

# BIOPESTICIDES INTERNATIONAL

## A Bi-Annual International Journal

### EDITOR-IN-CHIEF

#### OPENDER KOUL

Insect Biopesticide Research Centre

30 Parkash Nagar, Model town

Jalandhar, 144003, India and

Adjunct Professor, Kasetsart  
University, Bangkok, Thailand

Email: [okoul@koulresearch.org](mailto:okoul@koulresearch.org);

[okoul@yahoo.com](mailto:okoul@yahoo.com)

### REGIONAL EDITORS

#### John D. Stark

Puyallup Research and Extension Center

Washington State University

2606 W. Pioneer, Puyallup,  
Washington-98371, USA

Email: [starkj@wsu.edu](mailto:starkj@wsu.edu)

#### Juan A. Morales-Ramos

National Biological Control Laboratory

USDA, ARS, 59 Lee Road,  
Stoneville, MS-38776, USA

Email: [Juan.MoralesRamos@ARS.USDA.GOV](mailto:Juan.MoralesRamos@ARS.USDA.GOV)

#### M. B. Isman

Faculty of Land and Food Systems

University of British Columbia

Vancouver, BC, Canada, V6T 1Z4

Email: [murray.isman@ubc.ca](mailto:murray.isman@ubc.ca)

#### Tong-Xian Liu

Northwest A & F University

Yangling, Shaanxi, 712100, China

Email: [Tongxianliu@yahoo.com](mailto:Tongxianliu@yahoo.com);  
[txliu@nwsuaf.edu.cn](mailto:txliu@nwsuaf.edu.cn)

#### Philip C. Stevenson

Natural Resource Institute

University of Greenwich, Kent,

ME4 4TB, UK and

Royal Botanical Gardens,

Kew. TW9 3AB, UK

Email: [p.c.stevenson@gre.ac.uk](mailto:p.c.stevenson@gre.ac.uk)

### EDITORIAL ADVISORY BOARD

#### Steven Belmain

Professor of Ecology at Natural Resources Institute,  
University of Greenwich  
Chatham, Kent, UK  
E-Mail: [S.R.Belmain@gre.ac.uk](mailto:S.R.Belmain@gre.ac.uk)

#### Alistair Bishop

University of Plymouth, School of Biological Sciences  
Plymouth, Plymouth, GB  
E-Mail: [alistair.bishop@plymouth.ac.uk](mailto:alistair.bishop@plymouth.ac.uk)

#### Carlos L. Cespedes

Professor Titular,  
Plant Biochemistry and Phytochemical Ecology Lab  
Basic Sciences Department, University of Bio Bio, Chile  
E-mail: [cespedes.leonardo@gmail.com](mailto:cespedes.leonardo@gmail.com)

#### Kamal Chauhan

USDA-ARS Chemicals Affecting Insect Behavior Laboratory,  
10300 Baltimore Avenue  
Beltsville, MD  
E-Mail: [kamal.chauhan@ars.usda.gov](mailto:kamal.chauhan@ars.usda.gov)

#### Mukund Deshpande

Greenvention Biotech Pvt. Ltd., Pune, India  
E-Mail: [mvdeshpande1952@gmail.com](mailto:mvdeshpande1952@gmail.com)

#### Sunita Facknath,

Faculty of Agriculture, University of Mauritius  
Reduit, Mauritius  
E-Mail: [sunif@uom.ac.mu](mailto:sunif@uom.ac.mu)

#### Qili Feng

Guangzhou Key Lab of Insect Development,  
Regulation and Application Research  
South China Normal University, Guangzhou, China  
E-Mail: [qifeng@scnu.edu.cn](mailto:qifeng@scnu.edu.cn)

#### Christopher J. Geden

Research Entomologist, USDA, ARS, Gainesville, USA  
E-Mail: [chris.geden@usda.gov](mailto:chris.geden@usda.gov)

#### G. T. Gujar

Ex-Head, Division of Entomology  
Indian Agricultural Research Institute, New Delhi, India  
E-mail: [gtgujar@yahoo.com](mailto:gtgujar@yahoo.com)

#### Dwayne D. Hegedus

Saskatoon Research and Development Center  
107 Science Place, Saskatoon, Saskatchewan S7N 0X2,  
Canada  
E-Mail: [dwayne.hegedus@agr.gc.ca](mailto:dwayne.hegedus@agr.gc.ca)

#### Angelika Hilbeck

Department of Environmental Systems Sciences  
Institut für Integrative Biologie,  
Universitätsstrasse 16 8092 Zürich, Switzerland  
E-Mail: [angelika.hilbeck@env.ethz.ch](mailto:angelika.hilbeck@env.ethz.ch)

#### Hans E. Hummel

Justus Liebig Universität Gießen,  
Faculty of Agricultural Sciences  
Nutritional Sciences and Environment Management  
Giessen, Hesse, Germany  
E-mail: [hans.e.hummel@agr.uni-giessen.de](mailto:hans.e.hummel@agr.uni-giessen.de)

#### William D. Hutchison

Professor of Entomology, Department of Entomology,  
University of Minnesota  
219 Hodson Hall, 1980 Folwell Ave, Falcon Heights, St. Paul,  
MN, 55108, USA  
E-Mail: [bill.hutchison@uhnresearch.ca](mailto:bill.hutchison@uhnresearch.ca)

#### Jorge E. Ibarra

Center for research and Advanced Studies,  
National Polytechnic Institute  
Departamento: Biotecnología y Bioquímica,  
Laboratorio de Bioinsecticidas, Cinvestav, Mexico  
E-mail: [jorge.ibarra@cinvestav.mx](mailto:jorge.ibarra@cinvestav.mx)

