

**TITLE:** BIOFILM FORMATION BY *HISTOPLASMA CAPSULATUM* IN DIFFERENT GROWTH CONDITIONS

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**ABSTRACT:**

*Histoplasma capsulatum* is a dimorphic fungi that causes an important systemic mycosis, called histoplasmosis. Recently, the ability of these fungi to form biofilms has been described. A correlation between the mode of infection of *H. capsulatum* and the formation of these communities was also established, which can induce, in addition to resistance, the virulence of the pathogen. This work aimed to further study of these biofilms, by checking the influence of different culture media and oxygen atmospheres in the development of these communities. The biofilm formation by two strains (ATCC 26029 – G186A and EH315) was characterized in different nutrient conditions [*Brain Heart Infusion* (BHI), *Roswell Park Memorial Institute* (RPMI) with 2% of glucose, *Dulbecco's Modified Eagle Medium* (DMEM) supplemented with 10% fetal bovine serum and nutrient medium HAM-F12 (HAM-F12) supplemented with glucose (18.2 g / L), glutamic acid (1 g / L), HEPES (6 g / L), and L-cysteine (8.4 mg / L)] and atmospheres of oxygen (aerobic and microaerophilic). Optical microscopy techniques, XTT reduction assay, as well as crystal violet and safranin staining, and scanning electron microscopy (SEM) were performed. The results indicated that, although all the culture media stimulated the maturation of the communities, the nutrient-rich culture media, such as HAM-F12, provided a better biomass and extracellular matrix development when compared to the others. In addition, microaerophilic conditions were the most favorable than aerobic. The topographies observed in SEM showed yeasts surrounded at several points by an exuberant amount of extracellular matrix. However, in the biofilms formed in BHI, RPMI and DMEM, a reversal of yeasts for significant filamentation was observed, which needs better investigation. The results obtained so far represent significant advances for the field of biofilms and open new possibilities for the study of virulence and *Histoplasma*-host interaction.

**Keywords:** *Histoplasma capsulatum*, biofilms, virulence factors

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