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14 August 2019

# The potential of phytotherapeutic compounds available on the market as a new photosensitizers for dental antimicrobial PDT: a photochemical and photobiological in vitro study (Conference Presentation)

*Aguinaldo Silva Garcez; Elisa F. Nardini; Rielson Cardoso; Martha S. Ribeiro*

Author Affiliations +

Proceedings Volume 11070, 17th International Photodynamic Association World Congress, 110700P (2019)

[https://doi.org/ez67\\_periodicos.capes.gov.br/10.1117/12.2525257](https://doi.org/ez67_periodicos.capes.gov.br/10.1117/12.2525257)

Event: 17th International Photodynamic Association World Congress, 2019, Cambridge, Massachusetts, United States

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## Abstract

This study evaluated Curcuma longa, Citrus lemon, Hamamelis virginiana and Hypericum perforatum available on the market as photosensitizers (FS) in Antimicrobial Photodynamic Therapy (aPDT). Each FS were analyzed in a spectrophotometer between 350 and 750 nm, to determine the ideal light source. Once the absorption bands were determined, 3 light sources were selected to determine the concentration of use, the compounds were verified at different concentrations on bovine dentin samples to evaluate the risk of staining. Once the concentration was determined, FS were evaluated for cytotoxicity on fibroblast culture. Each compound was then irradiated with each light source and evaluated for indirect reactive oxygen species (ROS) production. The bacterial reduction was tested in culture of E. faecalis in planktonic form and in biofilm using energy of 10 J and Energy Density of 26 J/cm<sup>2</sup>. The tested compounds had light absorption in three bands of the visible spectrum: violet (405 nm), blue (470 nm) and red (660 nm). At 1:6 concentration, none of the compounds promoted tooth staining, as none of the compounds showed significant toxicity in cells or bacterial suspension. In addition, when the compounds were irradiated at each wavelength, significant ROS production was observed. When the aPDT was performed on the planktonic and biofilm bacteria, significant microbial reduction was observed for both cases, reaching up to 5Logs of reduction. In conclusion, extracts of Curcuma longa, Citrus lemon, Hamamelis virginiana and Hypericum perforatum, showed potential for use in aPDT as photosensitizing agents.

## Conference Presentation

MATERIALS AND METHODS

### MAXIMAL CONCENTRATION

- ▶ Samples of bovine dentin and enamel
- ▶ Teeth staining
- ▶ Spectrophotometer - Easysf
- ▶ 4 herbal extracts
- ▶ 1:1 to 1:10 concentrations
- ▶ 15 minutes

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Aguinaldo Silva Garcez, Elisa F. Nardini, Rielson Cardoso, and Martha S. Ribeiro "The potential of phytotherapeutic compounds available on the market as a new photosensitizers for dental antimicrobial PDT: a photochemical and photobiological in vitro study (Conference Presentation)", Proc. SPIE 11070, 17th International Photodynamic Association World Congress, 110700P (14 August 2019); [https://doi.org/ez67\\_periodicos.capes.gov.br/10.1117/12.2525257](https://doi.org/ez67_periodicos.capes.gov.br/10.1117/12.2525257)

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