

TITLE: MOLECULAR IDENTIFICATION AND ANTIFUNGAL ACTIVITY OF NANOCOMPOUNDS AGAINST *Sporothrix* sp.: AGENTS CAUSING SPOROTRICHOSIS IN HUMANS

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ABSTRACT:

Sporotrichosis is a mycosis characterized by cutaneous and subcutaneous lesions with lymphocutaneous dissemination, and, more rarely, systemic complications. It is caused by the thermotrophic fungi of the *Sporothrix schenckii* complex and transmitted by the traumatic inoculation of the agent to the host. Species of this complex are saprophytic and have a wide distribution in tropical and subtropical climates. They may affect animals, especially felines, and humans. As an alternative to currently available treatments for infectious diseases, nanocomposites have been developed, exhibiting high antimicrobial activity, low toxicity and biocompatibility. The objective of this work was to test the antifungal activity of silver/hydroxyapatite (Ag/HAP) nanocomposites, against these isolates of *Sporothrix* spp. For this purpose, secretion and biopsy were evaluated and after growth, morphophysiological characterization was performed by analysis of the colonies. Micromorphological characteristics were observed under optical microscopy in slide cultures incubated at 28°C, for 7 days. The strains were identified as *Sporothrix* sp. by molecular analysis using species-specific PCR for the *S. schenckii* complex, targeting a portion of the calmodulin gene region. Genomic DNA was extracted from the mycelial phase of isolates on PDA plates at 28°C for 10 days, using the FastDNA kit (MPBimedicals®). A primer targeting the ITS region was used as internal control, to guarantee the quality of the extracted DNA. The amplified products were analyzed with agarose gel electrophoresis. The in vitro susceptibility was tested by a microdilution reference method for yeast phase. All strains were identified as *Sporothrix brasiliensis*. The antifungal activity of Ag/HAP was observed for both silver concentrations, with a minimum inhibitory concentration ranging from 31,2-250 µg/ml. In recent years, the study of the *S. schenckii* complex has become of great relevance due to the increase in the number of cases of human and feline sporotrichosis registered throughout the country. In this scenario, this study contributes to the knowledge of biophysicochemical interactions at nano-bio interface between Ag-HAP nanocomposites and *S. brasiliensis*.

Keywords: *Sporothrix*, Sporotrichosis, epidemiology.

Development Agency: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)