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Environmental digest

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THEMED ISSUE: AIRMON 2011

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Editorial

Professor Yngvar Thomassen introduces papers from the AIRMON Symposium on Modern Principles of Air Monitoring and Biomonitoring.

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Contributors to the AIRMON themed issue

Journal of Environmental Monitoring profiles the contributors to the AIRMON 2011 themed issue.

FOCUS

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Bioaerosol exposure assessment in the workplace: the past, present and recent advances

Wijnand Eduard,* Dick Heederik, Caroline Duchaine and Brett James Green

This overview summarizes the options for risk assessment of bioaerosol exposure at the workplace, challenges and recent advances.

PERSPECTIVES

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Occupational and environmental aerosol exposure assessment: a scientific journey from the past, through the present and into the future

James H. Vincent

This perspective reviews the evolution of occupational and environmental aerosol exposure assessment during the past century, and points the way to some of the new challenges yet to come.

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Biological monitoring *versus* air monitoring strategies in assessing environmental–occupational exposure

Marek Jakubowski*

Biological and environmental monitoring of exposure to chemicals should be considered as equivalent methods depending on available methods for interpretation.

353

Occupational exposure to beryllium in primary aluminium production

Nils Petter Skaugset, Dag G. Ellingsen, Kari Dahl, Ivar Martinsen, Lars Jordbekken, Per Arne Drabløs and Yngvar Thomassen*

This study provides information of occupational Be exposure in aluminium pot room workers.

360

Interlaboratory evaluation of trace element determination in workplace air filter samples by inductively coupled plasma mass spectrometry

Kevin Ashley, * Stanley A. Shulman, Michael J. Brisson and Alan M. Howe

An interlaboratory study of sample dissolution and ICP-MS analysis was carried out to investigate method performance for occupational hygiene applications.

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Validation of diffusive mini-samplers for aldehyde and VOC and its feasibility for measuring the exposure levels of elementary school children

Atsuko Araki, Tazuru Tsuboi, Toshio Kawai, Yu Ait Bamai, Tomoya Takeda, Eiji Yoshioka and Reiko Kishi*

Data on personal exposure levels in children are scarce, thus small lightweight diffusive mini-samplers for aldehydes and volatile organic compounds (VOCs) were designed to measure the exposure level of children to these chemicals.

375

Field comparison of three inhalable samplers (IOM, PGP-GSP 3.5 and Button) for welding fumes

Agurtzane Zugasti, * Natividad Montes, José M. Rojo and M. José Quintana

183 samples collected in a homogeneous workplace environment enable reliable estimation of the relations between samplers' performance for welding fumes.

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Performance evaluation of two commercial chemiluminescence NO_x analysers according to European Standard EN 14211

Marta Doval Miñarro* and Enrique González Ferradás

Main uncertainty contributions to NO_x chemiluminescence measurements from two commercial analysers according to European Standard EN 14211.

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Preparation, certification and interlaboratory analysis of workplace air filters spiked with high-fired beryllium oxide

Thomas J. Oatts, Cheryl E. Hicks, Amy R. Adams, Michael J. Brisson, Linda D. Youmans-McDonald, Mark D. Hoover and Kevin Ashley*

This interlaboratory study investigated the effectiveness of methods for sample preparation and analysis of air samples containing refractory beryllium oxide.

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Determination of 14 amines in air samples using midjet impingers sampling followed by analysis with ion chromatography in tandem with mass spectrometry

Marie Verrièle, Hervé Plaisance, Laurence Depelchin, Samia Benchabane, Nadine Locoge* and Guillaume Meunier

An ion chromatography-mass spectrometry method was developed for the simultaneous quantification of 14 volatile amines in air.

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Documentation of bioaerosol concentrations in an indoor composting facility in France

Philippe Duquenne,* Xavier Simon, Véronique Koehler, Solimar Goncalves-Machado, Guylaine Greff, Thérèse Nicot and Pascal Poirot

Bioaerosol concentrations were investigated in a totally indoor composting facility processing fermentable household and green wastes to assess their variability.

