Radiolarian stratigraphy of the proposed GSSP for the base of the Aptian Stage (Gorgo Cerbara, Umbria-Marche Apennines, Italy)

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A revision of the radiolarian stratigraphy recorded at the proposed GSSP stratotype for the Barremian/Aptian boundary is presented. This revision encompasses the overlap interval of the biostratigraphic works carried out by JUD (1994) and O'DOGHERTY (1994) in the Gorgo Cerbara section.

We have re-examined a total of 52 productive samples yielding moderately to well-preserved radiolarians throughout the upper part of the Maiolica Formation and the Lower part of the Marne a Fucoidi Formation (up to the Lower Reddish Member). This interval corresponds to the stratigraphic levels 882 m to 915 m of LOWRIE AND ALVAREZ (1984), which are equivalent to -14 m to 19 m of PATRUNO et al. (2011). The Marne a Fucoidi consist of thick red pelitic levels with short intervals of whitish siliceous limestone beds and radiolarian sands, whereas the Maiolica is made up of whitish cherty limestones bearing discrete levels of black shales in its upper part. This sharp change in the lithology led to an uneven sample spacing, closer in the Marne a Fucoidi and looser at the upper part of the Maiolica Formation (46 samples from the Marne a Fucoidi Formation and only 6 form the upper part of the Maiolica Formation).

A detailed stratigraphic and taxonomic revision of the radiolarian assemblages from the uppermost Barremian–lower Aptian succession is presented, and a new subdivision of former radiolarian zones is proposed. In addition, we also present a brief analysis on the radiolarian turnover that occurred at the Barremian/Aptian boundary. The uppermost Barremian is characterized in Gorgo Cerbara by an important faunal crisis, encompassing the extinction of more than half of radiolarian species, whereas the earliest Aptian is characterized by a moderate and slow recovery (only a third of the fauna is renewed). An unusual biotic aspect is the absence of a true radiolarian extinction within the OAE-1a (Selli level), with the extinction of only seven radiolarian species immediately before or during the anoxic event and a high survivor number of species.

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