# ENVIRONMENTAL POLLUTION

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### SPECIAL ISSUE SECTION: Nitrogen Deposition, Critical Loads and Biodiversity

### Introduction

### 2211 Special issue on nitrogen deposition, critical loads, and biodiversity

C.L. Goodale, N.B. Dise, M.A. Sutton

### **Special Section Papers**

### 2214 Atmospheric nitrogen deposition: Revisiting the question of the importance of the organic component

S.E. Cornell

Routinely including the organic component of atmospheric deposition (known to be around 25–35% worldwide) would make the understanding and prediction of nitrogen biogeochemistry more robust. This paper makes a preliminary global synthesis based on literature reports.

### 2223 Nitrogen critical loads using biodiversity-related critical limits

M. Posch, J. Aherne, J.-P. Hettelingh

Biodiversity-related critical limits lead to optimal nitrogen and sulphur deposition envelopes for plant species or species compositions.

# 2228 Effects of experimental nitrogen additions on plant diversity in tropical forests of contrasting disturbance regimes in southern china

X. Lu, J. Mo, F.S. Gilliam, G. Yu, W. Zhang, Y. Fang, J. Huang

Research in disturbed forests of southeastern China demonstrates that land-use history can substantially alter effects of excess nitrogen deposition on plant diversity of tropical forest ecosystems.

# **2236** Diversity of shrub tree layer, leaf litter decomposition and N release in a Brazilian Cerrado under N, P and N plus P additions T.K.B. Jacobson, M.M.da.C. Bustamante, A.R. Kozovits

Shrub-tree diversity and functioning of Brazilian savanna are affected by increasing nutrient availability.

### 2243 The impact of nitrogen deposition on acid grasslands in the Atlantic region of Europe

C.J. Stevens, C. Duprè, E. Dorland, C. Gaudnik, D.J.G. Gowing, A. Bleeker, M. Diekmann, D. Alard, R. Bobbink, D. Fowler, E. Corcket, J.O. Mountford, V. Vandvik, P.A. Aarrestad, S. Muller, N.B. Dise

Atmospheric nitrogen deposition affects soils, plant-tissue chemistry and plant species composition in acid grasslands in the Atlantic biogeographic region of Europe.

### 2251 Nitrogen deposition and its ecological impact in China: An overview

X. Liu, L. Duan, J. Mo, E. Du, J. Shen, X. Lu, Y. Zhang, X. Zhou, C. He, F. Zhang

This paper reviews current knowledge on nitrogen deposition and its effects across China

### 2265 Nitrogen deposition effects on Mediterranean-type ecosystems: An ecological assessment

R. Ochoa-Hueso, E.B. Allen, C. Branquinho, C. Cruz, T. Dias, M.E. Fenn, E. Manrique, M.E. Pérez-Corona, L.J. Sheppard, W.D. Stock

Nitrogen deposition threatens the Mediterranean regions of the world.

### 2280 N deposition as a threat to the World's protected areas under the Convention on Biological Diversity

A. Bleeker, W.K. Hicks, F. Dentener, J. Galloway, J.W. Erisman

**Signific**ant areas of the UNEP Protected Areas Programme under the CBD receive high N deposition rates that are likely to increase in the future, especially in Asia, and may pose a significant threat to biodiversity.

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# 2289 Modelling the impact of nitrogen deposition, climate change and nutrient limitations on tree carbon sequestration in Europe for the period 1900–2050

W. de Vries, M. Posch

A modelling exercise indicates that nitrogen deposition was the main factor that enhanced tree carbon sequestration in Europe in the past, while climate change will do so in the future

#### **Recognition of Frequent Reviewers**

#### 2300 Recognition of frequent reviewers 2007-2010

#### Reviews

# 2301 Regional dynamics of persistent organic pollutants (POPs) in the Pearl River Delta, China: Implications and perspectives K. Zhang, B.-Z. Zhang, S.-M. Li, E.Y. Zeng

Regional dynamics of p,p'-DDT and BDE-209 in the Pearl River Delta (South China) are examined and used to predict temporal variances.

# 2310 Sources of ambient volatile organic compounds and their contributions to photochemical ozone formation at a site in the Pearl River Delta, southern China

Z.H. Ling, H. Guo, H.R. Cheng, Y.F. Yu

Solvent usage, diesel vehicular emissions and biomass/biofuel burning were the major contributors to the photochemical O3 formation in the PRD region.

# 2320 In vitro and in vivo approaches for the measurement of oral bioavailability of lead (Pb) in contaminated soils: A review M.H. Zia, E.E. Codling, K.G. Scheckel, R.L. Chaney

Improved risk evaluation and recommendations for Pb contaminated soils should be based on bioavailability-correlated bioaccessible soil Pb rather than total soil Pb.

### 2328 Fate and effects of anthropogenic chemicals in mangrove ecosystems: A review

M. Lewis, R. Pryor, L. Wilking

Chemical risk assessments and resource management are restricted by the limited chemical fate and effects database for mangroves.

#### Commentary

### 2347 Trophically available metal - A variable feast

P.S. Rainbow, S.N. Luoma, W.-X. Wang

Trophically Available Metal (TAM), the component of accumulated metal in food that is taken up by a feeding animal, varies with food type and consumer.

