

## INTISARI

*Streptococcus mutans* merupakan bakteri Gram positif yang dikenal sebagai bakteri utama penyebab karies gigi. Daun sirih merah (*Piper crocatum* Ruiz & Pav.) memiliki kemampuan antibakteri dan antiadhesi karena kandungan flavonoid, alkaloid, saponin, tannin, fenol dan minyak esensial. Hidrofobisitas permukaan sel bakteri merupakan faktor penting pada perlekatan sel bakteri. Hidrofobisitas permukaan sel bakteri yang tinggi memungkinkan bakteri untuk mengatasi gaya repulsif selama perlekatan non spesifik, dan melanjutkan ke perlekatan spesifik. Penelitian ini bertujuan untuk mengetahui pengaruh pemberian ekstrak daun sirih merah terhadap hidrofobisitas bakteri *S. mutans* ATCC 25175.

Daun sirih merah diekstraksi menggunakan metode maserasi kemudian diencerkan menggunakan akuades. Hidrofobisitas *S. mutans* ATCC 25175 diamati dengan metode pengukuran sudut kontak. Suspensi bakteri sebanyak 0,5 McFarland dicampur dengan klorheksidin glukonat 0,2% (kontrol positif), NaCl 0,9% (kontrol negatif), ekstrak daun sirih merah konsentrasi 1,30%, 2,61%, 5,21%, 10,42% dan 20,84% pada masing-masing subkelompok perlakuan. Suspensi yang telah dicampur lalu diinkubasi dan didepositkan ke dalam membran filter selulosa asetat. Pada membran filter selulosa asetat yang sudah terdeposit bakteri dilakukan *drop-profile analysis* dan dilanjutkan dengan pengukuran sudut kontak menggunakan *software* Image-J. Data dianalisis menggunakan uji *one-way* ANOVA dan dilanjutkan post hoc *LSD Test*.

Uji *one-way* ANOVA menunjukkan adanya perbedaan signifikan ( $p < 0,05$ ) pada hasil uji sudut kontak antar kelompok, yang berarti ekstrak daun sirih merah mampu menurunkan hidrofobisitas bakteri *S. mutans* ATCC 25175. Uji *LSD* menunjukkan bahwa tidak terdapat perbedaan signifikan ( $p > 0,05$ ) antara konsentrasi 10,42% dan 20,84%, yang berarti ekstrak dengan konsentrasi 10,42% dan 20,84% memiliki kemampuan yang sama dalam menurunkan hidrofobisitas bakteri *S. mutans*. Kesimpulan penelitian ini adalah ekstrak daun sirih merah memiliki kemampuan untuk menurunkan hidrofobisitas bakteri *S. mutans* ATCC 25175. Semakin tinggi konsentrasi ekstrak daun sirih merah, semakin tinggi juga kemampuannya dalam menurunkan hidrofobisitas bakteri. Ekstrak dengan konsentrasi 10,42% dan 20,84% memiliki kemampuan yang sama dalam menurunkan hidrofobisitas bakteri *S. mutans* ATCC 25175, tetapi masih lebih rendah dibandingkan klorheksidin glukonat 0,2%.

**Kata kunci:** *Piper crocatum* Ruiz & Pav., hidrofobisitas, ekstrak daun sirih merah, *Streptococcus mutans*

## ABSTRACT

*Streptococcus mutans* is a Gram-positive bacterium which is known as the main bacterium that causes dental caries. Red betel leaves (*Piper crocatum* Ruiz & Pav.) have antibacterial and anti-adhesive properties due to the content of flavonoids, alkaloids, saponins, tannins, phenols and essential oils. High cell surface hydrophobicity of bacteria enables bacteria to overcome the repulsive forces during non-specific attachment, and proceed to specific attachment. This study aimed to determine the effect of red betel leaf extract on the hydrophobicity of *S. mutans* ATCC 25175.

Red betel leaves were extracted using the maceration method and then diluted using distilled water. The hydrophobicity of *S. mutans* ATCC 25175 was observed by the contact angle measurement method. Bacterial suspension of 0.5 McFarland mixed with 0.2% chlorhexidine (positive control), NaCl 0.9% (negative control), red betel leaf extract concentration 1.30%, 2.61%, 5.21%, 10.42%, and 20.84% in each treatment subgroup. The mixed suspension was then incubated and deposited into the cellulose acetate membrane filter. Drop-profile analysis was carried out on the cellulose acetate membrane filter which had been deposited with bacteria and followed by measurement of the contact angle using Image-J software. Data were analyzed using the one-way ANOVA test and continued with post hoc LSD test.

The one-way ANOVA test showed a significant difference ( $p < 0.05$ ) in the results of the contact angle test between groups, which means that red betel leaf extract was able to reduce the hydrophobicity of *S. mutans* ATCC 25175. The LSD test showed that there was no significant difference ( $p > 0.05$ ) between concentrations of 10.42% and 20.84%, which means that extracts with concentrations of 10.42% and 20.84% have the same ability to reduce the hydrophobicity of *S. mutans* bacteria. The conclusion of this study is red betel leaf extract has the ability to reduce the hydrophobicity of the bacteria *S. mutans* ATCC 25175. The higher the concentration of red betel leaf extract, the higher its ability to reduce the hydrophobicity of bacteria. Extracts with concentrations of 10.42% and 20.84% had the same ability to reduce the hydrophobicity of *S. mutans* ATCC 25175, but still lower than 0.2% chlorhexidine gluconate.

**Keywords:** *Piper crocatum* Ruiz & Pav., hydrophobicity, red betel leaf extract, *Streptococcus mutans*