

# **Arsenic removal metabolism, genotoxic damage and genetic susceptibility in humans**

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## **Abstract:**

Exposure to arsenic (As) is a major problem in many parts of the world. In fact, it is estimated that more than 100 million people are exposed to arsenic, mainly through contamination of groundwater. Chronic arsenic exposure is associated with adverse effects on human health, such as cancer, cardiovascular diseases, neurological diseases and the rate of morbidity and mortality in the exposed population health is alarming.

Arsenic has a strong genotoxic potential and is capable of causing DNA damage such as aneuploidy; micronucleus formation, chromosomal aberrations, deletion mutations, sister chromatid exchange and DNA-protein crosslinks. Several mechanisms have been hypothesized to explain the cause of this DNA damage, but more studies are needed to establish the mechanism on the basis of genetic damage induced by arsenic in order to develop specific treatment strategies for related disorders with arsenic. In addition, epidemiological studies have found that there is a high inter-individual variability in susceptibility to arsenic-induced toxicity. Several studies have established the influence of genetic polymorphisms in susceptibility to arsenic through modulation as metabolism, detoxification and DNA repair.

Preliminary results from a pilot study in three villages of Poopo Lake showed that there is DNA damage in one population measured by comet assay, the parameters of comet assay: tail moment, moment olive and percentage of DNA in tail showed a significant difference between villages. It is necessary to increase the sample size to confirm the results found and to and to correlate with other variables in study.

## **References:**

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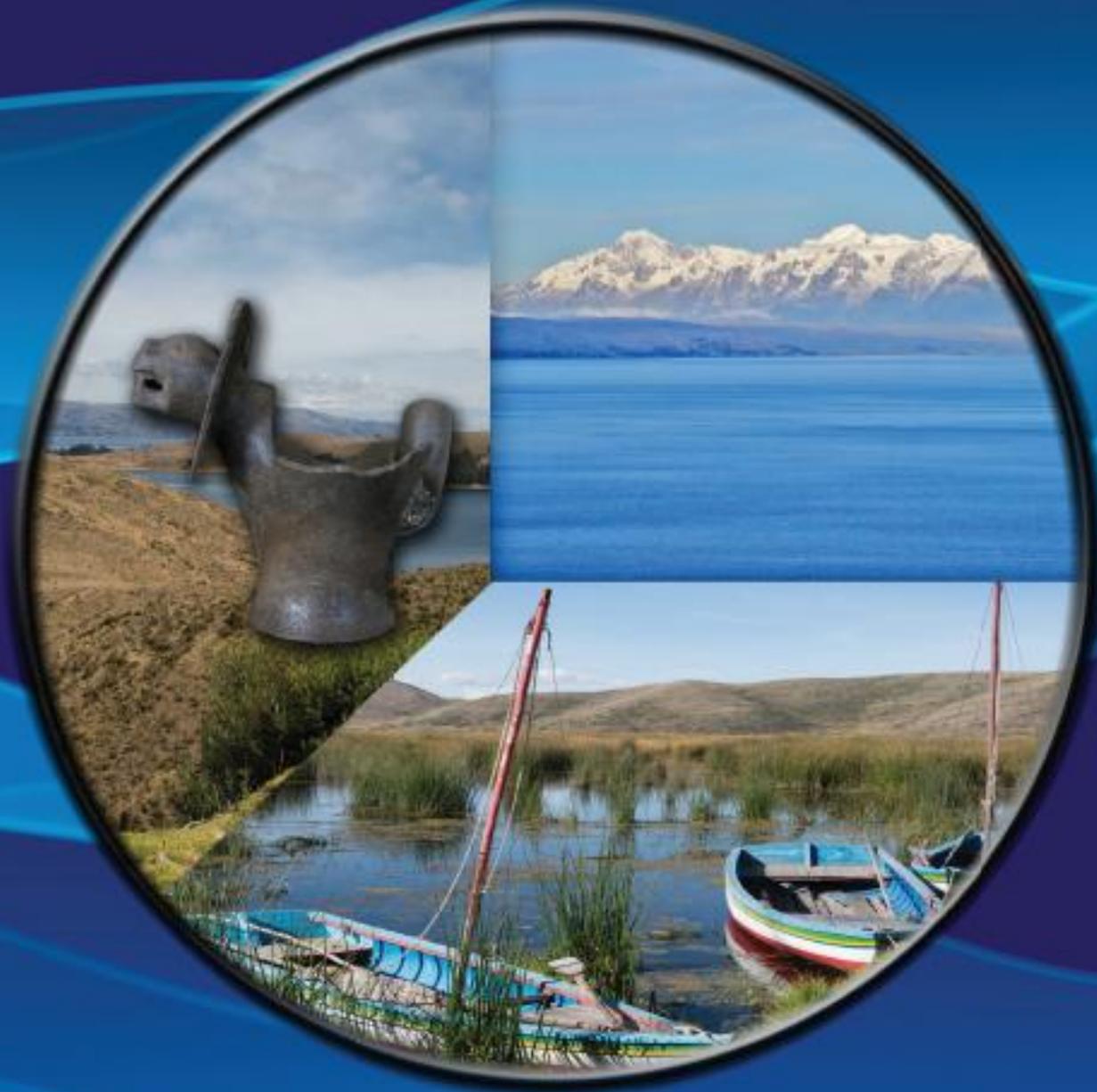
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# COLOQUIO INTERNACIONAL SOBRE LA CONTAMINACIÓN ACTUAL E HISTÓRICA EN LOS ECOSISTEMAS ACUÁTICOS ANDINOS



La Paz, 3 al 5 de mayo de 2016  
Universidad Mayor de San Andrés, Cota Cota, La Paz





## **Proceedings**

**International colloquium on current and ancient contamination in  
Andes aquatic ecosystems**

**Coloquio internacional sobre la contaminación actual y histórica  
en los ecosistemas acuáticos Andinos**

**Colloque international sur la contamination actuelle et historique  
des écosystèmes aquatiques andins**

**La Paz – May 3<sup>rd</sup> – 5<sup>th</sup> 2016**

**Universidad Mayor de San Andrés – Campus de Cota-cota, La Paz**

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## General Planning

- **May 3<sup>rd</sup> 2016: Contamination and eutrophication of Lake Titicaca**

*AM session: Mercury biogeochemistry and contamination of aquatic ecosystems of the Andes region*

Keynote Lecture: Hg contamination in Latin America: the past is not what we think, nor the future (J.-R. Davee Guimarães).

*PM session: Chemical contamination, eutrophication and monitoring of Lake Titicaca and its watershed*

Keynote Lecture: Eutrophication of the Cohana Bay (D. Acha).

- **May 4<sup>th</sup> 2016: Arsenic issues in the Andes**

*AM session: Arsenic biogeochemistry and contamination of aquatic ecosystems of the Andes region*

Keynote Lecture: Arsenic contamination of groundwater (Chile) (G. Lobos).

*PM session:*

*Workshop 1: Arsenic and mercury speciation.*

*Workshop 2: Paleoenvironmental studies in the Andean altiplano.*

- **May 5<sup>th</sup> 2016: Historical reconstructions of the human-climate interactions in the altiplano: implication of archeological purposes**

*AM session: Paleo-environmental reconstruction of Altiplano's archives*

Keynote Lecture: Holocene Paleoclimatic and Paleoenvironmental History of the Lake Titicaca Basin (S. Fritz & P. Baker).

*PM session: Archeology: historical human – environment interactions*

Keynote Lecture: Recent contribution of terrestrial and subaquatic archeological investigation in Lake Titicaca (C. Delaere & M-A. Vella).