

The base of the Campanian: isotopes, magnetostratigraphy and biostratigraphy – who's accurate?

Wolfgring E. *, Wagreich M. & Sames B.

University of Vienna.

Corresponding author email: erik.wolfgring@univie.ac.at

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A possible reference section for the Santonian/Campanian boundary in the northwestern Tethys, the Postalm section (Northern Calcareous Alps, Austria) was investigated for palaeomagnetic and stable isotope data, planktonic foraminifera and calcareous nannoplankton biostratigraphy, and strontium isotope stratigraphy, together with published correlated ammonite, crinoid and inoceramid data. The Postalm section shows a deepening trend from upper Santonian conglomerates and grey shelf marls to pelagic bathyal red marly limestones of mainly Campanian age. The end of the Long Cretaceous Normal Polarity Chron (the palaeomagnetic reversal from Chron 34n to C33r) is considered a primary marker for the Santonian/Campanian transition and marks the base of the Campanian at the Postalm section. Bioevents suggested to pinpoint the Santonian/Campanian transition include the last occurrence (LO) of the planktonic foraminifera *Dicarinella asymetrica* and the first occurrence (FO) of the nannofossil marker *Broinsonia parca parca*. Both events are documented in close proximity to the magnetic reversal; *B. parca parca* appears 1.66m and *D. asymetrica* shows its LO 1.24m above the magnetic reversal. At the Postalm section, the $\delta^{13}\text{C}$ signature shows a distinct positive excursion shortly after the palaeomagnetic reversal (with a peak at $\sim 1.5\text{m}$). This event is interpreted as representing the Santonian/Campanian Boundary Event (SCBE). Upon comparing the position of bioevents, the position of the SCBE and end of the Long Cretaceous Normal Polarity Chron at Postalm to other sections, differences in the succession of events around the Santonian/Campanian boundary are evident. Other reference sections show the SCBE right below the palaeomagnetic reversal (e.g., Bottaccione, Lägerdorf). Also the micro-/nannofossil record shows some diachroneity: In contrast to its LO at the Postalm section, the Bottaccione record shows the LO of *D. asymetrica* still within Chron C34n implying diachroneity of the bioevent. The position of the FO of *B. parca parca* is either recorded within the SCBE (Lägerdorf) or above the positive $\delta^{13}\text{C}$ excursion (Bottaccione, Bocieniec and Postalm). These slightly different levels of the SCBE and the different first and last occurrences of micro – and nannofossil markers point out the importance of high-resolution palaeomag sampling around critical reversals to provide stable and synchronous chronostratigraphic markers and section points for golden spikes.