

Impact of Ibrahim River on the spatial variation of coastal marine sediment characteristics

Myriam Ghsoub (1,2), Milad Fakhri (1), Thierry Courp (2), Gaby Khalaf (1), Roselyne Buscaïl (2), and Wolfgang Ludwig (2)

(1) Lebanese National Council for Scientific Research – National Centre for Marine Sciences (CNRS-L/CNSM) Lebanon (bihar@cnrs.edu.lb), (2) Université de Perpignan Via Domitia, Centre de Formation et de Recherche sur les Méditerranéens, UMR 5110, 52 Avenue Paul Alduy, 66860, Perpignan, France (cefrem@univ-perp.fr)

In the aim to evaluate the impact of Ibrahim River on the environmental status of its coastal marine zone, sedimentological (grain size composition), geochemical (organic carbon, total nitrogen, total carbon, organic matter, calcium carbonate, organic and inorganic phosphate) biochemical (chlorophyll-a, pheopigments) and biological parameters (macro-invertebrates) of the sediment were analyzed and interpreted. Three sampling campaigns were executed using the scientific vessel CANA-CNRS on 26-4-2016, 20-6-2016 and 29-7-2016 successively. The samples were collected according to a middle horizontal transect at three different depths (10, 20, and 30 m). The grain size composition of the sediment was mainly composed of fine sand. The obtained values of organic matter ranged between 32 and 54 mg/g. The total nitrogen was between 0.006 and 0.014%. The percentage of calcium carbonate fluctuated between 20 and 30%. This situation may be attributed to the decomposition and the sinking of the shells and some aquatic organism such as Coccolithophores, foraminifers, gastropods and bivalves. Calcium carbonate may also have terrestrial origin related to the carbonated adjacent land and may be exported to the coastal area with the river inputs. The sediment of the studied area was richer in pheopigments (between 0.8 and 3 $\mu\text{g/g}$) than in chlorophyll-a (less than 0.4 $\mu\text{g/g}$) witnessing the presence of degraded material due to the high hydrodynamic conditions. Furthermore, the low values of chlorophyll-a witnessed the oligotrophy of the zone. The concentrations of total phosphate ranged between 97 and 148 $\mu\text{g/g}$. The dominance of the inorganic phosphate at all sampling points indicates that phosphorus is available for the producers, and that the studied area is less contaminated with anthropogenic discharges. This research project reveals the presence of gastropods, crustaceans and some polychaetes along the five studied stations. These groups are generally found in sandy bottoms governed by a high hydrodynamism. On the other hand, low abundance characterizes these coastal areas subjected to unstable environmental conditions, coupled with a low availability of food resources preventing the establishment of stable benthic communities. The obtained results highlight the influence of the Ibrahim River flow on its coastal marine area subjected to high hydrodynamics conditions. According to this preliminary study, Ibrahim River coastal marine area was found to be less subjected to sources of contamination when comparing its sediment's chemical and biochemical contents to those from other coastal marine regions.