#### **Rapid Communication**

# 2350 Exposure to moderate concentrations of tropospheric ozone impairs tree stomatal response to carbon dioxide G. Onandia, A.-K. Olsson, S. Barth, J.S. King, J. Uddling

Exposure to moderate concentrations of tropospheric ozone impairs stomatal CO2 responsiveness of birch in the Aspen FACE experiment.

### **New Initiatives**

### 2355 Sorption isotherms of brominated diphenyl ethers on natural soils with different organic carbon fractions W. Liu, W. Li, B. Xing, J. Chen, S. Tao

Both linear distribution and nonlinear Freundlich model could well describe the sorption isotherms of PBDEs on natural soils.

### **Regular Papers**

# 2359 Assessing the diurnal variability of pharmaceutical and personal care products in a full-scale activated sludge plant R. Salgado, R. Marques, J.P. Noronha, J.T. Mexia, G. Carvalho, A. Oehmen, M.A.M. Reis

The diurnal variations of pharmaceuticals and musks were studied in an activated sludge plant, where the loadings of the musks were more repeatable than the pharmaceuticals.

# 2368 Species- and age-related variation in metal exposure and accumulation of two passerine bird species Å.M.M. Berglund, M.J. Koivula, T. Eeva

Accumulation of metals in liver of two insectivorous passerines reflects inter-specific differences in diet, absorption rate and physiological requirements.

### 2375 Sorption-desorption behavior of polybrominated diphenyl ethers in soils

Y. Olshansky, T. Polubesova, W. Vetter, B. Chefetz

Pronounced desorption hysteresis was observed for BDE-15 in natural soils.

# 2380 Wastewater treatment plants and landfills emit volatile methyl siloxanes (VMSs) to the atmosphere: Investigations using a new passive air sampler

Y. Cheng, M. Shoeib, L. Ahrens, T. Harner, J. Ma

Wastewater treatment plants and landfills are shown to emit large quantities of chemicals used in personal care products (volatile methyl siloxanes) to the atmosphere.

# 2387 Global DNA methylation in earthworms: A candidate biomarker of epigenetic risks related to the presence of metals/ metalloids in terrestrial environments

M.M. Santoyo, C.R. Flores, A.L. Torres, K. Wrobel, K. Wrobel

Biomethylation of As, Hg in earthworms versus DNA methylation – a candidate biomarker of epigenetic risks related to the presence of metals/metalloids in soil.

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### 2393 Mobile passive samplers: Concept for a novel mode of exposure

I.J. Allan, H.C. Nilson, I. Tjensvoll, C. Bradshaw, K. Næs

The first application of a novel mode of exposure for passive sampling devices in water is presented.

### 2398 Arsenite toxicity and uptake rate of rice (Oryza sativa L.) in vivo

H. Hoffmann, M.K. Schenk

Uptake of arsenite, water, and nutrients by rice seedlings was impaired by arsenite concentrations higher than the toxicity threshold of 2.4 μΜ.

### 2405 The effect of air pollution and other environmental stressors on leaf fluctuating asymmetry and specific leaf area of Salix alba L

T. Wuytack, K. Wuyts, S. Van Dongen, L. Baeten, F. Kardel, K. Verheyen, R. Samson

Specific leaf area of S. alba increased with increasing shade and, in less extent, with increasing NO<sub>x</sub> and decreasing O<sub>3</sub> concentration, while leaf asymmetry did not respond to air pollution

# 2412 Concentration of trace elements in feathers of three Antarctic penguins: Geographical and interspecific differences S. Jerez, M. Motas, M.J. Palacios, F. Valera, J.J. Cuervo, A. Barbosa

Trace element levels in feathers of three penguin species from the Antarctic Peninsula indicate the presence of pollution in certain locations.

# 2420 Within season and carry-over effects following exposure of grassland species mixtures to increasing background ozone F. Hayes, G. Mills, H. Harmens, K. Wyness

Increased background ozone enhanced leaf senescence and caused carry-over effects including reduced winter die-back and an acceleration in flowering the next year.

# 2427 Distribution, speciation and availability of antimony (Sb) in soils and terrestrial plants from an active Sb mining area G. Okkenhaug, Y.-G. Zhu, L. Luo, M. Lei, X. Li, J. Mulder

Antimony (Sb) in soils from an active Sb mining area is highly bioavailable and controlled by the solubility of calcium antimonate.

### 2435 Inorganic arsenic and trace elements in Ghanaian grain staples

E.E. Adomako, P.N. Williams, C. Deacon, A.A. Meharg

Ghanaian rice is generally low in potentially toxic trace elements and is of higher nutritional quality than rice imported into the country.

# 2443 Characterization of PBDEs in soils and vegetations near an e-waste recycling site in South China Y. Wang, C. Luo, J. Li, H. Yin, X. Li, G. Zhang

E-waste recycling sites are heavily contaminated with PBDEs, which may pose a potential health risk to the local ecosystem and inhabitants.

