# The Jurassic to Cretaceous transition in the Torre de' Busi section (Southern Alps): Integrated stratigraphy, geochemistry and microfossil changes

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During the Late Jurassic-earliest Cretaceous, major palaeoceanographic and biotic changes affected pelagic ecosystems of the Tethys Ocean, culminating in the onset of widespread pelagic carbonate sedimentation. This study investigates the Tithonian-Berriasian interval using the fully pelagic and stratigraphically complete Torre de' Busi section (western Tethys, Lombardian Basin), tightly constrained by integrated nannofossil, calpionellid, and magnetostratigraphy. High-resolution analyses of stable carbon and oxygen isotopes, carbonate content, magnetic susceptibility, gamma-ray spectroscopy data, and quantitative microfossil assemblages provide a multiproxy reconstruction of environmental and biotic evolution across the Jurassic-Cretaceous transition.

Results document a progressive increase in carbonate content from radiolarian-rich cherts of the Radiolariti Formation to the calcilutites of the Maiolica Formation, accompanied by a marked decline in terrigenous input. This lithological transition coincides with major changes in planktonic communities, including the decline and final disappearance of *Saccocoma*, the diversification and proliferation of calpionellids, and the expansion of heavily calcified calcareous nannoplankton, particularly nannoconids. A major turnover in microfossil assemblages occurred in the middle late Tithonian (base of nannofossil Zone NJT17; base of calpionellid Subzone *Crassicollaria intermedia*), synchronous with the onset of Maiolica deposition.

Carbon isotope data show a long-term Tithonian decrease in $\delta^{13}C$ values, reflecting a reorganization of the global carbon cycle, whereas minimum $\delta^{13}C$ values do not coincide with abrupt biotic changes. The synchronous increase in pelagic carbonate production and calcifying plankton abundance indicates supra-regional controls related to seawater chemistry, climate aridity, and reduced nutrient supply, highlighting the sensitivity of Tethyan pelagic systems to climate-driven oceanographic change.