



Stratigraphy and palaeoenvironmental analysis of the Triassic-Jurassic transition in Western Southern Alps (Northern Italy)

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High resolution stratigraphic studies were carried out in the Rhaetian-Hettangian succession of the Bergamasc Alps (western Southern Alps, Italy) with the aim to characterise the stratigraphical and palaeoenvironmental evolution of the Lombardian succession across the Triassic/Jurassic (Tr/J) boundary. The Tr/J boundary in the Bergamasc Alps is sandwiched between the Rhaetian carbonate ramp succession of Zu Limestone Formation and the lower Hettangian Malanotte Formation (Zu4 member Auct.), deposited during relative sea-level rise at the earliest Hettangian. The Zu Limestone is organised into subtidal mixed shale-carbonate asymmetric cycles documenting the regional evolution from distal to a proximal depositional environment of an articulated homoclinal carbonate ramp. The Malanotte Formation shows absence of cyclicity, thin bedding and dominant micritic facies and documents the subtidal evolution of a more homogenous outer carbonate ramp environment.

The C-isotope analyses evidence a marked negative C-isotope pulse which may be correlated with worldwide C-isotope curves covering the Tr/J boundary. The negative spike is followed by a positive C-isotope excursion starting in the Tr/J palynological transition. The negative $\delta^{13}\text{C}_{carb}$ spike occurs directly after the crisis of the shallow-water carbonate production and the crisis of the macro and microfauna of the Rhaetian stage, suggesting a biocalcification crisis at the end of the Triassic and the response to elevated atmospheric CO_2 levels at a time of massive volcanic activity in the Central

Atlantic Magmatic Province.

While the biocalcifying communities seems to be severely involved in the end-Triassic crisis, the microfloral associations present a gradual evolutionary change at the Tr/J boundary.