INTISARI

Karies dan penyakit periodontal bermula dari biofilm yang diinisiasi oleh bakteri pionir salah satunya bakteri *S. sanguinis*. *Eco-enzyme* kulit jeruk Pacitan (*Citrus x aurantium* L.) dan serai (*Cymbopogon citratus*) mengandung flavonoid, alkaloid, tanin, minyak atsiri, senyawa fenolik, dan saponin yang mampu mengganggu proses *quorum sensing* dan merusak matriks biofilm. Penelitian ini bertujuan untuk mengetahui pengaruh *eco-enzyme* kulit jeruk Pacitan dan serai terhadap destruksi biofilm bakteri *S. sanguinis* ATCC 10556 *in vitro*

Biofilm bakteri *S. sanguinis* dibuat dengan cara mencampurkan 40 µl media BHI dengan 10 µl suspensi bakteri konsentrasi 1,5 x 10^8 CFU/mL ke dalam *microplate* 96 *well*, kemudian diinkubasi selama 24 jam pada suhu 37°C. Biofilm yang terbentuk dipapar dengan 50 µl *eco-enzyme* dengan konsentrasi 40%, 20%, dan 10%, 50 µl *chlorhexidine gluconate* 0,2% sebagai kontrol positif, serta 50 µl PBS sebagai kontrol negatif. *Microplate* kemudian diinkubasi kembali selama 24 jam pada suhu 37°C, selanjutnya diwarnai dengan kristal violet 0,1%. Pembacaan nilai *optical density* menggunakan spektrofotometer dengan λ = 450 nm. Selanjutnya data dianalisis dengan *One-Way* ANOVA dan *Post-Hoc* LSD.

Hasil uji *One-Way* ANOVA menunjukkan adanya perbedaan signifikan antar kelompok perlakuan ($p<0,05$). Hasil uji *Post-Hoc* LSD menunjukkan terdapat perbedaan signifikan antara *eco-enzyme* konsentrasi 40%, 20%, 10%, dan *chlorhexidine gluconate* 0,1% ($p<0,05$). Kesimpulan dari penelitian ini, *eco-enzyme* 40% memiliki kemampuan terbesar dibandingkan konsentrasi lainnya dalam mendestruksi biofilm bakteri *S. sanguinis*, namun masih dibawah kemampuan *chlorhexidine gluconate* 0,1%.

Kata kunci : *Eco-enzyme*, destruksi biofilm, *Streptococcus sanguinis*

ABSTRACT

Caries and periodontal disease caused by biofilms initiated by pioneer bacteria, such as *S. sanguinis*. Eco-enzyme of Pacitan orange peels (*Citrus x aurantium* L.) and lemongrass (*Cymbopogon citratus*) contains flavonoids, alkaloids, tannins, essential oils, phenolic compounds, and saponins that interfere with the quorum sensing process and damage the biofilm matrix. This study aimed to determine the effect of eco-enzyme of Pacitan orange peels and lemongrass on the destruction of *S. sanguinis* ATCC 10556 bacterial biofilm in vitro.

Streptococcus sanguinis bacterial biofilm was made by mixing 40 µl of BHI media with 10 µl of bacterial suspension with a concentration of 1.5 x 108 CFU/ mL into a 96-well microplate, then incubated for 24 hours at 37°C. The biofilm formed was exposed to 50 µl of eco-enzyme with concentrations of 40%, 20%, and 10%, 50 µl of 0.2% chlorhexidine gluconate as a positive control, and 50 µl of PBS as a negative control. The microplate was then incubated again for 24 hours at 37°C, then stained with 0.1% crystal violet. Optical density values were read using a spectrophotometer with $\lambda = 450$ nm. Furthermore, the data were analyzed using One-Way ANOVA and Post-Hoc LSD.

The results of the One-Way ANOVA test showed significant differences between treatment groups ($p<0.05$). The results of the Post-Hoc LSD test showed significant differences between eco-enzyme concentrations of 40%, 20%, 10%, and chlorhexidine gluconate 0.1% ($p<0.05$). The conclusion of this study, eco-enzyme 40% has the greatest ability compared to other concentrations in destroying *S. sanguinis* bacterial biofilms, but is still below the ability of chlorhexidine gluconate 0.1%.

Keywords : Biofilm destruction, *Streptococcus sanguinis*, eco-enzyme