### 2449 Reduction in uptake by rice and soybean of aromatic arsenicals from diphenylarsinic acid contaminated soil amended with activated charcoal

T. Arao, Y. Maejima, K. Baba

Activated charcoal amendment to soil contaminated with diphenylarsinic acid reduced aromatic arsenicals in rice and soybean.

# 2454 Seabird feathers as monitors of the levels and persistence of heavy metal pollution after the *Prestige* oil spill R. Moreno, L. Jover, C. Diez, C. Sanpera

Monitoring heavy metal in seabird feathers indicated chronic oil pollution in the marine food web for at least three years after the Prestige oil spill.

### 2461 Groundwater quality assessment of one former industrial site in Belgium using a TRIAD-like approach

S. Crévecoeur, V. Debacker, C. Joaquim-Justo, S. Gobert, M.-L. Scippo, W. Dejonghe, P. Martin, J.-P. Thomé

This study presents the first application of the TRIAD approach on groundwater system. None of the TRIAD components (chemistry, physico-chemistry and ecotoxicity) could reliably predict the other one.

# 2467 Long-term effects of clear-cutting and selective cutting on soil methane fluxes in a temperate spruce forest in southern Germany

X. Wu, N. Brüggemann, R. Gasche, H. Papen, G. Willibald, K. Butterbach-Bahl

Forest management affects the soil CH<sub>4</sub> sink strength, with clear-cutting reducing uptake rates for at least eight years.

# 2476 Binational school-based monitoring of traffic-related air pollutants in El Paso, Texas (USA) and Ciudad Juárez, Chihuahua (México)

A.U. Raysoni, J.A. Sarnat, S.E. Sarnat, J.H. Garcia, F. Holguin, S.F. Luèvano, W.-W. Li

Spatial variability in traffic-mediated pollutant concentrations can exist at the intra-urban level and ambient monitoring sites may not accurately represent these concentration gradients.

### 2487 Reporting and evaluation criteria as means towards a transparent use of ecotoxicity data for environmental risk assessment of pharmaceuticals

M. Ågerstrand, A. Küster, J. Bachmann, M. Breitholtz, I. Ebert, B. Rechenberg, C. Rudén

The need for reporting and evaluation criteria towards a transparent and reliable use of ecotoxicity data.

# 2493 Enhanced nitrogen deposition exacerbates the negative effect of increasing background ozone in *Dactylis glomerata*, but not *Ranunculus acris*

K. Wyness, G. Mills, L. Jones, J.D. Barnes, D.L. Jones

Synergistic effects of elevated  $O_3$  and N were observed in below ground C-partitioning in the grass Dactylis glomerata, but not in the forb Ranunculus acris.

### 2500 Mercury accumulation in marine bivalves: Influences of biodynamics and feeding niche K. Pan, W.-X. Wang

The species-specific body concentrations of MeHg and THg in bivalves reflect the complicated interaction between the biodynamics of Hg(ll) and MeHg and the different food sources.

# 2507 Simultaneous adsorption and degradation of γ-HCH by nZVI/Cu bimetallic nanoparticles with activated carbon support C. Chang, F. Lian, L. Zhu

Impregnation of Cu amended iron on AC enhances the removal efficiency of  $\gamma$ -HCH and reduces the concentrations of its intermediates in aqueous solution.

### 2515 Environmental impact of sunscreen nanomaterials: Ecotoxicity and genotoxicity of altered TiO<sub>2</sub> nanocomposites on *Vicia* faba

A.-S. Foltête, J.-F. Masfaraud, E. Bigorgne, J. Nahmani, P. Chaurand, C. Botta, J. Labille, J. Rose, J.-F. Férard, S. Cotelle

Artificially aged TiO<sub>2</sub>-containing sunscreen nanocomposites caused few damages to Vicia faba in 48 h exposure, but particles clogged on roots and Ti entered the root tissues.

# 2523 Blood dynamics of mercury and selenium in northern elephant seals during the lactation period S. Habran, C. Debier, D.E. Crocker, D.S. Houser, K. Das

Blood levels of total Hg and Se are modified during the 4-week lactating period in northern elephant seals.

### 2530 Effects of organic matter and ageing on the bioaccessibility of arsenic

L. Meunier, I. Koch, K.J. Reimer

Adding organic carbon may increase arsenic bioaccessibility, especially in samples originally containing >30% bioaccessible arsenic in organic carbon-rich soils (>25%).

#### 2537 Can arbuscular mycorrhizal fungi improve grain yield, As uptake and tolerance of rice grown under aerobic conditions? H. Li, Z.H. Ye, W.F. Chan, X.W. Chen, F.Y. Wu, S.C. Wu, M.H. Wong

Different rice/AMF combinations had very different effects on arsenic and phosphorus uptake.

### 2546 Oxidation of bisphenol F (BPF) by manganese dioxide

Z. Lu, K. Lin, J. Gan

The commonly occurring  $MnO_2$  shows a high reactivity toward bisphenol F, which may account for its natural attenuation and suggest a beneficial use of  $MnO_2$  for managed removal of bisphenol F.

### 2552 Organic persistent toxic substances in soils, waters and sediments along an altitudinal gradient at Mt. Sagarmatha, Himalayas, Nepal

L. Guzzella, G. Poma, A. De Paolis, C. Roscioli, G. Viviano

Organic PTSs in environmental matrices in remote regions of the Himalayan ridge.

