

## CONTENTS

Volume 169 October 2012

### Including the Special Sections: Interactions Between Indoor and Outdoor Air Pollution - Trends and Scientific Challenges Ozone, Climate Change and Forests

#### Regular Papers

- 1 Metal immobilization and soil amendment efficiency at a contaminated sediment landfill site: A field study focusing on plants, springtails, and bacteria**  
V. Bert, C. Lors, J.-F. Ponge, L. Caron, A. Biaz, M. Dazy, J.-F. Masfaraud  
*In-situ incorporation of Thomas Basic Slag into a landfilled metal-contaminated sediment decreases metal mobility and ecotoxicity and increases bacterial activity.*
- 12 Sorption of atrazine and ametryn by carbonatic and non-carbonatic soils of varied origin**  
G.N. Kasozi, P. Nkedi-Kizza, Y. Li, A.R. Zimmerman  
*It is organic matter compositional differences rather than mineral surfaces that likely explain the sorption variation in this study of the sorption of predominately neutral s-triazines to varied soils.*
- 20 Distribution, historical trends and inventories of polychlorinated biphenyls in sediments from Yangtze River Estuary and adjacent East China Sea**  
H. Yang, S. Zhuo, B. Xue, C. Zhang, W. Liu  
*Spatial and temporal distributions of polychlorinated biphenyls have been delineated in sediments from Yangtze River Estuary and adjacent East China Sea.*
- 27 Effects of high CO<sub>2</sub> concentrations on ecophysiologicaly different microorganisms**  
A. Schulz, C. Vogt, H.-H. Richnow  
*Increased CO<sub>2</sub> concentrations, combined also with high pressure, adversely affected the growth and viability of four ecophysiological different microorganisms.*
- 35 Impacts of warming on aquatic decomposers along a gradient of cadmium stress**  
D. Batista, C. Pascoal, F. Cássio  
*Global warming may increase cadmium toxicity to freshwater decomposers with implications to ecosystem processes.*
- 42 Class 1 and 2 integrons, *sul* resistance genes and antibiotic resistance in *Escherichia coli* isolated from Dongjiang River, South China**  
H.-C. Su, G.-G. Ying, R. Tao, R.-Q. Zhang, J.-L. Zhao, Y.-S. Liu  
*Bacterial resistance to antibiotics in a catchment is related to the discharge of wastewater into the aquatic environment.*
- 50 *In vitro* immunotoxicity of environmentally representative antibiotics to the freshwater mussel *Elliptio complanata***  
M. Gust, M. Gélinas, M. Fortier, M. Fournier, F. Gagné  
*Environmentally relevant concentration of antibiotics and filtered urban effluent similarly modulate the in vitro immune response of mussels' hemocytes.*
- 59 Development of freshwater aquatic life criteria for Tetrabromobisphenol A in China**  
S.-w. Yang, Z.-g. Yan, F.-f. Xu, S.-r. Wang, F.-c. Wu  
*An acute water quality criterion of 0.1475 mg/L and a chronic water quality criterion of 0.0126 mg/L for TBBPA in China were developed according to USEPA guidelines.*
- 64 Long-term colloidal stability of 10 carbon nanotube types in the absence/presence of humic acid and calcium**  
I. Schwyzer, R. Kaegi, L. Sigg, R. Smajda, A. Magrez, B. Nowack  
*The long-term colloidal stability of 10 different CNT types in the presence of humic acid was dependent on oxygen content and diameter of the CNTs.*

Continued on inside back cover

# ENVIRONMENTAL POLLUTION

## CONTENTS—Continued from outside back cover

- 74 Arsenic resistance and cycling in earthworms residing at a former gold mine in Canada**  
M. Button, I. Koch, K.J. Reimer  
*Adaptation of earthworms to arsenic contaminated soils is widespread and not species specific.*
- 81 Sub-toxic effects of CuO nanoparticles on bacteria: Kinetics, role of Cu ions and possible mechanisms of action**  
O. Bondarenko, A. Ivask, A. Käkkinen, A. Kahru  
*Nano-CuO induces the bacterial ROS and DNA damage defence systems already at very low sub-toxic levels and these early adverse effects are triggered by dissolved Cu ions.*
- 90 Air–soil exchange of PCBs: Seasonal variations in levels and fluxes with influence of equilibrium conditions**  
Y. Tasdemir, G. Salihoglu, N.K. Salihoglu, A. Birgül  
*PCB concentrations, fugacity fractions and flux levels at air–soil interface were evaluated together on the seasonal basis.*
- 98 Estimating pesticide sampling rates by the polar organic chemical integrative sampler (POCIS) in the presence of natural organic matter and varying hydrodynamic conditions**  
L. Charlestra, A. Amirbahman, D.L. Courtemanch, D.A. Alvarez, H. Patterson  
*This study provides POCIS sampling rates data that can be used to estimate freely dissolved concentrations of toxic pesticides in natural waters.*
- 105 Atmospheric polybrominated diphenyl ethers (PBDEs) in the United Kingdom**  
A. Birgul, A. Katsoyannis, R. Gioia, J. Crosse, M. Earnshaw, N. Ratola, K.C. Jones, A.J. Sweetman  
*PBDE levels have declined in the United Kingdom since 2000 in a manner that broadly supports national atmospheric emissions inventories.*
- 112 Compound Specific Isotope Analysis (CSIA) for chlorine and bromine: A review of techniques and applications to elucidate environmental sources and processes**  
A. Cincinelli, F. Pieri, Y. Zhang, M. Seed, K.C. Jones  
*An overview of Compound Specific Isotope Analysis techniques and successful applications to elucidate sources and processes of chlorinated and brominated compounds is reported.*
- 128 Associations between standardized school performance tests and mixtures of Pb, Zn, Cd, Ni, Mn, Cu, Cr, Co, and V in community soils of New Orleans**  
S. Zahran, H.W. Mielke, S. Weiler, L. Hempel, K.J. Berry, C.R. Gonzales  
*Controlling for potential confounding variables, the accumulation of metals (Pb, Zn, Cd, Ni, Mn, Cu, Cr, and Co) in neighborhood soils is significantly negatively associated with 4th grade school performance on standardized tests in New Orleans.*

