

Contents in Context

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Arsenobetaine is a significant arsenical constituent of the red Antarctic alga *Phyllophora antarctica*

Marco Grotti, Francesco Soggia, Cristina Lagomarsino, Walter Goessler and Kevin A. Francesconi

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Although arsenic occurs in marine animals at high concentrations, the pathways by which it is biotransformed and accumulated remain largely unknown. The observation that some species of algae can contain significant concentrations of arsenobetaine, a major marine arsenic species, is relevant to explanations of the source of this compound to marine animals and its transport through the marine food web.

Changes in proportions of arsenic species within an *Ecklonia radiata* food chain

Simon Foster, William Maher and Frank Krikowa

Environ. Chem. **2008**, 5, 176

The present study examines arsenic species in kelp and associated grazing animals of an *Ecklonia radiata* food chain. The study focusses on the changes in proportions of arsenoribosides obtained from *E. radiata* and mechanisms are proposed to explain the transformations of arsenoribosides observed in the organisms that graze on it.

Trends in rainfall associated with sources of air pollution

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Environ. Chem. **2008**, 5, 184

Decreasing trends in rainfall over large areas of eastern and south-western Australia have resulted in critical water shortages. Three reasons have been suggested. The first is a change in atmospheric circulation as a result of greenhouse gas forcing. The second is that changes in land usage have affected surface moisture, albedo and cloud formation. Another, the subject of this study, is that airborne particulates associated with urban areas have acted to decrease the mean efficiency of rainfall, the growth of urban areas thereby causing an underlying decreasing trend in rainfall.

Occurrence of residues of the veterinary drug crystal (gentian) violet in wild eels caught downstream from municipal sewage treatment plants

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Environ. Chem. **2008**, 5, 194

Crystal violet (CV), also known as gentian violet, is a triphenylmethane dye used as a veterinary drug for the treatment of ornamental fish infected with the parasitic protozoa *Ichthyophthirius multifiliis*. CV is a suspected carcinogen not registered for use with food-producing animals in the European Union, Australia, the US and some other countries. The results from this study now demonstrate that residues of leuco CV, the main metabolite of CV, may occur as an organic contaminant in samples of wild eels caused by discharges of municipal sewage effluents.

Assessment of caudal fin clip as a non-lethal technique for predicting muscle tissue mercury concentrations in largemouth bass

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Environ. Chem. **2008**, 5, 200

In the development of fish consumption advisories, fisheries biologists routinely sacrifice fish and analyse muscle fillets in order to determine the extent of mercury contamination. Such lethal techniques may not be suitable for endangered species or limited fish populations from smaller-sized water bodies. We compared the measured total mercury concentrations in tail fin clips to that of muscle fillets and illustrated that tail fin clips may be used as an accurate tool for predicting mercury in muscle tissue. This is the first study on the use of tail fin clips to predict mercury levels in the muscle tissue of largemouth bass with minimal impact on the fish.

FLUXY: a simple code for computing steady-state metal fluxes at consuming (bio)interfaces, in natural waters

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Environ. Chem. **2008**, 5, 204

Until now there was no user-friendly code for metal flux computations in natural mixtures of aquatic complexants, which are however essential for prediction of metal bioavailability. The present paper describes the capabilities and limitations of one of the only two such codes presently available, called *FLUXY*. The results of *FLUXY* are compared with those of another code, and it is shown that it enables quick computation and is applicable to natural ligands under many environmental conditions.

A three-dimensional reactive transport model for sediments, incorporating microniches

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Environ. Chem. **2008**, 5, 218

Modelling of discrete sites of diagenesis in sediments (microniches) has typically been performed in 1-D and has involved a limited set of components. Here we present a new 3-D model for microniches within a traditional vertical sequence of redox reactions, and show example modelled niches of a range of sizes, close to the sediment–water interface. Microniche processes may have implications for understanding trace metal diagenesis, via formation of sulfides. The model provides a quantitative framework for examining microniche data and concepts.

***N,N*-Diethyl-*p*-phenylenediamine effectiveness in analysis of polysulfides and polythionates in water**

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Environ. Chem. **2008**, 5, 226

The importance of hydrogen sulfide as well as some of the reduced sulfur species such as polysulfides as environmental pollutants is a result of their toxicity, unpleasant odour, and their reactivity with metals and metallic ions found in various environmental samples. Although known to be popular, the effectiveness of *N,N*-diethyl-*p*-phenylenediamine and other related compounds in the spectrophotometric analysis of such sulfur compounds in water as well as in other environmental samples has not been fully investigated. Our results show that although the quantification of simple sulfides in the environmental samples may be easily accomplished spectrophotometrically by using *N,N*-diethyl-*p*-phenylenediamine, the level of difficulty in analysing such compounds may increase with their increasing sulfur chain.

Fitzroy River Basin, Queensland, Australia. III. Identification of sediment sources in the coastal zone

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The Fitzroy River Basin is a major source of suspended sediment and nutrients to the southern Great Barrier Reef lagoon. A reduction in sediment and nutrient loads is necessary to protect coastal reefs and this requires an understanding of the sediment sources. The present geochemical and modelling study provides a quantitative estimate of the spatial and temporal variations in the sources of sediment deposited in the Fitzroy River coastal zone.

Fitzroy River Basin, Queensland, Australia. IV. Identification of flood sediment sources in the Fitzroy River

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During flood events, the Fitzroy River is a major contributor to the loads of suspended sediment and nutrients to the southern Great Barrier Reef. The present geochemical and modelling study provides for the first time a quantitative estimate of the temporal variation in sediment sources over an entire flood hydrograph. Basaltic soils are substantially enriched in this flood event relative to their catchment abundance.