

Environmental Toxicology III

WIT*PRESS*

WIT Press publishes leading books in Science and Technology.

Visit our website for the current list of titles.

www.witpress.com

WIT*eLibrary*

Home of the Transactions of the Wessex Institute.

Papers presented at Environmental Toxicology III 2010 are archived in the WIT eLibrary in volume 132 of WIT Transactions on Ecology and the Environment (ISSN 1743-3541).

The WIT eLibrary provides the international scientific community with immediate and permanent access to individual papers presented at WIT conferences.

Visit the WIT eLibrary at www.witpress.com.

THIRD INTERNATIONAL CONFERENCE ON
ENVIRONMENTAL TOXICOLOGY

Environmental Toxicology III

CONFERENCE CHAIRMEN

V. Popov

Wessex Institute of Technology, UK

&

C.A. Brebbia

Wessex Institute of Technology, UK

INTERNATIONAL SCIENTIFIC ADVISORY COMMITTEE

H. Bojar
C. Calvo Sainz
T.-S. Chon
D. Dionysiou
O. Herbarth
C. Khalil
A. Kungolos
M. Moore
S. Riley
U. Rolle-Kampczyk
T. Tisler
M. Zamorano

Organised by

Wessex Institute of Technology, UK

Sponsored by

*WIT Transactions on Ecology and the Environment
The International Journal of Sustainable Development and Planning*

WIT Transactions

Transactions Editor

Carlos Brebbia

Wessex Institute of Technology
Ashurst Lodge, Ashurst
Southampton SO40 7AA, UK
Email: carlos@wessex.ac.uk

