

Mycotoxin Protocols

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Edited by

Mary W. Trucksess

and

Albert E. Pohland

*Food and Drug Administration
Washington, DC*

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Preface

Mycotoxins produced by molds are common contaminants of many important crops, including wheat, corn, rice, and peanuts. Some mycotoxins are found in fruits and vegetables. These contaminants have a broad range of toxic effects, including carcinogenicity, neurotoxicity, and reproductive and developmental toxicity. The occurrence of mycotoxins in foods is an unavoidable worldwide problem. About 80 countries have imposed regulatory limits to minimize human and animal exposure to mycotoxins. Regulatory limits, including international standards, have tremendous economic impact and must be developed using science-based risk assessments. The purpose of *Mycotoxin Protocols* is to provide the scientific and technological basis for analytical methods for use in obtaining the exposure data needed for risk assessments.

Mycotoxin Protocols is divided into four sections, which are interconnected. The first section: Chapters 1–5 describe the general techniques for mycotoxin analysis with emphasis on the importance of method validation based on statistical parameters; sampling procedures for collecting a sample as representative as possible of a bulk lot; the isolation of mycotoxins for use as analytical standards or for toxicological studies; the evaluation of purity and preparation of standards; and the detection and identification of impurities in isolated mycotoxins. Sections 2–4: Chapters 6–19 describe the most current chromatographic and immunochemical methods for studies on the major mycotoxins. The equipment, reagents, and procedures are given in great detail for the analysis of aflatoxins, aflatoxin M₁, cyclopiazonic acid, ochratoxin A, deoxynivalenol and other trichothecenes, moniliformin, fumonisins, zearalenone, *Stachybotrys* toxins, citrinin, patulin, ergot alkaloids, and *Alternaria* toxins.

Almost half of the methods are the molecular-based immunochemical or immunochemical/chromatographic techniques. The modern era of immunoassay techniques began with the development of a radioimmunoassay technique for insulin by Yalow and Berson in 1959. Although aflatoxin was discovered in 1960, immunochemical methods for mycotoxin analysis did not become widely used until commercial kits were developed in the 1980s. Immunochemical methods have now become an integral part of advanced techniques, such as mass spectrometric analysis, and complement such other useful analytical

procedures as thin layer chromatography, liquid chromatography, and capillary electrophoresis. With the development of biosensors, immunochemical methods will probably become the methods of choice for mycotoxins in the future.

We trust that readers will find each chapter of *Mycotoxin Protocols* helpful and informative for their own analytical needs. We wish to thank the authors for their enthusiastic and diligent work in preparation of this book.

Mary W. Trucksess, PhD

Albert E. Pohland, PhD

Contents

Preface	v
Contributors	ix

PART I. GENERAL TECHNIQUES

1 Mycotoxin Method Evaluation: <i>An Introduction</i> Albert E. Pohland and Mary W. Trucksess	3
2 Sampling Techniques Thomas B. Whitaker	11
3 Preparatory Isolation of Mycotoxins from Solid Phase Fungal Cultures Robert M. Eppley	25
4 Preparation of Mycotoxin Standards Stanley Nesheim and Michael E. Stack	31
5 Electrospray Mass Spectrometry for Mycotoxin Detection and Purity Analysis Jon G. Wilkes and Jackson O. Lay, Jr.	37

PART II. METHODS FOR *ASPERGILLUS* TOXINS

6 Measurement of Aflatoxins Using Capillary Electrophoresis Chris M. Maragos	51
7 Liquid Chromatographic Method for Aflatoxin M ₁ in Milk Hans P. van Egmond and Sylviane Dragacci	59
8 Immunochemical Method for Cyclopiazonic Acid Joe W. Dorney, Victor S. Sobolev, Wanjun Yu, and Fun S. Chu	71
9 Immunochemical Method for Ochratoxin A Ewald Usleber, Richard Dietrich, Elisabeth Schneider, and Erwin Märtlbauer	81

PART III. METHODS FOR *FUSARIUM* TOXINS

10 Solution Fluorometric Method for Deoxynivalenol in Grains Bruce Malone	97
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11	Chromatographic Method for Trichothecenes Takumi Yoshizawa	115
12	Chromatographic Method for the Determination of the Mycotoxin Moniliformin in Corn Célestin Munimbazi and Lloyd B. Bullerman	131
13	Liquid Chromatographic Method for Fumonisin in Corn Gordon S. Shephard	147
14	Enzyme-Linked Immunosorbent Assays of Zearalenone Using Polyclonal, Monoclonal, and Recombinant Antibodies Mi-Gyung Lee, Qiao-Ping Yuan, L. Patrick Hart, and James J. Pestka	159
PART IV. METHODS FOR OTHER FUNGAL TOXINS		
15	Chromatographic Method for <i>Stachybotrys</i> Toxins Simon F. Hinkley and Bruce B. Jarvis	173
16	Immunochemical Method for Citrinin David Abramson, Ewald Usleber, and Erwin Märklbauer	195
17	Solid Phase Extraction Method for Patulin in Apple Juice and Unfiltered Apple Juice Mary W. Trucksess and Yifeng Tang	205
18	Liquid Chromatographic Method for the Determination of Ergot Alkaloids in Cereal Grains Gary A. Lombaert	215
19	Chromatographic Method for <i>Alternaria</i> Toxins in Apple Juice Peter M. Scott and Shriniwas R. Kanhere	225
	Index	235

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