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Molecular Identification and Evaluation of the Ability to Produce Phospholipase and Proteinase by Aspergillus Environmental Isolates Obtained from Hospital

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Original Article

Abstract

Background: One of the causes of nosocomial infections is the dispersion of Aspergillus spores in the environment. The secretion of hydrolytic enzymes is considered as a virulence factor in Aspergillus species. The aim of this study was to identify environmental Aspergillus isolates via sequencing the beta-tubulin gene and evaluating the ability to produce phospholipase and proteinase in vitro.

Methods: 93 Aspergillus colonies were collected from the emergency, surgical wards, intensive care unit, and operation theatres of two teaching hospitals in Qazvin Province, Iran. The β-tubulin gene region was amplified using polymerase chain reaction (PCR) method, and 40 isolates were sequenced. Evaluation of proteinase and phospholipase production was performed using yeast carbon base (YCB) with bovine serum albumin and egg yolk agar medium, respectively.

Findings: Based on β-tubulin sequence, Aspergillus (A.) flavus (30%), A. tuberculosis (25%), A. fumigatus (20%), A. niger (10%), A. sydowii (7.5%), A. terreus (5%), and A. nidulans (2.5%) were identified. Evaluation of extracellular enzymes showed that 82.5% of the isolates had proteinase ability with a mean proteinase of 0.73 ± 0.13, and 52.5% of the studied Aspergillus isolates had phospholipase activity with a mean of 0.81 ± 0.17.

Conclusion: Our study showed that environmental strains have high proteinase production. Therefore, it seems necessary to better understand the association of virulence factors with aspergillosis infection in future studies.

Keywords: Aspergillus; Tubulin; Peptide hydrolases; Phospholipase

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