Including the Special Section: Mercury in the Laurentian Great Lakes Region commencing on p. 243 Regular Papers

First evidence on different transportation modes of arsenic and phosphorus in arsenic hyperaccumulator Pteris vittata M. Lei, X.-m. Wan, Z.-c. Huang, T.-b. Chen, X.-w. Li, Y.-r. Liu

Pteris vittata does not utilize a phosphate transporter to load arsenic across endodermis into xylem.

Formation of halogenated C-, N-DBPs from chlor(am)ination and UV irradiation of tyrosine in drinking water W. Chu, N. Gao, S.W. Krasner, M.R. Templeton, D. Yin

Exploring the integrated formation mechanism of regulated and emerging highly toxic DBPs, which is expected to preferably reduce their occurrence in drinking water.

Enhanced phytoextraction of chromium by the aquatic macrophyte Potamogeton pusillus in presence of copper M.V. Monferrán. M.L. Pignata, D.A. Wunderlin

We report enhanced effect of Cu⁺² upon phytoextraction of Cr⁺⁶ by Potamogeton pusillus from water. Metals accumulation occurs mainly in roots and leaves of this aquatic plant.

In situ sorption of hydrophobic organic compounds to sediment amended with activated carbon D. Kupryianchyk, M.I. Rakowska, J.T.C. Grotenhuis, A.A. Koelmans

We analyzed datasets from AC amendment trials to identify the variation in AC effectiveness and to explore to what extent HOC binding to AC may be generalized.

30 Removal of the antiviral agent oseltamivir and its biological activity by oxidative processes H. Mestankova, K. Schirmer, B.I. Escher, U. von Gunten, S. Čanonica

Ozone and hydroxyl radical treatment processes can degrade aqueous oseltamivir acid and remove its antiviral activity,

Vegetative cover and PAHs accumulation in soils of urban green space C. Peng, Z. Ouyang, M. Wang, W. Chen, W. Jiao

Industrial emissions aside, vegetative cover is the dominant factor controlling accumulation of PAHs in urban green space soils.

Use of a Bayesian isotope mixing model to estimate proportional contributions of multiple nitrate sources in surface water D. Xue, B. De Baets, O. Van Cleemput, C. Hennessy, M. Berglund, P. Boeckx

This paper successfully applied a dual isotope approach and Bayesian isotopic mixing model to identify and quantify 5 potential nitrate sources in surface water.

A contribution towards the risk assessment of soils from the São Domingos Mine (Portugal): Chemical, microbial and ecotoxicological indicators

P. Alvarenga, P. Palma, A. de Varennes, A.C. Cunha-Queda

Bioassays provide a more complete and relevant information to characterize the risk of contaminated soils, and should be used to complement chemical results.

Soil invertebrates as bioindicators of urban soil quality L. Santorufo, C.A.M. Van Gestel, A. Rocco, G. Maisto

- Soil metal contamination negatively affected soil invertebrate abundance and diversity.
- Inflammatory effects on human lung epithelial cells after exposure to diesel exhaust micron sub particles (PM, o) and pollen allergens

G. Mazzarella, V. Esposito, A. Bianco, F. Ferraraccio, M.V. Prati, A. Lucariello, L. Manente, A. Mezzogiorno, A. De Luca

The urban environment with the combination of inhalable air pollution and particulate are able to damage the acinar lung units and are able to activate cells of the immune system.

ENVIRONMENTAL POLLUTION

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70 Long-term biological monitoring of environmental quality around a solid waste landfill assessed with lichens L. Paoli, A. Corsini, V. Bigagli, J. Vannini, C. Bruscoli, S. Loppi

The results of lichen monitoring can contribute to decision making process concerning waste management.

76 The opposite impacts of Cu and Mg cations on dissolved organic matter-ofloxacin interaction B. Pan, M. Qiu, M. Wu, D. Zhang, H. Peng, D. Wu, B. Xing

Cu(II) promoted OFL-DOM interaction through the formation of ternary complexes, while the competitive binding between Mg(II) and OFL in DOM decreased OFL-DOM interaction.

