

## INTISARI

*Streptococcus sanguinis* adalah bakteri Gram-positif, anaerob fakultatif dan merupakan bakteri pionir pembentukan biofilm di rongga mulut dan memiliki virulensi tinggi pada *infective endocarditis*. Daun karika (*Carica pubescens*) mengandung senyawa fitokimia, seperti flavonoid, alkaloid, fenol, dan tanin yang bertindak sebagai antibakteri dan antibiofilm melalui berbagai mekanisme. Tujuan penelitian ini untuk mengetahui pengaruh ekstrak daun karika terhadap penghambatan pembentukan biofilm *S. sanguinis* ATCC 10556.

Uji makrodilusi menunjukkan bahwa *Minimum Inhibitory Concentration* (MIC) ekstrak daun karika terhadap pertumbuhan *S. sanguinis* ATCC 10556 adalah 45,45%. Biofilm dibuat dengan menginkubasi suspensi bakteri *S. sanguinis* ATCC 10556 dalam BHI-B yang mengandung sukrosa 1% pada 96-well microplate selama 24 jam. Biofilm kemudian diberi perlakuan dengan berbagai konsentrasi ekstrak daun karika (11,36%, 22,72%, 45,45%), *chlorhexidine gluconate* 0,1% (kontrol positif), dan NaCl 0,9% (kontrol negatif), kemudian diinkubasi pada suhu 37°C selama 24 jam. Microplate kemudian dibilas dengan NaCl 0,9% dan diwarnai dengan kristal violet 0,1%. Absorbansi diukur menggunakan *microplate reader* dengan panjang gelombang 450 nm.

Data dianalisis dengan *One-Way ANOVA* dilanjutkan uji *Least Significant Difference* (LSD). Hasil *One-Way ANOVA* menunjukkan perbedaan signifikan antar kelompok ( $p < 0,05$ ). Uji LSD menunjukkan perbedaan signifikan antara seluruh variasi konsentrasi ekstrak daun karika (11,36%, 22,72%, 45,45%) maupun *chlorhexidine gluconate* 0,1%. Dapat disimpulkan bahwa ekstrak daun karika dapat menghambat pembentukan biofilm *S. sanguinis* ATCC 10556. Semakin tinggi konsentrasi ekstrak, semakin efektif menghambat pertumbuhan biofilm bakteri *S. sanguinis* ATCC 10556 namun efektivitasnya belum sebanding dengan *chlorhexidine gluconate* 0,1%.

**Kata kunci:** *Streptococcus sanguinis*, ekstrak daun karika, penghambatan pembentukan biofilm.

## ABSTRACT

*Streptococcus sanguinis* is a Gram-positive, facultative anaerobic bacteria. This bacteria is a pioneer bacteria in the biofilm formation in oral cavity and has high virulence properties in causing infective endocarditis. Karika leaves (*Carica pubescens*) contain phytochemical compounds, such as flavonoids, alkaloids, fenols, and tannins which have antibacterial and antibiofilm properties through various mechanisms. This study aimed to determine the effect of karika leaf extract on the inhibition of biofilm formation of *S. sanguinis* ATCC 10556.

Macrodilution test showed that Minimum Inhibitory Concentration (MIC) of karika leaf extract on *S. sanguinis* ATCC 10556 growth was 45.45%. The inhibition test for *S. sanguinis* ATCC 10556 biofilm formation carried out using a 96-well microplate. *Streptococcus sanguinis* ATCC 10556 bacteria were incubated in BHI-B media together with karika leaf extract concentrations of 11.36%, 22.73%, and 45.45%, 0.1% chlorhexidine gluconate (positive control), and 0.9% NaCl (negative control), then incubated at 37°C for 24 hours. The microplate was then rinsed with 0.9% NaCl and the biofilm was then stained with 0.1% crystal violet and the absorbance was measured using a microplate reader at a wavelength 450 nm.

The data was analyzed using *One-Way ANOVA* and continued with the *Least Significant Difference* (LSD) test. The result of the *One-Way ANOVA* showed a significant difference among groups ( $p < 0.05$ ). *Least Significant Difference* test showed a significant difference between all variations in concentration of karika leaf extract (11.36%, 22.72%, 45.45%) and 0.1% chlorhexidine gluconate. In conclusion, karika leaf extract can inhibit *S. sanguinis* ATCC 10556 biofilm formation. The higher the concentration of the extract, the more effective in inhibiting the growth of *S. sanguinis* ATCC 10556 bacterial biofilm, although its effectiveness is lower than 0.1% chlorhexidine gluconate.

**Key words:** *Streptococcus sanguinis*, karika leaf extract, biofilm inhibition.