### 2565 Distributions of polyhalogenated compounds in Hudson River (New York, USA) fish in relation to human uses along the river

L.C. Skinner

Residues of polyhalogenated compounds in resident and migratory fish from the Hudson River are compared with human uses of the compounds in the river basin.

# 2575 Ecological risk assessment of heavy metals in sediment and human health risk assessment of heavy metals in fishes in the middle and lower reaches of the Yangtze River basin

Y. Yi, Z. Yang, S. Zhang

Possible ecological risk of sediment and slight non-cancer health risk of eating fish were found in the middle and lower reaches of the Yangtze River.

### 2586 Long-term patterns in soil acidification due to pollution in forests of the Eastern Sudetes Mountains R. Hédl, P. Petřík, K. Boublík

Strong acidification decreasing with altitude was observed in forest soils resurveyed after more than half a century.

### 2594 Sorption of simazine to corn straw biochars prepared at different pyrolytic temperatures G. Zhang, Q. Zhang, K. Sun, X. Liu, W. Zheng, Y. Zhao

The corn straw biochar prepared at higher temperature with stronger hydrophobicity, more aromatic C and larger surface area had higher sorption capacity for simazine.

#### 2602 Impacts of atmospheric pollution on the plant communities of British acid grasslands

R.J. Payne, C.J. Stevens, N.B. Dise, D.J. Gowing, M.G. Pilkington, G.K. Phoenix, B.A. Emmett, M.R. Ashmore

Ozone exposure and nitrogen deposition have distinct but additive impacts on the plant communities of British acid grasslands.

### 2609 Monitoring plastic ingestion by the northern fulmar Fulmarus glacialis in the North Sea

J.A. van Franeker, C. Blaize, J. Danielsen, K. Fairclough, J. Gollan, N. Guse, P.-L. Hansen, M. Heubeck, J.-K. Jensen, G. Le Guillou, B. Olsen, K.-O. Olsen, J. Pedersen, E.W.M. Stienen, D.M. Turner

Trends and patterns in the abundance of plastics in northern fulmar stomachs show that seabirds can be a valuable tool for monitoring marine litter.

# 2616 Adsorption of sulfamethoxazole on functionalized carbon nanotubes as affected by cations and anions D. Zhang, B. Pan, M. Wu, B. Wang, H. Zhang, H. Peng, D. Wu, P. Ning

The balance between decreasing and increasing roles determines the apparent sulfamethoxazole adsorption on carbon nanotubes depending on environmental conditions.

# 2622 The impact of heavy metal pollution gradients in sediments on benthic macrofauna at population and community levels J. Ryu, J.S. Khim, S.-G. Kang, D. Kang, C.-h. Lee, C.-h. Koh

Community and population level response to the polluted environment of the harbor reflected an integration effect, together with biological interactions.

### 2630 In situ evaluation of cadmium biomarkers in green algae

D.F. Simon, T.A. Davis, M.-L. Tercier-Waeber, R. England, K.J. Wilkinson

Algal transcription levels of several biomarkers were studied in two natural waters in situ.

### 2637 Arsenic distribution in soils and plants of an arsenic impacted former mining area

V. Otones, E. Álvarez-Ayuso, A. García-Sánchez, I. Santa Regina, A. Murciego

The plants Salix atrocinerea, Genista scorpius and Scirpus holoschoenus are suitable for revegetation or phytostabilisation approaches of As-polluted soils.

# 2648 Developmental toxicity of two common corn pesticides to the endangered southern bell frog (*Litoria raniformis*) C.B. Choung, R.V. Hyne, R.M. Mann, M.M. Stevens, G.C. Hose

A breakdown product of the insecticide terbufos retards development and delays metamorphosis of southern bell frog tadpoles.

# 2656 Seasonal and spatial variability of polychlorinated biphenyls (PCBs) in vegetation and cow milk from a high altitude pasture in the Italian Alps

L. Tato, P. Tremolada, C. Ballabio, N. Guazzoni, M. Parolini, M. Caccianiga, A. Binelli

In a mountain pasture, PCBs concentrations in vegetation were found to be related to emission flux from soil and to the mean temperature of the site, and a direct transfer to milk was also observed.

# 2665 Sediment-associated aliphatic and aromatic hydrocarbons in coastal British Columbia, Canada: Concentrations, composition, and associated risks to protected sea otters

K.A. Harris, M.B. Yunker, N. Dangerfield, P.S. Ross

Anthropogenically-derived hydrocarbons in coastal sediments in British Columbia may pose a risk to protected sea otters.

### 2675 Hydrocarbon degradation, plant colonization and gene expression of alkane degradation genes by endophytic Enterobacter ludwigii strains

S. Yousaf, M. Afzal, T.G. Reichenauer, C.L. Brady, A. Sessitsch

Enterobacter ludwigii strains belonging to the E. cloacae complex are able to efficiently degrade alkanes when associated with plants and to promote plant growth.

#### 2684 Field controlled experiments of mercury accumulation in crops from air and soil

Z. Niu, X. Zhang, Z. Wang, Z. Ci

Capsule Mercury accumulated in the aboveground organs of crop was mainly from the air.

