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Priority substances in a SW European coastal lagoon - Ria Formosa, Portugal. Twenty years of temporal evolution of metals and butyltins

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In the last years the European Union has decided to specifically include nickel, cadmium, plumb and TBT in its list of priority substances in water. Trace metals pose a significant threat to organisms because above threshold availability, act as enzyme inhibitors resulting in adverse ecological effects to sediment-associated biota (e.g. macrophytes, benthos, demersal fish) and to higher-biota (e.g. pelagic fish and aquatic birds). Since 2003 International Maritime Organization called for a ban of the application of tributyltin-based paints. Wide distribution, high hydrophobicity, and persistence of organotin compounds have raised concern about their bioaccumulation, their potential biomagnification in the food webs, and their adverse effects to human health and environment, particularly most recent reviews focuses on possible endocrine disrupting effects of OT′s (Galloway, 2006; Nakanishi, 2007; Takahashi et al., 1999; Veltman et al., 2006). Saltmarshes are highly heterogeneous environments that have been suffered pressures by the increasing urbanization and industrialization in the adjacent areas. Saltmarsh sediments integrate inputs of contaminants, like metals and organotin compounds and may act as long-term sources of contaminants. At the Ria Formosa saltmarsh several activities were responsible for long-term contaminants, some of them considered priority substances. This work aims to provide information about the present levels and temporal evolution in the last decades of metals (Mn, Zn, Cu, Cr, Ni, Pb, Mo, Cd and Ag, in addition to Fe and Al) and butyltins (TBT, DBT and MBT) in saltmarsh sediments at south of Portugal. Metals were analysed by atomic absorption spectrometry-AAS. Butyltins were determined, after derivatization, by solid phase micro extraction combined with gas chromatography with mass spectrometry (MS/MS). Results showed that legislation was an effective instrument for the decreasing of contamination levels, to sustainable values to ecosystem functioning and human health protection.
Keywords: Saltmarshes; Metals; Butyltins; Toxicity; Legislation; Temporal evolution;