

Distribution of Recent Marine Sediments of the Continental Shelf off Sinai, Egypt

A.-A. EL-SAMMAK and M.-A. EL-SABROUTI

Department of Oceanography, Faculty of Science, Alexandria University, Alexandria (Egypt)

Abstract: Shelf sediments off Sinai Egypt were studied. A patchy distribution of sediments can be observed. Mud covers most of the area. It is assured that the distribution of the sediments is governed by the current in the area as well as the sources of the sediments.

Previous reconnaissance studies of the shelf sediments off the Nile delta have involved by several authors (El-Wakeel *et al.* (1974); Misdrop and Sestini (1976); Summerhays and Marks (1976); El-Wakeel and El-Sayed (1978); Summerhays *et al.* (1978); Coleman *et al.* (1981); Yanaki and Kronfeld (1982); El-Sammak (1987); El-Sabrouiti and El-Sammak (1988); El-Askary and Frihy (1986) reviewed most of these studies; they mentioned that the near-shore facies is restricted to depths shallower than 30 m. in depth, which is a delta front platform covered with fine to very fine sand and admixture of sand and silt further seaward (offshore), prodelta mud which is composed of silt and clay extends almost as far as the shelf edge (20-70 m. in depth). Scattered patches of relict medium to coarse sand occur near the middle of the shelf; seaward of this, there is a broad muddy sand zone of high organic silty clay and clays (mud).

The present study is in accordance with the previous studies; however the eastern part, East of Port Said (i.e. off Sinai) is hardly ever studied. Actually the present study fills this gap. Accordingly a complete general picture for the type of sediments as well as their distribution can be given for the area of the south eastern Mediterranean Sea off Sinai peninsula east of Damietta.

The area surveyed (Figure 1.) covers the continental shelf and part of the upper continental slope of the south eastern Mediterranean Sea between 2 m. and 445 m. 30 sediment samples were collected using a Peterson grab sampler with a movable upper lid that covers surface area of 65 cm by 35 cm. Detailed granulometric analysis were made by standard sieve and pipette methods. The sediment types were given according to the method of Shepard (1954).

The study area shows a patchy distribution of the sediments. In general most of the outer shelf and the upper slope are covered with mud, this is due to the failure of coarse materials to reach the outer shelf, mud also covers most of the innershelf off the study area between Damietta and El-Tena. This area is characterized by receiving great amount of the fine materials, loaded by the Nile waters and lake waters through Rosetta branch and El-Manzalah lake opening (Boughaz El-Gamil). Sand presents in the innershelf area off Damietta derived mainly through Burullus lake opening. Silty sand, sandy silt and sand patches occur off El-Tena. El-Bardawil and El-Arish could be attributed to the secondary wind-borne deposits coming from northern Sinai. Middle shelf sand patch occur off Damietta may be related to the older mouths of the Nile (Misdrop and Sestini; 1976). Generally, the distribution of the sediments is governed by the current in the area as well as by the source of the sediments. In the south eastern Mediterranean, the general current is directed eastward, as a result most of the Nile sediments are deposited in a NNE direction. However, east of Damietta the eastern current slows down and follows two directions, ESE with a velocity of 6 cm/sec and another opposite current with a velocity of 4.6 cm/sec. (Mohamed and Anwar; 1978), making a sort of wide vortex. As a result, most of the fine sediments carried by the current are deposited in the area between Damietta and El-Tena.

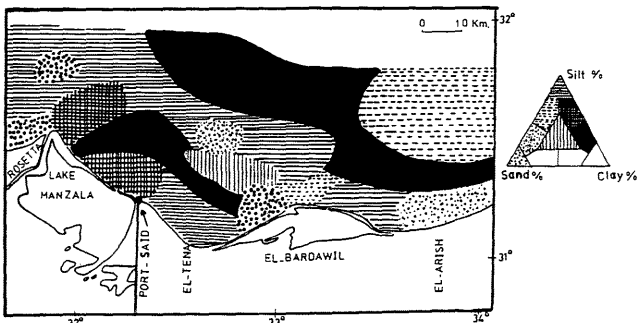


Figure 1. Areal distribution of sediments in the study area.

References:

- Anwar, Y.M., M.A. El-Askary and O.E. Frihy (1984). *J. Afr. Earth Sci.*, 2: 17-29.
 Coleman, J.H.; H.H. Roberts; S.P. Murray and M. Salama (1981). *Mar. Geol.*, 42: 301-326.
 El-Askary, N.A. and O.E. Frihy (1986). *J. Afr. Earth Sci.*, 5: 627-633.
 El-Sabrouiti, M.A. and A.A. El-Sammak (1988). 1st Sym. Env. Sci. Alex.: 32.
 El-Sammak, A.A. (1987). M.Sc. Thesis, Alex. Univ. (unpub. Mans.).
 El-Wakeel, S.K. and M. Kh. El-Sayed (1978). *Mar. Geol.*, 27: 137-160.
 El-Wakeel, S.K.; H.F. Abdou and M.A. Mohamed (1974). *Geol. Soc. Iraq.*, 7: 15-37.
 Misdrop, R. and G. Sestini (1976). Seminar on Nile delta Sed. Alex.: 145-161.
 Mohamed, M.A. and Y.M. Anwar (1978). *J. Univ. Kuwait (sci.)*, 5: 152-161.
 Shepard, F.P. (1954). *J. Sed. Petrol.*, 24: 151-158.
 Summerhays, C.P. and N. Marks (1976). Seminar on the Nile delta Sed. Alex.: 162-190.
 Summerhays, C.P.; G. Sestini and R. Misdrop (1978). *Mar. Geol.*, 27: 43-65.
 Yanaki, N.E. and J. Kronfeld (1982). *Mar. Geol.*, 49: 301-310.

Un exemple d'Impact de l'Interaction Tectonique - Eustatisme - Aménagements Anthropiques sur l'Equilibre d'un Domaine Littoral en Environnement Deltaïque Méditerranéen - L'Evolution Quaternaire du Littoral du Golfe de Tunis et ses Conséquences sur la Détermination d'une Stratégie d'Aménagement

Claude BOBIER*, Moncef SLITI** et Claude VIGUIER***

*Département de Géologie et Océanographie, Université de Bordeaux I, Avenue des Facultés, Talence (France)

**Direction des Ports Maritimes, Ministère de l'Equipement, Tunis (Tunisie)

***LERGA, Université de Bordeaux I, 355 Cours Gambetta, Talence (France)

Les auteurs présentent une synthèse des résultats d'une série de travaux d'océanographie géologique conduits sur le littoral du Golfe de TUNIS depuis 1980.

Dans un premier temps ils montrent que l'évolution quaternaire et particulièrement l'évolution récente du trait de côte sont le résultat de l'interaction dans un environnement deltaïque entre :

- l'évolution néotectonique active en raison du contexte géodynamique,

- et la courantologie au niveau du littoral et sur le proche plateau qui évolue en fonction des pulsations climato-eustatiques.

Il apparaît aussi que l'évolution naturelle des cortèges sédimentaires de haut niveau moyen des mers est fortement perturbée par l'impact des aménagements anthropiques réalisés dans les Bassins versants de l'Oued Médjerda et de l'Oued Miliane.

Dans une deuxième partie sont présentés les résultats d'observations et d'études expérimentales faites sur le comportement de brises lames dont l'implantation a été rendue nécessaire en raison du recul du littoral induit par ces interactions entre tectonique-eustatisme et aménagements anthropiques.

En conclusion, des règles touchant les caractéristiques des brises lames sont dégagées et une réflexion sur la stratégie d'aménagement du Nord de la TUNISIE est conduite.