ABSTRAK

AKTIVITAS EKSTRAK ETANOL BUNGA KECOMBRANG *(Etlingera elatior)* TERHADAP DEGRADASI BIOFILM *Streptococcus mutans* PENYEBAB KARIES GIGI

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Streptococcus mutans merupakan bakteri yang berperan penting dalam proses terjadinya karies gigi berkaitan dengan kemampuannya dalam membentuk biofilm. Bunga kecombrang *(Etlingera elatior)* memiliki aktivitas antibakteri sehingga dapat dikembangkan sebagai alternatif obat kumur berbahan alam untuk pengendalian plak penyebab karies gigi. Tujuan penelitian ini adalah untuk mengetahui pengaruh ekstrak etanol bunga kecombrang terhadap degradasi biofilm bakteri *S. mutans*. Jenis penelitian berupa eksperimental laboratoris secara *in vitro* menggunakan ekstrak etanol bunga kecombrang konsentrasi 1,56 mg/mL, 3,125 mg/mL, 6,25 mg/mL, 12,50 mg/mL, 25 mg/mL, dan 50 mg/mL. Kontrol positif yang digunakan adalah klorheksidin 0,2% dan kontrol negatif berupa DMSO 1%. Degradasi biofilm diuji menggunakan *microtitter plate assay* dengan pewarnaan kristal violet 1% yang densitas optiknya dibaca pada panjang gelombang 450 nm. *One-way ANOVA* dan *Post hoc* LSD digunakan dalam analisis data. Hasil persentase degradasi biofilm *S. mutans* oleh ekstrak etanol bunga kecombrang berturut-turut 49,42%, 68,56%, 83,28%, 77,23%, 67,05%, dan 53,01%. Persentase degradasi biofilm *S. mutans* mengalami peningkatan pada konsentrasi ekstrak etanol bunga kecombrang 1,56-6,25 mg/mL, namun menurun pada konsentrasi 12,5-50 mg/mL. Hasil analisis menunjukkan adanya persentase degradasi biofilm yang lebih tinggi secara bermakna antara kelompok perlakuan dengan DMSO 1% ($p<0,05$), namun masih lebih rendah secara bermakna dibandingkan CHX 0,2% ($p<0,05$). Konsentrasi ekstrak etanol bunga kecombrang 6,25 mg/mL menunjukkan aktivitas degradasi tertinggi terhadap biofilm *S. mutans*. Simpulan penelitian ini adalah terdapat pengaruh ekstrak etanol bunga kecombrang terhadap degradasi biofilm bakteri *S. mutans.*

Kata Kunci: Degradasi biofilm, *Etlingera elatior,* Karies gigi, *Streptococcus mutans*

ABSTRACT

ACTIVITIES OF TORCH GINGER FLOWERS (Etlingera elatior) ETHANOLIC EXTRACT AGAINST DEGRADATION OF BIOFILM Streptococcus mutans THAT CAUSES DENTAL CARIES

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Streptococcus mutans is a bacterium that plays an important role in the process of dental caries related to its ability to form biofilms. Torch ginger flowers (Etlingera elatior) has antibacterial activity to be developed as an alternative natural mouthwash to control plaque that causes dental caries. The aim of this study was to determine the effect of torch ginger flowers ethanolic extract on the degradation of the biofilm of S. mutans. This experimental laboratory in vitro study using ethanol extract of torch ginger flowers at concentrations of 1.56 mg/mL, 3.125 mg/mL, 6.25 mg/mL, 12.50 mg/mL, 25 mg/mL, and 50 mg/mL. The positive control used was 0.2% chlorhexidine and the negative control was 1% DMSO. Biofilm degradation was tested using a microtitter plate assay with 1% crystal violet staining whose optical density was read at a wavelength of 450 nm. One-way ANOVA and Post hoc LSD were used in data analysis. The percentage of S. mutans biofilm degradation by ethanol extract of kecombrang flowers was 49.42%, 68.56%, 83.28%, 77.23%, 67.05%, and 53.01%. The percentage of S. mutans biofilm degradation increased at the concentration of the torch ginger flowers ethanol extract from 1.56 to 6.25 mg/mL, but decreased at a concentration of 12.5-50 mg/mL. The results showed that there was a significantly higher percentage of biofilm degradation between the treatment group with 1% DMSO ($p<0.05$), but still significantly lower than 0.2% CHX ($p<0.05$). Torch ginger flowers ethanol extract concentration of 6.25 mg/mL showed the highest degradation activity against S. mutans biofilm. The conclusion of this study is that there is an effect of the ethanolic extract of torch ginger flowers on the degradation of the biofilm of S. mutans bacteria.

Keywords: *Biofilm degradation, Etlingera elatior, Dental caries, Streptococcus mutans*