# 2690 Variations in concentrations and compositions of polycyclic aromatic hydrocarbons (PAHs) in coals related to the coal rank and origin

S. Laumann, V. Micić, M.A. Kruge, C. Achten, R.F. Sachsenhofer, J. Schwarzbauer, T. Hofmann

The origin of coal has a strong influence on the concentration and composition of indigenous PAHs.

### 2698 Ecotoxicological assessment of TiO<sub>2</sub> byproducts on the earthworm Eisenia fetida

E. Bigorgne, L. Foucaud, E. Lapied, J. Labille, C. Botta, C. Sirguey, J. Falla, J. Rose, E.J. Joner, F. Rodius, J. Nahmani

A short time exposure to TiO2 byproducts can induce sublethal effects on the earthworm, Eisenia fetida.

# 2706 Stable carbon isotope analysis (δ<sup>13</sup>C values) of polybrominated diphenyl ethers and their UV-transformation products N. Rosenfelder, P. Bendig, W. Vetter

Diametrically progressing  $\delta^{13}$ C values in technical mixtures and UV-transformation products of DE-79 may be useful for source appointment of PBDEs in environmental samples

# 2713 Chronic toxicity of ZnO nanoparticles, non-nano ZnO and ZnCl<sub>2</sub> to *Folsomia candida* (Collembola) in relation to bioavailability in soil

P.L. Kool, M.D. Ortiz, C.A.M. van Gestel

ZnO nanoparticle toxicity to springtails in soil can be explained from Zn dissolution but not from particle size.

# 2720 Reproductive toxicity assessment of surface water of the Tai section of the Yangtze River, China by in vitro bioassays coupled with chemical analysis

X. Wang, J. Wu, Y. Hao, B. Zhu, W. Shi, G. Hu, X. Han, J.P. Giesy, H. Yu

In vitro bioassay responses observed in Yangtze River source water extracts showed great reproductive toxicity, and PAHs were responsible.

### 2726 Will PM control undermine China's efforts to reduce soil acidification?

Y. Zhao, L. Duan, Y. Lei, J. Xing, C.P. Nielsen, J. Hao

The control of anthropogenic PM emission in China will increase the risk of soil acidification even with reduced  $SO_2$  emission. Such implication is stronger than that in developed countries.

#### 2733 The effect of mercury on trees and their mycorrhizal fungi

S.R. Jean-Philippe, J.A. Franklin, D.S. Buckley, K. Hughes

Though evidence suggests that mercury-contaminated soils may reduce tree and fungal populations, there are tolerant species that may remain and survive following contamination.

# 2740 Terrestrial exposure of oilfield flowline additives diminish soil structural stability and remediative microbial function S.J. George, J. Sherbone, C. Hinz, M. Tibbett

Scale inhibitor and biocide oilfield flowline additives interactively affect soil physical and microbial properties

#### 2750 Changes in the chemistry of acidified Adirondack streams from the early 1980s to 2008

G.B. Lawrence, H.A. Simonin, B.P. Baldigo, K.M. Roy, S.B. Capone

Despite a 50% reduction in atmospheric sulfur deposition since the mid 1980s, chemical recovery of Adirondack streams has been slow, with minimal recovery from 2001 to 2008.

### 2759 Atmospheric phenanthrene pollution modulates carbon allocation in red clover (Trifolium pratense L.)

D. Desalme, P. Binet, D. Epron, N. Bernard, D. Gilbert, M.-L. Toussaint, C. Plain, G. Chiapusio

Exposure of clover to atmospheric PHE affected not only its growth, but also biomass partitioning and C allocation among its organs.

### 2766 Reproductive toxicity of bisphenol A and cadmium in *Potamopyrgus antipodarum* and modulation of bisphenol A effects by different test temperature

A. Sieratowicz, D. Stange, U. Schulte-Oehlmann, J. Oehlmann

A reproduction test with Potamopyrgus antipodarum with 2 substances for subsequent pre-validation is presented and bisphenol A effects show a temperature dependency.

# 2775 Heavy metal pollution exerts reduction/adaptation in the diversity and enzyme expression profile of heterotrophic bacteria in Cochin estuary, India

J. Jose, R. Giridhar, A. Anas, P.A. Loka Bharathi, S. Nair

Heavy metal pollution exerts pressure on the diversity and enzyme expression profile of estuarine bacteria.

### 2781 Dispersal networks for enhancing bacterial degradation in heterogeneous environments

T. Banitz, L.Y. Wick, I. Fetzer, K. Frank, H. Harms, K. Johst

Simulation modelling demonstrates that fungus-mediated bacterial dispersal can considerably improve the bioavailability of organic pollutants under spatially heterogeneous abiotic conditions typical for water-unsaturated soils.

### 2789 Arsenic and Mn levels in Isaza (Gymnogobius isaza) during the mass mortality event in Lake Biwa, Japan

S.H. Hirata, D. Hayase, A. Eguchi, T. Itai, K. Nomiyama, T. Isobe, T. Agusa, T. Ishikawa, M. Kumagai, S. Tanabe

As and Mn levels in dead Isaza caused by mass mortality.

