkan kemampuan mekanisme antibakterinya. Tujuan dari penelitian ini adalah untuk mengetahui potensi antibakteri nanospray kombinasi ekstrak daun pandan wangi, minyak atsiri bunga cengkeh dan kitosan dilihat dari jumlah koloni *Streptococcus sanguinis*.

Dua puluh tujuh subjek penelitian dibagi menjadi tiga kelompok perlakuan yaitu nanospray, Aloclair spray sebagai kontrol positif, dan akuades sebagai kontrol negatif. Uji antibakteri dilakukan dengan mengukur penurunan jumlah koloni bakteri *Streptococcus sanguinis* setelah diberi perlakuan. Data penelitian dianalisis dengan *Welch's One-way ANOVA* pada tingkat signifikansi 95%. Uji *Gas Chromatography-Mass Spectrometry* dilakukan untuk mengidentifikasi adanya senyawa aktif *phytol* dan *eugenol*. Uji fitokimia dilakukan untuk mengidentifikasi adanya senyawa aktif flavonoid, saponin, dan tanin. Uji kualitas dilakukan untuk menguji kualitas sediaan nanospray.

Hasil uji antibakteri menunjukkan nanospray menurunkan jumlah koloni *Streptococcus sanguinis* sebesar $88,98 \pm 4,48\%$ sehingga tergolong sebagai bakteristatik. Hasil *Welch's One-way ANOVA* membuktikan hipotesis diterima ($p < 0,05$). Uji *Gas Chromatography-Mass Spectrometry* membuktikan keberadaan *phytol* dan *eugenol*. Uji fitokimia membuktikan keberadaan flavonoid, saponin, dan tanin. Uji kualitas sediaan menunjukkan nanospray memenuhi standar ukuran partikel nano, kekentalan, dan bobot jenis nanoemulsi. Kesimpulan dari penelitian ini adalah nanospray kombinasi ekstrak daun pandan wangi, minyak atsiri bunga cengkeh dan kitosan berpotensi sebagai bakteristatik terhadap *Streptococcus sanguinis*.

Kata Kunci : nanospray, pandan wangi, cengkeh, kitosan, antibakteri, *Streptococcus sanguinis*

ABSTRACT

Acute wounds on the gingiva can potentially become infected by *Streptococcus sanguinis* and increase the risk of endocarditis. Antimicrobial agents such as disinfectants, antiseptics, and antibiotics are used to prevent bacterial infections but can potentially cause side effects and resistance. Pandan wangi leaves, cloves, and chitosan are combined as nanospray to increase the ability of its antibacterial mechanism. The objective of this research is to assess the antibacterial potential of a nanospray combination of fragrant pandan leaf extract, clove flower essential oil, and chitosan judging from the number of *Streptococcus sanguinis* colonies.

Twenty seven research subjects were divided into three treatment groups: nanospray, Alocclair spray as a positive control, and aquadest as a negative control. The antibacterial test was carried out by measuring the decrease in the number of *Streptococcus sanguinis* bacterial colonies after treatment. The data was analyzed using Welch's One-way ANOVA at 95% significance. The Gas Chromatography-Mass Spectrometry test was carried out to identify the presence of active compounds of phytols and eugenols. The phytochemical test was carried out to identify the presence of active compounds of flavonoids, saponins, and tannins. The quality test was carried out to test the quality of nanospray.

The results of the antibacterial test showed that nanospray reduced the number of *Streptococcus sanguinis* colonies by $88,98 \pm 4,48\%$ which was classified as bacteriostatic. The result of Welch's One-way ANOVA proved that the hypothesis is accepted ($p < 0.05$). The Gas Chromatography-Mass Spectrometry test proved the presence of phytols and eugenols. The phytochemical test proved the presence of flavonoids, saponins, and tannins. The quality test showed that nanospray meets the standards for nanoparticle size, viscosity, and specific gravity of nanoemulsion. The conclusion of this research is a nanospray combination of fragrant pandan leaf extract, clove flower essential oil, and chitosan has the potential as a bacteriostatic to *Streptococcus sanguinis* colonies.

Kata Kunci : nanospray, pandan wangi leaf, cloves, chitosan, antibacterial, *Streptococcus sanguinis*