Comparison of the aflatoxin B1 production pattern in fungal biomass and growth medium in toxigenic 
Aspergillus species of northern isolates of Iran

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Abstract
Aflatoxin is the most economically important mycotoxin in the world. The most toxic form of aflatoxin is aflatoxin B1. It is one of the few fungal toxins that is regulated by the US food and drug administration; moreover, compared with other mycotoxins, more is known about its biology and biosynthesis. In the present study, our aim was to detect the ability of aflatoxin B1 to be produced in different Aspergillus species that have been isolated from agro-ecological zones and processing plants in the North of Iran. The concentration of AFB1 in the samples was investigated by competitive enzyme-linked immunosorbent assay (ELISA). Also, through using the ELISA method, the aflatoxin B1 production pattern was compared between fungal biomass and growth medium in toxicogenic isolates. The results showed that all of the studied Aspergillus species isolates tended to produce aflatoxin B1. Although there was a statistically significant difference in the mean of aflatoxin B1 in growth medium and cell extract in several species, in A. flavus, A. parasiticus, A. sojae, A. terreus, A. ostianus, A. carbonarius, A. wentii, storing the toxin in fungal cell was more than that of releasing toxin in matrix culture medium. In the other isolates including A. niger, A. foetidus and A. ocreatus, export of toxin was more than that of cell storage. We concluded that toxicogenic isolates of Aspergillus spp can be found in all the studied geographic areas of Northern Iran. Although the behavior of species in releasing of aflatoxin into the growth environment was different, we hypothesized that it depends on different mechanisms that effect export toxin into the external environment.

Key words: Aflatoxin, Aspergillus, Fungal biomass, Growth medium, Toxigenic

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References


