Goldschmidt 2000
September 3rd–8th, 2000
Oxford, UK.

Journal of Conference Abstracts
Volume 5(2), 829

Geochemistry of Lower Jurassic Organic-Rich Sediments from the Mecsek Mountains, Southern Hungary

Béla Raucsik (raucsik@almos.vein.hu)[1], **Balázs Tolnai** (tolnaib@almos.vein.hu)[1], **Tímea Horváth** (horvtim@almos.vein.hu)[1], **Virág Szilágyi** (szilvir@almos.vein.hu)[1] & **Magdolna Hetényi** (hetenyi@geo.u-szeged.hu)[2]

[1] University of Veszprém, Department of Earth and Environmental Sciences, H-8201 Veszprém, P.O.B. 158., Hungary
[2] University of Szeged, Department of Mineralogy, Geochemistry and Petrology, H-6722 Szeged, P.O.B. 651., Hungary

TOC- and XRF-analysis, GC-MS and Rock Eval Pyrolysis measurements were carried out on organic-rich marls and black shales from the Mecsek Mountains. Following organic-rich lithologies have been analysed: Type 1: Lower Pliensbachian massive hemi-pelagic calcareous marls, Type 2: Upper Pliensbachian calcareous shales intercalated by massive turbidites, Type 3: Upper Pliensbachian mud turbidites and Type 4: laminated black shales Lower Toarcian in age. Organic composition of these rocks gives information about the type of the source of organic matter (OM) and alterations during burial diagenesis. The complex depositional environment of the examined sequences can be better understood by organic matter geochemistry.

Concentrations and special ratios of the biomarkers (pristane, phytane, terpenoids, steranes), n-alkane distribution and Rock Eval data indicate the small dominance of terrigenous OM over marine OM in all examined Pliensbachian samples. In contrast, Lower Toarcian black shales (Type 4 sediments) contain significant amount of marine OM. These differences relate to contrasting OM sources and type of sedimentation on the deep-shelf.

According to the maturity indicators (T_{max}, selected biomarker ratios) OM in the sediments has different degree of maturity. The examined Lower Pliensbachian rocks (Type 1) are mature and they are characterised by some hydrocarbon potential because of their TOC values. The Upper Pliensbachian turbidite-related rocks (Types 2 and 3) are only slightly mature and the Lower Toarcian black shales (Type 4) are immature. Their potential for generating hydrocarbons seem to be poor.

On the base of the Ti-normalized trace element pattern, Co, Cu, Mn and P show higher than the average shale concentration in the Types 1 and 4 samples. This observation indicates high amount excess, seawater-derived portion of these elements. Under reducing conditions Mn is getting mobilized diagenetically from the shelf sediment, but this process decreases with increasing organic carbon content. The high concentrations of the above mentioned elements are due to the enrichment capacity of the clay minerals and (in the case of the Type 4 samples) of the organic matter being present in high quantity. In contrast of the previously results, Types 2 and 3 samples do not show significant enrichment of the redox-sensitive and bio-productivity indicator elements.

The geochemical composition of the samples seems to be correlate with the eustatic history of the Mecsek Mountains. According to the widely-used Haq´s eustatic curve the Upper Pliensbachian is characterised by a significant regressive trend. This scenario could be favourable for the intensive turbidite activity and the deposition of high amount terrigenous OM as a result of lowstand progradation. For the preservation of the mainly high-plant derived organic matter seems to be favourable the high rate of sedimentation. High productivity, deposition of significant amount of marine OM (in connection with episodically reductive bottom-water) could be caused by the Lower Pliensbachian and the Lower Toarcian relative highstand of sea-level and high rate of sedimentation.