Workplace aerosol mass concentration measurement using optical particle counters

Peter Görner,* Xavier Simon, Denis Bémer and Göran Lidén

Schematic of the optical cell of an optical particle counter.

Influence of a portable air treatment unit on health-related quality indicators of indoor air in a classroom

Paul T. J. Scheepers,* Robbert Cremers, Stef P. R. van Hout and Rob B. M. Anzion

Portable air treatment units were tested in a real life setting, showing that their performance does not necessarily reflect technical performance.

Sulfuric acid at workplaces—applicability of the new Indicative Occupational Exposure Limit Value (IOELV) to thoracic particles

Dietmar Breuer,* Petra Heckmann, Krista Gusbeth, Gregoria Schwab, Morten Blaskowitz and Andreas Moritz

The paper presents a first comprehensive study of sulfuric acid measurements at workplaces using a high flow thoracic sampler.

Multiparametric approach for an exemplary study of laser printer emissions

Paola Castellano,* Silvia Canepari, Riccardo Ferrante and Nunziata L'Episcopo

The multiparametric approach of this work provides an insight into the characterisation of the different emission processes of laser printers.

455

Impact of agglomeration and different dispersions of titanium dioxide nanoparticles on the human related *in vitro* cytotoxicity and genotoxicity

Zuzana Magdolenova, Dagmar Bilaničová, Giulio Pojana, Lise M Fjellsbø, Alexandra Hudecova, Katarina Hasplova, Antonio Marcomini and Maria Dusinska*

Genotoxicity of TiO₂ NPs was investigated in human EUE cells by the comet assay. The TiO₂ NPs dispersion with large agglomerates induced DNA damage while smaller agglomerates had no effect.

REGULAR RESEARCH ARTICLES

CRITICAL REVIEW

465

Enantioselective aquatic toxicity of current chiral pesticides

Quan Zhang, Cui Wang, Xiaofeng Zhang, Daqing Jin, Changjiang Huang* and Meirong Zhao*

We review relevant work on the aquatic toxicity of chiral pesticides with an emphasis on the enantioselective aquatic toxicity under both chronic and acute exposure conditions.

PAPERS

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Bacterial communities in urban aerosols collected with wetted-wall cyclonic samplers and seasonal fluctuations of live and culturable airborne bacteria

Subbarao V. Ravva,* Bradley J. Hernlem, Chester Z. Sarreal and Robert E. Mandrell

Bacterial communities in urban aerosols were characterized by 16S rRNA gene sequencing and the influence of environmental conditions on fluctuations in culturable airborne bacteria was monitored.

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Occurrence and fate of androgens, estrogens, glucocorticoids and progestagens in two different types of municipal wastewater treatment plants

Shan Liu, Guang-Guo Ying,* Jian-Liang Zhao, Li-Jun Zhou, Bin Yang, Zhi-Feng Chen and Hua-Jie Lai

The activated sludge process is superior to the oxidation ditch in the degradation of steroids in wastewater.

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Heat shock protein 47 stress responses in Chinese hamster ovary cells exposed to raw and reclaimed wastewater

Mokhtar Guizani,* Yosuke Nogoshi, Fahmi Ben Fredj, Junkyu Han, Hiroko Isoda and Naoyuki Funamizu

This article is about stress response HSP47 in Chinese Hamster ovary cells due to exposure to reclaimed wastewater.

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Soil mineralization of two-phase olive mill wastes: effect of the lignocellulosic composition on soil C dynamics

N. Serramiá, A. Roig and M. A. Sánchez-Monedero*

The aim of this work was to evaluate the relationship between the lignocellulosic fraction of two-phase olive mill wastes (TPOMW) and the organic matter degradation rate in three agricultural soils amended with four TPOMW composting mixtures.

