

ABSTRACT**THE DIFFERENCE OF ENTEROCOCCUS FAECALIS BIOFILM
DEGRADATION AFTER DIODE LASER EXPOSURE WITH
CHLOROPHYLL AND PSORALENS PHOTSENSITIZER**

Background: *Enterococcus faecalis* are dominant in root canal infection and can survive harsh conditions such as high pH, scarce nutrients, and heat. They are able to form mature biofilm readily and able to resist disinfection approaches. Photo-activated disinfection with photosensitizer and laser irradiation is a viable alternative to eliminate *E. faecalis* biofilm. **Objective:** This study aimed to investigate and compare *E. Faecalis* biofilm degradation using photo-activated disinfection with chlorophyll or psoralens photosensitizer with 405 nm diode laser irradiation. **Methods:** This study used *E. Faecalis* biofilm grown in laboratory. Chlorophyll or psoralens were applied as photosensitizer, and then 405nm diode laser was irradiated as long as 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 23.6% biofilm degradation, whereas psoralens with 60 seconds of laser irradiation results in 41.3% biofilm degradation. One-way ANOVA test results in significant difference of 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 : *Enterococcus faecalis* biofilm, photo-activated disinfection, diode laser, photosensitizer, chlorophyll, psoralens

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DAFTAR SINGKATAN

EPS	= extracellular polysaccharide
NaOCl	= sodium hypochloride
EDTA	= ethylene diamine tetraacetic acid
CHX	= chlorhexidine
PCA	= parachloroanaline
LASER	= light amplification by simulated emission of radiation
PAD	= photo-activated disinfection
KTP	= potassium titanyl phosphate
LDF	= laser doppler flowmetry
GaAlAs	= gallium aluminium arsenide
CW	= continuous wave
LLLT	= low level laser therapy
PDT	= photodynamic therapy
PS	= photosensitizer
LED	= light-emitting diode
ROS	= reactive oxygen species
MB	= methylene blue
TBO	= toluidine blue O
OD	= optical density
TSB	= tryptic soy broth
PBS	= phosphate buffer saline