

Ber. Inst. Erdwiss. K.-F.-Univ. Graz	ISSN 1608-8166	Band 17	Graz 2012
IGCP 580, 4 th Annual Meeting		Graz, 24-30 th June 2012	

Susceptibility data from Upper Triassic beds in Turkey: implications on climatic changes

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The section at Aşağıyaylabel, located within the Taurus Platform Units (Turkey, Anatolia), comprises an Early to Late Carnian platform drowning sequence, yielding an ammonoid mass occurrence ("*Kasimlarceltites* nov. gen. beds"), deposited during the Carnian Crisis (Upper Triassic), which is also known as the Carnian Pluvial Event. Furthermore the Julian/Tuvalian boundary (= Lower/Upper Carnian boundary) is well observable at Aşağıyaylabel, proven by detailed facies analysis (LUKENEDER et al. 2011). Recent investigations on the ammonoid fauna, as well as gamma-ray-, and susceptibility measurements strengthen this assumption.

Subsequently the sequence at Aşağıyaylabel represents a key section concerning the environmental changes during the Early to Late Carnian. Gamma-log values at Upper Carnian beds are 2 times higher than values of Lower Carnian beds, and furthermore show a general slightly increasing tendency from the Lower Carnian (0.015-0.019 cps) to the Upper Carnian (0.026-0.040 cps). Contrastingly, susceptibility measurements indicate some distinct peaks, most of them well interpretable: The sequence starts with Lower Carnian shallow water limestones bearing susceptibility values between -0.011×10^{-3} SI and 0.035×10^{-3} SI. The abrupt drowning of this carbonate platform is indicated by deeper-water limestones ("*Kasimlarceltites* gen. nov. beds") which appears with susceptibility values between $0.033-0.108 \times 10^{-3}$ SI. The mentioned *Kasimlarceltites* (former "*Orthoceltites*") mass-occurrence at Aşağıyaylabel could also be detected in Karapınar (2 km NNE of Aşağıyaylabel). Not only the facies analogy between both mass-occurrences, but also the susceptibility and gamma-ray values, enables a correlation between both localities. The biggest peak concerning susceptibility values can be traced at the Julian/Tuvalian boundary. Pelagic sediments from the top (wacke- to packstones, Julian) indicate susceptibility values between 0.011×10^{-3} SI and 0.088×10^{-3} SI, whilst the lowermost layers of the Tuvalian show susceptibility values between 0.126×10^{-3} SI and 0.340×10^{-3} SI (approx. 2.5 times higher). The Lower Tuvalian at Aşağıyaylabel is marked by a delayed carbonate productivity crisis, which occurred much earlier (about 2 Ma) in other western Tethys sections (LUKENEDER et al., 2011). Climatic changes, due to more humid conditions, seem to be the reason for the change from carbonatic sediments to marly sediments and later on to shaly sediments, what has been well proved by Susceptibility measurements. Susceptibility measurements and resulting trends within the values, although attained by hand-held facilities, obtain reliable implications for lithological changes, displayed by siliciclastic or terrigenous input caused by variations in climatic conditions.

Acknowledgements: This study is funded by FWF P22109-B17.

References

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