Sedimentary Facies and Mineralogical Properties of Early Cretaceous Sediments at Minsherah Mountain, North Central Sinai, Egypt

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Sediments of Early Cretaceous at Minsherah Mountain, North Central Sinai of Egypt are represented by Malha Formation and divided into three sedimentological units. Unit-I (Lower part of Malha Formation) is represented by a facies of thickly bedded gravelly sandstone with minor mudstone intercalations. This facies includes four sedimentary lithofacies associated namely; petromict-conglomerate, large-scale trough cross-stratified gravelly sandstone, large-scale planar tabular cross-stratified gravelly sandstone, and horizontally laminated sandy siltstone associations. Unit-II (middle part of Malha Formation) is represented by a facies of thickly bedded sandstone-mudstone intercalation, containing two associations; large-scale trough cross-stratified sandstone and burrowed and rooted mudstone associations. Unit-III forms the upper part of the formation, and is represented by a thinly bedded cross-stratified fine sandstone facies.

Sediments of unit-I were deposited as successive widespread fluvial gravelly-sand sheet-floods. These sheet-floods were laid down within an extensive fluvial network of low-sinuosity braided streams running in a northward direction under the influence of a relatively high paleoslope. Sedimentary succession of unit-II was deposited mainly by laterally accreted meandering rivers forming point bars within flood plains. The flood plains were later completely or partially modified into paleosols under subaerial conditions. The sediments of unit -III include laterally extensive sheet sandstone bodies as siliciclastic tidal flats, deposited under the influences of shallow intertidal foreshore.

Heavy minerals are generally represented by super mature assemblage of sub rounded to rounded opaque minerals (magnetite, ilmenite and hematite) and non-opaque minerals (zircon, tourmaline, rutile, epidote, staurolite and muscovite in decreasing order of abundance). They generally reflect prolonged history of wear and recyclicity in the depositional history.

Clay minerals consist mainly of kaolinite and minor concentrations of illite, indicating a mature assemblage, which supports the recycled origin of the sediments examined.