JCHR

Journal of Community Health Research 2020; 9(3): 139-140.

The Effect of Edible Coating Containing Plant Extract on Inhibiting the Growth of Aflatoxin in Nuts

Mehrnoosh Shirdeli [1], MaryamSadat Shahidi [2], Matthew Shirani [3], Ameneh Marzban [4], Fatemeh Yaghoubi [*5]

1. Department of Food Hygiene and Safety, School of Public Health, Shahid Sadoughi University of Medical Sciences,Yazd, Iran
2. Department of Genetics and Biochemistry, Sirjan School of Medical Sciences, Sirjan, Iran
3. Department of biological Science, Chandler-Gilbert Community College, Maricopa County, Arizona, United States of America
4. Department of Human Ecology, School of Public Health, Shahid Sadoughi University of Medical Sciences,Yazd, Iran
5. Department of Clinical Biochemistry, School of Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

ARTICLE INFO

Letter to the Editor

Received: 20 Jun 2020
Accepted: 2 August 2020

Corresponding Author:
Fatemeh Yaghoubi
f.yaghobi67@gmail.com

How to cite this paper:
Shirdeli M, Shahidi MS , Shirani M, Marzban A, Yaghoubi F. The Effect of Edible Coating Containing Plant Extract on Inhibiting the Growth of Aflatoxin in Nuts. J Community Health Research. 2020; 9(3): 139-140.

Nutrition science has proven a great deal of benefits to nuts. In addition to providing a healthy diet, these foods can reduce the risk of certain chronic diseases, including Type 2 diabetes and cardiovascular disease (1).

Application of nuts is not only limited to health, but also plays an important role in the field of export and economic prosperity. It seems that the health quality of plant seeds such as pistachios and almonds has been effective in reducing the global market share of these products (2). Annually, 20% of food products produced in the world are contaminated with mycotoxins by fungal toxins. Aflatoxins are secondary fungal metabolites produced by toxic species of Aspergillus and Penicillium fungi (3). These compounds are highly toxic and carcinogenic and are known as mutagenic substances in the world. These carcinogenic compounds are produced by some species of Aspergillus at various stages, including harvesting, transporting, or storage (4). However, the most important factor in nuts contamination with aflatoxin is exposure to fungal contamination in the garden. So far, several methods have been used to detect these contaminants, including high-performance liquid chromatography (HPLC) and immunoaffinity 2 columns widely used in the detection of pistachio aflatoxin and other agricultural products in the research and commercial fields (5).

In this method, the isolation and extraction of aflatoxin is complicated, in addition to the time consuming and the need for a lot of experimenter experience with other characteristics of the application of this technique (6).

In recent years, extensive research has been conducted in various fields of medicine and pharmacy to utilize Raman spectroscopy, and in particular the Raman Signal Upgrade Technique (7). The main focus of this research was on the

Copyright: ©2020 The Author(s); Published by Shahid Sadoughi University of Medical Sciences. This is an open-access article distributed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

[Downloaded from jhr.ssu.ac.ir on 2026-09-09]

[DOI: 10.18502/jchr.v9i3.4257]

early detection and detection of cancerous tissues, bacteria, fungi, and pharmaceutical chemicals. In the research, multivariate classification or regression models are commonly used to map and interpret spectral information (8). Considering that the use of these methods is only used to detect fungal contamination of nuts after contamination of these products, which not only causes irreparable damage to the economy of the country, but also can be a health threat to the health of the community. Recently, a lot of attention has been paid to the use of medicinal plant extracts to control aflatoxin producing fungal contaminants on foodstuffs (9, 10). For example, in a study that investigated the effect of edible coating containing cinnamon extract on the control of Aflatoxin producing Aspergillus flavus, on almonds, The results of this study showed that edible coating containing cinnamon extract is effective in controlling the growth of Aspergillus flavus fungus on the almond brain. However, the practical use of these extracts requires more economic, microbial, and toxicological studies.

Acknowledgments

The authors would like to appreciate Dr.Abdolrazagh Marzban who helped us in writing the present study.

Author contribution

M.SH and A.M contributed to the research and M.SH, F,Y AND MS.SH writing of the manuscript.

Conflict of Interest

The author does not have any conflict of interest.

Keywords

Edible coating, Aflatoxin, Nuts

References

1. Bai SH, Brooks P, Gama R, et al. Nutritional Quality of Almond, Canarium, Cashew and Pistachio and Their Oil Photooxidative Stability. Journal of Food Science and Technology. 2019; 56(2): 792-798.
2. Augoustinos, Martha; Crabb, Shona; Shepherd, Richard. Genetically Modified Food in the News: Media Representations of the GM Debate in the UK. Public Understanding of Science. 2010; 19(1): 98-114.
3. Macheleidt J, Mattern DJ, Fischer J, et al. Regulation and Role of Fungal Secondary Metabolites. Annual Review of Genetics. 2016; 50: 371-392.
4. Šimko P. Factors Affecting Elimination of Carcinogenic Compounds from Food Products. Emerging and Traditional Technologies for Safe, Healthy and Quality Food: Springer. 2015: 55-66.
5. Sabet FS, Hosseini M, Khabbaz H, et al. FRET-Based Aptamer Biosensor for Selective and Sensitive Detection of Aflatoxin B1 in Peanut and Rice. Food Chemistry. 2017; 220:527-532.
6. Huertas-Pérez JF, Arroyo-Manzanares N, Hitzler D, et al. Simple Determination of Aflatoxins in Rice by Ultra-High Performance Liquid Chromatography Coupled to Chemical Post-Column Derivatization and Fluorescence Detection. Food Chemistry. 2018; 245:189-195.
7. Lednev VN, Sdvizhenskii PA, Grishin MY, et al. Laser Crater Enhanced Raman Spectroscopy. Optics Letters. 2017; 42(3):607-610.
8. Majeed S. Analysis, Inhibition and Degradation of Mycotoxins in Foodstuffs: Department of Biotechnology Pakistan Institute of Engineering and Applied Sciences Nilore, Islamabad, Pakistan. 2018.
9. Prakash B, Kedia A, Mishra PK, et al. Plant Essential Oils as Food Preservatives to Control Moulds, Mycotoxin Contamination and Oxidative Deterioration of Agri-Food Commodities–Potentials and Challenges. Food Control. 2015; 47:381-391.
10. Kosalec I, Cvek J, Tomić S. Contaminants of Medicinal Herbs and Herbal Products. Arhiv Za Higijenu Rada I Toksikologiju. 2009; 60(4): 485-500.

[Downloaded from jhr.ssu.ac.ir on 2026-09-09]

[DOI: 10.18502/jchr.v9i3.4257]