

TITLE: *IN VITRO* PRODUCTION OF KERATINASE AND COLLAGENASE BY ENVIRONMENTAL *Nannizzia gypsea* ISOLATES

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ABSTRACT:

Dermatophytes are keratinophilic fungi recognized for promoting superficial and zoonotic mycosis called dermatophytosis. In addition to the zoophilic and anthropophilic nature, some species are also classified as geophilic, naturally occurring in the soil, such as *Nannizzia gypsea* (*Microsporum gypseum*) and *N. nana* (*Microsporum nanum*). These are also potential dermatophytosis etiological agents, especially in animals. *N. gypsea* is one of the most prevalent keratinophilic species in soil samples from the most diverse localities, reinforcing the importance of the study considering this fungi species. Among the most important virulence factors of the dermatophytes, we highlight keratinase and collagenase. They have a key role in the development of dermatophytosis, being also reported as potential enzymes for industrial processes and waste biodegradation. The objective of this research was to cultivate *N. gypsea* from soil sources of several Brazilian locations and to evaluate the production of these enzymes by these environmental isolates. Soil samples from 34 different Brazilian locations were processed in the Mycology Laboratory of the Veterinary Institute of UFRRJ. To isolate the fungi, we used the classic Vanbreuseghen technique, which employs a natural source of keratin mixed with a soil sample. The keratinase and collagenase production was analyzed by stimulating the enzymatic production in broths containing substrates, followed by a quantification (U.K. - Keratinase Units / U.C. - Collagenase Units) based on absorbance readings in a spectrophotometer. Twenty-five isolates of *N. gypsea* were obtained, suggesting that this is the most prevalent dermatophytic species present in the evaluated soil. All isolates were keratinase and collagenase producers. The UK average was 2.172 ± 1.4 and the mean U.C. was 4.892 ± 0.3 . These data demonstrate the potential of *N. gypsea* in producing these virulence factors involved in dermatophytosis. More attention is needed on disease prevention, especially in the case of animals that have intimate contact with the soil. In addition, these fungi are potential agents for use in industrial processes involving these enzymatic substrates. Considering the production of these enzymes by all strains and the presence of these dermatophyte fungi in all samples, it is concluded that there is a need for adequate handling and care of the facilities of the animals and the places in which they occur, to avoid dermatophytoses by *N. gypsea*.

Keywords: Dermatophytes, Dermatophytosis, Enzymes, Virulence factors

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