



Application of magnetic susceptibility to the Maastrichtian–Eocene Phosphatic deposits of Sélja section in Gafsa-Métlaoui basin (southern part of central Tunisia)

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The aim of this study is to apply magnetic susceptibility (MS) to the Maastrichtian-Eocene phosphatic deposits of Sélja section, for correlation purpose and to help understanding of its particular depositional environment. The analysis of phosphogenesis evolution during the Eocene will lead us to explain whether or not they reflect long-term changes in ocean circulation. This study is based on facies and microfacies, MS measurements and comparison of facies and MS evolution, as well as on the relationship between MS and mineralogical variations.

The Sélja deposits are located in the Southern part of central Tunisia. The study outcrop is Maastrichtian to Eocene age and is perpendicular to the Tamerza-Metlaoui belt. During the Maastrichtian-Paleogene, the Sélja sequence was deposited in the shallow Gafsa basin. This basin was located between the Sahara platform to the south and the Kasserine Island to the North. The interchange with the open sea was therefore restricted and probably further hampered by small uplifted areas to the east and west which could have acted as barriers to circulation.

The MS measurements and microfacies interpretations are carried out on 228 samples which include various lithology such as phosphate, carbonates (dolomite, calcite), shales and gypsum. Different microfacies have been identified, from phosphatic open marine facies, to dolomitic and “gypsum” lagoonal facies. Fourth- and third-order sequences have also been identified and were probably related to sea level changes and local tectonic effect as well as to the sedimentary supplies. Facies evolution allowed us to identify six depositional sequences. These sequences were also recognized in the magnetic susceptibility pattern.

In addition to the very good third order correlation between the MS measurements and the sedimentological sequence identification, we made a comparison between the variations of the MS measurements and the percentage of quartz and calcite. This comparison seems to confirm the strong relationship between MS and detrital inputs (MS increases with quartz increasing and calcite decreasing).