

INTISARI

Streptococcus mutans memainkan peran penting terhadap terjadinya karies gigi. Bakteri *S. mutans* memiliki sifat hidrofobik yang berperan pada perlekatan bakteri ke permukaan gigi. Kitosan kulit udang galah (*Macrobrachium rosenbergii*) merupakan bahan alam yang berpotensi menurunkan hidrofobisitas karena dapat mengubah struktur komponen sel bakteri. Tujuan penelitian ini yaitu untuk mengetahui pengaruh kitosan ekstrak kulit udang galah terhadap hidrofobisitas bakteri *S. mutans*.

Uji hidrofobisitas dilakukan dengan metode pengukuran sudut kontak. Kelompok uji penelitian ini yaitu kitosan ekstrak kulit udang galah konsentrasi 0,5%, 0,25%, dan 0,125%. *Chlorhexidine gluconate* 0,1% sebagai kontrol positif dan *phosphate buffered saline* sebagai kontrol negatif. Suspensi bakteri dicampurkan dengan masing-masing kelompok uji dan kontrol ke dalam *microtube* kemudian diinkubasi pada suhu 37°C selama 20 jam. Pelet bakteri kemudian didepositkan ke *culture dish* yang berisi filter selulosa asetat dan diinkubasi selama 18 jam. Selanjutnya dilakukan *drop-file analysis* dan pengukuran sudut kontak menggunakan *software* Image-J. Analisis data menggunakan *One-Way ANOVA* dan dilanjutkan uji *Post-Hoc* LSD.

Hasil *One-Way ANOVA* menunjukkan terdapat pengaruh kitosan kulit udang galah dalam menurunkan hidrofobisitas *S. mutans*. Uji *Post-Hoc* LSD menunjukkan kitosan konsentrasi 0,5% memiliki kemampuan paling efektif dalam menurunkan hidrofobisitas *S. mutans* dibandingkan kitosan 0,25% dan 0,125%. Kesimpulan penelitian ini yaitu kitosan kulit udang galah mampu menurunkan hidrofobisitas *S. mutans* ATCC 25175 dan kitosan konsentrasi 0,5% mempunyai kemampuan paling efektif dalam menurunkan hidrofobisitas *S. mutans* ATCC 25175 meskipun efektivitasnya lebih rendah daripada *chlorhexidine gluconate* 0,1%.

Kata kunci: *Streptococcus mutans*, Kitosan kulit udang galah, Hidrofobisitas

ABSTRACT

Streptococcus mutans plays an important role in initiating caries formation. The bacteria have hydrophobic properties that facilitate their adhesion to tooth surfaces. Chitosan extracted from giant prawn shell (*Macrobrachium rosenbergii*) is a natural substance that may have the potential to reduce hydrophobicity by altering the structure of bacterial cell components. This study aimed to investigate the effect of chitosan from giant prawn shell on the hydrophobicity of *S. mutans*.

Hydrophobicity was tested using the contact angle measurement method. The test groups in this study were chitosan from giant prawn shells at concentrations of 0.5%, 0.25%, and 0.125%. *Chlorhexidine gluconate* 0.1% was used as a positive control and *phosphate-buffered saline* as a negative control. Bacterial suspensions were mixed with each test group and control in microtubes and incubated at 37°C for 20 hours. The bacterial pellets were then deposited onto culture dishes containing cellulose acetate filters and incubated for 18 hours. After *drop-file analysis* was carried out, contact angle measurements were performed using Image-J software. Data were analyzed using *One-Way ANOVA* followed by *Post-Hoc LSD* tests.

The results of *One-Way ANOVA* showed that chitosan from giant prawn shell reduced the hydrophobicity of *S. mutans*. *Post-Hoc LSD* tests indicated that 0.5% chitosan was the most effective concentration in reducing the hydrophobicity of *S. mutans* compared to 0.25% and 0.125% chitosan. This study concludes that chitosan from giant prawn shells can reduce the hydrophobicity of *S. mutans* ATCC 25175 and 0.5% chitosan being the most effective concentration, although its effectiveness is lower than that of 0.1% *chlorhexidine gluconate*.

Keywords: *Streptococcus mutans*, Giant freshwater prawn shell chitosan, Hydrophobicity