

ANTIFUNGAL EFFECT OF FREE AND ENCAPSULATED *Cymbopogon citratus* ESSENTIAL OIL AGAINST *Candida* SPECIES

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ABSTRACT:

The increasing incidence of infections by pathogenic microorganisms has become an important cause of morbidity and mortality in immunocompromised patients. One of the main agents of nosocomial fungal infections are *Candida spp.*, and *Candida albicans* is the most commonly isolated specie. Factors contributing to the reduction of the effectiveness of the treatment are the development of resistance to antifungal drugs, as well as the appearance of undesirable effects of certain antimicrobial agents. Thus, arises the need to search for new agents with low toxicity and side effects. Antimicrobial agents of natural origin are effective and economical alternatives. They are obtained from herbs rich in essential oils characterized by a remarkable antimicrobial activity and for this reason their derivatives can be used to retard or inhibit microbial growth. The aim of this study was evaluate the antifungal activity of free and encapsulated essential oil of *Cymbopogon citratus* (EO) against *Candida albicans*, *Candida parapsilosis* and *Candida tropicalis*. The antifungal effect of EO was observed by broth microdilution method according to CLSI. Checkerboard method was used to assess synergic interaction between EO and Nystatin. Nanoprecipitation with PLA (Poly-lactide) was used to obtain nanoparticles containing EO. The value of the Minimum Inhibitory Concentration (MIC) was 1000 µg/ml in Fungicidal Concentration (MFC) was 2000 µg/ml against all species. EO demonstrated synergic effect when associated with Nistatyn, FICI was 0,187. A reduction on germ tube formation was observed at 500 µg/ml. After the nanoencapsulation of essential oil in PLA nanoparticles, by precipitation method, MIC values of 1000 µg/ml against *C. albicans* and *C. parapsilosis*, and 500 µg/ml against *C. tropicalis*, and MFC of 1000 µg/ml against *C. albicans*, and 2000 µg/ml against *C. parapsilosis* and *C. tropicalis* were obtained. This demonstrated that the values were identical of the nonencapsulated EO. Given the ratio of the oil compared with the polymer, the antifungal effect of the essential oil was maintained or enhanced. Additional tests are being conducted to the characterization of nanoparticles. Thus, there are prospects in the incorporation of the *Cymbopogon citratus* essential oil in nanoparticles of as alternative for antifungal treatment.

Keywords: *Cymbopogon citratus*, *Candida spp.*, antifungal, essential oil, nanoparticles

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