

M  
E58

Volume 179

August 2013

ISSN 0269-7491



# ENVIRONMENTAL POLLUTION

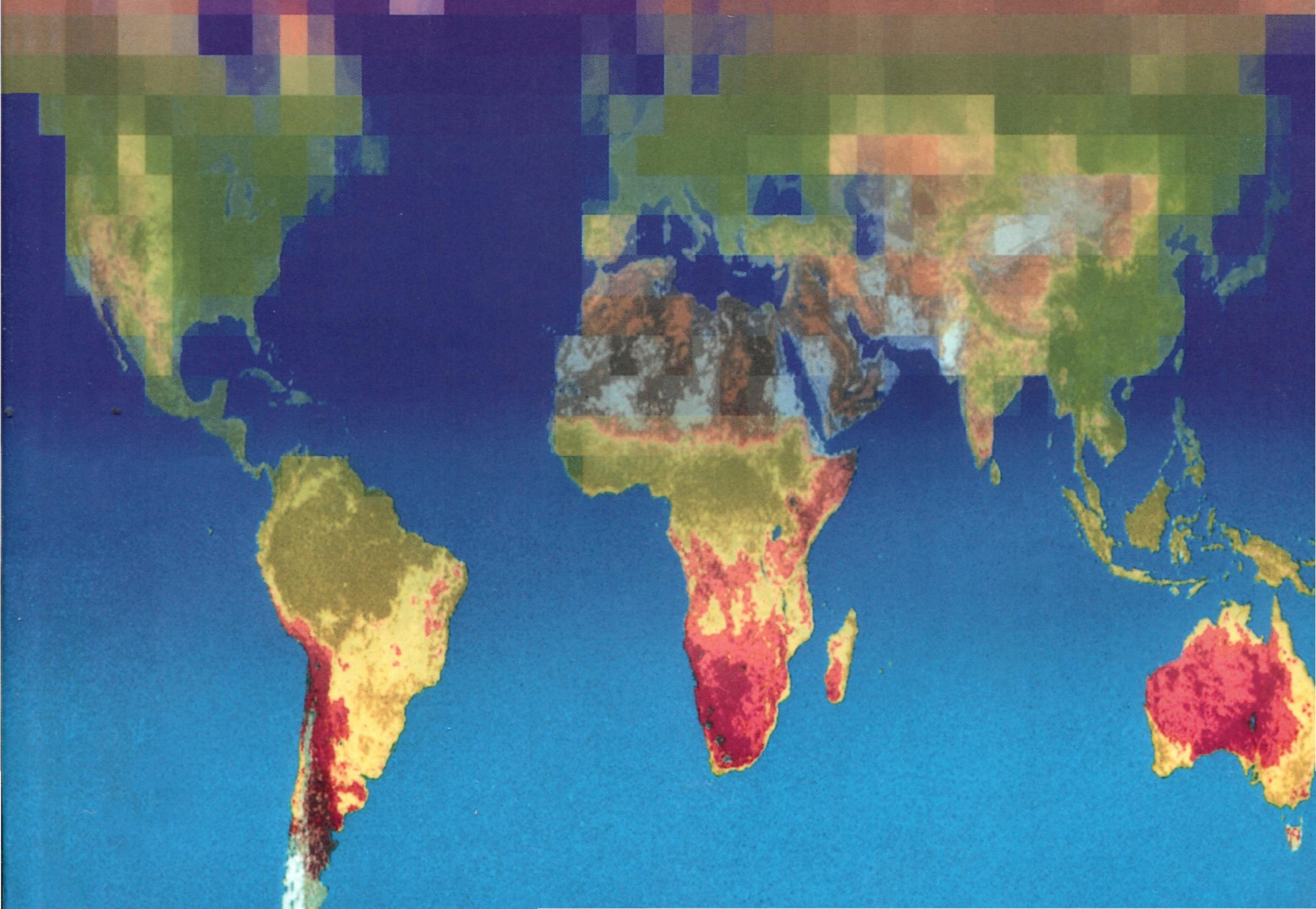
EDITOR-IN-CHIEF

**W.J. Manning**

ASSOCIATE EDITORS

**J. Gan  
B. Nowack**

**E. Paoletti  
C. Wiegand**





**CONTENTS**

**Volume 179 August 2013**

- 1 Artifact weathering, anthropogenic microparticles and lead contamination in urban soils at former demolition sites, Detroit, Michigan**  
J.L. Howard, B.R. Dubay, W.L. Daniels  
*The geochemical partitioning of Pb evolves over time as artifacts weather.*
- 13 Immunomodulation and hormonal disruption without compromised disease resistance in perfluorooctanoic acid (PFOA) exposed Japanese quail**  
J.E.G. Smits, S. Nain  
*Oral exposure of quail to the pollutant, PFOA, resulted in hormonal and immunological changes, but did not compromise disease resistance after challenge by a common avian pathogen.*
- 19 Effects of elevated O<sub>3</sub> exposure on nutrient elements and quality of winter wheat and rice grain in Yangtze River Delta, China**  
F. Zheng, X. Wang, W. Zhang, P. Hou, F. Lu, K. Du, Z. Sun  
*The nutrient elements and quality of winter wheat and rice grain were seriously affected under the elevated O<sub>3</sub> exposure.*
- 27 Social [and health] relevance of psychotropic substances monitoring in air**  
A. Cecinato, C. Balducci, R. Mollica, G. Serpelloni  
*The airborne cocaine/nicotine concentration ratio looks a promising tool to estimate the cocaine abuse prevalence.*
- 33 Role of metal mixtures (Ca, Cu and Pb) on Cd bioaccumulation and phytochelatin production by *Chlamydomonas reinhardtii***  
P. Abboud, K.J. Wilkinson  
*In metal mixtures containing Cd and Ca, Pb or Cu, bioaccumulated metal rather than free ion was a better predictor of biological effect.*
- 39 Metabolic and molecular methods to evaluate the organoclay effects on a bacterial community**  
C. Abbate, R. Ambrosoli, J.L. Minati, M. Gennari, M. Arena  
*This work is a good tool to determine the environmental impact of organoclays on a bacterial community.*
