

Metamorphic overprint and dolomitization of Mesozoic carbonates (Latemar Platform, Italy)

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Dolomitic rock (dolostone) is a major topic in carbonate research and a complex archive of its palaeoenvironment and diagenetic pathway. Combining field and laboratory techniques, we assess the complex diagenetic succession and subsequent contact metamorphic and hydrothermal overprint of Mesozoic carbonates of the Middle Triassic Latemar carbonate platform in Northern Italy. The Latemar is an intriguing natural laboratory as it allows for an in-depth study of increasing degrees, and differential alteration types of directly comparable lithologies. The aim is to better understand post-depositional alteration and metamorphic pathways of early diagenetic and hydrothermal dolostones. A suite of rock samples collected at the platform top, at the slope, and from the contact metamorphic aureole of the Predazzo intrusive complex reflects increasing degrees of diagenetic and metamorphic overprint. Cathodoluminescence microscopy documents a complex suite of paragenetic phases ranging from early to late stage dolomite, marine to meteoric/vadose calcite cements, and brucite as potential product of dedolomitization in the contact aureole. Patterns in oxygen and carbon isotope data disagree with the dominance of hypogenic magmatic fluids, but rather point to a complex combination of stratigraphic (marine/meteoric) drivers for geochemical shifts complemented by a geologically fast contact metamorphic heating event at the base of the Latemar. ⁸⁷Sr/⁸⁶Sr ratios indicate complex fluid-rock interaction with fluids related to the magmatic intrusion. A pervasive (open system) geochemical overprint is lacking.