Urban influence on organic matter preservation in different mediterranean paralic ecosystem

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The study of organic matter in the surface sediments from three coastal lagoons located around Tunis golf: Bizerte Lake (LB), lagoon of Ghar El Melh (LGM), and "Lac Sud" of Tunis (LS), was carried out to characterise major factors controlling the biogeochemical processes.

Despite the high organic matter discharged in LB ecosystem (13.5 tons / day), surface sediment records the lowest range of TOC (from 0.78% to 1.36%). This ecosystem is characterized by a significant exchange with the Mediterranean Sea (534 million m^3 in winter) and a good hydrodynamics ensuring the oxygenation of water column. The associate hydrocarbon shows a strong contamination by petroleum products with an advanced stage of biodegradation. In fact, total hydrocarbons represent up to 8% of TOC and the chromatograms of the saturated fraction shows reduced peaks of n-alkanes. The anaerobic conditions in LGM (influenced by morphology, depth, hydrodynamics, water renewal...) contribute to the preservation of organic matter (high TOC values: from 0.79% to 5.12%). However, hydrocarbon represents a low fraction of TOC and chromatograms shows well preserved n-alkanes with a bimodal distribution indicating a double origin (continental and marine). In the LS ecosystem, the western zone is characterised by an advanced 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 (up to 2033 ppm). The eastern zone is characterized by a less accentuated anoxic state with a low rate of organic matter conservation (TOC < 3%).

Evolution of aquatic systems in urban environments must be considered with a lot of interest to avoid the risk of reaching an irreversible state. Several factors must be taken into consideration as the organic matter input (flux, deposition rate, lability) and the capacity of the ecosystem to assimilate this organic matter [1] (oxydo-reduction conditions, presence of terminal electron acceptors, ...).

[1] Sandra, A., Jørgensen, B. B., LaRowe, D., Middelburg, J., Pancost, R., & P, R. (2013). Quantifying the degradation of organic matter in marine sediments : A review and synthesis. *Earth-Science Reviews* (**123**), 53–86.