

Comment on the manuscript « **Cross-continental age calibration of the Jurassic/Cretaceous boundary** » by Luis Lena et al.

Bruno Galbrun

Dear Editor

Thank you for giving me the opportunity to read this manuscript.

As this manuscript has already been the subject of two detailed and argued reviews, I will only make general comments and analyse whether the authors have taken these previous reviews into account.

I carefully read the manuscript, the reviewers' comments and the authors' responses to the comments.

General comment

This manuscript is quite interesting because it provides radiometric data over a poorly documented time interval. This is the very positive point of this manuscript. Unfortunately, this manuscript suffers from weaknesses: no magnetostratigraphic data (or no real discussion on previous data) while magnetostratigraphy is a key element to discuss the position of the Jurassic-Cretaceous boundary, too poor biostratigraphic data whose reliability is not sufficiently criticized, completeness of the sections not sufficiently discussed.

These shortcomings make the manuscript's conclusions a little too affirmative.

The authors have taken into account most of J. Palfy's comments. However, they have taken into account only very few of W. Wimbledon's comments. This is very surprising because W. Wimbledon as chairman of the ICS Berriasian working group is probably the most competent person to discuss the Jurassic-Cretaceous boundary, and his comments are pertinent.

The most common sentence in the authors' response is "*No modification was made since we feel we have answered this comment*". It seems that the authors spent more time denying the comments than trying to make the necessary changes.

Specific comments on the Introduction

Page 1, lines 23-24 : « *Approaches have varied from the coupling of magnetostratigraphy with biostratigraphy (Larson and Hilde, 1975)...* ».

This reference is inadequate: in their manuscript Larson and Hilde only consider oceanic magnetic anomalies (the Hawaiian lineation pattern), there were no magnetostratigraphic results on the Jurassic-Cretaceous boundary in the early 1970s... They just stuck to their magnetic polarity sequence the Geological Society of London (1964) time scale.

Page 1, Line 25 : « *...(Gradstein et al., 1995; Kent and Gradstein, 1985; Lowrie and Ogg, 1985; Ogg and Lowrie, 1986)* ».

Maybe add the reference: Channell et al., SEPM Sp Pub 54, 1995.

Page 1, Lines 26-28 : « *Due to the scarcity of numerical ages for the Late Jurassic and Early Cretaceous, a lot of the available JKB age data was derived from interpolating distant tie points for arguably large intervals of time (~25 Ma)* ».

It is not clear whether the authors refer here to sedimentary successions or to marine magnetic anomaly M-sequence. It's a little more complicated. The authors should provide some details on the general methodology previously used to propose an age of the Jurassic-

Cretaceous boundary : magnetostratigraphic results on sedimentary successions with very rare radiometric ages + correlations with the M-sequence of marine magnetic anomalies + very rare radiometric ages directly on the M-sequence (one or two on the Middle Jurassic ?) + Interpolation on the M-sequence between these tie-points (of various origins) considering a constant oceanic spreading rate + some cyclostratigraphic results (especially on Oxfordian and Kimmeridgian)... and so on. This methodology is widely developed in the GTS2012 Elsevier book (Geomagnetic Polarity Time Scale, Jurassic and Cretaceous chapters).

Page 2, Line 28 : « *More importantly, the data presented here permits to put o the test the currently ICS accepted age of the JKB* ».

As this goal seems to be an important objective of the authors they should better explain in this Introduction what is the criterion chosen to define the Jurassic-Cretaceous boundary in the most recent Geological Time Scale (the ICS and/or the GTS2012 - Gradstein et al -), as well as how a numerical age is proposed for this boundary (see my previous comment on the correlations between magnetostratigraphy and marine magnetic anomalies). This is necessary because it is not sufficiently included in the discussion. Perhaps the authors could at least indicate in this introduction the age of this boundary in the ICS scale, not only waiting the section 4.6.

Conclusion

This manuscript is likely to be published due to the provision of radiometric data. However, I wonder about the authors' conclusions. It seems to me that the main conclusion, the age of the Jurassic-Cretaceous boundary must be younger than currently accepted, seems premature. This manuscript provides numerical data but is not at all a "*Cross-continental age calibration...*", I think the title should be changed.

It seems to me that the authors should be a little more cooperative. I recommend the publication of this manuscript if only the authors make an effort to do so.