



## Oceanic Anoxic Event 1b: insights and new data from the Poggio le Guaine section (Umbria–Marche Basin)

Nadia Sabatino (1), Mario Sprovieri (1), Rodolfo Coccioni (2), Daniela Salvagio Manta (1), Silvia Gardin (3), and François Baudin (4)

(1) Istituto per l'Ambiente Marino Costiero, Consiglio Nazionale delle Ricerche (IAMC-CNR), Capo Granitola, Italy, (2) Dipartimento di Scienze della Terra, della Vita e dell'Ambiente, Università degli Studi "Carlo Bo", Urbino, Italy, (3) CNRS-UMR7207CR2P, Université Paris VI, Paris, France, (4) Institut des Sciences de la Terre de Paris, Sorbonne Universités, UPMC-Univ. Paris 06, France.

The upper Aptian to lower Albian interval (~114–109 Ma) represents a crucial period during Earth's history, with a major evolution in the nature of mid-Cretaceous tectonics, sea level, climate, and marine plankton communities. Interestingly, it also includes multiple prominent black shale horizons that are the sedimentary expression of oceanic anoxic event (OAE) 1b. An high-resolution planktonic foraminiferal and calcareous nannofossil biostratigraphy in combination with an integrated study of multiple geochemical proxies ( $\delta^{13}\text{C}_{carb}$ ,  $\delta^{13}\text{C}_{org}$ , TOC, HI,  $\text{CaCO}_3$ , trace elements/Al ratios) of the late Aptian–early Albian OAE 1b has been performed on the pelagic sedimentary sequence of Poggio le Guaine (Umbria–Marche Basin, central Italy). A comparison of the newly collected stable isotope carbon curve with the records from the Vocontian Basin (SE France), DSDP Site 545 and Hole 1049C provided a reliable and precise identification of the four main prominent black shale levels (113/Jacob, Kilian, Urbino/Paquier and Leenhardt) that definitively punctuate the OAE 1b. The studied record shows an increase in the marine organic carbon accumulation rate, in particular in the 113/Jacob and Urbino/Paquier levels. In the other black shales, TOC values are  $< 1\%$ , with evidence of degraded marine organic matter. Completely anoxic conditions were never established during the sediment deposition, although evidence of oxygen depletion at the bottom of the basin is clearly documented by the distribution pattern of redox-sensitive trace metals. The results suggest an increase in organic carbon burial rates during the OAE 1b due to the effect of enhanced surface productivity, as supported by a major increase in Ba/Al, and reduced bottom water ventilation. Noteworthy, the Kilian and Urbino/Paquier levels from the PLG section are characterized by the absence of correlative shifts in  $\delta^{13}\text{C}_{carb}$  and  $\delta^{13}\text{C}_{org}$ . The increase in the  $\delta^{13}\text{C}_{org}$  values in these levels is explained by an increase in the relative contribution of  $\delta^{13}\text{C}$  enriched marine planktonic archaeal biomass, while the concomitant negative excursions recorded in the  $\delta^{13}\text{C}_{carb}$  could reflect a major contribution of isotopically light terrestrial carbonate ions from increased continental runoff during documented more humid conditions.