#### 2797 Substituting missing data in compositional analysis

C. Real, J. Ángel Fernández, J.R. Aboal, A. Carballeira

A method is presented for the assessment of the possible distortions in multivariate analysis caused by the substitution of missing values.

### 2801 Inherent mineralization of 2,6-dichlorobenzamide (BAM) in unsaturated zone and aquifers – Effect of initial concentrations and adaptation

G.S. Janniche, L. Clausen, H.-J. Albrechtsen

BAM mineralization in subsurface and groundwater was demonstrated.

# 2808 Temporal genetic variability and host sources of *Escherichia coli* associated with fecal pollution from domesticated animals in the shellfish culture environment of Xiangshan Bay, East China Sea

L.-L. Fu, J.-B. Shuai, Y. Wang, H.-J. Ma, J.-R. Li

The temporal genetic variability and dominant host sources of E.coli in fecal contaminated shellfish growing waters of Xiangshan Bay was characterized.

### 2815 Distribution and bioaccumulation of steroidal and phenolic endocrine disrupting chemicals in wild fish species from Dianchi Lake, China

J. Liu, R. Wang, B. Huang, C. Lin, Y. Wang, X. Pan

Contaminants of endocrine disrupting chemicals in wild fish.

### 2823 Ozone affects pollen viability and NAD(P)H oxidase release from Ambrosia artemisiifolia pollen

S. Pasqualini, E. Tedeschini, G. Frenguelli, N. Wopfner, F. Ferreira, G. D'Amato, L. Ederli

This study focuses on the effects of the atmospheric pollutant ozone on ROS content and NAD(P)H oxidase activity of ragweed pollen grains.

# 2831 Using advanced surface complexation models for modelling soil chemistry under forests: Solling forest, Germany L.T.C. Bonten, J.E. Groenenberg, H. Meesenburg, W. de Vries

Surface complexation models with generic parameters make calibration of sorption superfluous in dynamic modelling of deposition impacts on soil chemistry under nature areas.

# 2840 Floodplain methylmercury biomagnification factor higher than that of the contiguous river (South River, Virginia USA) M.C. Newman, X. Xu, A. Condon, L. Liang

Higher methylmercury biomagnification on South River floodplain than the associated river likely explain high mercury in floodplain birds.

2845 <sup>1</sup>H NMR-based metabolomics of time-dependent responses of Eisenia fetida to sub-lethal phenanthrene exposure B.P. Lankadurai, D.M. Wolfe, A.J. Simpson, M.J. Simpson

<sup>1</sup>H NMR metabolomics is used to determine the relationship between phenanthrene exposure and the metabolic response of the earthworm E. fetida over time and also to elucidate the phenanthrene mode of toxicity.

2852 Nitrogen concentrations in mosses indicate the spatial distribution of atmospheric nitrogen deposition in Europe
H. Harmens, D.A. Norris, D.M. Cooper, G. Mills, E. Steinnes, E. Kubin, L. Thöni, J.R. Aboal, R. Alber, A. Carballeira, M. Coşkun,
L. De Temmerman, M. Frolova, L. González-Miqueo, Z. Jeran, S. Leblond, S. Liiv, B. Maňkovská, R. Pesch, J. Poikolainen, Å. Rühling,
J.M. Santamaria, P. Simonèiè, W. Schröder, I. Suchara, L. Yurukova, H.G. Zechmeister

Mosses as biomonitors of atmospheric nitrogen deposition in Europe.

2861 Accumulation of mercury and methylmercury by mushrooms and earthworms from forest soils S.R. Rieder, I. Brunner, M. Horvat, A. Jacobs, B. Frey

Accumulation of Hg and methyl-Hg by mushrooms and earthworms is species- and ecophysiological group dependent.

2870 Indoor metallic pollution related to mining activity in the Bolivian Altiplano F.E. Fontúrbel, E. Barbieri, C. Herbas, F.L. Barbieri, J. Gardon

In a typical Andean mining city, the urban indoor pollution with toxic metallic elements is directly related to the closeness of the mining activities.

2876 Comparison of competitive and synergetic adsorption of three phenolic compounds on river sediment P. Gao, Y. Feng, Z. Zhang, J. Liu, N. Ren

The coagulation theory can explain the adsorption among phenolic compounds on river sediment.

2882 The fate of the aqueous phase polycyclic aromatic hydrocarbon fraction in a detention pond system K. Neary, T.B. Boving

Aqueous-phase PAH concentrations in stormwater are relatively unaffected by treatment in a conventional detention pond system.

2891 Biomarker responses associated with halogenated organic contaminants in northern fulmars (*Fulmarus glacialis*) breeding in the Canadian Arctic

B.M. Braune, S. Trudeau, D.A. Jeffrey, M.L. Mallory

EROD induction occurs in northern fulmars in the Canadian Arctic at environmentally-relevant concentrations.

2899 Interspecies and spatial trends in polycyclic aromatic hydrocarbons (PAHs) in Atlantic and Mediterranean pelagic seabirds J.L. Roscales, J. González-Solís, P. Calabuig, B. Jiménez

PAH levels in Atlantic and Mediterranean pelagic seabirds show specific inter-species patterns related to trophic ecology but a minor influence of their geographic origin.

