

INTISARI

Streptococcus sanguinis diketahui sebagai bakteri pionir pembentuk plak gigi. Kemampuan perlekatan *S. sanguinis* pada permukaan gigi yang berperan pada proses terjadinya karies dipengaruhi oleh adanya protein adhesin dan enzim *glucosyltransferase* yang dihasilkan bakteri tersebut. Kitosan merupakan polimer kationik yang dapat menghambat perlekatan dan kolonisasi bakteri di jaringan *host* dengan membentuk ikatan elektrostatis ke permukaan negatif bakteri. Tujuan dari penelitian ini adalah untuk mengetahui efek kitosan ekstrak udang galah terhadap perlekatan *Streptococcus sanguinis* ATCC 10556 pada diskus hidroksiapatit *in vitro*.

Dua puluh empat diskus hidroksiapatit yang telah dilapisi saliva dimasukkan ke dalam tabung lalu dibagi menjadi empat kelompok yaitu tiga kelompok perlakuan dan satu kontrol negatif. Kitosan konsentrasi 1 %, 0,5 %, 0,25 %, BHI dengan sukrosa 2% dan suspensi bakteri *S. sanguinis* ditambahkan pada ketiga kelompok perlakuan sehingga konsentrasi akhir kitosan menjadi 0,4%, 0,2%, 0,1%. Pada kelompok kontrol negatif ditambahkan BHI dengan sukrosa 2% dan suspensi bakteri *S. sanguinis* tanpa kitosan. Semua diskus kelompok perlakuan dan kontrol diinkubasi selama 24 jam, lalu didispersi dengan PBS. Sampel kemudian didilusi hingga 10^{-3} dan dari dilusi terakhir dikultur pada media agar mitis salivarius. Setelah diinkubasi 48 jam pada suhu 37⁰ C kemudian koloni bakteri dihitung. Data dianalisis dengan *one way analysis of variance* (ANOVA) dan dilanjutkan uji LSD.

Hasil analisis statistik menunjukkan perbedaan konsentrasi kitosan secara signifikan menurunkan jumlah koloni bakteri *S. sanguinis* ATCC 10556 yang melekat pada diskus hidroksiapatit ($p < 0,05$). Kesimpulan dari penelitian ini adalah kitosan ekstrak kulit udang galah mampu mengurangi perlekatan bakteri *S. sanguinis* ATCC 10556 pada diskus hidroksiapatit. Kitosan 0,4 % terbukti lebih efektif mengurangi jumlah koloni bakteri *S. sanguinis* ATCC 10556 yang melekat pada diskus hidroksiapatit.

Kata Kunci: *S. sanguinis* ATCC 10556, kitosan, diskus hidroksiapatit, perlekatan

ABSTRACT

Streptococcus sanguinis is known as a pioneer of dental plaque formation. The ability of *S. sanguinis* to adhere to tooth surface plays a role in the process of caries and is affected by the presence of adherence protein and glucosyltransferase enzyme produced by the bacteria. Chitosan is a cationic polymer which inhibits the adherence and the colonization of the bacteria in the host tissue by creating electrostatic bounds to the negative side of the bacterial cell surfaces. The aim of this study was to determine the effect of chitosan from shrimp shells extract to the adherence of *S. sanguinis* ATCC 10556 on hydroxyapatite disc in vitro.

Twenty four hydroxyapatite discs were coated with saliva then put into tubes and divided into four groups in which one was the negative control and the other three were the treatment groups. Chitosan with the concentrations of 1%, 0.5%, 0.25%, BHI with 2% sucrose, and bacterial suspension of *S. sanguinis* was added into the three different treatment groups so the final concentration of chitosan became 0.4%, 0.2% and 0.1%. Negative control contained BHI with 2% sucrose and bacterial suspension of *S. sanguinis* without chitosan. All of the discs were incubated for 24 hours then soaked into a medium of PBS. Samples were diluted up to 10^{-3} and from the final dilution the cultured medium was spread on mitis salivarius agar. After 48 hours incubation at 37 °C, the number of colonies were counted. Data obtained were analyzed using the one way analysis of variance (ANOVA) followed by the LSD test.

The statistical analysis showed that different concentrations of chitosan significantly influenced the number of *S. sanguinis* ATCC 10556 colony which were adhered on hydroxyapatite disc ($P < 0.05$). The conclusion of this study was chitosan from shrimp shells extract decrease the adherence of *S. sanguinis* ATCC 10556 on hydroxyapatite disc. Chitosan with concentration 0.4% proved to be an effective concentration to decrease the number of *S. sanguinis* colony which were adhered on hydroxyapatite disc.

Keywords: *S. sanguinis* ATCC 10556, chitosan, hydroxyapatite disc, adherence