

DETECTION OF FUNGAL MYCOTOXINS PRODUCED BY THE GENERA ASPERGILLUS, PENICILLIUM, PAECILOMYCES AND CLADOSPORIUM IN AIR-CONDITIONED ENVIRONMENTS

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Abstract:

Filamentous fungi are extremely common organisms in nature and their development is related to optimum conditions of temperature and humidity. In such conditions, the air-conditioned environments propitiate the presence of these microorganisms, which often are associated to particles in suspension resulting of inadequate maintenance of circulation air equipment, or controllers of air humidity in precarious operating conditions. Some of these fungi produce mycotoxins, which are secondary metabolites that can cause illness or death when ingested by man, thus, becoming a public health problem. The objective of this research was to verify the production of mycotoxins by fungus of air-conditioned environments, which were previously isolated and identified by the Laboratory of Air-Conditioned Environments of UFAL. The studied sampling consisted of 176 fungal isolates, and was identified by microculture in 8 species: *Aspergillus fumigatus* (n=22), *Aspergillus flavus* (n=32), *Penicillium commune* (n=23), *Penicillium expansum* (n=21), *Penicillium rugulosum* (n=23) and *Penicillium spinulosum* (n=20), *Cladosporium cladosporioides* (n=15), *Paecilomyces variotii* (n=20). The samples were inoculated as central colonies in petri dishes with Coconut Milk Agar, and then incubated for 5-8 days at 28°C. Subsequently, the toxic activity was analyzed by the naked eye to verify the presence of pigmentation and under the Ultraviolet light to see the presence of fluorescent halos surrounding the colonies. From the 176 isolates, 119 (67.6%) are potential producers of mycotoxins: *A. fumigatus* 18 (81.8%), *A. flavus* 26 (81.2%), *P. commune* 17 (73.9%), *P. expansum* 16 (76.1%), *P. rugulosum* 16 (69.6%), *P. spinulosum* 10 (50%), *C. cladosporioides* 8 (53.3%), *P. variotii* 8 (40%). In summary, the studied species are cited as producers of mycotoxins, such as Ochratoxin (*P. variotii* and *P. rugulosum*), Patulin (*P. expansum*, *P. commune* and *P. rugulosum*), Aflatoxin (*A. flavus*, *P. variotii*), Rugulosin (*P. rugulosum*), Citrinin (*P. expansum*), and Gliotoxin (*A. fumigatus*) that are associated to mutagenic, carcinogenic and teratogenic effects. Given these facts, a deeper study is necessary to characterize the mycotoxins produced and analyze the gene expression involved in the biosynthesis, which can explain why some samples of the same species do not have toxic activity.

Key words: *Aspergillus*, Air-conditioned environments, *Cladosporium*, filamentous fungi, mycotoxins, *Paecilomyces*, *Penicillium*

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