**Open response questions**

Comments concerning methodology

*intended for the author*

Three more methodological issues will have to be addressed as well before publication: 1- Method 4: why two copies of the same vertebra, and not two articulated vertebrae? This is mentioned, but not explained in the paper. I understand this makes it easier with fossils, but you want to keep the discussion open for neontologists as well, so I think it’s important to elaborate on this. 2- Method 2 doesn’t necessarily lead to a kinked or jagged neural canal in a figure. That method only defines “horizontality” of a single vertebra, not the entire column, so you could just move neighboring vertebrae up or down accordingly to adjust for the “jagging”, and still have every single vertebra horizontal (and a continuous, but inclined neural canal). I know this is not the point here, but it’s an option that should be discussed in comparison to the “neural canal horizontal” method (see also comment on figure 11) 3- Measurement of the neural canal cross-section as shown in figure 15 is incorrect in my opinion, and will have to be corrected using sectioned vertebrae (see details in comment in annotated MS).

Comments concerning results and conclusions

*intended for the author*

I would propose a structure for the paper with an introduction as outlined above, a methods section followed by the various definitions, comparisons, and recommendations, the case study of Xenoposeidon (which should include what is now in the introduction), and finally the discussion. The paper would profit a lot with a fairly detailed methods section, including terminology of the vertebra, its possible orientation/directional terms, and structures that help orientating, explanation of how vertebrae can be oriented physically and/or digitally (which is now spread out over the descriptions of the methods 1-4), how to draw lines along curved articular surfaces (written within method 3 I think), how to articulate copies of vertebrae in 2D and 3D graphics programs (and thereby how the figures in the paper were produced), and the “paper roll” method to check orientation of the neural canal. Having the case study of Xenoposeidon separately allows you to keep (and actually strengthen) the wide focus on vertebrates in the paper, but still discuss how the paper came to be, what particular problems are when dealing with fossils, and the importance of open reviews.

A few more details are addressed and commented upon in the annotated MS.

General comments to authors

*intended for the author*

The paper addresses an often overlooked but sometimes crucial point, especially for descriptions and systematics based on comparative anatomy. The discussion is applicable to any vertebrate taxon, be it extant or extinct, and is therefore of wide importance for the fields of descriptive vertebrate zoology and comparative osteology, with further implications in systematics, phylogeny, biomechanics, and more. In fact, the authors make good use of figures of vertebrae from various vertebrates of diverging clades. This issue occurred to me first when I was working on my diplodocid phylogeny, where I deliberately tried to orient all the figured vertebrae such that the neural canal would be horizontal, but I didn’t actually state or discuss this in detail in the paper. The only real comment about it I could find again when re-reading my paper was in a comment on character 194, where I wrote: “The neural canal should be held horizontally, in order to accurately assess the expansion of the prezygapophysis.” Unfortunately, the introduction somewhat destroys the paper in its very beginnings. The introduction should outline a biological or methodological problem, and the context of the study, not the personal history of how the study came to be. The tone is too colloquial, and by focusing on the history of this particular study (the reviews on a sauropod description), the paper is immediately restricted in taxonomic scope to sauropods (which of course I don’t have any personal problem with, but I don’t think this should be the case in this particular paper). Having a more traditional introduction with a wider context (as mentioned shortly in the discussion) would be really helpful to not have readers think: “oh, another paper on sauropod necks, who cares”, but actually go on reading and hopefully eventually apply method 3 in their descriptive papers of fish, amphibians, reptiles, mammals, dinosaurs, and birds. I would therefore suggest acceptance of the paper, but after some serious restructuring and after a few methodological issues have been addressed in more detail (see below).

On a more editorial note, the abstract is probably far too long, as it has to be translated into Portuguese and printed in both languages on the first page of the paper – as for JPT style guidelines. I propose to shorten especially the part with the four definitions of horizontal.

If you wish to reveal your name to the authors, please print it here

*intended for the author*

Emanuel Tschopp

**Rating scale questions**

|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| --- | --- | --- | --- | --- | --- |
| The paper makes a significant contribution to scholarship.  *intended for the author* |  |  |  | ✔ |  |
| This contribution is of broad international interest.  *intended for the author* |  |  |  | ✔ |  |
| The paper is professionally written, easy to read and free from grammatical or spelling errors.  *intended for the author* |  |  | ✔ |  |  |
| The subject or concept is developed enough to be worth reporting.  *intended for the author* |  |  |  | ✔ |  |
| The research methodology for the study is appropriate and applied properly.  *intended for the author* |  |  | ✔ |  |  |
| This article adequately engages with the relevant scholarly literature.  *intended for the author* |  |  | ✔ |  |  |
| Data are sufficient to support the interpretations presented.  *intended for the author* |  |  |  | ✔ |  |
| The literature review was thorough given the objectives and content of the article.  *intended for the author* |  |  | ✔ |  |  |
| The title reflects the content of the manuscript.  *intended for the author* |  |  |  | ✔ |  |
| The abstract presents the main conclusions of the manuscript.  *intended for the author* |  |  |  |  | ✔ |
| The keywords are appropriate.  *intended for the author* |  |  |  |  | ✔ |
| Illustrations are adequate.  *intended for the author* |  |  |  | ✔ |  |
| Can illustrations be condensed or eliminated without compromising the scientific information of the article?  *intended for the author* | ✔ |  |  |  |  |
| Figure captions are clear and concise.  *intended for the author* |  |  |  | ✔ |  |

**Reviewer attachments**

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| --- | --- |
|  | [ms1\_rev.doc](http://app.scholasticahq.com/api/v1/attachments/27747/download) *only editors will see attachment* |

Help