Geochemical mapping of low density with focus on levels of mercury in sediments of drainage in the Pernambuco state, Brazil

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The work of low-density geochemical mapping executed by the Geological Survey of Brazil - CPRM by a Multipurpose Geochemistry Project managed to collect 1.170 samples of surface sediments from the bottom, representing basins with drainage areas less than 100 km2. The samples were put to drying at a temperature of 40°C, sieved fraction <80 mesh (0.177 mm) with open or aqua regia extraction and chemical determination performed by ICP-MS. From a statistical viewpoint, the levels of mercury (Hg) had a minimum value of 0.010 mg.kg-1, a maximum of 0.260 mg.kg-1, a median of 0.030 mg.kg-1, an average of 0.034 mg.kg-1 and a standard deviation of 0.028. The median is calculated over the range of variation of current reference sediments (NOAA, 2008), 0004-0005 mg.kg-1. Most of the values found are below the 0.170 mg.kg-1, lie in the range considered non-toxic to sediment by NOAA (Threshold Effect Level - TEL - 0.174 mg.kg-1), corresponding to Level 1 - 0.17 mg.kg-1 (CONAMA No. 344, 2004). Levels above this threshold were found in the municipality of Igarassu (0.19 mg.kg-1), Olinda (0.26 mg.kg-1) and Escada (0.19 mg.kg-1). In the first case, the contamination is known due to a manufacturing plant of soda-chlorine in this municipality, which dumps its effluent into the river Botafogo. The other two anomalies are not reported in literature and even if they present with valuesbelow Level 2 - 0.486 mg.kg-1, adopted by the Brazilian legislation (CONAMA No. 344, 2004) for sediments to be dredged, as a warning outlining environmental it appears as worthy of a geochemical survey comprising more detail to verify the type of contaminant source, if is in a point or diffuse, as well as their potential bioavailability, since it may already represent an adverse effect on biota since they are located in a metropolitan area of high population density. It should be noted that there is no description of the occurrence of Hg in Pernambuco and there are no records of relationship with volcanogenic rocks, metallogenetically favorable to mineralization of Hg.

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