Editorial Board

B Abersek University of Maribor, Slovenia

Y N Abousleiman University of Oklahoma,
USA

P L Aguilar University of Extremadura, Spain

K S Al Jabri Sultan Qaboos University, Oman

E Alarcon Universidad Politecnica de Madrid,
Spain

A Aldama IMTA, Mexico

C Alessandri Universita di Ferrara, Italy

D Almorza Gomar University of Cadiz,
Spain

B Alzhabi Kettering University, USA

J A C Ambrosio IDMEC, Portugal

A M Amer Cairo University, Egypt

S A Anagnostopoulos University of Patras,
Greece

M Andretta Montecatini, Italy

E Angelino A.R.P.A. Lombardia, Italy

H Antes Technische Universitat Braunschweig,
Germany

M A Atherton South Bank University, UK

A G Atkins University of Reading, UK

D Aubry Ecole Centrale de Paris, France

H Azegami Toyohashi University of
Technology, Japan

A F M Azevedo University of Porto, Portugal

J Baish Bucknell University, USA

J M Baldasano Universitat Politecnica de
Catalunya, Spain

J G Bartzis Institute of Nuclear Technology,
Greece

A Bejan Duke University, USA

M P Bekakos Democritus University of
Thrace, Greece

G Belingardi Politecnico di Torino, Italy

R Belmans Katholieke Universiteit Leuven,
Belgium

C D Bertram The University of New South
Wales, Australia

D E Beskos University of Patras, Greece

S K Bhattacharyya Indian Institute of
Technology, India

E Blums Latvian Academy of Sciences, Latvia

J Boarder Cartref Consulting Systems, UK

B Bobee Institut National de la Recherche
Scientifique, Canada

H Boileau ESIGEC, France

J J Bommer Imperial College London, UK

M Bonnet Ecole Polytechnique, France

C A Borrego University of Aveiro, Portugal

A R Bretones University of Granada, Spain

J A Bryant University of Exeter, UK

F-G Buchholz Universitat Gesanthochschule
Paderborn, Germany

M B Bush The University of Western
Australia, Australia

F Butera Politecnico di Milano, Italy

J Byrne University of Portsmouth, UK

W Cantwell Liverpool University, UK

D J Cartwright Bucknell University, USA

P G Carydis National Technical University of
Athens, Greece

J J Casares Long Universidad de Santiago de
Compostela, Spain

M A Celia Princeton University, USA

A Chakrabarti Indian Institute of Science,
India

A H-D Cheng University of Mississippi, USA

J Chilton University of Lincoln, UK
C-L Chiu University of Pittsburgh, USA
H Choi Kangnung National University, Korea
A Cieslak Technical University of Lodz, Poland
S Clement Transport System Centre, Australia
M W Collins Brunel University, UK
J J Connor Massachusetts Institute of Technology, USA
M C Constantinou State University of New York at Buffalo, USA
D E Cormack University of Toronto, Canada
M Costantino Royal Bank of Scotland, UK
D F Cutler Royal Botanic Gardens, UK
W Czyczula Krakow University of Technology, Poland
M da Conceicao Cunha University of Coimbra, Portugal
A Davies University of Hertfordshire, UK
M Davis Temple University, USA
A B de Almeida Instituto Superior Tecnico, Portugal
E R de Arantes e Oliveira Instituto Superior Tecnico, Portugal
L De Biase University of Milan, Italy
R de Borst Delft University of Technology, Netherlands
G De Mey University of Ghent, Belgium
A De Montis Universita di Cagliari, Italy
A De Naeyer Universiteit Ghent, Belgium
W P De Wilde Vrije Universiteit Brussel, Belgium
L Debnath University of Texas-Pan American, USA
N J Dedios Mimbela Universidad de Cordoba, Spain
G Degrande Katholieke Universiteit Leuven, Belgium
S del Giudice University of Udine, Italy
G Deplano Universita di Cagliari, Italy
I Doltsinis University of Stuttgart, Germany
M Domaszewski Universite de Technologie de Belfort-Montbeliard, France
J Dominguez University of Seville, Spain
K Dorow Pacific Northwest National Laboratory, USA
W Dover University College London, UK
C Dowlen South Bank University, UK
J P du Plessis University of Stellenbosch, South Africa
R Duffell University of Hertfordshire, UK
A Ebel University of Cologne, Germany
E E Edoutos Democritus University of Thrace, Greece
G K Egan Monash University, Australia
K M Elawadly Alexandria University, Egypt
K-H Elmer Universitat Hannover, Germany
D Elms University of Canterbury, New Zealand
M E M El-Sayed Kettering University, USA
D M Elsom Oxford Brookes University, UK
A El-Zafrany Cranfield University, UK
F Erdogan Lehigh University, USA
F P Escrig University of Seville, Spain
D J Evans Nottingham Trent University, UK
J W Everett Rowan University, USA
M Faghri University of Rhode Island, USA
R A Falconer Cardiff University, UK
M N Fardis University of Patras, Greece
P Fedelinski Silesian Technical University, Poland
H J S Fernando Arizona State University, USA
S Finger Carnegie Mellon University, USA
J I Frankel University of Tennessee, USA
D M Fraser University of Cape Town, South Africa
M J Fritzler University of Calgary, Canada
U Gabbert Otto-von-Guericke Universitat Magdeburg, Germany
G Gambolati Universita di Padova, Italy
C J Gantes National Technical University of Athens, Greece
L Gaul Universitat Stuttgart, Germany
A Genco University of Palermo, Italy
N Georgantzis Universitat Jaume I, Spain
P Giudici Universita di Pavia, Italy
F Gomez Universidad Politecnica de Valencia, Spain
R Gomez Martin University of Granada, Spain
D Goulias University of Maryland, USA
K G Goulias Pennsylvania State University, USA
F Grandori Politecnico di Milano, Italy
W E Grant Texas A & M University, USA
S Grilli University of Rhode Island, USA

