

TITLE: INHIBITORY ACTION OF FARNESOL ON BIOFILM OF TRICHOSPORON ASAHII AND T. INKIN

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ABSTRACT:

Systemic infections caused by *Trichosporon* are emerging opportunistic diseases with higher occurrence in patients with immunological weaknesses, especially those with hematological malignancies. They are fungi with great ability in the formation of biofilms in medical devices - sessile microbial communities, resistant to antifungals, whose presence is associated with therapeutic failures. Given the limited antifungal and antibiofilm arsenal currently available, several studies have been investigate as alternative antifungal molecules. Farnesol is a compound belonging to the quorum sensing system of *Candida albicans*, whose antifungal potential has been described in the last decade. The aim of this study was to evaluate the effect of farnesol on biofilms of *T. asahii* (n=1) and *T. inkin* (n=1) by means of scanning electron microscopy (SEM) and laser confocal microscopy. For this, the biofilms were formed on Thermanox™ slides with inoculum at the concentration of 10⁶ cells/mL and incubated at 35 °C. Farnesol was added at the concentration of 598 µM at times of cell adhesion (0-6 h), development (6-48 h) and after mature biofilm (48-98 h), then compared to its free controls of compound. For analysis in SEM the biofilms were fixed in 2.5% glutaraldehyde with 0.15 M sodium cacodylate buffer and added with 0.01% alcian blue dye and incubated at 4 ° C overnight. Then the biofilms were dehydrated, covered with gold and analyzed by SEM. For confocal microscopy the biofilms were treated with Live/Dead™ fluorescence dye and the slides were evaluated on a Nikon C2 confocal microscope, with a wavelength of 488 nm for the detection of SYTO9 dye and at 561 nm for the detection of propidium iodide. Electron microscopy images showed that farnesol reduced cell adhesion, biofilm development, and disrupted the mature biofilm of *T. asahii* and *T. inkin*. In the confocal microscopy images, it was possible observe that farnesol reduced the viability of the cells in the adhesion process, which presented cellular damages. Farnesol also altered the viability and structure of developing biofilms and mature biofilms. Thus, we can infer that farnesol is a promising compound as an antibiofilm agent in strains of *T. asahii* and *T. inkin*.

Keywords: *Trichosporon asahii*, *Trichosporon inkin*, Biofilm, Farnesol, antibiofilm, Quorum sensing,

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