

Title: *Syngonanthus nitens* (Bong.) Ruhland-LOADED INTO LIQUID CRYSTAL PRECURSOR SYSTEM AGAINST *Candida krusei*: *in vitro* ANTIFUNGAL ACTIVITY AND ANTI-BIOFILM POTENTIAL

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Abstract:

Infections caused by *Candida krusei* is characterized as a problem of extreme complexity due to its intrinsic resistance from azole drugs and their ability to form biofilm in surfaces. The plant *Syngonanthus nitens* (Bong.) Ruhland have been to be promising in the antifungal activity, which stimulates research of new forms of application, such as the use of nanostructured system for drug delivery as the liquid crystal precursor systems (LCPS) that aimed to increase their pharmacological parameters. This study evaluated the antifungal potential of the methanolic extract of scapes of *S. nitens* loaded (SNEL) or not (SNE) into LCPS [Constituted in oleic acid (50%) as oil phase, PEG-5-Ceteth-20 (40%) as surfactant and a polymer dispersion of Carbophol™ + Policarbophyl 974P™ (10%) as aqueous phase] against *C. krusei* strains. For determination of the minimal inhibitory concentration (MIC) was used the dilution in microplates technique (microdilution) which the SNE and SNEL were evaluated in the concentrations from 1000 to 7.8 µg/mL using 1 standard strain (ATCC 6258) and 3 clinical strains (CKV1, 2 and 3). The *Time kill* assay was performed with the standard strain and the clinical more sensitive (CKV3) to evaluate the inhibitory behavior at different intervals (0, 30 min, and 1, 2, 4, 8, 12, 24, 36 and 48 hours), which aliquots were inoculated on Sabouraud dextrose agar plates. The plates were incubated at 37°C for 48 h for counting the number of colonies forming units (CFU). The assay of inhibition of the biofilm (ATCC and all clinical strains) was realized in microplate after 48 hours of biofilm formation and SNE and SNEL were evaluated at concentrations from 20 to 0.6 mg/mL. Amphotericin-B was used as control. The results showed more effective SNEL antifungal activity with MIC values from 62,5 to 31.2 µg/mL and the biofilm inhibition assays was active against one clinical biofilm (CKV2= 10 mg/mL). The *Time kill* showed that SNE and SNEL controlled the fungal growth (8 hours) in comparison to the growth control, after this period it was observed increase of CFU, indicating a possible fungistatic profile. It was concluded that the incorporation in LCPS was important for the delivery of SNE, improved their antifungal activity according *in vitro* analysis and could be an important source of investigation of the drugs with inhibitory action of the biofilm.

Keywords: *Candida krusei*; *Syngonanthus nitens*; Liquid crystal precursor system; Antifungal activity.

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