

Sinari Alfat Sunarko, The potency of pheophytin a as photosensitizer in 405 nm diode laser photoinactivation of *Streptococcus mutans* (the product of chlorophyll breakdown extracted from *Pleomele angustifolia* leaves). This research is under guidance of Dr. Suryani Dyah Astuti, M.Si dan Dr. Wiwied Ekasari, MSi., Apt.

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### ABSTRACT

This research aimed to know the potency of pheophytin a as a photosensitizer agent to inactivated *Streptococcus mutans* using 405 nm diode laser. Pheophytin a is known as chlorophyll a derivate that loss magnesium ion at the center of porphyrin ring structure. Porphyrins are commonly employed for aPDT as photosensitizer. Pheophytin a was obtained from the chlorophyll breakdown of *Pleomele angustifolia* leaves. Methods of this research were pheophytin a isolation, laser characterization, toxicity test of 20 % pheophytin a solution and photoinactivation of *Streptococcus mutans* using 405 nm diode laser with doses of 2.5, 5, 7.5, 10, 12.5, 15.0, 17.5 and 20.0 J/cm<sup>2</sup>. Pheophytin a obtained from *Pleomele angustifolia* leaves characterized using TLC, UV-Vis spectra and infrared spectra profiles. *Streptococcus mutans* incubated with pheophytin a without photoinactivation resulted no significant death (untoxic). The final result of this research showed that photoinactivation of *Streptococcus mutans* incubated with pheophytin a caused the reduction of *Streptococcus mutans* colonies greater than laser exposure without pheophytin a incubation at the same dose of diode laser. The greatest percentage of *Streptococcus mutans* reduction occurred at the group of *Streptococcus mutans* incubated with pheophytin a dan exposed with 20 J/cm<sup>2</sup> diode laser. The reduction was 62%.

Keywords: Photodynamic Therapy, Diode Laser, *Streptococcus mutans*, Photosensitizer, Pheophytin a