

As 2006

International Congress
Mexico City
20 - 24 June 2006

NATURAL ARSENIC IN GROUNDWATERS OF LATIN AMERICA

Occurrence-Health Impact-Remediation-Management

http://www.lwr.kth.se/Personal/personer/bhattacharya_prosun/As-2006.htm

<http://www.ioez.tu-freiberg.de/veranstaltungen/veranstaltungen.html>

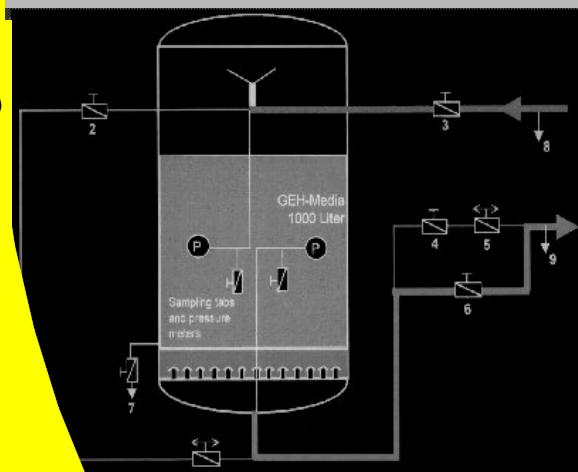
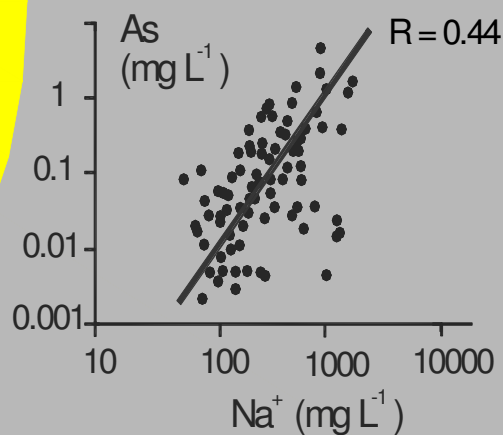
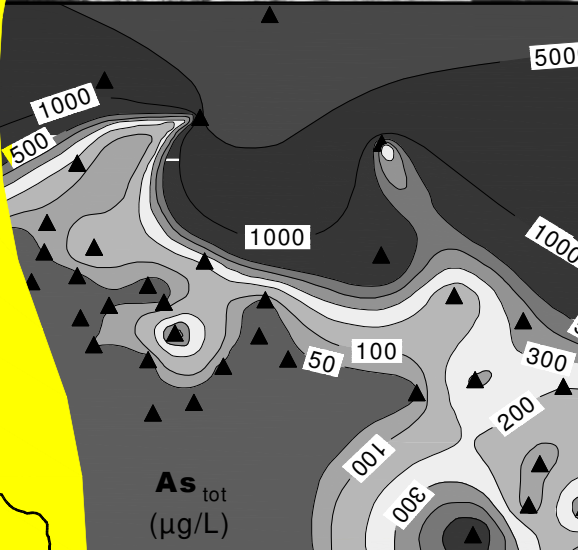


- **As** - occurrence
- **As** - sources
- **As** - mobility controls
- **As** - in food chain
- **As** - exposure
- **As** - social impacts
- **As** - health effects
- **As** - management
- **As** - remediation



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The Congress

Groundwater resources – which serve as a backbone for human development – naturally contain rather high levels of arsenic (As) in many parts of the world. The As-concentrations often exceed the World Health Organisation (WHO) guideline value of 10 µg/L. In several areas, severe health effects have been associated with elevated As concentrations in groundwater used for drinking purposes. People in low income countries, particularly in South East Asia and Latin America, are most severely affected. There is increasing evidence of various susceptibility factors, e.g., malnutrition.

Arsenic in groundwater is one of the most important environmental health risks of the present century. Several million people depending on arsenic-containing groundwater for drinking purposes are at increased risk arsenic-related health effects. So far, most research has concerned cancer effects of arsenic. There is a need for more information about other health effects, e.g. on other arsenic-related health effects, and on factors influencing susceptibility.

