Evaluation of heavy metals in sediments of Chapala Lake

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The Chapala Lake is the largest and most important water body in Mexico, from a geological, chemical and ecological point of view [1, 2, 3]. In this work a relationship between size grain and heavy metals is presented.

Area	Granulometry				Chemical analyzes	
	Mz (Φ)	σ (Φ)	SK	K_G	$\%CO_3^{-2}$	%organic matter
Bank	6.9	2.1	0.1	1.4	4.2	1.0
Center	5.1	1.7	0.0	0.9	4.4	1.1
Lerma River	5.3	1.6	0.0	0.8	2.5	0.6

Table 1 Size grain and chemical analyzes of carbonate and organic matter in the sediments.

Area	Geoaccumulation index					
	Ba	Cr	Cu	Ni	Zn	Pb
Bank	-0.0	0.9	0.2	0.2	0.2	-0.4
Center	-1.1	0.5	0.6	0.5	0.8	-0.1
Lerma River	-1.0	0.6	0.8	0.2	1.0	-0.1

Table 2 Geoaccumulation index calculated [4] for different areas in the Chapala Lake.

According to the calculation of geoaccumulation index and the scale given by Ramos *et al* (1990), no contamination by heavy metals in surface sediments was observed. The size grain is fine; the sediment is poorly sorted, near symmetrical and leptokurtic and the mineralogical analyses show the predominance of clays. The delta of the River Lerma generates organic matter and carbonates migrate to others areas in the lake.

[1] Rosales *et al* (2000), *Environmental Geology* **39**, 378-383. [2] Hansen *et al* (2001), Kluwer Academic/Plenum Publishers, New York. [3] Zárate del Valle *et al* (2005), *RMCGeológicas* **22**, 358-370. [4] Ramos *et al* (1990), *Lurralde* **13**, 157-164.

Neo-Archean domains in the Mediterranean and their implications

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Mantle-derived rocks, including xenoliths and peridotite massifs, are widesrread thorough the Mediterranean region. A synthesis of Re-depletion model ages (T_{RD}) for both whole-rock samples and *in situ*-analysed of individual sulfides from these mantle-derived rocks reveal mantle domains of different ages across the Mediterranean region.

A maximum T_{RD} age of 1.8 Ga is common to sulfides in xenoliths sampling the the mantle beneath Western Europe (Calatrava Volcanic Field, Spain; Languedoc and Massif Central, France) and of whole-rock samples from Azrou (North Africa) and the Pyrenees (France). A maximum at <1.4-1.3 Ga observed in whole-rock samples from Central Europe (Bohemian and Rhenish Massifs). In contrast, Os-bearing phases in xenoliths (sulfides) and in peridotite massifs (sulfides and platinum-group minerals) from the inner Mediterranean region (Hyblean Plateau in Sicily and Kraubath Massif in Austria) all show an oldest T_{RD} peak at ~ 2.3 Ga, equivalent to the oldest whole-rock T_{MA} of 2.2 Ga for rocks of Beni Boussera in northern Morocco and the 2.4 Ga peak in sulfides from peridotites of the internal Ligurides (Italy). A peak at 2.6 Ga is defined by sulfides in mantle xenoliths from the Tallante volcanic Field in southern Spain.

These data cleary identify the existence of a common Paleo-Proterozoic (~ 1.8 Ga) mantle on both sides of the Mediterranean realm, and an older (~2.2.-2.6 Ga) lithospheric mantle domain within the more recent Maghrebide-Appenine-Betic front generated during the Alpine-Betic orogeny. The Mediterranean basin may contain several buoyant Archean microplates, which could have impeded the northward movement of Africa and contributed to complex tectonics in the Mediterannean basin.

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