

Cortical Fabrics in the Coated Grains of the Shelf Sediments
between Sidi Abdel Rahman and Matruh, Egypt

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The term "Coated grains" was coined by WOLF (1960) as a substitute for FOLK's (1959), to include other concentrically formed materials such as pisolites and Rhodoids (c.f. PERYT, 1983). According to TUCKER and WRIGHT (1990) coated grains are polygenetic in origin with different process forming similar types of grains and many of these process are still very poorly understood.

The present study aims to study the types of coated grain, the microfibrils and the mineralogy as well as to study the origin of this coated grains using a combination of SEM, XRD and petrographic techniques.

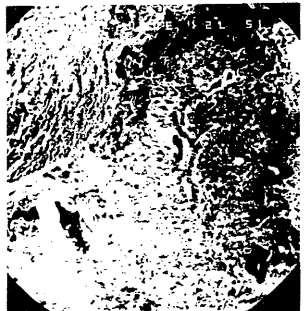
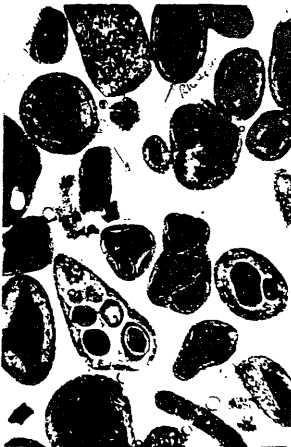
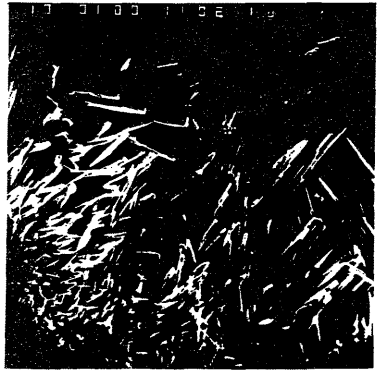
The study area, situated between Sidi Abdel Rahman and Matruh, covering the beach and the inner shelf, west of Alexandria, Egypt. Shelf sediments were collected using a pettersson grab sampler, where beach sediments were collected by hand. Samples were subsequently analyzed for mineralogy (XRD), microfibrils (SEM), petrography (thin sections). For mineralogy the samples were scanned from 25° to 33° (Cu-K α) at 1/2 degree per minute. The peak area method (MILLIMAN and BORNHOLD, 1973) was used for calculating the percentage of different mineral species. Thin sections were prepared and studied petrographically. Representative coated grains were analyzed by means of JEOL JSM U-3 Scanning Electron Microscope.

Results and Discussion

Among the coated grain, Both chemical precipitate coated grains (Ooids) and biologically encrusted grains (Rhodoids) were recognized. Most of the ooids collected from the shelf and beach sediments have tangential microfibrils, and consist of aragonite "grains" whose long axes are aligned parallel to the ooid laminae. The grains consist of aragonite rods without crustal terminations less than 3 μ m long and have an average diameters of 0.2 μ m. Many of the ooids have a complex nucleus. Some of the nucleus are terrigenous grain (quartz) other are carbonate grain (pellets or skeletal fragments).

Rhodoids were also observed, where coralgae has been coated with tangential layers of aragonite. These rhodoids are similar to those rhodoid from Ras Muhammad, Gulf of Aqaba, Red Sea (c.f. HOTTINGER, 1983). Mineralogical analysis reveals that these ooids consist mainly from Aragonite (comprises 80% of the total minerals) and Mg-calcite (12 mol% MgCO₃, comprises 20% of the total minerals). On the basis of microfibrils of the studying coated grains, available data on the growth rate of rhodoid (c.f. HOTTINGER 1983), as well as the mineralogical composition of these coated grains. It can be concluded that many of these coated grains are recently formed. However the radial microfibrils of some grains were also found, indicating the presence of ancient ooids. This conclusion agrees with the previous study on the oolitic sand from the same area of study (ANWAR *et al.*, 1984 ; EL-SABROUTI, 1990).

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