

## Summary of Paper No. 4

\* **Title in English:** Diagenetic evolution of the Eocene ramp carbonates (a paradigm from the Nile valley Egypt): Petrographical and geochemical attributes.

\* **Authors:** Ahmed Wagih Hussein & Essam .H. Abd El- ahman.

\* **Journal Name:** Marine and Petroleum Geology.                      \* **Impact Factor:** 4.34 .

\* **Date of Publication:** 2022 .    \* **Publishing Data:** 11 : 1 44 4.

### English Summary

Carbonate rocks of east Nile valley in Egypt have been investigated as a paradigm for revealing the diagenetic evolution of the Eocene ramp carbonates. The integration of petrographical, elemental geochemical and stable isotopic data revealed that the studied carbonates have been influenced by a sequence of diagenetic processes which are included in three diagenetic episodes (i.e. eogenesis, mesogenesis and telogenesis) and are related to four diagenetic environments (i.e. marine-phreatic, meteoric-phreatic, burial and uplifting environments). The paragenetic sequence of the studied carbonates commences with the eodiagenetic episode which includes the marine- and meteoric-phreatic diagenetic environments. The marine-phreatic diagenetic environment comprises micritization, glauconitization, pyritization, marine cementation (fibrous calcite and syntactical overgrowth rim cements), early dolomitization (formation of fine-crystalline matrix-replace dolomites) and early stages of mechanical compaction before significant burial. The meteoric-phreatic diagenetic environment includes the neomorphism, dissolution, meteoric cementation (earlier phases of sparry calcite cements) and precipitation of megacryst in the void spaces of the peritidal carbonates. During the mesogenesis episode, the studied carbonates were exposed to burial diagenesis. The shallow burial diagenesis resulted in the creation of point-tangential contacts between the allochemical constituents and the precipitation of a medium-coarse crystalline dolomite cement filling the dissolved fossils and dissolution pores. The deep burial diagenetic processes embody the chemical compaction (condensed-fitted interpenetration and pressure-dissolution fabrics), fracturing and burial cementation. The telodiagenesis represents the last episode in the diagenetic history of the studied carbonates. It witnessed the fracturing, meteoric-adiabatic cementation and hematitization processes.

**Keywords:** carbonate diagenesis, Petrography, geochemistry, Eocene Nile valley, Egypt.