

An International Journal of Analytical Science



The Scientific Association Dedicated to Analytical Excellence

A PUBLICATION OF A OAC INTERNATIONAL

## **JOURNAL OF** AOAC INTERNATIONAL

A Peer-Reviewed Journal Publishing Basic and Applied Research in the Analytical Sciences Related to Foods, Drugs, Agriculture, and the Environment

#### **EDITORIAL BOARD**

Steven Dentali, Chair Joseph M. Betz Gabriel Giancaspro Sarwar Gilani Thomas Hammack James Harnly Milan Ihnat **Bert Popping** Jeanne I. Rader David L. Soderberg Edward Waysek Luann Wetzler Robert E. Rathbone, Staff Liaison

#### **JOURNAL EDITORS**

**Agricultural Materials** 

Nancy Thiex

**Dietary Supplements** 

Albert E. Pohland

**Drug Formulations and Clinical Methods** 

Samir Wahab

**Food Biological Contaminants** 

Anthony D. Hitchins

**Food Chemical Contaminants** Albert E. Pohland

**Food Composition and Additives** 

Sarwar Gilani

Microbiological Methods Anthony Hitchins

**Residues and Trace Elements** 

Alexander J. Krynitsky

Statistical Analysis

George W. Latimer, Jr

**Veterinary Drug Residues** 

Joe Boison

**Acquisitions Editor** 

Joseph Sherma

#### **JOURNAL STAFF**

Publisher: Sr Director, Publications: **Production Manager: Production Editors:** 

E. James Bradford Robert E. Rathbone Catherine Wattenberg Jennifer J. Diatz

Tien L. Milor

Subscriptions: Chris Bradley

**Advertising Sales:** AOAC INTERNATIONAL 481 N. Frederick Ave, Suite 500 Gaithersburg, MD 20877, USA Tel: +1-301-924-7077. • Fax: +1-301-924-7089 E-mail: cbradley@aoac.org

#### **AOAC BOARD OF DIRECTORS**

President: President-Elect: Treasurer: Secretary:

Stan W. Bacler Mark R. Coleman Jonathan W. DeVries Darryl M. Sullivan Russell S. Flowers James M. Harnly

**Immediate Past President:** Directors:

Norma R. Hill Douglas A. Hite Ronald L. Johnson Erik J.M. Konings Xiumei Liu

Directors-at-Large:

David Acheson Clay Detlefsen

# Table of Contents

November/December 2011 Vol. 94, No. 6

JAINEE 94(6) 1659-1974 (2011)

64A Journal Information 65A Cumulative Author Index 71A Thanks to Reviewers

#### SPECIAL GUEST EDITOR SECTION

1659	Nontarget Screening Methods for the Analysis of Contaminant Residues in
	Food Matrixes by Gas Chromatography/Mass Spectrometry and Liquid
	Chromatography/Mass Spectrometry
	Kaushik Banerjee

1661 Suitability of an Orbitrap Mass Spectrometer for the Screening of Pesticide Residues in Extracts of Fruits and Vegetables Lutz Alder, Angelika Steinborn, and Sebastian Bergelt

1674 Evaluation of Relevant Time-of-Flight-MS Parameters Used in HPLC/MS Full-Scan Screening Methods for Pesticide Residues Milagros Mezcua, Octavio Malato, Maria Angeles Martinez-Uroz, Ana Lozano, Ana Agüera, and Amadeo R. Fernández-Alba

1685 Applications of LC/ESI-MS/MS and UHPLC/Qq-TOF-MS for the Determination of 141 Pesticides in Tea Jian Wang, Willis Chow, and Daniel Leung

1715 Multiresidue Analysis of Plant Growth Regulators in Grapes by Triple Quadrupole and Quadrupole-Time-of-Flight-Based Liquid Chromatography/Mass Spectrometry Dasharath P. Oulkar, Kaushik Banerjee, and Sunil Kulkarni