- 45 Bioaccumulation of perfluoroalkyl carboxylates (PFCAs) and perfluoroalkane sulfonates (PFSA) by earthworms (*Eisenia fetida*) in soil**  
S. Zhao, L. Zhu, L. Liu, Z. Liu, Y. Zhang  
*Perfluoroalkyl substances (PFASs) can be effectively bioaccumulated in earthworms including those with seven or less perfluoroalkyl carbon chain length.*
- 53 Carbonate minerals in porous media decrease mobility of polyacrylic acid modified zero-valent iron nanoparticles used for groundwater remediation**  
S. Laumann, V. Micić, G.V. Lowry, T. Hofmann  
*Carbonate minerals in porous aquifers significantly decrease the mobility of commercially available polyacrylic acid modified nanoscale zero-valent iron.*
- 61 Age- and gender-related accumulation of perfluoroalkyl substances in captive Chinese alligators (*Alligator sinensis*)**  
J. Wang, Y. Zhang, F. Zhang, L.W.Y. Yeung, S. Taniyasu, E. Yamazaki, R. Wang, P.K.S. Lam, N. Yamashita, J. Dai  
*Age- and gender-related accumulation of perfluoroalkyl substances in captive Chinese alligators.*
- 68 Effects of copper on germination and reserve mobilization in *Vicia sativa* L. seeds**  
S. Muccifora, L.M. Bellani  
*Copper excess allowed germination but arrested radicle growth in *Vicia sativa* L. seeds.*

*Continued on inside back cover*

(Abstracted/indexed in: AGRICOLA database; Air Pollution Control Association Journal; Biological and Agricultural Index; CAB ABSTRACTS database; Elsevier BIOBASE/Current Awareness in Biological Sciences; Cambridge Scientific Abstracts; Chemical Abstracts; Current Contents/ Agriculture, Biology & Environmental Sciences; Environment Abstracts; Environmental Periodicals Bibliography; Energy Information-Abstracts; EMBASE/Excerpta Medica; Geo Abstracts; GEOBASE; Index Medicus/MEDLINE/PubMed; Thomson Scientific GeoSciTech; Science Citation Index; SciSearch). Also covered in the abstract and citation database SciVerse Scopus®. Full text available on SciVerse ScienceDirect®.



