FACING ARSENIC ENVIRONMENTAL AND HEALTH ISSUES IN URUGUAY WITH A MEDICAL GEOLOGY APPROACH

NELLY MAÑAY[1]*, MARIELA PISTÓN[2], CESAR GOSO[3]

[1]*Toxicología e Higiene Ambiental- Facultad de Química-UdelaR, Universidad de la República Montevideo-Uruguay*
[2]*Química Analítica-Facultad de Química-UdelaR, Universidad de la República Montevideo-Uruguay*
[3]*Geología- Facultad de Ciencias-UdelaR, Universidad de la República Montevideo-Uruguay*
nmanay@fq.edu.uy

Scientific research has been recently conducted in Uruguay to study the presence of geogenic arsenic (As) in groundwater and preliminary results, showed As levels above those recommended by WHO for drinking water (10 μg/L) in different aquifers of the country. For example, in a study on Raigon aquifer, water samples showed an arsenic concentration range from 1,4 to 24,2 μg/L with a median of 14,2 μg/L while in other study, the median, maximum and minimum As concentrations determined in several acquifers (Mercedes, de la Costa) have been 16.9, 58.0 and 0.1 μg/L, respectively. Besides, As concentrations between 4,9 and 116 μg/L in water samples from thermal corridor of Uruguay river, were published recently.
Several laws and decrees regulate water sources quality and the drinking water is supplied only by a state company that is controlled by a state regulation institute, being As new recommended levels < 20 μg/L. In a 6 years period study of those data assessment, As concentration in drinking water samples taken from different areas of the country, showed an increase from not detectable to quantified levels.
The risk of the Uruguayan population consuming this water has not yet been estimated, so it is important to develop systematic studies to assess population's chronic exposure to inorganic arsenic through drinking water and health impacts. This environmental health issue is now becoming a matter of concern with a medical geology approach, as similar aims research teams and experts from geosciences and biosciences, joined to face those arsenic exposure risks problems.
As a consequence, several multidisciplinary studies have been developed, focusing on arsenic geological and toxicological aspects. For this purpose, analytical and speciation methodologies were optimized and validated for arsenic analysis in water and urine, as available tools in Uruguay. Arsenic biomonitoring and determination of urine metabolites of general population and exposed workers, are currently ongoing research studies. Those environmental and health arsenic issues in Uruguay, are reviewed in this work, to show the recent advances in this Medical Geology subject in our country.

Keywords: arsenic, medical geology, Uruguay