83 Presence and biological effects of emerging contaminants in Llobregat River basin: A review S. González, R. López-Roldán, J.-L. Cortina

The presence of different pollutants (mainly pesticides, pharmaceuticals, surfactants and estrogens) and their biological effects in the Llobregat River are reviewed.

93 Long term trends in PBDE concentrations in gannet (Morus bassanus) eggs from two UK colonies J.D. Crosse, R.F. Shore, K.C. Jones, M.G. Pereira

PBDE levels in gannet eggs from two UK colonies mirrored patterns of PBDE consumption, but sources other than PeBDE became more prevalent in recent years.

101 Distribution of PCBs and PBDEs in soils along the altitudinal gradients of Balang Mountain, the east edge of the Tibetan Plateau

X. Zheng, X. Liu, G. Jiang, Y. Wang, Q. Zhang, Y. Cai, Z. Cong

The concentrations of POPs in soils in the east edge of the Tibetan Plateau were mainly influenced by forest filter effect and mountain cold-trapping.

107 Can the integration of multiple biomarkers and sediment geochemistry aid solving the complexity of sediment risk assessment? A case study with a benthic fish

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Evaluation of multi-level biomarker responses in fish for ecological risk assessment

121 Influence of black carbon addition on phenanthrene dissipation and microbial community structure in soil P. Wang, H. Wang, L. Wu, H. Di, Y. He, J. Xu

BC amendments on phenanthrene extraction were different for two soils and time was a more effective factor in microbial community changes.

128 Distribution and toxicity of current-use insecticides in sediment of a lake receiving waters from areas in transition to urbanization

J.-Z. Wang, H.-Z. Li, J. You

Evaluation of the distribution, potential toxicity, and input sources of organophosphate and pyrethroid insecticides in sediment from Chaohu Lake, China.

134 Persistent organic pollutants in four bivalve species from Svalbard waters

I. Vieweg, H. Hop, T. Brey, S. Huber, W.G. Ambrose Jr., W.L. Locke V, G.W. Gabrielsen

New findings of organochlorines in Arctic bivalves that are central for evaluating the importance of geographical location and species for the organochlorine pattern in benthic organisms.

143 Formation and stability of Pb-, Zn- & Cu-PO₄ phases at low temperatures: Implications for heavy metal fixation in polar environments

D.A. White, E.G. Hafsteinsdóttir, D.B. Gore, G. Thorogood, S.C. Stark

Pb, Cu and Zn react with PO_4^3 – at low temperatures (2 °C) to form low solubility metal- PO_4 phases at rates that may enable the in-situ remediation of metal contaminated soils in polar areas.

154 Atmospheric concentrations of halogenated flame retardants at two remote locations: The Canadian High Arctic and the Tibetan Plateau

H. Xiao, L. Shen, Y. Su, E. Barresi, M. DeJong, H. Hung, Y.-D. Lei, F. Wania, E.J. Reiner, E. Sverko, S.-C. Kang

Several brominated flame retardants (BTBPE, EHTeBB, TBPH) were present in the atmosphere of the Arctic and the Tibetan Plateau at levels similar to those of the PBDEs.

162 Spatial distribution of per- and polyfluoroalkyl compounds in coastal waters from the East to South China Sea M. Cai, Z. Zhao, H. Yang, Z. Yin, Q. Hong, R. Sturm, R. Ebinghaus, L. Ahrens, M. Cai, J. He, Z. Xie

Concentrations of 9 PFCs were quantified in coastal waters from the East to South China Sea for the first time.

170 Coal fly ash basins as an attractive nuisance to birds: Parental provisioning exposes nestlings to harmful trace elements A.L. Bryan Jr., W.A. Hopkins, J.H. Parikh, B.P. Jackson, J.M. Unrine

Nestlings of common grackles attracted to nest around coal ash settling basins were exposed to elevated dietary Se, As, Cd, and Sr, resulting in elevated Se tissue concentrations approaching reported levels of concern.

