

Depositional Facies, Carbon and Oxygen Isotope Records and Sequence Stratigraphy of the Coniacian–Santonian Matulla Formation, West Central Sinai, Egypt

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Four outcrops of the Coniacian-Santonian Matulla Formation in west central Sinai were studied to determine facies associations and depositional environments within a sequence stratigraphic framework and to evaluate C/O isotopic signatures to compare with global events. The Matulla Formation is composed of wave and tide influenced mixed siliciclastic-carbonates with ironstone interbeds. Deposition took place in coastal and shallow marine environments on a mixed siliciclastic-carbonate ramp. Three 3rd order depositional sequences made of up higher frequency 4th and 5th order sequences and cycles have been identified. The limestone, marl, dolostone and calcareous sandstone of the Matulla Formation have been investigated for their carbon and oxygen isotopic signatures. The results showed that, despite the locally pronounced effect of diagenesis, that there are major positive $\delta^{13}\text{C}$ excursions especially in the lower part of the section (Coniacian) with a general pattern that appears to correlate to data from the English Chalk (JARVIS et al., 2006) and other reference sections (WENDLER, 2013). There is a pronounced positive $\delta^{13}\text{C}$ excursion at the uppermost Turonian in all the studied sections with $\delta^{13}\text{C}$ values ranging from +1.24‰ to +2.76‰. This is followed across the Turonian/Coniacian boundary by a remarkable decrease in the $\delta^{13}\text{C}$ at the base of the Coniacian in all the studied outcrops with $\delta^{13}\text{C}$ values ranging from +0.16‰ to +0.83‰. We propose that this change is very similar and may be equivalent to the change from the Hitchwood Event to the Navigation Event (JARVIS et al., 2006). The Santonian/Campanian boundary is characterized by a significant positive shift in the $\delta^{13}\text{C}$ excursion with an average $\delta^{13}\text{C}$ values of 2.58‰ which may also be equivalent to the Santonian/Campanian Boundary Event (JARVIS et al., 2006). Other regional and global signals may also be present. This study provides some of the highest resolution C/O isotopic data for the Coniacian–Santonian in Egypt in an attempt to provide a correlation tool and to enhance our understanding for the diagenetic history of the studied rocks.

JARVIS, I. et al., 2006. *Geol. Mag.*, **143/5**, 561–608.

WENDLER, I., 2013. *Earth-Sci. Rev.*, **126**, 116–146.