## Letter to the Editor

- 136 Comment on “Abundance of birds in Fukushima as judged from Chernobyl” by Møller et al. (2012)**  
N.A. Beresford, C. Adam-Guillermin, J.-M. Bonzom, J. Garnier-Laplace, T. Hinton, C. Lecomte, D. Copplestone

## Reply to Letter to the Editor

- 137 Reply to “Comment on “Abundance of birds in Fukushima as judged from Chernobyl” by Møller et al. (2012)”**  
T.A. Mousseau, A.P. Møller, K. Ueda

## Response

- 139 Response to authors' reply regarding “Abundance of birds in Fukushima as judged from Chernobyl” by Møller et al. (2012)**  
N.A. Beresford, C. Adam-Guillermin, J.-M. Bonzom, J. Garnier-Laplace, T. Hinton, C. Lecomte, D. Copplestone, C. Della Vedova, C. Ritz

## Reply to Response

- 141 Reply to response regarding “Abundance of birds in Fukushima as judged from Chernobyl” by Møller et al. (2012)**  
T.A. Mousseau, A.P. Møller

## Letter to the Editor

- 143 Comments to “Multicorrelation models and uptake factors to estimate extractable metal concentrations from soil and metal in plants in pasturelands fertilized with Manure” by Lopes et al. (2012). [Environmental Pollution 166 (2012) 17-22]**  
P.F. Römkens

## Reply to Letter to the Editor

- 144 Reply to comment on “Multicorrelation models and uptake factors to estimate extractable metal concentrations from soil and metal in plants in pasturelands fertilized with manure” by Lopes et al. (2012)**  
E. Roca

## CONTENTS—Continued from inside back cover

### Response

- 146 **Response to authors' reply on "Multicorrelation models and uptake factors to estimate extractable metal concentrations from soil and metal in plants in pasturelands fertilized with manure" by Lopes et al. (2012)**  
P.F. Römken

### Reply to Response

- 147 **Reply to response regarding "Multicorrelation models and uptake factors to estimate extractable metal concentrations from soil and metal in plants in pasturelands fertilized with manure" by Lopes et al. (2012)**  
E. Roca

## Special Section Papers: Interactions Between Indoor and Outdoor Air Pollution - Trends and Scientific Challenges

### 149 About the Guest Editors

### Introduction

- 150 **Interactions between indoor and outdoor air pollution – Trends and scientific challenges**  
A. Katsoyiannis, C. Bogdal

### Special Section Papers

- 152 **Variability of indoor and outdoor VOC measurements: An analysis using variance components**  
C. Jia, S.A. Batterman, G.E. Relyea

*Indoor VOC concentrations were primarily controlled by seasonal and residence effects; and outdoor concentrations were homogeneous within neighborhoods. Variance component analysis is a useful tool for designing effective sampling programs.*

- 160 **Occurrence and exposure to polycyclic aromatic hydrocarbons and their derivatives in a rural Chinese home through biomass fuelled cooking**

J. Ding, J. Zhong, Y. Yang, B. Li, G. Shen, Y. Su, C. Wang, W. Li, H. Shen, B. Wang, R. Wang, Y. Huang, Y. Zhang, H. Cao, Y. Zhu, S.L.M. Simonich, S. Tao

*Rural residents, particularly housewives that cook, are exposed to very high PAH, including nitro and oxygenated-PAH, concentrations in indoor air.*

- 167 **Aerosols generated by hardcopy devices and other electrical appliances**  
T. Salthammer, T. Schripp, E. Uhde, M. Wensing

*Electrical appliances like household devices and laser printers are potential sources of ultrafine particles in the indoor environment.*