During the last decade, the As-containing groundwater in South and South-East Asia has received much attention. However, the situation seems to be equally important in Latin America, where the number of studies is still relatively low, and the extent and severity of As-exposure in the populations marginally evaluated. Arsenic occurrence in groundwater in Argentina, Bolivia, Brazil, Chile, Mexico, Nicaragua, Peru, and other Latin American countries need to be investigated. Recently, in Nicaragua - a country where the groundwater arsenic problem was not assumed to exist – elevated arsenic concentrations in groundwater as well as arsenic-related health effects were detected. However, the actual number of people at risk for chronic As toxicity is not yet known. This current status of incomplete knowledge of As-occurrence and related health risks deserves serious attention.

Land and agricultural sustainability in the Latin American countries are threatened by the use of As-contaminated irrigation water. Elevated levels of natural arsenic in groundwater from geogenic sources is therefore an issue of primary environmental concern, which limits the use of these resources for drinking or other purposes, and hinders socio-economic growth. Hence there is an urgent need to improve the understanding on the genesis of As-rich groundwaters, constraints on the mobility of As in groundwater, As-uptake from soil and water by plants, As-propagation through the food chain, health impacts on human beings, assessment of environmental health risks and impacts, and As-removal technologies, to improve the socio-economic status of the affected regions.

Interdisciplinary Platform Objective

The goal of the international congress "As 2006" is to bring together geo-scientists, specialists from public health, from chemical and engineering sciences involved in arsenic-related issues. The regional focus of attention is dedicated to Latin America.

The conference serves as a platform for discussion and exchange of scientific knowledge and ideas to identify future research targets needed to improve the understanding of (1) the occurrence and mobility of arsenic in groundwater, (2) the health impacts and risks when using this water for drinking or irrigation purposes, and (3) to develop, evaluate, select and apply those remediation methods, which are the most suitable ones, which means adapted to the hydrogeological and hydrogeochemical properties of the aquifer, the specific hydrochemical composition of the groundwater, the social conditions and the economic situation of the affected population and the respective water service providers.

The international congress is designed to (1) create interest within the Latin American countries, affected by the presence of arseniferous aquifers, (2) to address the international scientific community in general, (3) to update the current status of knowledge on the dynamics of natural arsenic from the bedrock and soils via aquifers and groundwater to food chain, (4) to continue the important worldwide forum on improved and efficient techniques for As-removal in regions with elevated arsenic levels in groundwater, and (5) to increase awareness among administrators, policy makers and company executives, and to improve the international cooperation on that topic. However, we strongly encourage all other researchers working on arsenic elsewhere in the world to contribute, which would strengthen this global issue.

Sessions Topics

During the congress, the genesis of arseniferous groundwater in sedimentary and hard rock aquifers and the assessment of health impacts and risks, economic and social impacts, and arsenic removal technologies will be discussed in 7 sessions:

I. Arsenic Occurrences in Sedimentary and Hard-rock Aquifers

Case studies from: ♦ Argentina ♦ Bolivia ♦ Brazil ♦ Chile ♦ Nicaragua ♦ Mexico ♦ Peru, and other Latin American countries .

II. Biogeochemistry of Arsenic in Soil and Groundwater

Arsenic speciation: Inorganic/organic and methylated arsenic ♦ reactions, solubility and thermodynamic constants ♦ mobility and transport ♦ adsorption/desorption processes and kinetics ♦ redox processes and transformations biotic vs. abiotic, methylation/demethylation ♦ volatilization and arsine formation ♦ chemical equilibrium modeling ♦ speciation and analytical methods (spectrophotometry, hydride generation, ICP-MS and others)

III. Arsenic in the Food Chain

Fate of arsenic in soil, water and crops/food ♦ soil-plant transfer of arsenic ♦ bio-availability of arsenic from food ♦ arsenic in food chain ♦ higher-level speciation of arsenic in food ♦ dietary intake of arsenic via food

