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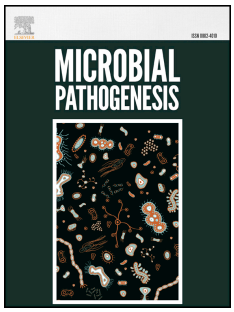

Antimicrobial and antibiofilm activities of nanoemulsions containing *Eucalyptus globulus* oil against *Pseudomonas aeruginosa* and *Candida* spp

Priscilla Maciel Quatrin, Camila Marina Verdi, Márcia Ebling de Souza, Samantha Nunes de Godoi, Bruna Klein, Andre Gundel, Roger Wagner, Rodrigo de Almeida Vaucher, Aline Ferreira Ourique, Roberto Christ Vianna Santos

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ANTIMICROBIAL AND ANTIBIOFILM ACTIVITIES OF NANOEMULSIONS CONTAINING *EUCALYPTUS GLOBULUS* OIL AGAINST *PSEUDOMONAS AERUGINOSA* AND *CANDIDA* SPP.

Priscilla Maciel Quatrin, Camila Marina Verdi, Márcia Ebling de Souza, Samantha Nunes de Godoi, Bruna Klein, Andre Gundel, Roger Wagner, Rodrigo de Almeida Vaucher, Aline Ferreira Ourique, Roberto Christ Vianna Santos

ABSTRACT

Candida species are the main responsible microorganisms for causing fungal infections worldwide, and *Candida albicans* is most frequently associated with infectious processes. *Pseudomonas aeruginosa* is a gram-negative bacterium commonly found in immunocompromised patients. The infection persistence caused by these microorganisms is often related to antimicrobial resistance and biofilm formation. In this context, the objective of the present study was to prepare and characterize nanoemulsions containing *Eucalyptus globulus* oil and to verify its antimicrobial and antibiofilm activities against *P. aeruginosa* and *Candida* spp. The nanoemulsions had a size of approximately 76 nm, a polydispersity index of 0.22, a zeta potential of – 9,42 mV and a pH of approximately 5.0. The *E. globulus* oil was characterized by gas chromatography, being possible to observe its main components, such as 1-8-Cineol (75.8%), p- Cymene (7.5%), α-Pinene (7.4%) and Limonene (6.4%). The antimicrobial activity of the nanoemulsion was determined from the macrodilution tests and the cell viability curve, where the minimum fungicidal concentration of 0.7 mg/mL for *C. albicans* and 1.4 mg/mL for *C. tropicalis* and *C. glabrata* were obtained. However, the nanoemulsions did not present antimicrobial activity against *P. aeruginosa*, since it contains only 5% of the oil, being ineffective for this microorganism. The nanoencapsulated oil action against the formed biofilm was evaluated by atomic force microscopy and calcofluor staining, and the nanoemulsion was more efficient for two of the three *Candida* species when compared to free oil.

Keywords: Nanotechnology, Biofilm, Atomic Force Microscopy, Calcofluor White.