INTISARI

Periodontitis disebabkan oleh bakteri, seperti *Enterococcus faecalis (E. faecalis)*, yang dapat memperburuk perawatan dengan memfasilitasi kolonisasi bateri patogen lain dan menginduksi inflamasi, mengganggu proses penyembuhan melalui matriks ekstraseluler. Perancah (*scaffold*) dapat menggantikan peran matriks ekstraseluler dalam mendukung penyembuhan jaringan periodontal. Infeksi mempercepat degradasi perancah dan proliferasi bakteri, tetapi leunca (*Solanum nigrum*) memiliki efek antiinflamasi, antioksidan, dan antibakteri. Eksosom adalah vesikel ekstraseluler mengandung protein, lipid, dan asam nuklea yang dapat berasal dari sel punca hewan atau tumbuhan, yang disebut *plant-derived exosome-like nanoparticle* (PDEN). Untuk mengatasi keterbatasan eksosom, spons hemostatik berbasis karbonat apatit dapat digunakan untuk retensi dan kontrol pelepasan eksosom, meningkatkan efektivitas terapi regeneratif, serta menghambat pertumbuhan bakteri *E. faecalis*.

Metode yang digunakan untuk menguji penghambatan pertumbuhan bakteri *E. faecalis*, yaitu metode difusi sumuran pada *Tryptone Soya Agar*. Kelompok uji yang digunakan, yaitu spons gelatin (kelompok kontrol negatif), spons karbonat apatit (kelompok perlakuan 1), inkorporasi PDEN leunca dengan spons karbonat apatit (kelompok perlakuan 2), spons gelatin dengan ciprofloxacin (kelompok kontrol positif). Analisis data dilakukan menggunakan analisis deskriptif.

Hasil penelitian menunjukkan kelompok perlakuan 1 tidak terdapat zona hambat bakteri. Sementara itu, kelompok perlakuan 2 menunjukkan terdapat zona hambat bakteri pada salah satu repetisi sedangkan lainnya tidak. Kesimpulan penelitian ini adalah inkorporasi eksosom tanaman leunca dengan spons hemostatik karbonat apatit berpengaruh pada penghambatan pertumbuhan *E. faecalis*, tetapi perlu optimalisasi kualitas PDEN leunca dan metode penelitian.

Kata kunci: *Enterococcus faecalis*, perancah, eksosom, leunca

ABSTRACT

Periodontitis is caused by bacteria, such as *Enterococcus faecalis* (*E. faecalis*), which can worsen treatment by facilitating colonization of other pathogenic bacteria and inducing inflammation, disrupting the healing process through the extracellular matrix. Scaffolds can replace the role of the extracellular matrix in supporting periodontal tissue healing. Infection accelerates scaffold degradation and bacterial proliferation, but leunca (*Solanum nigrum*) has anti-inflammatory, antioxidant, and antibacterial effects. Exosomes are extracellular vesicles containing proteins, lipids, and nucleic acids that can be derived from animal or plant stem cells, called plant-derived exosome-like nanoparticle (PDEN). To overcome the limitations of exosomes, hemostatic sponges based on carbonate apatite can be used for retention and control of exosome release, increasing the effectiveness of regenerative therapy, and inhibiting the growth of *E. faecalis* bacteria.

The method used to test the inhibition of *E. faecalis* bacterial growth is the well diffusion method on Tryptone Soya Agar. The test groups used were gelatin sponge (negative control group), carbonate apatite sponge (treatment group 1), incorporation of leunca exosomes with carbonate apatite sponge (treatment group 2), gelatin sponge with ciprofloxacin (positive control group). Data analysis was carried out using descriptive analysis.

The results showed that treatment group 1 did not have a bacterial inhibition zone. Meanwhile, treatment group 2 showed a bacterial inhibition zone in one of the repetitions while the others did not. The conclusion of this study is that the incorporation of leunca PDEN with carbonate apatite hemostatic sponges has an effect on inhibiting the growth of *E. faecalis*, but it is necessary to optimize the quality of leunca PDEN and research methods.

Keywords: *Enterococcus faecalis*, scaffold, exosome, leunca