INTISARI

Dental unit dapat terkontaminasi akan bakteri *Staphylococcus aureus* dan berpotensi menginfeksi pasien. Klorheksidin 0,2% sebagai antibakteri mampu menangani kontaminasi, tetapi memiliki dampak jangka panjang berupa pewarnaan jaringan mulut. Asam asetat hasil fermentasi kedondong bersama dengan kitosan dan minyak atsiri jahe merah berpotensi untuk dikombinasikan menjadi nanoemulsi berefek antibakteri pencegah infeksi rongga mulut pasien. Penelitian ini bertujuan untuk mengetahui pengaruh nanoemulsi asam asetat kedondong, kitosan, dan minyak atsiri jahe merah terhadap diameter zona hambat pertumbuhan *Staphylococcus aureus*.

Penelitian dilakukan dengan desain eksperimental laboratoris yang diawali dengan determinasi dan fermentasi kedondong. Pembuatan nanoemulsi dilakukan dengan mencampurkan asam asetat kedondong 1%, kitosan 1,5%, minyak atsiri jahe merah 0,5%, dan tween 80 2% serta akuades. Pencampuran diikuti dengan sonikasi agar terbentuk nanoemulsi. Kualitas nanoemulsi diuji dengan parameter ukuran partikel, potensial zeta, pH, dan organoleptik akan bau, warna, serta kejernihan. Pengujian diameter zona hambat *Staphylococcus aureus* dilakukan dengan membandingkan nanoemulsi, kontrol negatif larutan kitosan, dan kontrol positif klorheksidin 0,2% yang diulang sebanyak 5 kali.

One-way ANOVA dilakukan sebagai uji hipotesis dan ditemukan hasil $p<0,05$ yang berarti bahwa hipotesis penelitian diterima. *Post-hoc* LSD dilakukan untuk melihat signifikansi perbedaan mean diameter zona hambat antar kelompok perlakuan. Perbedaan signifikan atau $p<0,05$ ditemukan antara kelompok kontrol negatif, nanoemulsi, dan kontrol positif. Penelitian berkesimpulan bahwa nanoemulsi asam asetat kedondong, kitosan, dan minyak atsiri jahe merah berpengaruh secara signifikan terhadap diameter zona hambat pertumbuhan *Staphylococcus aureus*.

Kata kunci: Kedondong, Asam Asetat, Kitosan, Jahe Merah, *Staphylococcus aureus*, Nanoemulsi.

ABSTRACT

Dental unit can be contaminated by *Staphylococcus aureus*, which could potentially infect patient. 0,2% Chlorhexidine can be used to eliminate contamination, but long-term effect of tissue discoloration has been documented. Acetic acid produced by ambarella fermentation, chitosan, and red ginger essential oil has potential to form nanoemulsion with antibacterial properties for patient oral infection prevention. This research was conducted to determine the effect of ambarella acetic acid, chitosan, and red ginger essential oil nanoemulsion on the inhibition zone diameter of *Staphylococcus aureus* growth.

This research was designed to be a laboratory experimental study that stars with determination and fermentation of ambarella. Nanoemulsion was prepared by mixing 1% ambarella acetic acid, 1,5% chitosan, 0,5% red gingger essential oil, 2% tween 80, and aquadest. Mixture is sonicated to form nanoemulsion. Nanoemulsion went through assesment based on particle size, zeta potential, pH, and organoleptic of aroma, color, and clarity. Inhibition zone diameter against *Staphylococcus aureus* was tested by comparing nanoemulsion with chitosan solution as negative control and 0,2% chlorhexidine as positive control with 5 repetitions.

One-way ANOVA was conducted as a hypothesis test, result of $p<0,05$ was obtained, indicating the research hypothesis was accepted. Post-hoc LSD test was used to asses significant amount of mean difference of inhibiton zone diameter between treatment groups. Significant difference was revealed between negative control, nanoemulsion, and positive control. It was concluded that ambarella acetic acid, chitosan, and red ginger essential oil nanoemulsion significantly influenced *Staphylococcus aureus* inhibition zone diameter.

Keywords: Ambarella, Acetic Acid, Chitosan, Red Ginger, *Staphylococcus aureus*, Nanoemulsion.