



Hg soil pollution around a decommissioned and unrestored Chlor-alkali plant: Jodar, Jaén province, SE Spain. Incidence in other environmental compartments.

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Data from soil pollution and its consequences around a decommissioned chlor-alkali plant are presented in this communication. The plant was active in the period 1977-1991, producing during these years a heavily pollution of Guadalquivir River and hidrargirism in more than local 45 workers. It is located at 7 km South of Jódar, a locality with some 12,120 inhabitants. Mercury usage was general in this type of plants, but at present it is being replaced by other types of technologies, due to the risks of mercury usage in personal and environment.

A soil geochemistry survey was carried out in the area, together with the analysis of olive-tree leaves from the same area. 75 soil samples were taken at two different depths (0-15 cm. and 15-30 cm), together with 75 olive tree samples, 5 water samples. Besides, two monitoring surveys for total gaseous mercury in the atmosphere were performed.

Mercury content of geologic and biologic samples was determined by means of Atomic Absorption Spectrometry with Zeeman Effect, using a Lumex RA-915+ device with the RP-91C pyrolysis attachment. Air surveys were carried out using a RA-915M Lumex portable analytical device, with GPS georeferenciation of the analysis points. Soil mercury contents were higher in topsoil than in the deeper soil samples, indicating that incorporation of mercury was due to dry and wet deposition of mercury vapors emitted from the plant. A local reference level was calculated as $GM + 2SD$ (where GM is the geometric mean and SD the standard deviation). With this reference level it was possible to delimitate a contaminated soil area centered on the decommissioned chlor-alkali plant.

A high affinity of local olive trees to accumulate mercury from the contaminated soil was also found, with a calculated maximum mercury content of 243.5 ng g⁻¹. This maximum level is slightly higher than tolerable level for agronomic crops.

Total mercury content in the analyzed waters was slightly higher than the chronic exposure level for aquatic life. Atmospheric mercury levels registered on the study area were much lower than most restrictive levels for chronic exposure. The area of influence of the facility (in terms of mercury content in air) was restricted to distances between 100 and 200 meters, depending on meteorological conditions.

Main conclusions of this research work are the following: i) The Jódar decommissioned chlor-alkali plant is still a mercury source 20 years after its cease of activities without any reclamation measures; ii) The activity of the plant has produced an important dissemination of mercury in the surrounding environment; and iii) The corresponding pollution levels, in particular in soils, may suppose a risk to the main crops of the area (olive trees).