1722 Validation of Automated Library-Based Qualitative Screening of Pesticides by Comprehensive Two-Dimensional Gas Chromatography/Time-of-Flight Mass Spectrometry Hans G.J. Mol, Henk van der Kamp, Guido van der Weg, Martijn van der Lee, Arjen Punt, and Theo C. de Rijk

1741 Multiresidue Pesticide Analysis in Ginseng and Spinach by Nontargeted and Targeted Screening Procedures Douglas G. Hayward, Jon W. Wong, Kai Zhang, James Chang, Feng Shi, Kaushik Banerjee, and Paul Yang

> Copyright, 2011 by AOAC INTERNATIONAL, Inc. All rights reserved. The Journal of AOAC INTERNATIONAL [ISSN 1060-3271 (print), ISSN 1944-7922 (digital)] is published bimonthly by AOAC INTERNATIONAL, 481 N. Frederick Ave, Suite 500, Gaithersburg, MD 20877, USA. Subscriptions for Vol. 94 (2011) are: Members, \$400.00 in North America, \$490.00 outside North America; Nonmembers, \$560.00 in North America, \$650.00 outside North America. Periodicals postage paid at Gaithersburg, Maryland, USA, and additional mailing offices. Abstracted or indexed in AGRICOLA, Analytical Abstracts, Biological Abstracts, Cambridge Scientific Abstracts, Chemical Abstracts, Current Advances in Ecological Sciences, Current Contents, and others. Printed in USA.

POSTMASTER: Send address changes to Journal of AOAC INTERNATIONAL, 481 N. Frederick Ave, Suite 500, Gaithersburg, MD 20877, USA.

### DIFTARY SUPPLEMENTS

1752	Determination of Astaxanthin in <i>Haematococcus pluvialis</i> by First-Order Derivative Spectrophotometry  Liu Xiao Juan, Wu Ying Hua, Zhao Li Chao, Xiao Su Yao, Zhou Ai Mei, and
	Liu Xin
1758	Spectrofluorimetric Determination of Some Water-Soluble Vitamins Abdel-Maaboud I. Mohamed, Horria A. Mohamed, Niveen M. Abdel-Latif, an Marwa R. Mohamed
1770	Differentiation Between Sulfoaildenafil and Its Analogs Takako Moriyasu, Keiko Minowa, Miho Sakamoto, Kiyoko Kishimoto, Hideo Kadoi, Jun'ichi Nakajima, Ken'ichiro Mori, Shuzo Ogino, Haruhiko Fukaya, and Yasuo Shida
1778	Control of Modified Xiaoyao San Through the Determination of 22 Active Components by Ultra-Performance Liquid Chromatography Feng Qin, Jun Huang, Xinjian Qiu, Sihang Hu, and Xi Huang
DRUG F	ORMULATIONS AND CLINICAL METHODS
1785	High-Performance Column Liquid Chromatographic Method for the Simultaneous Determination of Buclizine, Tryptophan, Pyridoxine, and Cyanocobalamin in Tablets and Oral Suspension Gislaine Kuminek, Hellen K. Stulzer, Monika P. Tagliari, Paulo R. Oliveira, Larissa S. Bernardi, Gabriela S. Rauber, and Simone G. Cardoso
1791	Stability Studies of Clonazepam, Diazepam, Haloperidol, and Doxepin with Diverse Polarities in an Acidic Environment Anna Maślanka, Jan Krzek, Mariusz Stolarczyk, Maria Walczak, and Agata Gogowska
1800	Development and Validation of a Reversed-Phase Ultra-Performance Liquid Chromatographic Method for Assay of Lacidipine and Related Substances Arivozhi Mohan, Hitesh B. Patel, and Dhandayutham Saravanan
1807	Microsized Graphite Sensors for Potentiometric Determination of Cyclobenzaprine Hydrochloride in Pure Powder, Tablets, and Plasma Nesrin K. Ramadan, Hala E. Zaazaa, and Hanan A. Merey
1815	Stability-Indicating High-Performance Column Liquid Chromatography and High-Performance Thin-Layer Chromatography Methods for the Determination of Olopatadine Hydrochloride in Tablet Dosage Form Susheel John Varghese, A. Manikanta Kumar, and Thengungal Kochupappy Ravi
FOOD B	IOLOGICAL CONTAMINANTS
1821	Evaluation of VIDAS <sup>®</sup> Salmonella (SLM) Easy Salmonella Method for the Detection of Salmonella in a Variety of Foods: Collaborative Study Erin Crowley, Patrick Bird, Kiel Fisher, Katherine Goetz, M. Joseph Benzinger, Jr, James Agin, David Goins, and Ronald L. Johnson
1835	Reveal <sup>®</sup> E. coli 2.0 Method for Detection of Escherichia coli O157:H7 in Raw Beef Rebecca Hoerner, Jill Feldpausch, R. Lucas Gray, Stephanie Curry, Paul Lewis, Jerry Tolan, Tim Goldy, Frank Klein, Barry Neiditch, Edan Hosking, Paul Norton, Jennifer Rice, and Mark Mozola
1846	BIOTECON Diagnostics <b>food</b> proof <sup>®</sup> <i>E. coli</i> O157 Detection Kit, 5' Nuclease for <i>E. coli</i> O157 in Combination with <b>food</b> proof ShortPrep II Kit Benjamin Junge, Cordt Grönewald, and Kornelia Berghof-Jäger