510

Projected Years Lost due to Disabilities (YLDs) for bacillary dysentery related to increased temperature in temperate and subtropical cities of China

Ying Zhang,* Peng Bi, Yuwei Sun and Janet E. Hiller

The temperature-related health burden of bacillary dysentery in China may greatly increase in the future if there is no effective intervention.

517

Development of a novel solid-phase extraction element for the detection of nonylphenol in the surface water of Hangzhou

Liping Lou, Guanghuan Cheng, Qiang Yang, Xinhua Xu, Baolan Hu* and Yingxu Chen

A novel solid-phase extraction method with magic chemisorber for nonylphenol was developed, which had high capacity, efficiency, accuracy and repeatability.

Estimating the aquatic emissions and fate of perfluorooctane sulfonate (PFOS) into the river Rhine

Alexander G. Paul, Martin Scheringer, Konrad Hungerbühler, Robert Loos, Kevin C. Jones and Andrew J. Sweetman*

The sources, distribution, levels and sinks of perfluorooctane sulfonate (PFOS) estimated to be released from areas of high population density, have been explored using the river Rhine as a case study.

Arsenic contamination and speciation in surrounding waters of three old cinnabar mines

Raquel Larios, Rodolfo Fernández-Martínez, Verónica Silva, Jorge Loredo and Isabel Rucandío*

The impact of arsenic pollution in surrounding waters from cinnabar mines and factors contributing to its mobilization was evaluated by means of speciation studies, physicochemical characterization and statistical treatment.

Changes in the sorption and rate of 17 β -estradiol biodegradation by dissolved organic matter collected from different water sources

Ji Ho Lee, John L. Zhou, Yunho Lee, Seok-Young Oh and Sang Don Kim*

The potential biodegradation and subsequent transformation of 17 β -estradiol (E2) to estrone (E1) were examined in the presence of various dissolved organic matter isolated from effluent, river and lake waters.

Analysis of the air pollution climate at a background site in the Po valley

Alessandro Bigi,* Grazia Ghermandi and Roy M. Harrison

Measurements of air pollutants from Modena, a town within the Po valley, are analysed. These comprise hourly data for CO, NO, NO₂, NO_x, and O₃, and daily gravimetric equivalent data for PM₁₀ from 1998–2010.

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Environmental monitoring of radon in soil during a very seismically active period occurred in South West Greece

Dimitrios Nikolopoulos,* Ermioni Petraki,
Anna Marousaki, Stelios M. Potirakis, Grigorios Koulouras,
Constantinos Nomicos, Dionisios Panagiotaras,
John Stonham and Anna Louizi

This paper focuses on the environmental monitoring of radon in soil as a potential trace gas in the search of earthquake precursors.

579

Monitoring of potentially toxic cyanobacteria using an online multi-probe in drinking water sources

A. Zamyadi, N. McQuaid, M. Prévost and S. Dorner*

This paper clarifies the utility of an *in vivo* fluorescence probe for the detection of cyanobacterial alert levels in drinking-water sources.

589

Assessing temporal representativeness of water quality monitoring data

Saku Anttila,* Mirva Ketola, Kirsi Vakkilainen
and Timo Kairesalo

Temporal representation analysis can be used as a tool in sampling design by adjusting the sampling interval to suit the actual temporal variation in the monitoring area.

596

Neglected sources of pharmaceuticals in river water—footprints of a Reggae festival

Atlasi Daneshvar,* Jesper Svanfelt, Leif Kronberg
and Gesa A. Weyhenmeyer

Open-air festivals can temporarily become a more important source for pharmaceutical occurrence in surface water than wastewater treatment plants.

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Exposure to inhalable dust and endotoxin among Danish livestock farmers: results from the SUS cohort study

Ioannis Basinas,* Torben Sigsgaard, Dick Heederik, Hisamitsu Takai, Øyvind Omland, Nils T. Andersen, Inge M. Wouters, Jakob H. Bønløkke, Hans Kromhout and Vivi Schlünssen

The paper provides comparable information on variability and levels of personal dust and endotoxin exposure in four different types of animal farmers.