2906 How seasonality affects the flow of estrogens and their conjugates in one of Japan's most populous catchments V. Kumar, N. Nakada, N. Yamashita, A.C. Johnson, H. Tanaka

This manuscript provides a comprehensive survey of estrogen conjugates in a densely populated river catchment.

2913 Occurrence and distribution of antibiotics in coastal water of the Bohai Bay, China: Impacts of river discharge and aquaculture activities

S. Zou, W. Xu, R. Zhang, J. Tang, Y. Chen, G. Zhang

River discharge and aquaculture were suggested to be important sources for antibiotics occurred in the coastal water of the Bohai Bay, North China.

2921 Toxicity of dispersant application: Biomarkers responses in gills of juvenile golden grey mullet (*Liza aurata*) T. Milinkovitch, J. Godefroy, M. Théron, H. Thomas-Guyon

When the meteorological conditions induce the dispersion of the oil slick (e.g. wave), the application of dispersant does not increase the toxicity of petroleum.

2929 Screening of pharmaceuticals and hormones at the regional scale, in surface and groundwaters intended to human consumption

E. Vulliet, C. Cren-Olivé

52 pharmaceuticals and hormones investigated in 71 surface waters and 70 groundwaters intended to human consumption.

2935 Vertical emission profiles for Europe based on plume rise calculations

J. Bieser, A. Aulinger, V. Matthias, M. Quante, H.A.C. Denier van der Gon

Vertical emission profiles that take into account the spatial and temporal variability of effective emission heights improve the usability of European point-source emissions in CTMs.

2947 Spectral estimation of global levels of atmospheric pollutants

J. Fernández-Macho

A structural spatial model is proposed for the estimation of underlying smooth levels of atmospheric pollutants by spectral methods.

2954 Modeling vehicle emissions in different types of Chinese cities: Importance of vehicle fleet and local features H. Huo, Q. Zhang, K. He, Z. Yao, X. Wang, B. Zheng, D.G. Streets, Q. Wang, Y. Ding

Vehicle emission characteristics of Chinese cities are remarkably different, and local features need to be taken into account in vehicle emission studies and control strategy.

2961 Modeling redistribution of  $\alpha$ -HCH in Chinese soil induced by environment factors

C. Tian, L. Liu, J. Ma, J. Tang, Y.-F. Li

This study provides the first comprehensive overview to redistribution of a toxic chemical incurred by long-term variation of environmental factors across China.

# 2968 The application of zero-water discharge system in treating diffuse village wastewater and its benefits in community afforestation

Y. Wu, L. Xia, Z. Hu, S. Liu, H. Liu, B. Nath, N. Zhang, L. Yang

A zero-water discharge system has proven highly-effective for removing COD, SS, TP, and TN from diffuse village wastewater and benefiting the community afforestation.

### 2974 Comparison of solid and liquid-phase bioassays using ecoscores to assess contaminated soils

C. Lors, J.-F. Ponge, M. Martínez Aldaya, D. Damidot

Aqueous and solid phases of contaminated soils give similar results in terms of toxicity but are complementary for the evaluation of environmental hazards by ecoscores.

# 2982 Particle-bound Dechlorane Plus and polybrominated diphenyl ethers in ambient air around Shanghai, China Z. Yu, R. Liao, H. Li, L. Mo, X. Zeng, G. Sheng, J. Fu

The moderate PBDEs levels with deca-BDE being the most important contributor and low DP levels in ambient air around Shanghai reflected their different usage in this area.

# 2989 Spatio-temporal variations of nitrogen in an agricultural watershed in eastern China: Catchment export, stream attenuation and discharge

D. Chen, J. Lu, Y. Shen, D. Gong, O. Deng

High flow rate brings large catchment nitrogen export but low in-stream attenuation efficiency, and then enhances stream nitrogen discharge.

### 2996 Modelling arsenic toxicity in wheat: Simultaneous application of diffusive gradients in thin films to arsenic and phosphorus in soil

O. Mojsilovic, R.G. McLaren, L.M. Condron

Diffusive gradient in thin films (DGT) measure of soil arsenic-to-phosphorus ratio provides a promising indicator of arsenic toxicity in wheat.

### 3003 Synergistic toxic effect of nano-Al<sub>2</sub>O<sub>3</sub> and As(V) on Ceriodaphnia dubia

D. Wang, J. Hu, B.E. Forthaus, J. Wang

 $Nano-Al_2O_3$  could accumulate background As(V) and enhance As(V) toxicity on C. dubia through the uptake of As(V)-loaded nano- $Al_2O_3$  particles.

### 3009 Functional redundancy and food web functioning in linuron-exposed ecosystems

F. De Laender, P.J. Van den Brink, C.R. Janssen

Food web modelling reveals functional redundancy of the planktonic community in microcosms treated with linuron.

# 3018 Phytostabilization of semiarid soils residually contaminated with trace elements using by-products: Sustainability and risks A. Pérez-de-Mora, P. Madejón, P. Burgos, F. Cabrera, N.W. Lepp, E. Madejón

Phytostabilization using by-products as amendments is a suitable approach for long-term immobilization of various trace elements in semiarid contaminated soils.

