# The Cretaceous-Tertiary transition at Gams, Austria: a multiproxies approach

**Thierry Adatte[1], G. Keller[2], H. Khozyem Saleh[1], J. Spangenberg[3]**

[1] IGP, Lausanne University, 1015 Lausanne, Switzerland
[2] Dpt of geosciences, Princeton University, NJ 08544, USA
[3] IMG, Lausanne University, 1015 Lausanne, Switzerland

The Cretaceous-Tertiary (K-T) transition in eastern Austria (Gams, Styria) was analyzed in terms of lithology, mineralogy (bulk and clay minerals), stable isotopes, major and traces elements and biostratigraphy (planktic foraminifera). The Gamsbach section is part of the Nierental Formation and comprises a 6.4 m thick deep-water sequence composed of marlstones, marly limestones interbedded with sandy to silty turbidites, which become more frequent above the KTB. Age control is based on a high-resolution planktic foraminiferal biozonation of which permits evaluation of the continuity of the sedimentary record across the KTB transition based on the presence of relatively short interval zones and subzones. Presence of P. hantkeninoides in the 1.75 m below the KTB at Gamsbach indicates sediment deposition occurred in zone CF1, or during the last 150 ky of the Maastrichtian. Just below the KTB, an irregular wavy surface at the top of the marly limestone marks an unconformity, which is strongly bioturbated (Chondrites-type burrows) coincident with a 2.5 permil drop in $\delta^{13}C$ values and low calcite content (< 2%). Most Maastrichtian species abruptly disappear at this level, except for survivor species that continue into the early Danian and a few reworked specimens. Above this surface, 0.2 to 0.4 cm of yellowish rusty clay marks the basal Danian overlain by 2 – 3 cm thick gray claystones both enriched in Ir, Co, Cr, Sc, Zn, Pb and Ni indicating an extraterrestrial source. Ten Danian species abruptly appear at that level, including P. longiapertura and P. eugubina the index species for zone P1a and abundant Eoglobigerina edita . The high species diversity and presence of Parasubbotina pseudobulloides 3 cm above marks subzone P1a(2). This indicates that zone P0 and subzone P1a(1) are mainly missing at this hiatus. Erosion of the top part of zone CF1 below the unconformity is also likely. Reworked Cretaceous species in Danian sediments are frequent in particular intervals and reflect downslope transport of eroded older sediments in upslope or shelf areas probably during times of intensified ocean circulation Two hiatuses can be therefore identified in the Gamsbach section: 1) at the KTB where the basal Danian zone P0 and subzone P1a(1) are mainly missing above an undulating erosion surface of Upper Maastrichtian marly limestone, and 2) in the lower Danian where most of zone P1b is missing. Bulk and clay minerals indicate reduced detrital input in the Upper Maastrichtian becoming more significant during the lower Danian reflecting increased turbidite activity linked to growing Austro-Alpine tectonic subsidence and erosion. Weathering Index of Parker (WIP) that shows higher values in the Lower Danian confirms this change in detrital inputs.