# CHARACTERISTICS OF SEDIMENTS FROM THREE DIFFERENT WATER BODIES SURROUNDING ALEXANDRIA

Massoud A.H. SAAD

Oceanography Department, Faculty of Science, Alexandria University U.A.R.

Summary : Sediment samples from three different water bodies surrounding Alexandria were subjected to some investigations. The density of wet mud showed indirect correlation with water content. No clear correlation existed between water content and organic and allochthonous materials. The highest average percentage of calcareous substances was found in the eastern harbour and the lowest in the Hydrodrome sediments. An inverse correlation existed between the percentages of calcareous and allochthonous meterials. The high silica values found in some samples reflect their richness with diatom frustules.

Some physico-chemical investigations were carried out on the bottom sediments of three water bodies surrounding Alexandria in order to throw light on their fertility and to compare the sediment characteristics of each one with those of the others. These water bodies, located in the same area, differ greatly in their salt content. They are represented by the sea water (eastern harbour), the brackish water (Lake Mariut) and the fresh water (Nozha Hydrodrome). Lake Mariut proper has an area about five times larger than each of the harbour and the hydrodrome. Lake Mariut is highly polluted and receives larg amounts of drainage waters, sewage and industrial wastes. The Hydrodrome is fed only by Nile water.

The density of wet mud gave average values of 1.82, 1.20 and 1.40 $g/cm^3$ for the eastern harbour, Lake Mariut and the Hydrodrome, respectively. The wet density showed indirect correlation with water content. In the sediments of the harbour, Lake Mariut and the Hydrodrome, the average percentages of water were 31.26, 77.84, and 58.63 % and the average amounts were 5.6, 9.3 and 7.9 $Kg/m^2$, respectively. No clear correlation existed between the water content and the amounts of organic and allochthonous materials, due to the limited numbers of samples obtained from each water body.

The average percentages of organic matter were 2.54, 14.07 and 7.00 % and the average amounts were 0.3, 0.4 and 0.4 $Kg/m^2$ for the sediments of the harbour, Lake Mariut and the Hydrodrome, respectively. The average percentages of organic matter are different from those recorded by El-Wakeel (1964), probably due to the different methods used for estimation of organic matter and or the changes occurred in the bottom of these water bodies. The relatively higher average amounts of organic matter in Lake Mariut and Hydrodrome sediments indicate higher organic production in these lakes.

In the sediments of the harbour, Lake Mariut and the Hydrodrome,

the average percentages of calcareous substances were 84.21, 62.53 and 39.40 % and the average amounts were 10.8, 1.6 and 2.6 Kg/$m^2$, respectively. El-Wakeel (1964) also found a highest percentage of $CaCO_3$ in the harbour and a lowest in the Hydrodrome sediments. He attributed the high percentage mainly to shells and shell fragments and the low to the predominance of silt and clay.

The average percentages of allochthonous materials were 13.09, 22.71 and 52.75 % and the average amounts were 1.56, 0.63 and 3.05 Kg/$m^2$ for the sediments of the harbour, Lake Mariut and the Hydrodrome, respectively. An inverse correlation existed between the percentage of the allochthonous and calcareous materials. The low percentages of calcareous substances in the Hydrodrome sediments coincided with the decrease in the amounts of calcareous shells (Saad, 1976a). This is due mainly to the continual covering of these shells by the entering allocthonous materials via Nile water (Saad, 1974).

In the sediments of the harbour, Lake Mariut and the Hydrodrome, the average percentages of $SiO_2$ were 0.33, 1.47 and 1.81 % and the average amounts of Si were 20, 18 and 53 g/$m^2$, respectively. The lowest average silica percentage in the harbour sediments coincided with the relative low productivity in the marine environment. The high silica values found in some samples reflect their richness with diatom shells (Saad, 1971, 1972, 1976a, 1976b).

References :

EL-WAKEEL S.K., 1964. Recent bottom sediments from the neighbourhood of Alexandria, Egypt. *Mar. Geol.*, 2: 137-146.

SAAD M.A.H., 1971. Diatom-silica in the sediments of Lake Mariut and the Nozha Hydrodrome, Egypt. *Bull. Fac. Sci. Univ. Alex.*, 11: 215-229.

SAAD M.A.H., 1972. Diatomaceous silica of the sediments in four brackish water Egyptian lakes. *Rapp. Comm. int. Mer Médit.*, 21: 121-123.

SAAD M.A.H., 1974. Calcareous deposits of the brackish water lakes in Egypt. *Hydrobiologia*, 44: 381-387.

SAAD M.A.H., 1976a. Studies on the nature and composition of the sediments of two Egyptian lakes found under different local conditions. *Limnologica*, 11: 1-8.

SAAD M.A.H., 1976b. Core sediments from Lake Brollus (Bahra el Burullus), Egypt. *Acta Hydrochim. Hydrobiol.*, 4: 469-478.