Abstract

Ochratoxin A (OTA) is a mycotoxin which contaminates different plant products, including cereals, coffee, and dried grape. *Aspergillus* and *Penicillium* species were identified as the main producer of OTA. Ochratoxin A is a potent nephrotoxin. The presence of OTA in raisin is an important barrier to raisin export. The maximum tolerable level of OTA in raisin is 10 µg/kg. During 2010-2012 a research was carried out on the monitoring of ochratoxin A and ochratoxin A-producing fungi in Khorasan, Azarbaijan, and Qazvin provinces. The samples were collected from different processing stages of raisin, storages and factories. To study fungal contamination two methods of plating surface disinfected raisin and washing of raisin surface (suspension) on artificial media were used. *Aspergillus* section *Nigri* species were isolated and the growth of *Aspergillus* section *Nigri* species which were assumed to produce ochratoxin A were recorded after incubation period. To confirm morphological identification of *A. carbonarius* isolates, DNA of three *A. carbonarius* isolates were extracted and their ITS regions of ribosomal DNA and β- tubulin genes were amplified by PCR and sequenced. Ochratoxin A contaminations of the raisin samples were estimated using HPLC-IAC method. To study ochratoxin A producing ability of *Aspergillus* section *Nigri* species isolated from raisin, 14 isolates selected as representative were cultured on PDB medium and OTA produced by each isolate was evaluated using HPLC-IAC method. All raisin samples were contaminated by *Aspergillus* section *Nigri* species. The mean of the assumed ochratoxin A producing -fungi contamination of raisin samples was 56.31 (8-100%) but varied depending on the processing method, raisin variety and location. The highest contamination was found in injured not directly edible raisin. Twenty percent of the isolates belonged to *A. carbonarius* species and the rest to *A. nigra*. Ochratoxin A was found in five samples out of 44 (11%) raisin samples at the contamination levels of 0.4 to 100 ng/g. 71% of tested *A. carbonarius* isolates produced ochratoxin between 0.78-108.8 ppb. DNA sequencing data were generated for a part of 18S-ITS1-5.8S-ITS2 and 28S region of the rDNA, and β- tubulin gene region. These sequences were compared to other sequences of *A. carbonarius* in GenBank and showed 100% and 99% similarity, respectively. These data confirmed the morphological examinations. Sequences were submitted to GenBank under the accession numbers KF434631, KF434632, and KF434633 for ITS, and KF434634-KF434635 for β- tubulin gene. Since the highest contamination was found in injured raisins, they can be easily removed to reduce contamination by fungi and ochratoxin.

Keywords: Raisin, Iran, Ochratoxin, *Aspergillus carbonarius*

See Persian text for figures and tables (Pages 1-4).
References


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