#### B. L. Jalali

Ex-Research Director, CCS Haryana Agricultural University  
Hissar, India.  
E-Mail: [bjjalali@gmail.com](mailto:bjjalali@gmail.com)

#### Harry K. Kaya

Professor Emeritus, Department of Entomology and Nematology  
University of California Davis, Davis, CA 95616, USA  
E-Mail: [hkkaya@ucdavis.edu](mailto:hkkaya@ucdavis.edu)

#### G. G. Khachatourians

Department of Food and Bioproduct Sciences  
University of Saskatchewan, Saskatoon, Canada  
E-Mail: [george.khachatourians@usask.ca](mailto:george.khachatourians@usask.ca)

#### Hoi-Seon Lee

Department of Bioenvironmental Chemistry  
Chonbuk National University, Jeonju 561-756, South Korea  
E-Mail: [hoiseon@jnu.ac.kr](mailto:hoiseon@jnu.ac.kr)

#### Vijay L. Maheshwari

Professor, School of Life Sciences, Department of Biochemistry  
KBC North Maharashtra Ubniversity  
Jaigaon 425001, India  
E-Mail: [vjmaheshwari@rediffmail.com](mailto:vjmaheshwari@rediffmail.com)

#### Sameh A. Mansour

Environmental Toxicology Research Unit (ETRU),  
Department of Pesticide Chemistry  
National Research Centre, Dokki, Cairo, Egypt  
E-Mail: [Sameh.Mansour@mansomar.com](mailto:Sameh.Mansour@mansomar.com)

#### Daniela M. A. F. Navarro

Departamento de Química Fundamental,  
Universidade Federal de Pernambuco (UFPE)  
Cidade Universitária, 50740-560, Recife, PE, Brazil  
E-Mail: [dmfafn@ufpe.br](mailto:dmfafn@ufpe.br)

#### J. Nawrot

Ex-Head, Department of Entomology,  
Institute of Plant protection, Poznan, Poland  
E-Mail: [jw.nawrot@gmail.com](mailto:jw.nawrot@gmail.com)

#### Maureen O'Callaghan

AgResearch, Private Bag 4749,  
Christchurch 8140, New Zealand  
E-Mail: [Maureen.o'callaghan@agresearch.co.nz](mailto:Maureen.o'callaghan@agresearch.co.nz)

#### Sara María Palacios

Fine Chemical and Natural Products Laboratory,  
School of Chemistry  
Catholic University of Córdoba  
Av. Armada Argentina 3555, Córdoba,  
Argentina  
E-Mail: [sarapalacios@ucc.edu.ar](mailto:sarapalacios@ucc.edu.ar)

#### Roman Pavella

Crop Research Institute, Dmowska 507, 161 06 Prague  
Czech Republic  
E-Mail: [pavela@vurv.cz](mailto:pavela@vurv.cz)

#### Appa Rao Podile

Vice Chancellor and Professor of Life sciences  
University of Hyderabad  
Hyderabad Central University Rd, CUC, Gachibowli,  
Telangana 500046, India  
E-mail: [podilerao@gmail.com](mailto:podilerao@gmail.com); [podilerao@uohyd.ac.in](mailto:podilerao@uohyd.ac.in)

#### Guadalupe Rojas

Biological Control of Pest Research, USDA, ARS  
59 Lee Road, NBCL, Stoneville, MS 387760067, USA  
E-Mail: [guadalupe.rojas@usda.gov](mailto:guadalupe.rojas@usda.gov)

#### S. Senthil-Nathan

Sri Paramakalyani Centre for Excellence in Environmental Sciences,  
Manonmaniam Sundaranar University,  
Alwarkurichi 627 412, Tamil- Nadu, India  
E-Mail: [senthil@msuniv.ac.in](mailto:senthil@msuniv.ac.in)

#### David Shapiro-Ilan

Fruit and Tree Nut Research, USDA, ARS  
21 Dunbar Road, Byron, GA 310080000, USA  
E-Mail: [david.shapiro@usda.gov](mailto:david.shapiro@usda.gov)

#### Ram Singh

Ex-Head, Department of Entomology  
CCS Agricultural University, Hissar, India  
E-Mail: [ramjood@rediffmail.com](mailto:ramjood@rediffmail.com)

#### C. M. Smith

University Distinguished Professor Emeritus  
University of Kansas, 128 W. Waters Hall  
Manhattan KS 66506, USA  
E-Mail: [cmsmith@ksu.edu](mailto:cmsmith@ksu.edu)

#### Duraïd K. Al Taey

Department of Horticulture, College of agriculture  
Al-Qasim Green University, Iraq  
E-Mail: [duraïdaltay@gmail.com](mailto:duraïdaltay@gmail.com)

#### Suresh Walia

Consultant, AINP on Pesticide Residues  
Division of Agricultural Chemicals, IARI  
New Delhi 110012, India  
E-Mail: [suresh\\_walia@yahoo.com](mailto:suresh_walia@yahoo.com)

#### S. P. Wraight

Research Ecologist, USDA-ARS,  
Emerging Pest and Pathogen Research  
Biological Integrated Pest Management Unit, Ithaca, NY, USA  
E-Mail: [steve.wraight@ars.usda.gov](mailto:steve.wraight@ars.usda.gov)

#### Hanhong Xu

State Key Laboratory for Conservation and Utilization of  
Subtropical Agro-Bioresources  
and Key Laboratory of Natural Pesticide and Chemical Biology  
Ministry of Education, South China Agricultural University,  
Guangzhou, China  
E-Mail: [hxu@scau.edu.cn](mailto:hxu@scau.edu.cn)