TITLE: BIOFILM FORMATION AND ADHESION HABILITY OF CLINICAL AND ENVIRONMENTAL ISOLATES OF *Candida albicans*

AUTHORS: BENTO, A.O.; ZUZA-ALVES, D.L.; MEDEIROS, S.S.T.Q.; SILVA-ROCHA, W.P.; SOUZA, L.B.F.C.; MEDEIROS, M.A.P.; CHAVES, G.M.

INSTITUTION: LABORATÓRIO DE MICOLOGIA MÉDICA E MOLECULAR, DEPARTAMENTO DE ANÁLISES CLÍNICAS E TOXICOLÓGICAS, UNIVERSIDADE FEDERAL DO RIO GRANDE DO NORTE (AV. GAL. CORDEIRO DE FARIA S/N, 1º ANDAR, CEP 59012-570 - PETRÓPOLIS, NATAL – RN, BRAZIL)

ABSTRACT:

Superficial fungal infections may affect a great part of human populations, including those who frequent coastal environments, that may be contaminated with yeasts that normally belong to the normal human microbiota. These yeasts may cause opportunistic infections under certain circumstances, but also have the ability to express important virulence factors, such as adhesion to epithelial cells and biofilm formation. *Candida albicans* is still the most prevalent and virulent species of the *Candida* genus. The present study aimed to determine adhesion to epithelial cells and biofilm production capacity of 64 *C. albicans* isolates as follows: 32 isolates obtained from the sandy beach of Ponta Negra, Rio Grande do Norte, Brazil comparing with 32 isolates obtained from patients with superficial infections (mucosa, skin and nails). Adhesion was determined by counting yeast cells adhered to 150 Human Buccal Epithelial Cells (HBEC), after 1 h incubation at 37 °C, 200 rpm. Biofilm formation was performed in microtiter plates, with the determinations of OD readings at 570 nm, with crystal violet staining, after 66 h incubation. Clinical isolates of *C. albicans* have shown greater ability to adhere to HBEC, with 225 ± 75.2 *C. albicans* cells/150 CEBH in average, whereas environmental isolates showed an average of 171 ± 43.9 *C. albicans* cells/150 CEBH. Regarding biofilm formation, only 6.25% (2/32) of the environmental strains did not form biofilm; 53.12% (17/32) were considered weak producers; 9.38% (3/32) produced moderately biofilm and 31.25% (10/32) were classified as strong biofilm producers. OD_{570nm} readings ranged from 0.02 ± 0.01 to 2.50. All the clinical clinical strains were characterized weak biofilm producers, and absorbance ranged from negative values to 0.19 ± 0.01. Reference strains of *C. albicans* (ATCC90028 and SC5314) showed absorbance of 0.16 ± 0.00 and 0.17 ± 0.01, respectively, both classified as weak biofilm producers. Thus, our results show that clinical isolates of *C. albicans* have greater adhesion capacity when compared to environmental isolates, but environmental strains obtained from sandy beaches are still able to adhere to epithelial cells. In addition, strains from the coastal environment presented higher biofilm production when compared to reference strains and clinical strains obtained from superficial mycoses, revealing a possible pathogenic potential.

Keywords: *Candida albicans*, adhesion capacity, biofilm formation, clinical and environmental isolates

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