The Cecca Level: A Lower Barremian (Lower Cretaceous) Lithostratigraphic Marker of the Maiolica Formation in the Umbria-Marche Basin (Central Italy)

Conti C.*[1-6], Gambacorta G.[2], Di Marcantonio E.[3], Chiari M.[4], Zanchetta G.[1], Morigi C.[1] & Negri A.[5]

[1] Dipartimento di Scienze della Terra, Università di Pisa. [2] Dipartimento di Scienze della Terra, Università degli Studi di Firenze. [3] Dipartimento di Scienze della Terra, Sapienza Università di Roma. [4] CNR-Istituto di Geoscienze e Georisorse. [5] Dipartimento di Scienze della Vita e dell'Ambiente, Università Politecnica delle Marche. [6] Museo Brancaleoni di Piobbico, Associazione Neroniade.

Corresponding author e-mail: christian.conti@phd.unipi.it

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The Lower Cretaceous Maiolica Formation of the Umbria-Marche Basin (Central Italy) is characterized by white to ivory micritic limestones locally interbedded with chert and, within specific stratigraphic intervals, by discrete black shales (Sprovieri et al., 2006), which are usually challenging to correlate across different sections of the basin. In this study, we identify and characterize five different black shales-rich lithostratigraphic intervals that are recognized over widely separated sections. We have examined these intervals to determine their possible correlatability by combining lithostratigraphy, ammonite biostratigraphy, geochemistry, and stable isotope stratigraphy. With merely small local changes, the data show strikingly comparable stacking patterns suggesting a lithostratigraphic correlation. They are also distinguished by similar ammonite assemblages and consistent values of $\delta^{13}C_{carb}$, $\delta^{18}O$, $CaCO_3$, and TOC. Furthermore, ammonite biostratigraphy indicates that the examined intervals belong to the same biostratigraphic interval, spanning the *Kotetishvilia compressissima* Zone (Holcodiscus caillaudianus Subzone) and the *Moutoniceras moutonianum* Zone of the lower Barremian (Szives et al., 2023). The $\delta^{13}C_{carb}$ data further support the correlation between intervals predating the Mid Barremian Event (MBE, Coccioni et al., 2003). In honor of Fabrizio Cecca, whose research significantly improved our knowledge of the Mesozoic successions of the Umbria-Marche region, we name this basin-scale horizon the Cecca Level. In addition to being a lithostratigraphic marker, the Cecca Level also attests to the occurrence of significant fluctuations in pelagic marine primary productivity coupled with recurrent drops in bottom-water ventilation, which resulted in the development of transient oxygen-depleted conditions whose expression at a supra-basin scale required further investigation.

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