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Research highlights: elucidation of biogeochemical factors influencing methylmercury production

Paul R. Erickson and Vivian S. Lin*

This Highlight features recent articles that examine in detail the effects of nutrient availability on the methylation–demethylation activity of microorganisms living in sediment with mercury contamination.

1712

Nano-plastics in the aquatic environment

K. Mattsson,* L.-A. Hansson and T. Cedervall

Nano-sized plastics originate from direct release of nanoparticles or from degradation of discarded plastic and mainly enter the aquatic food chain through uptake by algae or herbivorous invertebrates, and then continue up the food web.

1722

Influence of biochar on sorption, leaching and dissipation of bisphenol A and 17 α -ethynylestradiol in soil

Nan Xu, Bo Zhang, Guangcai Tan, Jie Li and Hongyuan Wang*

Biochar amendment significantly enhanced the sorption of BPA and EE2 in soil to reduce their mobility and environmental risks.

1731

Spatio-temporal impacts of dairy lagoon water reuse on soil: heavy metals and salinity

Dennis L. Corwin* and Hamaad Raza Ahmad

Heavy metal and salinity impacts on soil from dairy lagoon water reuse are monitored using geospatial apparent soil electrical conductivity measurements.

1749

Ultrafine and respirable particle exposure during vehicle fire suppression

Douglas E. Evans* and Kenneth W. Fent

Vehicle fires are a common occurrence, yet few studies have reported exposures associated with burning vehicles.

1760

Characterization of selenium in UO₂ spent nuclear fuel by micro X-ray absorption spectroscopy and its thermodynamic stability

E. Curti,* A. Puranen, D. Grolimund, D. Jädernas, D. Sheptyakov and A. Mesbah

The long-lived fission product ⁷⁹Se is tightly bound to the UO₂ lattice in spent nuclear fuel; it will thus be released only very slowly from a geological repository for radioactive waste.

Distribution, migration and potential risk of heavy metals in the Shima River catchment area, South China

Lei Gao, Jianyao Chen,* Changyuan Tang, Zhiting Ke, Jiang Wang, Yuta Shimizu and Aiping Zhu

The distribution, migration and potential risk of heavy metals in water and soil environments, related to city water supply, were investigated.

Copper nanoparticles/compounds impact agronomic and physiological parameters in cilantro (*Coriandrum sativum*)

Nubia Zuverza-Mena, Illya A. Medina-Velo, Ana C. Barrios, Wenjuan Tan, Jose R. Peralta-Videa and Jorge L. Gardea-Torresdey*

Concentration of essential nutrients in shoots of cilantro exposed to nanosize and microsize copper compounds at 20 mg Cu per kg soil.

Characterization and sources of black carbon in PM_{2.5} at a site close to a roadway in Gwangju, Korea, during winter

Seung Shik Park* and Kwon-Ho Lee

Potential source contribution function maps for black carbon (BC) observed at a roadway site indicate that the BC observed during episode "A" was most likely attributed to local emissions, while local sources and regional transport of air masses contributed to the enhanced BC concentrations during episode "B".

Possibility of using a lithotrophic iron-oxidizing microbial fuel cell as a biosensor for detecting iron and manganese in water samples

Phuong Hoang Nguyen Tran, Tha Thanh Thi Luong, Thuy Thu Thi Nguyen, Huy Quang Nguyen, Hop Van Duong, Byung Hong Kim and Hai The Pham*

A lithotrophic iron-oxidizing microbial fuel cell containing an enriched iron-oxidizing bacterial consortium has the potential to be used as a biosensor for detecting iron in water samples.

1816

Remarkably constant PAH concentrations in Swiss soils over the last 30 years

Andreas Gubler,* Daniel Wächter, Franziska Blum and Thomas D. Bucheli

Over the last 30 years, concentrations of medium to heavy PAH remained remarkably constant for Swiss topsoils, whereas concentrations of light PAH decreased.

1829

Dissolved organic matter in Lake Superior: insights into the effects of extraction methods on chemical composition

Hongyu Li* and Elizabeth C. Minor

The SPE resin choice (C18 vs. SDB-XC) affects the chemical composition of the resulting extract but differences between near and offshore dissolved organic matter samples remain clear.

1841

A statistical method for assessing network stability using the Chow test

Kostas Sotirakopoulos,* Richard Barham, Ben Piper and Luca Nencini

A computationally inexpensive statistical method for the identification of drifts from calibration in noise monitoring wireless sensor networks.

1851

Distribution characteristics of organic phosphorus in sediments from Lake Hulun, China

Changwei Lü,* Jiang He,* Bin Zhou, Rolf D. Vogt, Rui Guan, Weiyang Wang, Le Zuo and Daohao Yan

The amount of organic phosphorus (OP) and its distribution among different pools in lake sediments depend on biotic and abiotic processes driving OP fractionation.