

INTISARI

Bakteri *Enterococcus faecalis* merupakan salah satu yang sering dijumpai pada kasus kegagalan perawatan saluran akar. Bakteri *E. faecalis* mempunyai faktor-faktor virulensi yang berfungsi membantu perlekatan, kolonisasi pada *host* dan pembentukan biofilm. Royal jelly merupakan produk dari lebah *Apis mellifera* mengandung *major royal jelly proteins*, royalisin, dan royalaktin yang diduga berpotensi menghambat pembentukan biofilm bakteri *E. faecalis*. Tujuan penelitian ini adalah untuk mengetahui pengaruh royal jelly terhadap pembentukan biofilm bakteri *E. faecalis* ATCC 29212.

Uji pembentukan biofilm telah dilakukan menggunakan *microtiter dish biofilm formation assay*. Media *Brain Heart Infusion* (BHI), ekstrak royal jelly 50%, 25%, 12,5%, 6,25%, kontrol positif (*chlorhexidine digluconate* 0,2%), dan kontrol negatif (akuades) dimasukkan dalam *microplate*. Suspensi bakteri ($1,5 \times 10^8$ CFU/mL) diinokulasikan pada *microplate*, kemudian diinkubasi selama 24 jam pada suhu 37°C. *Microplate* dibilas menggunakan *phosphate buffer saline* dan dilakukan pewarnaan menggunakan *crystal violet* 0,1% kemudian ditambahkan 200 μ l etanol. Pembacaan nilai densitas optik (OD) dilakukan menggunakan spektrofotometer dengan panjang gelombang 590 nm dilanjutkan analisis statistik persentase penghambatan biofilm. Data dianalisis menggunakan *Independent Sample T-Test* pada $p < 0,05$.

Nilai penghambatan ekstrak royal jelly terhadap pembentukan biofilm bakteri *E. faecalis* konsentrasi 50%, 25%, 12,5%, dan 6,25% secara berurut-turut sebesar 86,17%, 74,49%, 51,79%, dan 11,61%. Hasil uji *independent sample T-Test* menunjukkan adanya perbedaan yang bermakna antar konsentrasi pada pembentukan biofilm bakteri *E. faecalis*. Kesimpulan penelitian ini yaitu ekstrak royal jelly konsentrasi 50% menunjukkan persentase tertinggi untuk menghambat pembentukan biofilm bakteri *E. faecalis*.

Kata kunci: Biofilm, *Enterococcus faecalis*, royal jelly, faktor virulensi

Enterococcus faecalis is one of bacteria that is frequently found in the root canal treatment failure. This bacterium is associated with virulence factors functioning to help attachment, host colonization, and biofilm formation. Royal jelly produced by *Apis mellifera* contains major royal jelly proteins, royalisin, and royalactin having the potential to inhibit *E. faecalis* biofilm formation. This study aims to identify the effects of royal jelly on *E. faecalis* ATCC 29212 biofilm formation.

Microtiter dish biofilm formation assay was used to test the biofilm formation. Brain heart infusion medium; 50%, 25%, 12.5%, and 6.25% royal jelly extract; positive control (0,2% chlorhexidine digluconate); and negative control (aquadest) were placed in the microplate wells. Bacterial suspension ($1,5 \times 10^8$ CFU/well) was inoculated in the microplate and incubated aerobically later for 24 hours at 37°C. Microplate was rinsed by using phosphate buffer saline, stained by using 0.1% crystal violet and then solubilized by 200 μ l 96% ethanol. The optical density (OD) was measured by using spectrophotometer at a wavelength of 590 nm and furthered analysed to measure the percentage of biofilm inhibition formation. Data were analysed using independent sample T-Test at $p < 0,05$.

The inhibition values of royal jelly extract on the biofilm formation of *E. faecalis* at concentration of 50%, 25%, 12,5%, and 6,25% were 86,1%, 74,49%, 51,79%, dan 11,61% respectively. The result of independent sample T-Test shows that there is significant difference on the effect of royal jelly extract on *E. faecalis* biofilm formation. It can be concluded that royal jelly extract at concentration of 50% appears to have the highest percentage to inhibit *E. faecalis* biofilm formation.

Keywords: Biofilm, *Enterococcus faecalis*, royal jelly, virulence factor