Arsenic in water and sediments of Aveiro Ria – a monitorization programme

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Arsenic is a high abundant element, occurring naturally in soils, rocks and water. Arsenic compounds are released into environment by natural processes like weathering and vulcanic activities and mainly by antropogenic activities as mining and smelting operations of non-ferrous metals, industrial releases, sewage-effluent discharges, applications of arsenic pesticides to crops, fertilizer use and leaching from arsenic-treated wood products.

Marine sediments can act as a sink and/or source for arsenic depending of the physico-chemical conditions, the presence of organic chelators and the abundance of living organisms. At concentrations found in natural waters As is the most carcinogenic of all substances named in current drinking water regulations.

This paper aim to present arsenic concentration, grain size, organic carbon and normalizers elements found in sediments and water of Aveiro ria during a monitoring programme that starts in 2004 and ends in 2010. During this programme 11 bi-annual (summer and winter period) and 10 annual stations of water and sediments respectively were sampled.

The measurement of arsenic was made by flame atomic spectroscopy preceded by hydride generation.

Quality assurance of results was achieved by the participation in the Quasimeme – Quality Assurance of Information from marine Environmental Monitoring in Europe, since first round. Statistical evaluation of the analytical results is made using the Z-score statistical indicator established for each parameter.

The results show spatial and temporal variations in water and sediment samples but in water samples seasonal variation were also detected.

Higher values were found in water in Largo do Laranjo (5.62 µg L-1) and Largo da Coroa (4.25 µg L-1) in summer. For sediments higher values were also found in the same locations with 52 mg kg-1 and 35 mg kg-1 respectively, related with the influents that came directly from the Fontela River and Estarreja creek (Estarreja industrial complex).

The As concentrations values were compared with OSPAR 2000 and 20008 reference values and with ecotoxicological assessment criteria.

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