engineering proceedings

MDPI

Abstract

Anti-mycotoxigenic efficacy of redox-active natural compounds and derivatives †

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† Presented at the 4th International Electronic Conference on Applied Sciences, 27 Oct–10 Nov 2023.

Abstract: Contamination of the food supply by natural sources such as mycotoxins is problematic, with outbreaks of commodity-specific food products directly affecting the public health. This study addresses developing control measures to reduce or eliminate mycotoxin contamination by *Aspergillus* species by using natural products or their structural derivatives. The natural, redox-active chemicals, such as benzoic compounds, can be potent redox cyclers that inhibit normal fungal physiology by disrupting cellular redox homeostasis, thus interfere with mycotoxin biosynthesis. Thirteen compounds, generally recognized as safe, were examined at concentrations maintaining fungal growth but inhibiting mycotoxin production in *Aspergillus flavus* and *Aspergillus parasiticus*. Our data indicated that 4-isopropyl-3-methylphenol, structural analog of the natural compound thymol, exhibited a potent anti-mycotoxigenic activity while salicylic acid was less effective. Structure-activity relationship existed for the differential efficacy of test compounds on the inhibition of mycotoxin production. We concluded that selected natural products can be used for preventing mycotoxin contamination, which could be applicable to safe production of foods.

Keywords: aflatoxins; *Aspergillus*; benzoic derivatives; food safety; redox-active compound; structure-activity relationship

Author Contributions: Conceptualization, J.H.K.; methodology, J.H.K.; validation, J.H.K., K.L.C. and D.F.; formal analysis, J.H.K.; investigation, J.H.K., K.L.C. and D.F.; data curation, J.H.K. and D.F.; writing—original draft preparation, J.H.K.; writing—review and editing, J.H.K., K.L.C. and D.F.; supervision, J.H.K. All authors have read and agreed to the published version of the manuscript.

Funding: This research was supported by USDA-ARS CRIS Project 2030-42000-054-000-D.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data generated by this study are available in the slide.

Acknowledgments: We thank Siov Sarreal and Jeffrey D. Palumbo, Foodborne Toxin Detection and Prevention Research Unit, Western Regional Research Center, USDA-ARS, for technical assistance.

Conflicts of Interest: The authors declare no conflict of interest.

Citation: To be added by editorial staff during production.

Academic Editor: Firstname Lastname

Published: date