615

Monitoring water quality in reservoirs for human supply through multi-biomarker evaluation in tropical fish

Izabella de Andrade Brito, Carolina Arruda Freire, Flávia Yoshie Yamamoto, Helena Cristina Silva de Assis, Luciana Rodrigues Souza-Bastos, Marta Margarete Cestari, Nédia de Castilhos Ghisi, Viviane Prodocimo, Francisco Filipak Neto and Ciro Alberto de Oliveira Ribeiro*

The present study investigated the water quality in three reservoirs along *Paraíba do Sul* River through physiological, morphological, biochemical, and genetic biomarkers.

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Polar organic chemical integrative sampler (POCIS): application for monitoring organic micropollutants in wastewater effluent and surface water

Cécile Miège,* Hélène Budzinski, Romain Jacquet, Coralie Soulier, Thomas Pelte and Marina Coquery

The capacity of POCIS is discussed: assessment of time-averaged water concentration, limits of quantification, standard configurations for comparable results, cost, and deployability.

636

Distribution of perfluorinated compounds in water, sediment, biota and floating plants in Baiyangdian Lake, China

Yali Shi, Yuanyuan Pan, Jieming Wang and Yaqi Cai*

The perfluorinated compounds (PFCs) showed significant geographical difference in Baiyangdian Lake and different composition profiles between floating plants and aquatic animals.

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Spatial mapping of city-wide PBDE levels using an exponential decay model

Laurence K. Hearn,* Karen Kennedy, Darryl W. Hawker, Leisa-Maree L. Toms, Vincent Alberts and Jochen F. Mueller

Passive air samplers were deployed at 6 outdoor air monitoring stations in different land use categories to assess the spatial distribution of polybrominated diphenyl ethers in the Brisbane airshed.

651

Monitoring of heavy metal contaminants using feathers of shorebirds, Korea

Jungsoo Kim and Jong-Min Oh*

Lead and cadmium concentrations in feathers were significantly different among shorebirds and both concentrations in the feather were correlated to the liver concentrations. Feathers of shorebirds as bioindicators are useful to evaluate the presence of internal heavy metal contaminations.

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Field comparison of manual and semi-automatic methods for the measurement of total gaseous mercury in ambient air and assessment of equivalence

Richard J. C. Brown,* Yarshini Kumar, Andrew S. Brown, Matthew A. Dexter and Warren T. Corns

The results of the first field trial to compare the semi-automatic reference method with the manual method for the measurement of total gaseous mercury in air are presented.

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Update of long-term trends analysis of ambient 8-hour ozone and precursor monitoring data in the South Central U.S.; encouraging news

Mark E. Sather* and Kevin Cavender

This paper reports significant long-term decreases in ambient ozone and precursor concentrations in four South Central U.S. cities, especially over the recent five year period 2006–2010.

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Evolution of building façade road traffic noise levels in Flanders

Timothy Van Renterghem,* Dick Botteldooren and Luc Dekoninck

A measurement campaign that was repeated 3 times in a 13-year period at the same 250 locations in Flanders (Belgium) showed that road traffic noise levels at street-facing building façades did not change in general.

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Detection and quantification of major toxigenic *Microcystis* genotypes in Moo-Tan reservoir and associated water treatment plant

Hung-Kai Yen, Tsair-Fuh Lin* and I-Cheng Tseng

Two molecular methods were developed and used for the characterization and quantification of several microcystin producers in Moo-Tan Reservoir, Taiwan and its associated water treatment plant.

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Seasonal source influence on river mass flows of benzotriazoles

Aliz Kiss and Elke Fries*

Applications, input sources and environmental fate of benzotriazoles.

704

Metal immobilization and phosphorus leaching after stabilization of pyrite ash contaminated soil by phosphate amendments

Marija Zupančič,* Simona Lavrič and Peter Bukovec

This study clearly shows the importance of a holistic approach to phosphate based metal stabilization studies where all aspects of chemical treatments should be observed and evaluated.