

Distribution of mercury and methylmercury concentrations in surface and core sediments and waters in the Pontevedra Ria (NW Iberian Peninsula)

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The eighteen Rias situated in the northwest coast of the Iberian Peninsula form a unique system within the European continental Atlantic coastline. These Rias are under anthropogenic influence; in particular, the Ria of Pontevedra (141 km²) has a paper factory, working since 1966, situated in the inner Ria. A positive residual circulation and a high primary productivity (260 gC•m⁻²•y⁻¹) results from freshwater runoff during the wet season, Lérez river (25.6 m³•s⁻¹) runs into the Ria head, and upwelling during spring and summer. The research on mercury is very scarce in the Galician Coast, although recently Hg and MeHg were investigated in sediments of the nearby Ria of Vigo. Occasional studies were focused in the Ria of Pontevedra at the surroundings of a paper factory showing increased concentrations in sediments.

In order to access the Hg and MeHg distribution in the Ria, 48 surface sediments were collected in July 1998. Ten years after (September 2008), 15 surface sediments were sampled at the same locations. Additionally, 33 water samples were collected at the surface and near the bottom. Mercury concentrations in surface sediments ranged from 0.1 to 3.7 µg•g⁻¹ while MeHg varied between 2.1 and 35 ng•g⁻¹ (ten times higher than Vigo). Both Hg and MeHg showed a similar spatial distribution with higher values near the southern margin of the inner Ria. Levels de-

creased from the contamination source towards fluvial and oceanic ways. Analogously to the observed in the Vigo Ria, no correlations were found between Hg, MeHg and particulate organic carbon (POC) in the sediments. The exponential correlation between total Hg and Al ($r=0.91$) suggests that accumulation in sediments is controlled by the nature of the sediments. The lack of relationships between MeHg-Al and MeHg-POC coupled with a strong positive correlation between Hg and MeHg levels suggests that MeHg production is influenced by active processes of methylation/demethylation which appear to be dependent of Hg availability. In the water column of the Ria dissolved Hg ranged from 3 to 21 ng•L⁻¹ evidencing higher levels in the sediment hotspot area of Hg.

Results from water and sediments clearly indicate a Hg contamination in Ria of Pontevedra. Moderated Hg contaminated aquatic ecosystem with high levels of Hg and MeHg were found in the southern seaboard of the inner Ria near an industrial complex.

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