Mycotoxin contamination of dried grapes and strategies to control the damages

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Acta Horticulturae 963: 65-67. 2012.

Abstract

Grape is a fruit appreciated by consumers as fresh, dried (raisins), or as processed products, such as grape juice and wine. Sometimes these products are heavily infected with chemical composition and secondary metabolites such as mycotoxins. Several factors affecting mycotoxin production include the fruit or vegetable type, geographical location, climate, harvest treatments and storage management. Relevant mycotoxins are signaled in fruits, with major problems in dried fruits as compared to fresh fruits. Iran has large orchards of various grape cultivars and potential to improve the cultivation and production. Also, it is one of the important producers of raisins in the world with more than 240,000 MT annually. Raisins are one of the significant products with rich nutrient and extremely high calories. They may carry a significant mycological load contaminated via cultivation, post-harvest processing and drying process. Mycotoxins are toxic in trace amounts therefore assays must be extremely sensitive. Temperate climates are the biggest risk with respect to mycotoxins from climate change in developed countries. The most prevalent genera from which mycotoxins were isolated from raisin samples are *Aspergillus* and *Penicillium* spp., including ochratoxin A., aflatoxins, patulin, and citrinin. Although, these toxins are associated with a wide range of lower optima temperatures, surveys for ochratoxin A have been carried out in many countries and it is the main toxin in grape and dried vine. In contrast to the significant work on ochratoxin A, there are fewer reports on the presence of aflatoxins in dried vine fruits. Different storage conditions with water activity and temperature levels below 0.930 and 15°C, respectively, allow limiting the ochratoxin A production in raisins. This discussion explains postharvest strategies and the use of natural and chemical agents are important in the prevention of mycotoxin contamination.