

## INVASION PROCESS OF *Trichophyton rubrum* IN HEALTHY HUMAN NAIL AS ONLY NUTRITIONAL SOURCE

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**ABSTRACT :** Onychomycosis is the infection of the nail caused by fungi distributed worldwide. *Trichophyton rubrum* is one of the main anthropophilic species, being its infection usually caused by direct contact of susceptible parts of the body with contaminated surfaces and fomites. It has been proved that these fungi are keratinophilic, however it is not well elucidated about the invasion and destruction process of healthy nails. Thus, the aim of this work was to assess the process used by *T. rubrum* in the invasion of a healthy nail using it as only nutritional source. It was used a clinical isolate of *T. rubrum* originated from onychomycosis which is maintained at the Medical Mycology laboratory at Universidade Estadual de Maringá. An inoculum of  $1 \times 10^7$  CFU/mL was prepared from the fungal isolate previously grown for seven days on Potato Dextrose Agar (Difco, Detroit). 500 $\mu$ l of the inoculum was incorporated, according to the pour plate technique, to YNB Agar (Yeast Nitrogen Base, Difco, Detroit) without any source of carbon. After the agar solidification, fragments of healthy nails previously autoclaved were inoculated with the fungus and inserted on strategical points on the agar. The plates were incubated for seven days at 25 °C with daily inspection in order to assess the necessary time consumed by the isolate to grow using the nail as only nutritional source as well as the speed of fungal invasion on the nail plate. Macroscopic and microscopic aspects of this growth were also compared. Macroscopically, it was possible to observe hyphae spreading over the nail, indicating that this fungus is capable of growing using only this tissue. Besides, the micro morphologic analysis enabled us to visualize a great number of internalized hyphae spread over the nail, suggesting that *T. rubrum* may cause severe damage once it penetrates the tissue. This result contributes to the discovery of new penetration techniques and to the maintenance of the fungal infection with keratinophilic fungi. Researches like this are of crucial importance to unravel the process of infection, therapy obstacles and the chronicity of dermatophytosis.

**KEYWORDS:** Onychomycosis, *Trichophyton rubrum*, nail.