178 Seasonal variation in mercury and food web biomagnification in Lake Ontario, Canada L. Zhang, L.M. Campbell, T.B. Johnson

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ENVIRONMENTAL POLLUTION

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185 Characterizing the emission of chlorinated/brominated dibenzo-p-dioxins and furans from low-temperature thermal processing of waste printed circuit board

H. Duan, J. Li, Y. Liu, N. Yamazaki, W. Jiang

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192 Quantitative identification of dynamic and static quenching of ofloxacin by dissolved organic matter using temperaturedependent kinetic approach

B. Pan, Y. Liu, D. Xiao, F. Wu, M. Wu, D. Zhang, B. Xing

Dynamic and static quenching of ofloxacin fluorescence by dissolved organic matter are successfully identified in temperature-dependent fluorescence quenching kinetics study.

199 Enhanced dissipation of polycyclic aromatic hydrocarbons in the presence of fresh plant residues and their extracts B. Chen, M. Yuan

It is feasible to amend fresh plant residues and their extracts to stimulate the bio-dissipation of polycyclic aromatic hydrocarbons in the contaminated environment.

206 Toxicokinetic of benzo[a]pyrene and fipronil in female green frogs (Pelophylax kl. esculentus)

S. Reynaud, I.A.M. Worms, S. Veyrenc, J. Portier, A. Maitre, C. Miaud, M. Raveton

Fipronil is more recalcitrant than benzo[a]pyrene to detoxification processes in frog.

215 Chemical characteristics of size-resolved PM_{2.5} at a roadside environment in Beijing, China

S. Song, Y. Wu, J. Jiang, L. Yang, Y. Cheng, J. Hao

Size-resolved patterns of PM mass and chemical species are significantly influenced by emission sources and meteorological conditions.

222 Spatial distribution of chlordanes and PCB congeners in soil in Cedar Rapids, Iowa, USA

A. Martinez, N.R. Erdman, Z.L. Rodenburg, P.M. Eastling, K.C. Hornbuckle

Chlordane compounds (trans-, cis- and trans-nonachlor) and PCBs (164 peaks for 209 congeners) were measured in the soils of a small medium-sized American city.

229 PBDEs in Italian sewage sludge and environmental risk of using sewage sludge for land application

A. Cincinelli, T. Martellini, L. Misuri, E. Lanciotti, A. Sweetman, S. Laschi, I. Palchetti

Determination of PBDEs in sewage sludge by GC-NCI-MS and ELISA test and risk assessment when sewage sludge is used for land application.

235 A GIS technology based potential eco-risk assessment of metals in urban soils in Beijing, China

M. Wang, Y. Bai, W. Chen, B. Markert, C. Peng, Z. Ouyang

Spatial distributions and potential eco-risks of soil-borne heavy metals in Beijing.

Special Section Papers: Mercury in the Laurentian Great Lakes Region

243 Mercury contamination in the Laurentian Great Lakes region: Introduction and overview

J.G. Wiener, D.C. Evers, D.A. Gay, H.A. Morrison, K.A. Williams

A synthesis of Hg data from the Great Lakes region reveals the chronology of contamination; the importance of wet and dry deposition and evasion to Hg budgets; the influence of land-water linkages; bioaccumulation in aquatic foods webs; and risks associated with Hg in an important prey fish.

252 Spatial and temporal patterns of mercury accumulation in lacustrine sediments across the Laurentian Great Lakes region P.E. Drevnick, D.R. Engstrom, C.T. Driscoll, E.B. Swain, S.J. Balogh, N.C. Kamman, D.T. Long, D.G.C. Muir, M.J. Parsons, K.R. Rolfhus, R. Rossmann

An analysis of data from 104 sediment cores from the Laurentian Great Lakes and nearby inland lakes indicates sedimentary Hg flux is declining region-wide.

