



Sedimentological Aspects and Diagenetic Alterations of Beda "C" , Southwestern Sirt Basin, Libya

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The rock sequence of Tertiary Lower Beda Formation Beda "C" of southwest NC74B block in Sirt Basin has considered subdivided into facies and subfacies . These facies are dominated by muddy carbonates, such as skeletal mudstones, wackestones, and packstones with dolomites and anhydrite. Rock textures, faunal assemblages and sedimentary structures suggest open to partly open to shallow marine, lagoonal shelf , and upper subtidal to lower supratidal (Preitidal) environments. The Beda "C" Member represents a shallowing-upward sequence typical of lagoonal and tidal flat environments marked at the top by sabkha and brackish-water sediments. Petrographic and microfossils studies have been made by means of microscopic examination of (24) thin section. Microfossils include benthonic foraminifera, in addition ostracods, molluscs, echinoderms, and bryozoans. Dolomite, where present, is finely crystalline and an early replacement product. Anhydrite occurs as nodular, indicating supratidal sabkha deposition. Compaction, micritization , dolomitization, cementation, and dissolution resulted in alteration and obliteration of primary sedimentary structures of the Beda "C" Member facies and subfacies.

The study area is marked by several horsts and grabens; due to extensional tectonic activity. The area was tectonically active throughout the Tertiary period. Primary porosity is mainly intergranular, and dissolution diagenetic processes are significant enhancing the porosity. Primary porosity is intergranular and intragranular, and secondary processes are characterized by dissolution, intercrystalline, fracture. Diagenesis, through solution leaching and dolomitization, contributed greatly to development of porosity. Anhydrite occurs as replacement in top Member indicating supratidal deposition using a regular petrographic microscope, SEM and XRD analysis.