

INTISARI

Streptococcus mutans merupakan bakteri yang dominan dalam etiologi karies dan berperan sebagai *primary colonizer* dalam perkembangan biofilm rongga mulut. *Lactobacillus acidophilus* ATCC 4356 mampu menghasilkan metabolit berupa bakteriosin, biosurfaktan, hidrogen peroksida, serta asam organik yang mampu menghambat pembentukan biofilm. Penelitian ini bertujuan untuk mengetahui pengaruh metabolit *L. acidophilus* ATCC 4356 terhadap penghambatan pembentukan biofilm *S. mutans* ATCC 25175.

Penelitian dilakukan pada empat kelompok uji, yaitu kontrol negatif (NaCl) serta variasi konsentrasi metabolit *L. acidophilus* ATCC 4356 12,5%, 25%, dan 50%. Uji penghambatan pembentukan biofilm *S. mutans* ATCC 25175 dilakukan menggunakan *96-well microtiter plate* dan diinkubasi selama 24 jam kemudian diberi pewarnaan *crystal violet* 0,1%. Pembacaan hasil uji penghambatan pembentukan biofilm menggunakan *microplate reader* ($\lambda=540$ nm). Data dianalisis dengan uji *One-way ANOVA* dan uji *post-hoc LSD*.

Uji *One-way ANOVA* menunjukkan hasil penghambatan pembentukan biofilm *S. mutans* memiliki perbedaan bermakna antarkelompok dengan $p<0,05$. Uji *post-hoc LSD* menunjukkan bahwa metabolit *L. acidophilus* ATCC 4356 konsentrasi 50% memiliki efektivitas tertinggi terhadap penghambatan pembentukan biofilm *S. mutans* ATCC 25175. Pada penelitian ini, dapat disimpulkan bahwa metabolit *L. acidophilus* ATCC 4356 konsentrasi 50% memiliki efektivitas tertinggi dalam menghambat pembentukan biofilm *S. mutans* ATCC 25175.

Kata kunci : *Streptococcus mutans*, *Lactobacillus acidophilus*, metabolit, penghambatan pembentukan biofilm

ABSTRACT

Streptococcus mutans plays a dominant role in caries progression and also acts as primary colonizer in biofilm formation. *Lactobacillus acidophilus* produces metabolites such as bacteriocin, biosurfactant, hydrogen peroxide, and organic acid which have antiadhesion and antibacterial properties that may inhibit biofilm formation. The purpose of this study was to determine the effect of *L. acidophilus* on the inhibition of *S. mutans* biofilm formation.

Biofilm formation inhibition test was carried out with 96 well-microtiter plate. *Streptococcus mutans* ATCC 25175 was incubated with various metabolite concentrations of *L. acidophilus* ATCC 4356 (12.5%, 25%, and 50%) as well as NaCl as a negative control. After the biofilm was incubated for 24 hours, the biofilm was stained with 0.1% crystal violet. The optical density was measured using a microplate reader ($\lambda=540\text{nm}$). The data was analyzed using One-way ANOVA test followed by post-hoc LSD test.

One-way ANOVA test showed significant differences in the inhibition of *S. mutans* biofilm formation among the groups ($p<0.05$). The result of post-hoc LSD test showed that the 50% metabolite of *L. acidophilus* ATCC 4356 had the highest effectiveness in inhibiting *S. mutans* biofilm formation. In conclusion, *L. acidophilus* ATCC 4356 metabolite inhibits *S. mutans* biofilm formation.

Keywords : *Streptococcus sanguinis*, *Lactobacillus acidophilus*, metabolite, biofilm inhibition test