#### **FOOD COMPOSITION AND ADDITIVES**

1853	LC/MS Method Using Cloud Point Extraction for the Determination of	
	Permitted and Illegal Food Colors in Liquid, Semiliquid, and Solid Food Matrixes: Single-Laboratory Validation Ebru Ates, Klaus Mittendorf, and Hamide Senyuva	Inform
1863	Sensitive Detection of Soy ( <i>Glycine max</i> ) by Real-Time Polymerase Chain Reaction Targeting the Mitochondrial atpA Gene <i>Tobias Bauer, Katja Kirschbaum, Silvia Panter, Marion Kenk, and Jörg Bergemann</i>	
1874	A Simple Method for Simultaneous Determination of Basic Dyes Encountered in Food Preparations by Reversed-Phase HPLC Sumita Dixit, Subhash K. Khanna, and Mukul Das	

1882	Determination of Some Organophosphorus and Azole Group Pesticides in Water Samples by Dispersive Liquid–Liquid Microextraction Coupled with GC/MS
	Abdullah Akdoğan, Ümit Divrikli, and Latif Elçi
1891	Simple Analysis of Naphthalene, Fluorene, and Anthracene in Whole Blood by Gas Chromatography/Mass Spectrometry After Headspace-Solid Phase Microextraction Hatice Ardag Akdoğan
1896	A New Cadmium Reduction Device for the Microplate Determination of Nitrate in Water, Soil, Plant Tissue, and Physiological Fluids James D. Crutchfield and John H. Grove
1906	Homogeneity and Stability Studies During the Preparation of a Laboratory Reference Material of Soy Leaves for the Determination of Metals Ana M.P. dos Santos, Daniel C. Lima, Robson M. de Jesus, and Sergio L.C. Ferreira
1911	Preparation and Identification of Generic Antigens and Broad-Spectrum Monoclonal Antibodies for Detection of Organophosphorus Pesticides Panpan Jiang and Jiguo He
1918	Polyacrylic Acid-Modified Alumina for Solid-Phase Extraction and Preconcentration of Trace Iron and Chromium from Plant Samples Fatemeh Sabermahani and Mohammad Ali Taher
1925	Preparation and Characterization of Porous Calcium Titanate-Based Coated Glass Fiber Filter Material and Its Application in Determination of Lead and Cadmium Ion Concentrations in Water Dong Zhang, Ping Yu, and Xiang He

#### **INDEXES**

1934	Author Index
1948	Subject Index