



Sedimentary architecture, depositional facies and diagenetic response to intracratonic deformation and climate change inferred from outcrops for a pivotal period (Jurassic/Cretaceous boundary, Paris Basin, France)

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The aim of this study is to decipher the respective influences of geodynamic and climate disturbances at the Jurassic/Cretaceous boundary on sedimentary facies and carbonate diagenesis in a stable intracratonic basin using isotopic geochemistry and subsidence quantification. Fourteen lithofacies were deposited in a (1) carbonate platform and (2) a delta plain environment. Climate change from cool and wet to warm and semi-arid conditions during the early Tithonian influenced the syn-sedimentary dolomitization process within the carbonate platform during the mid-Tithonian. Architecture and facies reconstructions well-constrained the Jurassic-Cretaceous Unconformity (JCU), which was an important local structural episode marked by (1) an 80 m uplift in the eastern Paris Basin and by (2) the formation of a NW-SE low wavelength 15 km-wide and 30 km-long flexure. This first tectonic event tended to maintain brine ponds and supratidal marsh environments in the platform during the late Tithonian and early Berriasian, forming Purbeckian facies and associated dolomitic facies. A major depositional change occurred between the early and late Berriasian from shallow carbonate platform environments to fluvial-deltaic clastic deposits (Wealden facies). This facies change is underlain by a major unconformity corresponding to the Ryazanian unconformity. It is marked (1) by erosion processes, karstification of the carbonate substrate, and the development of ferruginous weathering products (goethite), followed by (2) incision processes in a fluvial-deltaic environment. This unconformity is consecutive to a 40 m uplift in the eastern Paris Basin. The rifting phase in the Bay of Biscay, in the Pyrenean Zone, and in the Arctic-North Atlantic together with the opening of the Ligurian Sea had a major influence on the northern part of France by causing uplifts (120 m from the Tithonian) and flexuring. Geodynamics played a major role in carbonate demise in the Paris Basin leading to exposure and karstification of the carbonate platform. Added to the generalized uplift, western Tethyan cool and humid conditions from the late Berriasian caused terrigenous influx into large-scale marine domains which was detrimental and unfavorable to carbonate growth.

Mots-Clés: Carbonate Facies Purbeck beds Jurassic Stratigraphy Diagenesis

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