

INTISARI

Staphylococcus aureus merupakan salah satu mikroorganisme rongga mulut yang sering menyebabkan infeksi oportunistik pada rongga mulut, seperti penyakit periodontal. Kulit buah nangka diketahui mengandung senyawa bioaktif flavonoid, saponin, dan tanin yang bersifat antibakteri. *Nanostructured lipid carrier* (NLC) merupakan inovasi berupa sistem penghantaran berbasis lipida yang dapat melindungi serta mentransfer senyawa bioaktif sehingga dapat meningkatkan kemampuan stabilitas dan bioavailabilitas. Penelitian ini bertujuan untuk mengetahui pengaruh formula *quercetin nanostructured lipid carrier* (ekstrak kulit buah nangka (*Artocarpus heterophyllus*) terhadap daya hambat pertumbuhan bakteri *Staphylococcus aureus*.

Metode yang digunakan dalam penelitian ini yaitu difusi cakram pada media *Mueller Hinton Agar*. Kelompok uji pada penelitian ini yaitu DMSO 5% (kontrol negatif), ekstrak kulit buah nangka 30%, QT-NLC ekstrak kulit buah nangka (perlakuan), dan klorheksidin glukonat 0,2% (kontrol positif). Pengujian yang dilakukan yaitu uji *quercetin* ekstrak, uji kualitas dan karakterisasi sediaan, dan uji *in vitro* untuk mengetahui diameter zona hambat bakteri *Staphylococcus aureus*. Data penelitian dianalisis menggunakan metode ANOVA *Welch test* dan dilanjutkan dengan Uji *Post Hoc Games-Howell* dengan tingkat signifikansi 95%.

Rerata diameter zona hambat tertinggi pada kontrol positif (21,84 mm), diikuti ekstrak (8,40 mm), dan perlakuan QT-NLC (7,65 mm), tidak terbentuk zona hambat pada kontrol negatif. Uji statistik ANOVA *Welch* menunjukkan terdapat perbedaan signifikan ($p < 0,05$) pada semua kelompok perlakuan. Uji *Post Hoc Games-Howell* menunjukkan ada perbedaan signifikan antara kelompok QT-NLC dan kontrol negatif. Dapat disimpulkan bahwa formula *quercetin nanostructured lipid carrier* ekstrak kulit buah nangka memiliki pengaruh terhadap diameter zona hambat pertumbuhan bakteri *Staphylococcus aureus*.

Kata Kunci: *Artocarpus heterophyllus*, *Quercetin*, *Nanostructured lipid carrier*, *Staphylococcus aureus* ATCC 25923, Antibakteri.

ABSTRACT

Staphylococcus aureus is recognized as one of the oral cavity microorganisms frequently causing opportunistic infections such as periodontal disease. Bioactive compounds with antibacterial properties such as flavonoids, saponins, and tannins, have been identified in the jackfruit peel. An innovation called nanostructured lipid carrier (NLC) has been developed as a lipid-based delivery system designed to protect and transfer bioactive compounds, thereby enhancing stability and bioavailability. This study aims to determine the effect of the quercetin nanostructured lipid carrier formula derived from jackfruit peel extract (*Artocarpus heterophyllus*) on the *Staphylococcus aureus* bacterial growth inhibition zone.

The method used in this study was disc diffusion method on Mueller Hinton Agar media. The test groups in this study were 5% DMSO (negative control), 30% jackfruit peel extract, QT-NLC jackfruit peel extract (treatment), and 0.2% chlorhexidine gluconate (positive control). Determination of quercetin content in the extract, formulation quality and characterization tests, and in vitro tests to determine the inhibition zone diameter of *Staphylococcus aureus* were conducted.

Data were analyzed using ANOVA Welch test followed by Post Hoc Games-Howell test with a 95% confidence level. The highest average inhibition zone diameter was recorded in the positive control (21.84 mm), followed by the extract (8.40 mm), and the QT-NLC treatment (7.65 mm), whereas no inhibition zone was formed in the negative control. ANOVA Welch statistical test showed a significant difference ($p < 0.05$) in all treatment groups. The Games-Howell Post Hoc test showed a significant difference between the QT-NLC group and the negative control. From the results, it can be concluded that the quercetin nanostructured lipid carrier formula from jackfruit peel extract caused an effect on the diameter of the inhibition zone for the growth of *Staphylococcus aureus* bacteria.

Keywords: *Artocarpus heterophyllus*, Quercetin, Nanostructured lipid carrier, *Staphylococcus aureus* ATCC 25923, Antibacterial