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Extended Abstracts

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Mineral and thermal water

4.3
Hydrogeochemical characteristics of mineral and thermal waters

title: **Mercury concentrations assessment in bottled and spring waters (N Portugal): hydrochemical approach**

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This work is strongly related to one of the essential water research issues of this millennium, “Water Dependencies: Systems under Stress and Societal Responses” under the scope of the main theme “adapting to the impacts of global changes in river basins and aquifer systems” (see UNESCO IHP VII Programme (2008–2013): <http://www.unesco.org>).

The full effect of the increased mercury (Hg) loading, for both industrial and agriculture use, results in a significant enhance in environmental contamination, especially on water. The main goal of this work was to assess the potential mercury concentrations in some Portuguese bottled waters and springs. Special emphasis was dedicated to quantify mercury concentrations in the several hydromineral systems spring waters issuing along the Verín-Régua-Penacova fault zone and surrounding area. The geological framework is characterised mainly by granitic and metasedimentary rocks, as well as metavulcanites and doleritic veins. The main regional structure is the Verín-Régua-Penacova fault zone (North Portugal, Iberian Peninsula), trending NNE-SSW along more than 200 km, which controls thermomineral water occurrences. This megastructure is part of a late-Variscan deep fault system that was reactivated by the Alpine tectonics.

Water samples for mercury analysis were collected from 19 bottled water and springs. Temperature, pH, and electrical conductivity of the waters were determined in situ. The mercury was determined by a cold vapour generation atomic absorption spectrometry (ContrAA 700 Analytik Jena) at Instituto Superior de Engenharia do Porto|ISEP, which uses an innovated technology that combines a continuum source, with a high resolution double echelle monochromator and a CCD detector. The limit of detection of the method was about 0,059 µg/L. Data analysis from bottled and spring water samples showed very-low and slightly variations (c. 0,28 µg/L to 0,17 µg/L) of mercury level that is probably close related with the Verín-Régua-Penacova fault zone system. The preliminary results suggested that mercury concentrations in groundwater are related to the regional deep fault zone with neotectonic activity. The water samples collected away from the main regional fault zone indicated very-low mercury levels. Some samples showed values close to the limit of detection of the method. Apparently, there are no anthropogenic interferences neither old mine tailing deposits near the springs.



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