



## **Palynology and C isotope stratigraphy of the Triassic/Jurassic boundary in the Tiefenbachgraben section – Northern Calcareous Alps (Austria)**

**W. M. Kuerschner** (1) and L. Krystyn (2)

(1) Palaeoecology, Laboratory of Palaeobotany and Palynology, Utrecht University, Budapestlaan 4, 3584 CD Utrecht, The Netherlands (w.m.kuerschner@bio.uu.nl), (2) Department of Paleontology, University of Vienna, Geozentrum, Althanstrasse 4, Vienna, Austria A-1090 (leopold.krystyn@univie.ac.at)

The end – Triassic is characterized by enhanced rates of biotic turnover in both the marine and terrestrial realms. C isotope anomalies have been reported worldwide that may indicate coeval global disturbances in the biogeochemical cycles presently not well understood for their causal background. The results of an integrated study of the structural and the C isotope composition of organic matter in the Tiefenbachgraben section St. Wolfgang (Austria) are presented. C isotope values from bulk organic matter show significant fluctuations throughout the T/J boundary with two prominent negative  $\delta^{13}\text{C}$  excursions. An initial negative C isotope excursion occurs at the base of the Kendlbach Fm., Tiefenbachgraben Mr. (=Pre-planorbis beds), which correlates with a prominent shift in the palynofacies composition. Palynofacies assemblages in this interval are dominated by plant detritus which is the result of either increased run-off or preservation by anoxia or both. Although conodonts have their LO at the top of the underlying Koessen Fm, the palynomorph assemblages indicate a still Rhaetian age for the lower part of the Pre-planorbis beds. Moreover, high abundance of marine organic walled phytoplankton, particularly prasinophytes indicate increased productivity caused by eutrophication of shallow coastal surface waters. A second negative C isotope excursion occurs in the middle part of the pre – planorbis beds, about 8m below the first occurrence of *Psiloceras* at the base of the Breitenberg Mr. This isotope shift correlates with a marked change in the terrestrial palynomorph association. An increase in the spore – pollen ratio together with the decline or even disappearance of Late Triassic pollen types indicate concomitant vegetation changes on land.

Although also some important Late Triassic pollen have their last occurrence at this level, the quantitative pattern of floral turnover has a transient character rather than a major extinction among Triassic plant taxa. The palynological T/J boundary may be drawn 6m above the base of the Pre-planorbis beds by the FO of *Cerebropollenites thiergartii*, which appears at the top of the second  $\delta^{13}\text{C}$  isotope excursion. The established C isotope curve and biostratigraphic events can be correlated with other T/J boundary key sections, such as St. Audrie's bay (England), Greenland and New York Canyon (Utah, USA). Our results suggest a rather complete sedimentary record of the Triassic – Jurassic boundary in the Tiefenbachgraben section despite a possible short depositional break at the discontinuity surface on top of the Koessen Fm. The excellent preservation of the organic matter underlines the relevance of the Austrian T/J sections for a correlation of events that took place during the Late Triassic biotic crises on land and in the sea.