

Paper Number: 2774

Factors influencing on formation of chalk-marl couplets in Turonian-Santonian succession, Kopet-Dagh basin, NE Iran

Fateh Bahari, L.¹ and Mahmudy Gharaie, M.H.¹

¹ Faculty of science, Ferdowsi University of Mashhad, Mashhad, Iran. lfbahary@ymail.com

Upper Cretaceous Ab-Deraz Formation (Turonian-Santonian in age) is composed of calcareous shale sediments with three units of chalk-marl couplets. This Formation is widely cropped out in Kopet-Dagh basin in North-East of Iran. The carbonate facies in chalky units are mainly pithonellid packstone-wackestone, inoceramid packstone-wackestone and foraminifera packstone-wackestones. Bed by bed measurements was documented in two Hamam-Ghale and Padeha outcrops to investigate the cyclic changes in chalky-marl units. High-resolution stratigraphic analysis of chalk-marl couplets reveal decimetric to metric cycles, which are visible as light-dark cyclicity in the field. Carbonate content of chalky beds are ranged 80-95% (carbonate-rich) in rhythmic couplets and around 65-80% carbonate in marly beds (carbonate-poor), which are one of prominent features in Cretaceous and in particular Turonian to Coniacian sedimentary intervals.

Variations in the earth orbital parameters (Milankovitch cycles) caused climate fluctuation resulting to rhythmic sedimentation patterns. Three dominant frequencies have been identified in the natural gamma-ray log of well no.56 in the area. They are attributed to three Milankovitch cycles of precession (21-23kyr), eccentricity (100kyr) and long eccentricity (413kyr) cycles. Counted eccentricities cycles are in agree with established biostratigraphic age determination. Two production and dilution cycles affected to form these couplets in Ab-Deraz Formation. In fact high production of calcareous algae and pithonellids is a major factor in the formation of chalky beds, while high influx of siliciclastics into the basin cause low production of pithonellids leading to carbonate dilution through terrigenous particles increasing in the Kopet-Dagh basin.

