

Interactive comment on “Bio-chemostratigraphy of the Barremian–Aptian shallow-water carbonates of the southern Apennines (Italy): pinpointing the OAE1a in a Tethyan carbonate platform” by M. Di Lucia et al.

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Received and published: 21 September 2011

It was with great interest that I read and reviewed the manuscript by Di Lucia et al. In this manuscript, the authors present the results of an in-depth study of three platform carbonate sections through the Barremian and Aptian in southern Italy, with a focus on the early Aptian and especially on the time period during which Oceanic Anoxic Event (OAE) 1a occurred. The goal was to establish a robust chronostratigraphic framework, which is based on the high-resolution stable carbon-isotope records and their correlation with well-calibrated records from the (hemi-)pelagic realm, and which is corroborated

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both by strontium-isotope ages obtained on well-preserved rudists, as well as by microfossil biostratigraphy. The manuscript is quite innovative in that the authors not only succeed in identifying the equivalent of OAE 1a in this platform setting, but also propose partly new calibrations of the biostratigraphic ranges of a selection of time-diagnostic benthic organisms, which are based on the carbon-isotope chemostratigraphy obtained for this platform setting. This latter aspect is important, since microfossils often offer the only possibility to date the shallow-water carbonate sections of this time period, and since their time calibration is partly controversial, as is discussed by the authors.

I highly appreciated the care the authors took in the interpretation of their data and especially the way they dealt with the carbon-isotope data. For example, their statistical treatment of the isotope-data set as a function of different facies and microfacies types is important and not too often observed in comparable approaches. To this comes that the manuscript is generally well written and well illustrated. I therefore recommend (very) minor revision, which is based on a few observations concerning the first part of the manuscript.

Abstract Page 790 1. I would write: "Low-resolution biostratigraphy and the lack of chronostratigraphic calibration hinder precise correlations of platform carbonates with coeval deep-water successions" 10. I would write: "and the level documenting the second acme" 12. Same here: " from the level containing the first acme"

Introduction Page 790 23. "On a global scale" may be too general. Organic-rich sediments related to OAE1a are not ubiquitous in the marine realm. 24. "Many carbonate platforms" is also not quite right. The northern Tethyan shelf was occupied by what appears to have been one single and continuous platform.

Page 791 6. Same remark as before. 16. I would write: "Biostratigraphy may not always offer a solution as well". The original statement is rather hard, since ammonite biostratigraphy may offer the right resolution (as is known from the Vercors and Helvetic

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platform areas, for example) 20. This is not quite right: Föllmi et al. (2006, 2007), Föllmi and Gainon (2008) and Föllmi (2008) assumed a deshayesi age for the onset of OAE 1a. The drowning of the northern Tethyan Urogenian platform preceded OAE 1a and is dated as close to the limit between the weissii (or forbesi) and the deshayesi zones.

Materials and Methods Page 794 3. I don't know the meaning of "double-polished"? 4. Stable isotopes (rather than stable-isotopes)

Discussion Page 806 26. "Under the hypothesis": Using the hypothesis?

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Interactive comment on Solid Earth Discuss., 3, 789, 2011.