

TITLE: ADHESION AND BIOFILM FORMATION BY *Candida tropicalis* UNDER DIFFERENT GROWING CONDITIONS.

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ABSTRACT:

Candida tropicalis (*Ct*), is the third most recurrent pathogen of the *Candida* genus. Adhesion is the first stage of the infectious process and the biofilm formation (BF), being essential for colonization. *Ct* adheres strongly to medical devices and to epithelial and endothelial cells from different anatomical sites. This species is a high biofilm-producing and the second most virulent *Candida* species. The present study aimed to evaluate the adhesion ability and BF by the clinical isolate of *Ct*-49.07 (CIs-49.07) from tracheal secretion, under different culture conditions (CC): RPMI-1640 medium (control condition), and media that simulate host microenvironments - vaginal mucosa medium (VM) and artificial urine medium (AU). 1×10^7 cells/mL of CIs-49.07 were inoculated in polystyrene microtiter plates and incubated at 37°C for 60 min (adhesion) and 72 hours (biofilm). Adhesion and BF were evaluated for total biomass (TB) by crystal violet, metabolic activity (MAct) by XTT and cell viability (CViab) by CFU counting. We also investigated the effect of culture condition on the cell surface hydrophobicity (CSH) of yeast, through the determination of fungal adhesion to hydrocarbons. We noted that the medium not modify the CSH of CIs-49.07 ($p > 0.05$), which was hydrophobic under all CC (CSH >45%) ($p < 0.05$). CIs-49.07 exhibited higher TB production in RPMI-1640, followed by CC that simulate host microenvironments, VM and AU, respectively, for both adhesion and BF. The CViab of the *Ct* biofilm was also higher in RPMI ($3.5 \times 10^6 \pm 1.2 \times 10^5$ cells/mL), followed by AU ($3.56 \times 10^5 \pm 1.96 \times 10^4$ cells/mL) and VM ($2.85 \times 10^5 \pm 3.89 \times 10^4$ cells/mL/ml) ($p < 0.05$). Similar MAct of adhered and biofilm yeast cells were observed in RPMI and AU medium; reduced MAct was observed in VM ($p < 0.05$). IsC-49.07 showed maintenance of the adhesion phenotype throughout the biofilm maturation under different host microenvironments, considering that the TB and MAct observed in adhesion step was correlated to TB and MAct in the mature biofilm for all CC (Pearson correlation r^2 0.7498, $p=0.0430$). Our data revealed that *Ct* has high CSH, regardless of CC. Furthermore, the correlation between adhesion and FB by *Ct* under different host niches suggests that the BF is a sequential process proportionally maintained over time, regardless of microenvironment. Therefore, IsC-49.07 has high phenotypic plasticity for adhesion and BF, essential virulence factors to *Ct* infection success.

Keywords: adhesion, biofilm, *Candida tropicalis*, host microenvironments.

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