0269-7491(201308)179;1-C



ELSEVIER

## CONTENTS—Continued from outside back cover

- 75 **Hexachlorocyclohexanes (HCHs) in placenta and umbilical cord blood and dietary intake for women in Beijing, China**  
Y. Yu, B. Wang, X. Wang, R. Wang, W. Wang, G. Shen, H. Shen, W. Li, M. Wong, W. Liu, S. Tao  
*HCHs in placenta of women in Beijing were significantly correlated with total food consumption, dietary intake, and maternal age.*
- 81 **Protective role of fine silts for PAH in a former industrial soil**  
A. Pernot, S. Ouvrard, P. Leglise, P. Faure  
*Simultaneous highest concentrations and smallest availability of PAH are found in fine silts. They play a protective role for PAH in a former industrial soil.*
- 88 **Vertical eddy diffusion as a key mechanism for removing perfluorooctanoic acid (PFOA) from the global surface oceans**  
R. Lohmann, E. Jurado, H.A. Dijkstra, J. Dachs  
*Vertical eddy diffusion is an important removal process for hydrophilic organic pollutants such as PFOA from the surface ocean.*
- 95 **Biodegradation of carbamate pesticides by natural river biofilms in different seasons and their effects on biofilm community structure**  
C.-J. Tien, M.-C. Lin, W.-H. Chiu, C.S. Chen  
*Biodegradation of carbamate pesticides by river biofilms.*
- 105 **Diastereoisomer and enantiomer-specific profiles of hexabromocyclododecane and tetrabromobisphenol A in an aquatic environment in a highly industrialized area, South China: Vertical profile, phase partition, and bioaccumulation**  
M.-J. He, X.-J. Luo, L.-H. Yu, J.-P. Wu, S.-J. Chen, B.-X. Mai  
*Biogeochemistry behaviors of TBBPA and HBCDs in aquatic environment in a highly industrialized area in South China were demonstrated.*
- 111 **Pre-exposure to nitric oxide modulates the effect of ozone on oxidative defenses and volatile emissions in lima bean**  
S.R. Souza, J.D. Blande, J.K. Holopainen  
*Nitric oxide modulates the ozone-induced oxidative stress in lima bean by cross-tolerance effect.*
- 120 **Heterogeneity of atmospheric ammonia at the landscape scale and consequences for environmental impact assessment**  
E. Vogt, U. Dragosits, C.F. Braban, M.R. Theobald, A.J. Dore, N. van Dijk, Y.S. Tang, C. McDonald, S. Murray, R.M. Rees, M.A. Sutton  
*Fine scale resolution modelling to reproduce the spatial heterogeneity of atmospheric NH<sub>3</sub> concentrations and deposition is critical for NH<sub>3</sub> risk assessment on sensitive ecosystems.*
- 132 **Analysis of mercury in rock varnish samples in areas impacted by coal-fired power plants**  
P. Nowinski, V.F. Hodge, S. Gerstenberger, J.V. Cizdziel  
*Cold vapor atomic absorption spectrometry (CVAAS) was used for analysis of mercury in varnished rocks collected in the fallout zones of two coal-fired power plants.*
- 138 **Evaluation of AERMOD and CALPUFF for predicting ambient concentrations of total suspended particulate matter (TSP) emissions from a quarry in complex terrain**  
D. Tartakovsky, D.M. Broday, E. Stern  
*This work evaluates dispersion calculations of AERMOD and CALPUFF for particulate matter emissions from a quarry located in a complex terrain.*
- 146 **Simulated degradation of biochar and its potential environmental implications**  
Z. Liu, W. Demisie, M. Zhang  
*The simulated degradation of biochar in this study could provide a mechanism for forecasting short- or long-term environmental degradation of biochar.*
- 153 **Influence of organic matter type and medium composition on the sorption affinity of C12-benzalkonium cation**  
Y. Chen, J.L.M. Hermens, S.T.J. Droge  
*C12-BAC sorption to the four organic matter samples were investigated by the ion-exchange SPME and the NICA-Donnan model explained the different sorption affinities caused by Na<sup>+</sup> and Ca<sup>2+</sup>.*
- 160 **Arsenic K-edge X-ray absorption near-edge spectroscopy to determine oxidation states of arsenic of a coastal aquifer-aquitard system**  
Y. Wang, J.J. Jiao, S. Zhu, Y. Li  
*As K-edge X-ray absorption near-edge spectroscopy is efficient in determining arsenic oxidation states of the bulk sediments with low arsenic contents and heterogeneous distribution of arsenic species.*
- 167 **Phytotoxicity of zinc and manganese to seedlings grown in soil contaminated by zinc smelting**  
W.N. Beyer, C.E. Green, M. Beyer, R.L. Chaney  
*This work estimates the phytotoxic thresholds of Zn to tree seedlings in smelter-contaminated soil and explains the interactions of Zn with Mn and Ca.*
- 177 **Application of MicroResp™ for soil ecotoxicology**  
S. Wakelin, E. Lombi, E. Donner, L. MacDonald, A. Black, M. O'Callaghan  
*The miniaturised whole-soil substrate induced respiration method 'MicroResp' was modified for soil ecotoxicology.*

