

**Dynamics of a paleoecosystem reef associated with oceanic change in carbonate
sedimentary regime and carbon cycling (Oxfordian, Swiss Jura)**

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ABSTRACT

Herein we report an analysis of an Oxfordian (Upper Jurassic) paleoreef located in the Swiss Jura Mountains. The paleoreef is located in a Middle Oxfordian transitional interval in which sedimentation switched from marl-dominated to carbonate-dominated deposits. The paleoecosystem is composed of four successive fossil communities characterized by microsolenid corals and organisms that specialized in suspension feeding. Carbon isotopes measured from echinoid spine carbonates exhibit a positive trend from ~1.0‰ to 2.5‰ in $\delta^{13}\text{C}$ values from the base to the top of the paleoreef. Comparison of $\delta^{13}\text{C}$ curves with organic matter and belemnites shows different patterns not compatible with a global variation of the carbon cycle. Similar fossil assemblages and stratigraphic sequences identical in age are found along the continental margin of the Tethys–Atlantic Ocean. This biolithostratigraphic succession corresponds to increasing $\delta^{13}\text{C}$ values of marine and biogenic carbonates, to the transition from marl-dominated to carbonate-dominated deposits, and to the development of carbonate platforms, which together suggest a change in the carbon cycling regime within the Tethys–Atlantic Ocean system.