# 3028 Trace element uptake by *Eleocharis equisetina* (spike rush) in an abandoned acid mine tailings pond, northeastern Australia: Implications for land and water reclamation in tropical regions

B.G. Lottermoser, P.M. Ashley

The metal-excluding aquatic macrophyte Eleocharis equisetina is of use in land and water remediation in tropical regions.

# 3036 Patterns of insect communities along a stress gradient following decommissioning of a Cu-Ni smelter J. Babin-Fenske, M. Anand

Our study finds both unexpected and expected responses of insect communities to a landscape gradient of past pollution suggesting the emergence of novel ecosystems.

# 3044 Polybrominated diphenyl ethers (PBDEs) in feathers of colonial water-bird species from Pakistan R.N. Malik, C. Moeckel, K.C. Jones, D. Hughes

Feathers are used as a biomonitoring tool for PBDEs contamination.

### 3051 Pyrethroid insecticides in urban salmon streams of the Pacific Northwest

D.P. Weston, A.M. Asbell, S.A. Hecht, N.L. Scholz, M.J. Lydy

Pyrethroid insecticides are present in sediments of urban creeks of Oregon and Washington, though less commonly than in studies elsewhere in the U.S.

# 3057 Assessment of heavy metal pollution from a Fe-smelting plant in urban river sediments using environmental magnetic and geochemical methods

C. Zhang, Q. Qiao, J.D.A. Piper, B. Huang

Heavy metal (HM) contamination of river sediments from industrial input by surface water transport and deposition can be detected by using magnetic methods providing a convenient assessment of HM pollution in industrialized cities.

### 3071 The use of environmental metabolomics to determine glyphosate level of exposure in rapeseed (*Brassica napus* L.) seedlings

I.L. Petersen, G. Tomasi, H. Sørensen, E.S. Boll, H.C.B. Hansen, J.H. Christensen

A novel untargeted environmental metabololomic approach is used to detect low-level glyphosate exposure of rapeseed seedlings.

# 3078 Field sampling of soil pore water to evaluate trace element mobility and associated environmental risk E. Moreno-Jiménez, L. Beesley, N.W. Lepp, N.M. Dickinson, W. Hartley, R. Clemente

In situ pore water sampling from a wide variety of soils proves to be a beneficial application to monitor the stability of pollutants in soils and subsequent risk through mobility.

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3086 Global gene expression profile induced by the UV-filter 2-ethyl-hexyl-4-trimethoxycinnamate (EHMC) in zebrafish (Danio rerio)

S. Zucchi, D.M. Oggier, K. Fent

Gene expression changes by 2-ethyl-hexyl-4-trimethoxycinnamate in zebrafish.

3097 Accumulation, subcellular distribution and toxicity of inorganic mercury and methylmercury in marine phytoplankton Y. Wu, W.-X. Wang

The inter-species difference in methylmercury and inorganic mercury toxicity in phytoplankton can be explained by cellular accumulation and subcellular distribution.

3106 Does small mammal prey guild affect the exposure of predators to anticoagulant rodenticides? D.G. Tosh, R.A. McDonald, S. Bearhop, N.R. Lilewellyn, S. Fee, E.A. Sharp, E.A. Barnett, R.F. Shore

Restriction of the small mammal prey guild is associated with enhanced exposure of predators to anticoagulant rodenticides.

3113 Seasonal and spatial variation of diffuse (non-point) source zinc pollution in a historically metal mined river catchment, UK E. Gozzard, W.M. Mayes, H.A.B. Potter, A.P. Jarvis

Diffuse zinc sources are an important source of instream contamination to mine-impacted rivers under varying flow conditions.

#### **Short Communications**

3123 Identifying genes and gene networks involved in chromium metabolism and detoxification in *Crambe abyssinica*A. Zulfigar, B. Paulose, S. Chhikara, O.P. Dhankher

This study describes the identification and isolation of differentially expressed genes involved in chromium metabolism and detoxification in a non-food industrial oil crop Crambe abyssinica.

3129 Contrasting controls on arsenic and lead budgets for a degraded peatland catchment in Northern England J.J. Rothwell, K.G. Taylor, M.G. Evans, T.E.H. Allott

Degraded peatlands can be significant sources of previously deposited arsenic and lead

3134 Degradability of aged aquatic suspensions of C<sub>60</sub> nanoparticles N.B. Hartmann, I.M. Buendia, J. Bak, A. Baun

Aged suspensions of  $nC_{60}$  were found not to be ready biodegradable according to the OECD test procedure. The biomass was not inhibited by the presence of  $nC_{60}$ .

3138 Trends in atmospheric reactive nitrogen for the Eastern United States R.W. Pinder, K.W. Appel, R.L. Dennis

Ambient observations and simulation results indicate decreasing oxidized nitrogen levels over the Eastern US, but no trend in reduced nitrogen.

### Corrigendum

3142 Corrigendum to "Time trends of perfluorinated compounds from the sediment core of Tokyo Bay, Japan (1950s–2004)" [Environ. Pollut. 158 (2010) 756–763]
Y. Zushi, M. Tamada, Y. Kanai, S. Masunaga