- 185 **Nitrogen deposition alters nitrogen cycling and reduces soil carbon content in low-productivity semiarid Mediterranean ecosystems**  
R. Ochoa-Hueso, F.T. Maestre, A. de los Ríos, S. Valea, M.R. Theobald, M.G. Vivanco, E. Manrique, M.A. Bowker  
*N deposition alters N cycling and reduces soil C content in semiarid Mediterranean ecosystems.*
- 194 **Occurrence and risk assessment of organophosphorus and brominated flame retardants in the River Aire (UK)**  
J. Cristale, A. Katsoyiannis, A.J. Sweetman, K.C. Jones, S. Lacorte  
*Organophosphorus flame retardants and BDE-209 were detected at high concentrations along River Aire (UK) and a risk assessment indicated significant risk for adverse effects to aquatic organisms.*
- 201 **Tracing decadal environmental change in ombrotrophic bogs using diatoms from herbarium collections and transfer functions**  
A. Pouličková, P. Hájková, K. Kintrová, R. Bat'ková, M. Czudková, M. Hájek  
*We provide clear evidence that the recent pH/calcium gradient appeared ca 20 years ago owing to aerial liming of forests.*
- 210 **Arsenic transport in irrigation water across rice-field soils in Bangladesh**  
M.L. Polizzotto, E.M. Lineberger, A.R. Matteson, R.B. Neumann, A.B.M. Badruzzaman, M. Ashraf Ali  
*Arsenic concentrations in flowing and static irrigation water in Bangladesh varied over space and time, suggesting careful design is required for land-based pre-treatment schemes that aim to remove As from solution.*
- 218 **Nitrogen deposition effects on plant species diversity; threshold loads from field data**  
E. Tipping, P.A. Henrys, L.C. Maskell, S.M. Smart  
*Analysis of extensive field data provides estimates of nitrogen deposition rates above which plant species richness is reduced.*
- 224 **Application of fingerprint-based multivariate statistical analyses in source characterization and tracking of contaminated sediment migration in surface water**  
F. Chen, W.D. Taylor, W.B. Anderson, P.M. Huck  
*Fingerprint- and concentration-based multivariate analyses provide effective tools for source characterization and tracking the migration of contaminated aquatic sediment.*
- 232 **Assessing ecotoxicity and uptake of metals and metalloids in relation to two different earthworm species (*Eiseina hortensis* and *Lumbricus terrestris*)**  
T. Leveque, Y. Capowiez, E. Schreck, C. Mazzia, M. Auffan, Y. Foucault, A. Austruy, C. Dumat  
*Behavioural factors and inorganic pollutant uptake by earthworms provide a valuable indication of bioavailability and ecotoxicity.*
- 242 **Influence of fine process particles enriched with metals and metalloids on *Lactuca sativa* L. leaf fatty acid composition following air and/or soil-plant field exposure**  
E. Schreck, C. Laplanche, M. Le Guédard, J.-J. Bessoule, A. Austruy, T. Xiong, Y. Foucault, C. Dumat  
*Metal uptake via both foliar and root pathways alters in a distinctive manner the fatty acid composition of lettuce leaves.*
- 250 **Estimation of main greenhouse gases emission from household energy consumption in the West Bank, Palestine**  
M. Abu-Madi, M.A. Rayyan  