IV. Environmental Health Effects and Risk Assessment

Environmental background levels ♦ arsenic exposure assessment ♦ arsenic metabolism ♦ toxicological mechanisms ♦ cancer effects ♦ non-cancer effects ♦ immunological and endocrinological effects ♦ reproductive and neurodevelopmental effects ♦ gender differences in exposure and health effects ♦ susceptibility factors ♦ screening of arsenic-related health effects at village/country level ♦ case definition treatment

V. Assessment of Social and Economic Impacts

Arsenicosis and economic status ♦ arsenicosis and social implications ♦ social awareness of safe water supply at household level ♦ economic effects of arsenic poisoning – assessment ♦ arsenicosis and its socioeconomic impact on village households and models of mitigation

VI. Remediation of As-rich Groundwaters

Techniques for arsenic removal from groundwater ♦ conventional techniques and innovations for community supplies ♦ sophisticated technologies such as ion exchange and reverse osmosis ♦ arsenic removal at domestic scale ♦ In-situ remediation techniques ♦ emerging techniques using natural medium ♦ sorption of arsenic using plants as a method of removal of arsenic-phytoremediation and use of medicinal plants ♦ removal of arsenic from groundwater is an important worldwide issue ♦ treatment and deposition of As-rich sludge generated during arsenic removal

VII. Management of As-rich Groundwaters

Assessment of environmental quality based on natural background concentration of As ♦ Strategies for management of arsenic in drinking water ♦ major problems with remediation of arsenic contaminated groundwater systems ♦ site specific approach for economically feasible and effective management of groundwater arsenic contamination ♦ targeting arsenic-safe aquifers for managing drinking water supplies ♦ sustainability issues to circumvent the environmental health disasters

Registration

Please register using the attached form and send it by e-mail to the congress organisers (see below).

Language

The principal language of the Congress will be English, secondary language will be Spanish. Simultaneous translation will be provided upon request.

Paper Presentation

Please send an abstract of maximum 500 words by e-mail to the organisers (Microsoft Word; deadline May, 31, 2005). Results of the reviews will be communicated by July 31, 2005. Abstracts may be submitted in English (preferred) or in Spanish. The latter option shall allow for Non-English speaking contributors to share their experiences with the international scientific community, international organisations or funding institutions.

Publication of Proceedings

The full papers will be peer-reviewed by an international committee. After acceptance, the contribution shall be published in English in a book by AB Balkema Publishers (Taylor & Francis Group). For a wider international audience we would encourage non English speaking Latin American colleagues to submit their paper in Spanish. After review, acceptance, and revision by the author, we will assist the author in translation to English.

The book will be the first comprehensive bibliography which would reflect the state of art knowledge of problems in Latin America caused by natural occurrence of groundwater arsenic and potential techniques of remediation and management.

IMPORTANT

Contributors, who can not personally participate in the congress, are encouraged to submit their abstracts. After approval, these colleagues will be invited to submit their full paper for publication. A deadline for the latest submission will be given in each step and will be mandatory.

Costs

Participation at the congress:

US\$ 280 Regular participants

US\$ 180 Participants from developing countries

US\$ 180 Presenters of manuscripts without personal participation in Mexico

All above registration categories include one free copy of the book published by A.A. Balkema (Taylor & Francis Group), which contains the full peer-reviewed papers of the congress.

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Personal Particulars:

Title (Prof/Dr/Etc.) First NameLast Name.....

Organization
.....

Address for Correspondence : Mailing:

City..... Post Code.....Country.....

Telephone (W) Telephone (H).....

Telefax E-mail..... Mobile.....

Intended Scientific Contribution: Title of the paper/poster

Theme of Interest:
.....

Will you prefer a Poster presentation.....or Oral presentation.....(Please check)

Date.....

Signature.....

Please send this preliminary registration to: jochenbunds Schuh@yahoo.com or prosun@kth.se