

Instabilities in the Carbon Cycle during the Carnian as recorded in the Northern Calcareous Alps

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The Carnian Pluvial Episode is a major phase of global climatic and biotic changes during the Triassic. A drastic increase in siliciclastics, profound changes of the type of carbonate factory on the platform and drastic biotic turnover marked this period. Multiple shifts in the carbon isotope curves record perturbations in the carbon cycle. However, until now there are discrepancies between the $\delta^{13}\text{C}_{\text{carb}}$ and the $\delta^{13}\text{C}_{\text{org}}$ curves. Carbonate carbon isotope curves in the classical sections of the Dolomites and the Northern Calcareous Alps of Austria are not reflecting the multiple negative shifts as seen in the $\delta^{13}\text{C}_{\text{org}}$ of these areas or in the $\delta^{13}\text{C}_{\text{carb}}$ in South China and Oman. Here we present $\delta^{13}\text{C}_{\text{carb}}$ curves from two sections in the Juvavicum nappes system of the Northern Calcareous Alps of Austria: Leckkogel (Gosaukamm), a 320m long section and the 770m long Aflenz-Bürgeralmsection (Hochschwab). Both successions start with 350m of the Julian (early Carnian) Leckkogel Formation, a detritus-rich carbonate slope facies interrupted by three terrigenous intervals; the latter is followed in Aflenz by 400m of platy limestone of Tuvalian age (late Carnian). These two expanded sections show three negative shifts of 1 to 4 per mill in the Julian1 to Tuvalian 1 and a strong positive peak of up to 4.8‰ at the base of Tuvalian 2. The new results demonstrate that the multiple shifts in the carbon isotope curves on carbonates are also present in the western Tethys, where the carbonate successions are expanded enough. Within our well-dated chronostratigraphic framework, they show the high complexity of the perturbations of the carbon cycle around the Carnian Pluvial Episode.