*The most polluting energy sources that produce most of the CO<sub>2</sub> and SO<sub>2</sub> emissions in the West Bank are wood and electricity.*
- 258 **In vitro toxicity of silver nanoparticles to kiwifruit pollen exhibits peculiar traits beyond the cause of silver ion release**  
A. Speranza, R. Crinelli, V. Scoccianti, A.R. Taddei, M. Iacobucci, P. Bhattacharya, P.C. Ke  
*AgNP toxicity to pollen does not match the effects of released Ag<sup>+</sup>.*
- 268 **Effects of soil pollutants, biogeochemistry and microbiology on the distribution and composition of enchytraeid communities in urban and suburban holm oak stands**  
E. Rota, T. Caruso, F. Monaci, D. Baldantoni, F. De Nicola, P. Iovieno, R. Bargagli  
*The co-variation between pollution and other soil chemico-physical factors affects significantly the enchytraeid communities in Mediterranean urban holm oak stands.*
- 277 **The organic air pollutant cumene hydroperoxide interferes with NO antioxidant role in rehydrating lichen**  
M. Catalá, F. Gasulla, A.E. Pradas del Real, F. García-Breijo, J. Reig-Armiñana, E. Barreno  
*The organic air pollutant cumene hydroperoxide induces oxidative membrane damage in the lichen *Ramalina farinacea* during rehydration. Nitric oxide (NO) is involved in lichen response.*
- 285 **A systematic review of the effectiveness of liming to mitigate impacts of river acidification on fish and macro-invertebrates**  
R.C. Mant, D.L. Jones, B. Reynolds, S.J. Ormerod, A.S. Pullin  
*A systematic review showed lime application to acidified rivers increased average fish abundance, and abundance and richness in acid-sensitive invertebrates, but not always.*
- 294 **Influence of plant root morphology and tissue composition on phenanthrene uptake: Stepwise multiple linear regression analysis**  
X. Zhan, X. Liang, G. Xu, L. Zhou  
*The contribution of specific surface area is greater than that of lipid in the two most important root morphological and compositional factors affecting phenanthrene uptake.*
- 301 **Kinetic control of contaminant release from NAPLs – Information potential of concentration time profiles**  
M. Wehrer, J. Mai, S. Attinger, K.U. Totsche  
*Identification of rate limiting release processes from NAPL requires thorough model evaluation and long experimental duration.*

**315 Kinetic control of contaminant release from NAPLs – Experimental evidence**

M. Wehrer, T. Rennert, K.U. Totsche

*Release of PAHs from tar phases is severely restricted by retarded pore diffusion.*

**326 A review of metal (Pb and Zn) sensitive and pH tolerant bioassay organisms for risk screening of metal-contaminated acidic soils**

E.E.V. Chapman, G. Dave, J.D. Murimboh

*This review identifies bioassay species able to withstand naturally acidic soils while being sensitive to metal contaminants.*

**343 Using biomarkers in an evolutionary context: Lessons from the analysis of biological responses of oligochaete annelids to metal exposure**

M. Pauwels, H. Frérot, D. Souleman, F. Vandenbulcke

*Considering the possibility of adaptation into the biomarker concept.*