INTISARI

Bakteri *Enteroccocus faecalis* merupakan salah satu flora normal di dalam rongga mulut yang dapat menyebabkan infeksi saluran akar. Selain itu, faktor yang menyebabkan *E. faecalis* dapat bertahan hidup di dalam saluran akar sebagai organisme tunggal dan resisten terhadap obat-obat antimikrobial sehingga sulit dieliminasi dari saluran akar secara sempurna. Saat ini banyak dikembangkan penggunaan tanaman sebagai alternatif, dikarenakan adanya resistensi bakteri *E. faecalis* terhadap obat-obatan saluran akar terdahulu. Royal jelly mengandung senyawa-senyawa yang bersifat antibakteri, diantaranya *major royal jelly protein* dan royalisin. Tujuan penelitian ini adalah untuk mengetahui sensitivitas bakteri *E. faecalis* dan *time kill assay* ekstrak royal jelly terhadap *E. faecalis* ATCC 29212.

Uji sensitivitas *E. faecalis* dilakukan dengan metode serial dilusi. Pada media BHI diinokulasikan suspensi *E. faecalis* dan dimasukkan ke *microplate* 96 sumuran. Larutan uji royal jelly dari setiap kelompok (n=4) dimasukkan ke dalam *microplate* sebanyak 100 µL. Setelah diinkubasi selama 24 jam pada suhu 37^{o}C, sensitivitas dibaca menggunakan spektrofotometer untuk mendapatkan nilai densitas optik. Data diolah dengan uji *One-way ANOVA* dan *Post-hoc Scheffe*. *Time-kill assay* dilakukan dengan cara mencampurkan suspensi 100 µL *E. faecalis* dengan 1 ml larutan uji setiap kelompok (n=4). 100 µL cuplikan diambil setiap 24 jam dan 48 jam lalu ditanam pada media *Mueller Hinton Agar*. Setelah diinkubasi selama 24 jam pada suhu 37^{o}C, dilakukan penghitungan jumlah koloni bakteri yang tumbuh pada agar. Data diolah dengan uji *Kruskall-Wallis* dilanjutkan *Post-hoc Scheffe*.

Hasil uji sensitivitas menunjukkan kelompok ekstrak royal jelly dengan konsentrasi 25% menunjukkan adanya sensitivitas dan terdapat perbedaan signifikan ($p<0,05$). Hasil *time-kill assay* menunjukkan pada kelompok *ciprofloxacin* (kontrol positif) tidak terdapat adanya koloni *E. faecalis* yang tumbuh pada semua waktu. Hasil ini berbeda bermakna dengan kelompok ekstrak royal jelly 25% dan kontrol negatif. Ekstrak royal jelly terbukti bersifat antibakteri terhadap *E. faecalis*, waktu papar 48 jam ekstrak royal jelly 25% selama 48 jam lebih efektif menekan pertumbuhan bakteri daripada 24 jam.

Kata kunci: Royal jelly, Royalisin, *Enterococcus faecalis*, Uji sensitivitas, *Time-kill assay.*

ABSTRACT

Enterococcus *faecalis* is one of the normal flora in the oral cavity that can cause root canal infections. In addition, the factors that cause *E. faecalis* to survive in the root canal as a single organism and are resistant to antimicrobial drugs make it difficult to completely eliminate it from the root canal. Currently, the use of plants as an alternative has been widely developed, due to the resistance properties of *E. faecalis* and some of the disadvantages of previous root canal drugs. Royalisin compounds in royal jelly make royal jelly can be used as an inhibitor of bacterial growth. The purpose of this study was to determine the antibacterial effect of royal jelly extract and its effectiveness as a substitute for antibiotics in inhibiting the growth and *time-kill assay* of *E. faecalis* ATCC 29212.

In this study, the sensitivity test of *E. faecalis* and time-kill assay was carried out. Sensitivity test was performed by serial dilution method. In BHI media, E. faecalis and put into microplate-wells. The test solution from each group (n=4) was added to microplate-wells 100 µL after being incubated for 24 hours at 37^{o}C, the sensitivity was read using a spectrophotometer to see the results. Data were processed by One-way ANOVA and Post-hoc Scheffe. The time-kill assay was carried out by mixing 100 L of *E. faecalis* with 1 ml of the test solution for each group (n=4). 100 L of samples were taken every 24 hours and 48 hours and then planted on MHA media. After being incubated for 24 hours at 37^{oC}colonies E. faecalis counted.data were processed using the Kruskall-Wallis followed by Post-hoc Scheffe. The results of the sensitivity test showed that the royal jelly extract group with a concentration of 25% showed a clear zone or sensitivity and there was a significant difference ($p<0.05$) compared to the negative control group. The results of the time-kill assay showed that in the combination group there were no E. faecalis growing in all seconds. The results of the time-kill assay showed that in the positive control group (ciprofloxacin) there were no *E. faecalis* growing at all times. These results were significantly different from the 25% royal jelly extract group and the negative control group. Royal jelly 25% extract has antibacterial effect and is more effective at 48 hours exposure which can be used as dressing material in root canal treatment.

Keywords: Royal jelly, Royalisin, *Enterococcus faecalis*, Sensitivity test, *Time-kill assay*