- 175 **Legacy and current-use flame retardants in house dust from Vancouver, Canada**  
M. Shoeib, T. Harner, G.M. Webster, E. Sverko, Y. Cheng

*The ban of the Penta and Octa PBDE flame retardant (FR) formulations led to the broad use of alternative (non-PBDEs) FRs. New information is presented on levels of PBDEs and non-PBDEs in house dust samples collected from Vancouver, Canada.*

- 183 **A comparison of submicrometer particle dose between Australian and Italian people**  
G. Buonanno, L. Morawska, L. Stabile, L. Wang, G. Giovenco

*Alveolar and tracheobronchial-deposited submicrometer particle doses, in terms of number and surface area, were evaluated through a Monte Carlo method for different age groups population in Brisbane, Australia and compared to previously published Italian data.*

- 190 **Polycyclic aromatic hydrocarbons on indoor/outdoor glass window surfaces in Guangzhou and Hong Kong, south China**  
S.-H. Pan, J. Li, T. Lin, G. Zhang, X.-D. Li, H. Yin

*Higher PAH concentrations on exterior window films indicated that outdoor air acted as a major source of pollution.*

- 196 **Atmospheric fate of poly- and perfluorinated alkyl substances (PFASs): I. Day-night patterns of air concentrations in summer in Zurich, Switzerland**

C.E. Müller, A.C. Gerecke, C. Bogdal, Z. Wang, M. Scheringer, K. Hungerbühler

*Semivolatile PFAS concentrations follow a diel trend in Zurich City in stable summer conditions likely due to atmospheric boundary layer effects and urban emissions.*

- 204 **Atmospheric fate of poly- and perfluorinated alkyl substances (PFASs): II. Emission source strength in summer in Zurich, Switzerland**

Z. Wang, M. Scheringer, M. MacLeod, C. Bogdal, C.E. Müller, A.C. Gerecke, K. Hungerbühler

*Using field measurements and an environmental fate model in combination, we estimate the strength of diffusive emissions of four semi-volatile PFAS in the city of Zurich, an urban area typical of Western industrialized countries.*

- 210 **Influence of sugarcane burning on indoor/outdoor PAH air pollution in Brazil**

J. Cristale, F.S. Silva, G.J. Zocolo, M.R.R. Marchi

*Biomass burning at Brazilian sugarcane plantations has been identified as an important outdoor source of PAHs, which increases the PAH levels in indoor air and represents a public health risk in cities affected by this practice.*

**217 Polybrominated diphenyl ethers (PBDEs) in the indoor and outdoor environments – A review on occurrence and human exposure**

A. Basis, C. Samara

*Although dietary intake is major human exposure route to PBDEs, there is sufficient body of evidence for the ubiquitous presence of these compounds in indoor air and dust, therefore for the potential for significant exposure at work, at home, as well as in closed means of transport.*

**230 Building materials. VOC emissions, diffusion behaviour and implications from their use**

A. Katsoyiannis, P. Leva, J. Barrero-Moreno, D. Kotzias

*Neopentyl glycol was detected in high concentrations in emissions from building materials.*

**235 Estimation of human body concentrations of DDT from indoor residual spraying for malaria control**

T. Gyalpo, L. Fritsche, H. Bouwman, R. Bornman, M. Scheringer, K. Hungerbühler

*Model predictions of a one-compartment pharmacokinetic model confirm the trends of DDT found in human samples of inhabitants living in DDT-treated dwellings.*

**242 The contribution of waste water treatment plants to PBDEs in ambient air**

T. Martellini, K.C. Jones, A. Sweetman, M. Giannoni, F. Pieri, A. Cincinelli

*Waste water treatment plants as sources of PBDEs to the ambient air.*

**Special Section Papers: Ozone, Climate Change and Forests**

**Introduction**

**249 Ozone, climate change and forests**

E. Paoletti, P. Cudlin

**Special Section Papers**

**250 Ozone visible symptoms and reduced root biomass in the subalpine species *Pinus uncinata* after two years of free-air ozone fumigation**

M. Díaz-de-Quijano, M. Schaub, S. Bassin, M. Volk, J. Peñuelas

*Ozone concentrations similar to those in the Pyrenees affect *Pinus uncinata* by reducing root biomass and possibly increasing susceptibility to other stresses.*

**258 Ozone deposition to an orange orchard: Partitioning between stomatal and non-stomatal sinks**

S. Fares, R. Weber, J.-H. Park, D. Gentner, J. Karik, A.H. Goldstein

*We observe tropospheric ozone fluxes in a Citrus orchard and conclude that non-stomatal ozone deposition is larger than stomatal uptake.*

**267 The influence of climate change on stomatal ozone flux to a mountain Norway spruce forest**

M. Zapletal, J. Pretel, P. Chroust, P. Cudlín, M. Edwards-Jonášová, O. Urban, R. Pokorný, R. Czerný, I. Hůnová

*Though the exceedance of the flux-based critical level of O<sub>3</sub> might be lower for Norway spruce, stomatal flux will have negative effect on NEP values in a future climate.*