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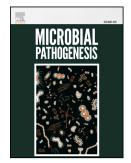
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ANTIMICROBIAL AND ANTIBIOFILM ACTIVITIES OF NANOEMULSIONS CONTAINING EUCALYPTUS GLOBULUS OIL AGAINST PSEUDOMONAS AERUGINOSA AND CANDIDA SPP.

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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.

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