Evolution of anoxic aquatic systems under urban environments : Case of "Lac Sud" Tunisia

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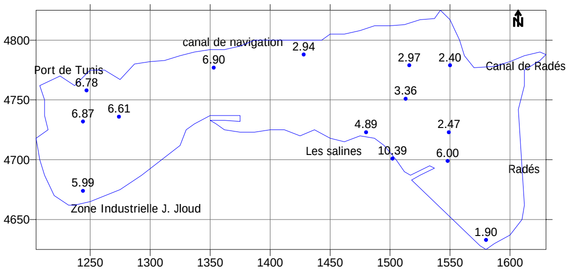
The "lac sud" of Tunis, is an anoxic confined environment evolving under the direct control of an urban environment that affects him to various degrees (Didyk, B.M., *et al* 1978).

The quantitative and qualitative study of the organic matter contained in surface sediments, by the determination of the total organic carbon (TOC), the free and potential hydrocarbon compounds (S1 and S2), the total hydrocarbons and specially the saturated fraction (analyzed by gas chromatography) permit to distinguish 3 principal zones in the lake characterized by various degree of anoxia.



The western zone is characterised by an advanced and irreversible anoxic state, with an exceptional rate of conservation of organic matter (TOC > 6 %) and an exceptional enrichment in hydrocarbon compounds of biogenic and anthropological origin (HT > 2033 ppm).

The zone situated in the east of salt works is characterized by an anoxic state less accentuated with a rate of organic matter conservation (TOC < 3 %) and a total hydrocarbon content (HT < 820 ppm), less important. Hydrocarbons present are of mixed origin continental and marine (Jaffé R.*et al*, 2001).

Finally, in the central and north-eastern zone the anoxic state is in way of installation, the contents in organic matter and in total hydrocarbons are the weakest.

In addition, the analysis of the lipidic fraction allowed to show that the whole system is under direct influence of the urbanization (Medeiros P.M. and Bícego M.C., 2004):. The development of the anoxia in preferential zones of the lake is

Evolution of aquatic systems in urban environments must be considered with a lot of interest to avoid the risk of controlled by the low reactivity of organic matter of anthropological origin.reaching an irreversible state.

References

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In situ geochemical data from metamorphic rocks in the active Mariana subduction zone

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The active serpentine mud volcanism of the Izu-Bonin-Mariana (IBM) forearc exposes variably serpentinized harzburgites and blueschist-facies mafic fragments to the ocean floor. The latter indicate that some of the fragments are derived from depths corresponding to the slab-mantle interface (20-40 km), i.e. between the actively subducting Pacific oceanic crust and the IBM subarc mantle.

In the past, only a few blueschist-facies mafic fragments (up to several cm in diameter; [1]) were analyzed petrologically in great enough detail. For example [1] estimated that PT-metamorphic conditions for key mineral assemblages (lawsonite + quartz, aragonite, lawsonite + pumpellyite) reveal low temperatures (150-250 °C) at pressures reaching 0.5-0.6 GPa. But to date, no in-situ trace element data exist on mafic blueschist-facies clasts from any serpentine mud volcano.

We will present abundant petrological descriptions of several newly discovered mafic fragments from the South Chamorro Seamount, ODP Leg 195. The mineral assemblages of the blueschist-facies clasts include (a) Na-amphibole + phengite + chlorite ± apatite ± sphene ± spinel ± rutile, (b) Na-amphibole + chlorite + sphene + rutile + epidote + allanite + phengite + spinel ± pumpellyite ± pyroxene (Acm-Di-Jad) ± zircon, (c) chlorite + epidote + allanite + Na-amphibole + sphene + garnet + Fe-oxide ± rutile ± apatite and (d) phengite + Na-amphibole + chlorite ± spinel. Albite and quartz are always absent.

For studying the light elements boron and lithium we used Time-of-Flight SIMS imaging capability with a µm-scale resolution. Our multi-element maps with high spatial resolution show that in the shallow subducted slab Li resides in phengite ≥ chlorite > amphibole and that boron preferentially resides in both phengite and chlorite. SIMS analyses verify the high concentration in B and Li in these phases (with ~35 µg/g B and ~80 µg/g Li in phengite). Interestingly our images also show that boron is strongly enriched in parts of chlorite, possibly due to B remobilization from circulating fluids. Thanks to the high concentration of B in phengite and chlorite, we will measure □11B by SIMS and evaluate existing models of early B-release and subsequent isotope fractionation by forearc slab fluids.

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