261 Spatial patterns and temporal trends in mercury concentrations, precipitation depths, and mercury wet deposition in the North American Great Lakes region, 2002–2008

M.R. Risch, D.A. Gay, K.K. Fowler, G.J. Keeler, S.M. Backus, P. Blanchard, J.A. Barres, J.T. Dvonch

Analysis of monitoring data from 5 networks in the USA and Canada determined that mercury wet deposition was unchanged in the North American Great Lakes region during 2002–2008.

272 Assessment of modeled mercury dry deposition over the Great Lakes region

L. Zhang, P. Blanchard, D. Johnson, A. Dastoor, A. Ryzhkov, C.J. Lin, K. Vijayaraghavan, D. Gay, T.M. Holsen, J. Huang, J.A. Graydon, V.L. St. Louis, M.S. Castro, E.K. Miller, F. Marsik, J. Lu, L. Poissant, M. Pilote, K.M. Zhang

Uncertainties in dry deposition estimates from mercury transport models were quantified and the relative importance of each mercury species to total mercury dry deposition were explored.

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284 Litterfall mercury dry deposition in the eastern USA M.R. Risch, J.F. DeWild, D.P. Krabbenhoft, R.K. Kolka, L. Zhang

A multi-year study of Mercury Deposition Network sites found that annual mercury dry deposition from litterfall in predominately deciduous forests exceeded annual mercury wet deposition in the eastern USA.

291 A synthesis of rates and controls on elemental mercury evasion in the Great Lakes Basin J.S. Denkenberger, C.T. Driscoll, B.A. Branfireun, C.S. Eckley, M. Cohen, P. Selvendiran

A synthesis of Hg evasion was conducted and this information was used to develop an estimate of Hg evasion for the Great Lakes Basin.

299 Watershed and discharge influences on the phase distribution and tributary loading of total mercury and methylmercury into Lake Superior

C. Babiarz, S. Hoffmann, A. Wieben, J. Hurley, A. Andren, M. Shafer, D. Armstrong

Tributary inputs, which are confined to the near-shore zones of Lake Superior, provide more mercury to these sensitive aquatic habitats than direct atmospheric deposition.

311 Streamwater fluxes of total mercury and methylmercury into and out of Lake Champlain J.B. Shanley, A.T. Chalmers

Eighty-seven percent of total mercury deposition to the Lake Champlain basin is retained in the terrestrial basin; stream export of total and methylmercury to the lake is primarily in the particulate phase.

321 Methylmercury and dissolved organic carbon relationships in a wetland-rich watershed impacted by elevated sulfate from mining

M.E. Berndt, T.K. Bavin

Methylmercury concentrations in mining and non-mining streams are controlled by quantity and quality of DOC.

328 Spatial distribution and trends of total mercury in waters of the Great Lakes and connecting channels using an improved sampling technique

A. Dove, B. Hill, P. Klawunn, J. Waltho, S. Backus, R.C. McCrea

A new, clean sampling method for metals is described and basin-wide measurements of total mercury are provided for Great Lakes surface waters for the first time.

335 Estimating mercury concentrations and fluxes in the water column and sediment of Lake Ontario with HERMES model A.L.M. Ethier, J.F. Atkinson, J.V. DePinto, D.R.S. Lean

Evaluation of a screening-level Hg model (HERMES) on a large well-studied urban lake (Lake Ontario).

Spatial and temporal variation in mercury bioaccumulation by zooplankton in Lake Champlain (North America) C. Chen, N. Kamman, J. Williams, D. Bugge, V. Taylor, B. Jackson, E. Miller

Large spatiotemporal variations in MeHg bioaccumulation in zooplankton within a single large lake were linked to spatial variation in trophic status across basins and to inter-annual variation in algal density.

Toxicological significance of mercury in yellow perch in the Laurentian Great Lakes region J.G. Wiener, M.B. Sandheinrich, S.P. Bhavsar, J.R. Bohr, D.C. Evers, B.A. Monson, C.S. Schrank

Yellow perch in some waters in the Great Lakes region bioaccumulate methylmercury to concentrations that could adversely affect their reproduction and health, the reproduction of common loons, and the health of mercury-sensitive groups of humans who eat fish from inland waters.