

Comparison of *Enterococcus faecalis* biofilm degradation after diode laser exposure with *Chlorophyll* and *Psoralens* photosensitizer

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Introduction: *Enterococcus faecalis* are dominant in root canal infection and can survive harsh conditions such as high pH, scarce nutrients, and heat. They form mature biofilm readily and can resist disinfection approaches. *Photo-activated disinfection* with *photosensitizer* and laser irradiation is a viable alternative to eliminate *E. faecalis* biofilm. This study aimed to investigate and compare *E. Faecalis* biofilm degradation using *photo-activated disinfection* with *chlorophyll* or *psoralens* photosensitizer and 405 nm diode laser irradiation.

Methods: This study used *E. Faecalis* biofilm grown in the laboratory. *Chlorophyll* or *psoralens* were applied as a photosensitizer, and then 405 nm diode laser was irradiated for 30 or 60 seconds. The effectiveness of biofilm degradation was measured with *optical density* using *microplate reader*.

Results: *Chlorophyll* with 30 seconds of laser irradiation results in 30.8% biofilm degradation, whereas *psoralens* with 60 seconds of laser irradiation result in 81.8% biofilm degradation. *One-way ANOVA* test results in significant difference in biofilm degradation effectiveness amongst all groups.

Conclusion: *Psoralens* with 60 seconds of 405nm diode laser irradiation yielded the most *Enterococcus faecalis* biofilm degradation compared to other groups.

Keywords: Photo-activated disinfection, photochemical reaction, photosensitizer, root canal biofilm