- R H J Grimshaw** Loughborough University, UK
- D Gross** Technische Hochschule Darmstadt, Germany
- R Grundmann** Technische Universitat Dresden, Germany
- A Gualtierotti** IDHEAP, Switzerland
- R C Gupta** National University of Singapore, Singapore
- J M Hale** University of Newcastle, UK
- K Hameyer** Katholieke Universiteit Leuven, Belgium
- C Hanke** Danish Technical University, Denmark
- K Hayami** National Institute of Informatics, Japan
- Y Hayashi** Nagoya University, Japan
- L Haydock** Newage International Limited, UK
- A H Hendrickx** Free University of Brussels, Belgium
- C Herman** John Hopkins University, USA
- S Heslop** University of Bristol, UK
- I Hideaki** Nagoya University, Japan
- D A Hills** University of Oxford, UK
- W F Huebner** Southwest Research Institute, USA
- J A C Humphrey** Bucknell University, USA
- M Y Hussaini** Florida State University, USA
- W Hutchinson** Edith Cowan University, Australia
- T H Hyde** University of Nottingham, UK
- M Iguchi** Science University of Tokyo, Japan
- D B Ingham** University of Leeds, UK
- L Int Panis** VITO Expertisecentrum IMS, Belgium
- N Ishikawa** National Defence Academy, Japan
- J Jaafar** UiTm, Malaysia
- W Jager** Technical University of Dresden, Germany
- Y Jaluria** Rutgers University, USA
- C M Jefferson** University of the West of England, UK
- P R Johnston** Griffith University, Australia
- D R H Jones** University of Cambridge, UK
- N Jones** University of Liverpool, UK
- D Kaliampakos** National Technical University of Athens, Greece
- N Kamiya** Nagoya University, Japan
- D L Karabalis** University of Patras, Greece
- M Karlsson** Linkoping University, Sweden
- T Katayama** Doshisha University, Japan
- K L Katsifarakis** Aristotle University of Thessaloniki, Greece
- J T Katsikadelis** National Technical University of Athens, Greece
- E Kausel** Massachusetts Institute of Technology, USA
- H Kawashima** The University of Tokyo, Japan
- B A Kazimee** Washington State University, USA
- S Kim** University of Wisconsin-Madison, USA
- D Kirkland** Nicholas Grimshaw & Partners Ltd, UK
- E Kita** Nagoya University, Japan
- A S Kobayashi** University of Washington, USA
- T Kobayashi** University of Tokyo, Japan
- D Koga** Saga University, Japan
- S Kotake** University of Tokyo, Japan
- A N Kounadis** National Technical University of Athens, Greece
- W B Kratzig** Ruhr Universitat Bochum, Germany
- T Krauthammer** Penn State University, USA
- C-H Lai** University of Greenwich, UK
- M Langseth** Norwegian University of Science and Technology, Norway
- B S Larsen** Technical University of Denmark, Denmark
- F Lattarulo** Politecnico di Bari, Italy
- A Lebedev** Moscow State University, Russia
- L J Leon** University of Montreal, Canada
- D Lewis** Mississippi State University, USA
- S Ighobashi** University of California Irvine, USA
- K-C Lin** University of New Brunswick, Canada
- A A Liolios** Democritus University of Thrace, Greece
- S Lomov** Katholieke Universiteit Leuven, Belgium
- J W S Longhurst** University of the West of England, UK
- G Loo** The University of Auckland, New Zealand
- D Lóránt** Károly Róbert College, Hungary
- J Lourenco** Universidade do Minho, Portugal

