

INTISARI

Streptococcus mutans merupakan mikroorganisme kariogenik yang menempel pada permukaan gigi dan membentuk biofilm. Ekstrak umbi bit mengandung antibakteri dan anti adhesi seperti flavonoid, fenolik, betasianin, saponin, tanin, terpenoid, dan alkaloid sehingga berpotensi menghambat pembentukan biofilm. Penelitian ini bertujuan untuk mengetahui aktivitas antibiofilm ekstrak umbi bit terhadap bakteri *S. mutans* ATCC 25175.

Pengujian aktivitas antibiofilm berupa penghambatan biofilm bakteri *S. mutans* ATCC 25175 dengan metode *Microtiter Plate Assay* (MPA) menggunakan *96-wells microplate*. Media kaldu BHI dan suspensi bakteri *S. mutans* ATCC 25175 dimasukkan dalam masing-masing sumuran kemudian ditambahkan *chlorhexidine gluconate* 0,2% (kontrol positif), variasi konsentrasi ekstrak umbi bit 10%, 7,5%, dan 5%, serta larutan *saline* (kontrol negatif). *Microplate* diinkubasi selama 18 jam pada suhu 37°C, kemudian dicuci menggunakan *phosphate buffer saline*, dan diberi pewarnaan *crystal violet* 0,1%. Kuantifikasi biofilm *S. mutans* ATCC 25175 yang terbentuk diukur menggunakan spektrofotometer $\lambda=450$ nm.

Hasil uji *One-way ANOVA* menunjukkan perbedaan bermakna ($p<0,05$) antara ekstrak umbi bit konsentrasi 5% dengan *chlorhexidine gluconate* 0,1%. Kesimpulan penelitian ini adalah ekstrak umbi bit memiliki kemampuan menghambat pembentukan biofilm bakteri *S. mutans* ATCC 25175. Semakin tinggi konsentrasi ekstrak umbi bit yang digunakan maka semakin besar kemampuannya dalam menghambat pembentukan biofilm *S. mutans* ATCC 25175. Ekstrak umbi bit dengan konsentrasi 5% memiliki aktivitas antibiofilm *S. mutans* ATCC 25175 setara dengan *chlorhexidine gluconate* 0,1%.

Kata kunci : *Streptococcus mutans*, ekstrak umbi bit, aktivitas antibiofilm

ABSTRACT

Streptococcus mutans is a cariogenic microorganism that attaches to the surface of teeth and forms a biofilm. Beetroot extract contains active phytochemical compounds which have antibacterial and anti-adhesion potential such as flavonoids, phenolics, betacyanins, saponins, tannins, terpenoids and alkaloids, so they have the potential to inhibit biofilm formation. This study aims to determine the anti-biofilm activity of beetroot extract against the bacteria *S. mutans* ATCC 25175.

Antibiofilm activity testing consisted of inhibiting the *S. mutans* ATCC 25175 bacterial biofilm using the Microtiter Plate Assay (MPA) method using a 96-well microplate. BHI broth and *S. mutans* ATCC 25175 bacterial suspension were added to each well then 0.1% chlorhexidine gluconate (positive control), various concentrations of beetroot extract of 10%, 7,5% and 5% were added, and saline solution (negative control). Microplates were incubated for 18 hours at 37°C, then washed using phosphate buffer saline, and stained with 0.1% crystal violet. Quantification of the *S. mutans* ATCC 25175 biofilm formed was measured using a spectrophotometer $\lambda=450$ nm.

The results of the One-way ANOVA test showed a significant difference ($p<0.05$) between beetroot extract with a concentration of 5% and chlorhexidine gluconate 0.1%. The conclusion of this research is that beetroot extract has the ability to inhibit the formation of *S. mutans* ATCC 25175 bacterial biofilm. The higher the concentration of beetroot extract used, the greater its ability to inhibit the formation of *S. mutans* ATCC 25175 biofilm. Beetroot extract with a concentration of 5% has activity. *S. mutans* antibiofilm ATCC 25175 is equivalent to 0.1% chlorhexidine gluconate.

Key words: *Streptococcus mutans*, beetroot extract, antibiofilm activity