

Interactive comment on “Palaeoclimatic oscillations in the Pliensbachian (Lower Jurassic) of the Asturian Basin (Northern Spain)” by J. J. Gómez et al.

Anonymous Referee #2

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The paper looks to provide Lower Jurassic isotope data from the Asturias Basin from Spain. There are a number of significant issues and omissions which need addressing. These are as follows:

The text contains quite a few typographic errors, spelling mistakes etc. The text needs a thorough re-read through.

The paper mixes the terms Lower/early and Upper/late throughout - early or late should be used – when referring to time etc. So for example Line 12 should be early Toarcian warming events, major early Toarcian mass extinction etc. for example as in line 19, Late Pliensbachian cooling.

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It is noted that the objective of the paper is to provide data on the evolution of the sea-water palaeotemperatures through the Lower Jurassic. All such palaeotemperature interpretations require an assumption regarding the isotopic composition of seawater. A δ_w value of -1 is used throughout. However, some discussion is needed of whether this value is appropriate and its effects on the interpreted temperature changes. Many research papers have used other independent means to evaluate the δ_w or temperature (e.g. Mg/Ca ratios or climate models). Some reference to these approaches is required.

The 110 m thick studied section composed of 562 layers? Are these beds and not layers.

It is noted in the materials and methods section that ammonites were prepared and studied following the usual palaeontological methods. This alludes to ammonites being part of this study and they are not. Also here it is noted that a total of 191 analyses of stable isotopes were performed on belemnite calcite samples. It would be better to say the number of belemnites analysed and not the number of isotope analyses.

For the assessment of possible burial diagenetic alteration of the belemnites, the material and methods section describes the methods to evaluate preservation. Nowhere in the results section is a description and interpretation of the CL/thick section work. I would have expected to see a figure showing examples of the well-preserved/poorly preserved samples, number of samples rejected and reasons for rejection etc. Was there any trace element work undertaken to evaluate preservation? Also, with respect to the isotope data, is this available in a table or appendix and does this dataset include which belemnites species were analyzed?

What was the instrument used in the stable isotope laboratory of the Michigan University? And was reproducibility really better than 0.02 permil?

3.2 Spelling of Biochronostratigraphy

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Within the Carbon Isotopes section (and elsewhere) data are presented with 0, 1 and two decimal places. Consistency is needed. I suggest just 1 decimal place would be appropriate. It is noted that positive ^{13}C excursions are difficult to account for. . . is this really the case? Further it is noted that the positive ^{13}C shift cannot necessarily be the consequence of the widespread preservation of organic-rich facies under anoxic waters, as no anoxic facies are present in the Spanish Lower Toarcian sections. But this is not the case as the positive ^{13}C shift is seen as a global shift – and certainly what is happening in the Spanish sections (i.e. a lack of anoxic facies) is local.

Section 4.2. insert references with respect to the Toarcian mass extinction. Palaeolatitudes are mention here. These should have already been noted earlier.

An Upper Sinemurian Warming interval is not recorded in the data from Cleveland Basin of the UK (e.g. Hesselbo et al., 2000).

4.2.2 “normal” is this really the best way to describe temperature here. It implies other temperature trends are abnormal. A Pliensbachian Warming interval is also described - but the data (If really showing warmth) are really restricted to the lbex zone. Again Pliensbachian cooling is not the entire interval.

The conclusions don't conclude. They need to be much reduced in length and address the key findings –what is presented at times is a rambling summary and discussion. For example it is noted that causes of the exceptional Pliensbachian cooling are still unknown – this is not being very conclusive.

Figure 1 is far too crowded, the text on shaded areas is impossible to read, why so many fonts used.

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