J E Luco University of California at San Diego, USA

H Lui State Seismological Bureau Harbin, China

C J Lumsden University of Toronto, Canada

L Lundqvist Division of Transport and Location Analysis, Sweden

T Lyons Murdoch University, Australia

Y-W Mai University of Sydney, Australia

M Majowiecki University of Bologna, Italy

D Malerba Università degli Studi di Bari, Italy

G Manara University of Pisa, Italy

B N Mandal Indian Statistical Institute, India

Ü Mander University of Tartu, Estonia

H A Mang Technische Universität Wien, Austria

G D Manolis Aristotle University of Thessaloniki, Greece

W J Mansur COPPE/UFRJ, Brazil

N Marchettini University of Siena, Italy

J D M Marsh Griffith University, Australia

J F Martin-Duque Universidad Complutense, Spain

T Matsui Nagoya University, Japan

G Mattrisch DaimlerChrysler AG, Germany

F M Mazzolani University of Naples "Federico II", Italy

K McManis University of New Orleans, USA

A C Mendes Universidade de Beira Interior, Portugal

R A Meric Research Institute for Basic Sciences, Turkey

J Mikielewicz Polish Academy of Sciences, Poland

N Milic-Frayling Microsoft Research Ltd, UK

R A W Mines University of Liverpool, UK

C A Mitchell University of Sydney, Australia

K Miura Kajima Corporation, Japan

A Miyamoto Yamaguchi University, Japan

T Miyoshi Kobe University, Japan

G Molinari University of Genoa, Italy

T B Moodie University of Alberta, Canada

D B Murray Trinity College Dublin, Ireland

G Nakhaeizadeh DaimlerChrysler AG, Germany

M B Neace Mercer University, USA

D Neculescu University of Ottawa, Canada

F Neumann University of Vienna, Austria

S-I Nishida Saga University, Japan

H Nisitani Kyushu Sangyo University, Japan

B Notaros University of Massachusetts, USA

P O'Donoghue University College Dublin, Ireland

R O O'Neill Oak Ridge National Laboratory, USA

M Ohkusu Kyushu University, Japan

G Oliveto Università di Catania, Italy

R Olsen Camp Dresser & McKee Inc., USA

E Oñate Universitat Politècnica de Catalunya, Spain

K Onishi Ibaraki University, Japan

P H Oosthuizen Queens University, Canada

E L Ortiz Imperial College London, UK

E Outa Waseda University, Japan

A S Papageorgiou Rensselaer Polytechnic Institute, USA

J Park Seoul National University, Korea

G Passerini Università delle Marche, Italy

B C Patten University of Georgia, USA

G Pelosi University of Florence, Italy

G G Penelis Aristotle University of Thessaloniki, Greece

W Perrie Bedford Institute of Oceanography, Canada

R Pietrabissa Politecnico di Milano, Italy

H Pina Instituto Superior Tecnico, Portugal

M F Platzer Naval Postgraduate School, USA

D Poljak University of Split, Croatia

V Popov Wessex Institute of Technology, UK

H Power University of Nottingham, UK

D Prandle Proudman Oceanographic Laboratory, UK

M Predeleanu University Paris VI, France

M R I Purvis University of Portsmouth, UK

I S Putra Institute of Technology Bandung, Indonesia

Y A Pykh Russian Academy of Sciences, Russia

F Rachidi EMC Group, Switzerland

M Rahman Dalhousie University, Canada

K R Rajagopal Texas A & M University, USA

T Rang Tallinn Technical University, Estonia

J Rao Case Western Reserve University, USA

A M Reinhorn State University of New York at Buffalo, USA

A D Rey McGill University, Canada
D N Riahi University of Illinois at Urbana-Champaign, USA
B Ribas Spanish National Centre for Environmental Health, Spain
K Richter Graz University of Technology, Austria
S Rinaldi Politecnico di Milano, Italy
F Robuste Universitat Politècnica de Catalunya, Spain
J Roddick Flinders University, Australia
A C Rodrigues Universidade Nova de Lisboa, Portugal
F Rodrigues Poly Institute of Porto, Portugal
C W Roeder University of Washington, USA
J M Roesset Texas A & M University, USA
W Roetzel Universitaet der Bundeswehr Hamburg, Germany
V Roje University of Split, Croatia
R Rosset Laboratoire d'Aerologie, France
J L Rubio Centro de Investigaciones sobre Desertificacion, Spain
T J Rudolphi Iowa State University, USA
S Russenckuck Magnet Group, Switzerland
H Ryssel Fraunhofer Institut Integrierte Schaltungen, Germany
S G Saad American University in Cairo, Egypt
M Saiidi University of Nevada-Reno, USA
R San Jose Technical University of Madrid, Spain
F J Sanchez-Sesma Instituto Mexicano del Petroleo, Mexico
B Sarler Nova Gorica Polytechnic, Slovenia
S A Savidis Technische Universitat Berlin, Germany
A Savini Universita de Pavia, Italy
G Schmid Ruhr-Universitat Bochum, Germany
R Schmidt RWTH Aachen, Germany
B Scholtes Universitaet of Kassel, Germany
W Schreiber University of Alabama, USA
A P S Selvadurai McGill University, Canada
J J Sendra University of Seville, Spain
J J Sharp Memorial University of Newfoundland, Canada
Q Shen Massachusetts Institute of Technology, USA
X Shixiong Fudan University, China
G C Sih Lehigh University, USA
L C Simoes University of Coimbra, Portugal
A C Singhal Arizona State University, USA
P Skerget University of Maribor, Slovenia
J Sladek Slovak Academy of Sciences, Slovakia
V Sladek Slovak Academy of Sciences, Slovakia
A C M Sousa University of New Brunswick, Canada
H Sozer Illinois Institute of Technology, USA
D B Spalding CHAM, UK
P D Spanos Rice University, USA
T Speck Albert-Ludwigs-Universitaet Freiburg, Germany
C C Spyraeos National Technical University of Athens, Greece
I V Stangeeva St Petersburg University, Russia
J Stasiak Technical University of Gdansk, Poland
G E Swaters University of Alberta, Canada
S Syngellakis University of Southampton, UK
J Szmyd University of Mining and Metallurgy, Poland
S T Tadano Hokkaido University, Japan
H Takemiya Okayama University, Japan
I Takewaki Kyoto University, Japan
C-L Tan Carleton University, Canada
M Tanaka Shinshu University, Japan
E Taniguchi Kyoto University, Japan
S Tanimura Aichi University of Technology, Japan
J L Tassoulas University of Texas at Austin, USA
M A P Taylor University of South Australia, Australia
A Terranova Politecnico di Milano, Italy
E Tiezzi University of Siena, Italy
A G Tjihuis Technische Universiteit Eindhoven, Netherlands
T Tirabassi Institute FISBAT-CNR, Italy
S Tkachenko Otto-von-Guericke-University, Germany
N Tosaka Nihon University, Japan
T Tran-Cong University of Southern Queensland, Australia
R Tremblay Ecole Polytechnique, Canada
I Tsukrov University of New Hampshire, USA

