

## INTISARI

Karies merupakan penyakit kronis berupa kerusakan lokal jaringan keras gigi yang disebabkan oleh produk asam hasil fermentasi bakteri kariogenik. *Streptococcus mutans* berperan penting dalam karies melalui produksi enzim glukosiltransferase (GTF), yang mengubah sukrosa menjadi glukosa mediator perlekatan bakteri pada permukaan gigi. Bunga rosella (*Hibiscus sabdariffa* L.) mengandung flavonoid, tanin, alkaloid, dan saponin yang berpotensi menghambat aktivitas enzim GTF. Penelitian ini bertujuan untuk mengetahui pengaruh ekstrak bunga rosella terhadap aktivitas enzim glukosiltransferase *Streptococcus mutans*.

Penelitian ini menggunakan ekstrak bunga rosella konsentrasi 10%, 5%, dan 2,5% sebagai kelompok uji, klorheksidin glukonat 0,12% sebagai kontrol positif, dan akuades sebagai kontrol negatif. Setiap tabung reaksi diisi dengan 250  $\mu$ L ekstrak, klorheksidin, atau akuades, 20  $\mu$ L enzim GTF, dan 730  $\mu$ L larutan substrat (sukrosa 1,25%, larutan penyangga kalium fosfat 6,35 mM pH 6,5, dan natrium azida 0,025%). Tabung reaksi diinkubasi selama 16 jam pada suhu 37°C dengan kemiringan 45°, kemudian supernatan dibuang, ditambahkan akuades, di ultrasonikasi selama 30 menit, dan diukur absorbansinya menggunakan spektrofotometer UV-Vis 1800 pada panjang gelombang 550 nm.

Hasil uji *One Way ANOVA* menunjukkan adanya perbedaan bermakna antar kelompok perlakuan ( $p < 0,05$ ). Uji lanjut *post hoc* Least Significant Difference (LSD) menunjukkan ekstrak bunga rosella pada konsentrasi 10%, 5%, dan 2,5% berbeda bermakna dibandingkan klorheksidin glukonat 0,12% ( $p < 0,05$ ). Dengan demikian, ekstrak bunga rosella pada konsentrasi 10%, 5%, dan 2,5% mampu menghambat aktivitas enzim GTF *S. mutans*, meskipun penghambatannya masih lebih rendah daripada klorheksidin glukonat 0,12%.

**Kata kunci:** karies, *Streptococcus mutans*, glukosiltransferase, ekstrak bunga rosella.

## ABSTRACT

Dental caries is a chronic disease characterized by localized destruction of hard dental tissues caused by acidic products of fermentation by cariogenic bacteria. *Streptococcus mutans* play an important role in caries development through the production of glucosyltransferase (GTF) enzymes, which convert sucrose into glucans that mediate bacterial adhesion to tooth surfaces. Roselle (*Hibiscus sabdariffa* L.) contains flavonoids, tannins, alkaloids, and saponins, which may inhibit GTF activity. This study aimed to determine the effect of roselle flower extract on the glucosyltransferase activity of *Streptococcus mutans*.

Roselle flower extract at concentrations of 10%, 5%, and 2.5% was used as the test groups, 0.12% chlorhexidine gluconate as the positive control, and distilled water as the negative control. Each reaction tube contained 250  $\mu$ L of extract, chlorhexidine, or distilled water, 20  $\mu$ L of GTF enzyme, and 730  $\mu$ L of substrate solution (1.25% sucrose, 6.35 mM potassium phosphate buffer at pH 6.5, and 0.025% sodium azide). The tubes were incubated for 16 hours at 37°C with a 45° inclination. The supernatant was discarded, distilled water was added, the samples were ultrasonicated for 30 minutes, and absorbance was measured using a UV–Vis 1800 spectrophotometer at 550 nm.

One-way ANOVA showed significant differences among treatment groups ( $p < 0.05$ ). Post hoc Least Significant Difference (LSD) tests indicated that roselle flower extract at 10%, 5%, and 2.5% differed significantly from 0.12% chlorhexidine gluconate ( $p < 0.05$ ). Therefore, roselle flower extract at 10%, 5%, and 2.5% inhibited *S. mutans* GTF activity, although its inhibitory effect was lower than that of 0.12% chlorhexidine gluconate.

**Keywords:** dental caries, *Streptococcus mutans*, glucosyltransferase, roselle flower extract.