R Turra CINECA Interuniversity Computing
Centre, Italy

S G Tushinski Moscow State University,
Russia

J-L Uso Universitat Jaume I, Spain

E Van den Bulck Katholieke Universiteit
Leuven, Belgium

D Van den Poel Ghent University, Belgium

R van der Heijden Radboud University,
Netherlands

R van Duin Delft University of Technology,
Netherlands

P Vas University of Aberdeen, UK

W S Venturini University of Sao Paulo, Brazil

R Verhoeven Ghent University, Belgium

A Viguri Universitat Jaume I, Spain

Y Villacampa Esteve Universidad de
Alicante, Spain

F F V Vincent University of Bath, UK

S Walker Imperial College, UK

G Walters University of Exeter, UK

B Weiss University of Vienna, Austria

H Westphal University of Magdeburg,
Germany

J R Whiteman Brunel University, UK

Z-Y Yan Peking University, China

S Yanniotis Agricultural University of Athens,
Greece

A Yeh University of Hong Kong, China

J Yoon Old Dominion University, USA

K Yoshizato Hiroshima University, Japan

T X Yu Hong Kong University of Science &
Technology, Hong Kong

M Zador Technical University of Budapest,
Hungary

K Zakrzewski Politechnika Lodzka, Poland

M Zamir University of Western Ontario,
Canada

R Zarnic University of Ljubljana, Slovenia

G Zharkova Institute of Theoretical and
Applied Mechanics, Russia

N Zhong Maebashi Institute of Technology,
Japan

H G Zimmermann Siemens AG, Germany

Environmental Toxicology III

Editors

V. Popov

Wessex Institute of Technology, UK

&

C.A. Brebbia

Wessex Institute of Technology, UK

WITPRESS Southampton, Boston



V. Popov

Wessex Institute of Technology, UK

C.A. Brebbia

Wessex Institute of Technology, UK

Published by

WIT Press

Ashurst Lodge, Ashurst, Southampton, SO40 7AA, UK

Tel: 44 (0) 238 029 3223; Fax: 44 (0) 238 029 2853

E-Mail: witpress@witpress.com

<http://www.witpress.com>

For USA, Canada and Mexico

Computational Mechanics Inc

25 Bridge Street, Billerica, MA 01821, USA

Tel: 978 667 5841; Fax: 978 667 7582

E-Mail: infousa@witpress.com

<http://www.witpress.com>

British Library Cataloguing-in-Publication Data

A Catalogue record for this book is available
from the British Library

ISBN: 978-1-84564-438-3

ISSN: 1746-448X (print)

ISSN: 1743-3541 (online)

*The texts of the papers in this volume were set
individually by the authors or under their supervision.
Only minor corrections to the text may have been carried
out by the publisher.*

No responsibility is assumed by the Publisher, the Editors and Authors for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the material herein. The Publisher does not necessarily endorse the ideas held, or views expressed by the Editors or Authors of the material contained in its publications.

© WIT Press 2010

Printed in Great Britain by MPG Books Group, Bodmin and King's Lynn.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Publisher.

Preface

The efforts of modern societies to design and manufacture goods that make human lives easier and more comfortable have produced a story of success in terms of offering constant improvements to our lifestyle. There is another side to this story, and that is the one which reports increased risks to human health and environment due to presence of various harmful substances in the environment. It is questionable whether there is any part of the environment that has been left unchanged and unaffected due to these activities. In many cases close to the human settlements the risks to health increase due to various stressors. Yet, many of us have to accept living cities with the commodities that they offer and the health risks that they create.

Environmental toxicology is an interdisciplinary science which integrates biology, microbiology, chemistry, engineering, environmental sciences, ecology and other sciences. Assessment of the environmental effects of chemicals is complicated as it depends on the organisms tested and involves not only the toxicity of individual chemicals, but also their interactive effects, genotoxicity, mutagenicity and immunotoxicity testing. Various stressors affect the environment sometimes showing synergistic effects which are very difficult to quantify or predict. These threats require more experimental and theoretical developments in order to produce approaches for characterization and appropriate strategies and assays for screening in order to detect the harmful agents and prevent them from reaching sensitive endpoints.

The Environmental Toxicology Conference created an atmosphere which encouraged fruitful interactions and exchange of knowledge and ideas amongst the participants working in industry and government and those employed at universities and research organizations.

This volume contains the edited contributions presented at the third Conference on Environmental Toxicology, which was held in Cyprus in 2010. The conference was organized by the Wessex Institute of Technology. It was sponsored by WIT

Transactions on Ecology and the Environment and The International Journal of Sustainable Development and Planning. The first Conference took place in Myconos Island, Greece in 2006 and the second one was held in Granada, Spain in 2008.

The editors would like to thank all the authors for their papers and, in particular, the members of the International Scientific Advisory Committee for their help during the review process.

The Editors,
Cyprus, 2010

Contents

Section 1: Environmental health risk

Toxicity of volatile organic compounds (VOCs) mixtures using human derived cells <i>C. Khalil & J. Nasir</i>	3
Carcinogenesis in female C57Bl/6J mice chronically exposed to sodium arsenate (As ^V) in drinking water for 2 years <i>M. Krishnamohan, A. A. Seawright, M. R. Moore & J. C. Ng</i>	13
Aspects to consider for selection of chemical risk assessment methodology: the case of formaldehyde occupational exposure <i>S. Viegas & J. Prista</i>	23
The possibility of removal of endocrine disrupters from paper mill waste waters using anaerobic and aerobic biological treatment, membrane bioreactor, ultra-filtration, reverse osmosis and advanced oxidation processes <i>D. Balabanič, D. Hermosilla, A. Blanco, N. Merayo & A. Krivograd Klemenčič</i>	33
Poultry fungal contamination as a public health problem <i>C. Viegas, C. Veríssimo, L. Rosado & C. Silva Santos</i>	45
Factors controlling the release of arsenic from mining tailings <i>B. E. Rubio-Campos, I. Cano-Aguilera, A. F. Aguilera-Alvarado, G. De la Rosa & S. H. Soriano-Pérez</i>	55
Correlation between cluster analyses of <i>Salmonella</i> strains isolated from diarrhetic patients in Kuwait and biofilm formation <i>A. Al-Mousawi, A. Eissa, F. Abu-Zant, H. Drobiova, I. Al-Saif & E. Al-Saleh</i>	67

Section 2: Ecosystem health

Hazardous substances in the water, biota and sediments of the North Estonian coastal sea <i>O. Roots & Ü. Suursaar</i>	79
Controlling groundwater pollution from petroleum products leaks <i>M. S. Al-Suwaiyan</i>	91
Acute toxicity of lead nitrate to red swamp crayfish, <i>Procambarus clarkii</i> <i>A. Balarezo & P. B. Tchounwou</i>	101

Section 3: Biodegradation, bioremediation and biomonitoring

Biostimulation combined treatments for remediation of diesel contaminated soil <i>C. Calvo, G. A. Silva-Castro, I. Uad, M. Manzanera, C. Perucha, J. Laguna & J. Gózález-López</i>	111
New isolation method of desiccation-tolerant microorganisms for the bioremediation of arid and semiarid soils <i>M. Manzanera, J. J. Narváez-Reinaldo, L. SantaCruz-Calvo, J. I. Vilchez, J. González-López & C. Calvo</i>	121
An evaluation of organopollutant biodegradation by some selected white rot fungi: an overview <i>M. Tekere, J. S. Read & B. Mattiasson</i>	131
Adaptation of bacterial biotests for monitoring mycotoxins <i>Cs. Krifaton, J. Kukolya, S. Szoboszlai, M. Cserhádi, Á. Szűcs & B. Kriszt</i>	143
Role of fulvic acid on the reduction of cadmium toxicity on tilapia (<i>Oreochromis niloticus</i>) <i>A. E. Noor El Deen, M. S. Zaki & H. A. Osman</i>	155

Section 4: New trends in environmental toxicology

Technical issues surrounding the preparation, characterisation and testing of nanoparticles for ecotoxicological studies <i>R. Tantra, S. Jing & D. Gohil</i>	165
--	-----

High-throughput analysis of multiple stress pathways using GFP reporters in <i>C. elegans</i> <i>D. de Pomerai, C. Anbalagan, I. Lafayette, D. Rajagopalan,</i> <i>M. Loose, M. Haque & J. King</i>	177
Author Index	189