

Dr. Wedel,

Thank you very much for your decision on our paper, “An unusual archosauriform tooth increases known tetrapod diversity in the lower Chinle Formation (Late Triassic) of southeastern Utah.” It has taken some time for myself and my coauthors to reach a decision about whether or not to continue with the publication process on this paper as it exists or incorporate it into a larger paper on the paleontology and stratigraphy of the Chinle Formation at Comb Ridge. Just such a paper is one of the long-term goals of our program and we debated whether this would be a better fit as a part of a larger endeavor. In the end we have decided to pursue publication of this manuscript in its own right. The main reason for doing so is that several of the student authors on this paper have already moved on to universities and maintaining contact with them will become more difficult in the future.

We have improved the figures to include both differential shading for the wear facet and the inclusion of anatomical markers. I personally apologize for their absence earlier – I had saved the image without the appropriate layer being active.

The comments from the reviewers have been primarily addressed in the revised manuscript. Points raised in the reviewer summary or questions raised in the manuscript we respond to here, especially if we weren't able to respond or correct a point in the manuscript. In some cases the reviewers had changes opposite one another. We have done our best to process both sets into this manuscript. An additional part of the acknowledgements was added in to express our thanks to those who have improved the manuscript.

Review 1:

Reviewer 1 asked on page 2, line 9 about our statement, “The ecological revolution of the Triassic Period laid the groundwork for dinosaurs (including modern birds), crocodiles, and mammals to dominate terrestrial vertebrate assemblages for the next 200 million years,” specifically pointing out that mammals and birds are still dominant. This was our point – the ecological change in the Late Triassic was so important its impact on what clades persist today can still be seen. Perhaps we were unclear in our wording – if so we'd be happy to modify that if you see fit.

Reviewer 1 on page 12 (line 231) says that our statement, that most of Utah's Chinle fossils (at least those that have been published) have come from the Church Rock Member, is incorrect but provides no reference or information why this is the case. Since I've been doing fieldwork in the Chinle Formation in Utah most of the vertebrate fossils from the Chinle that we have discovered have been found in the Church Rock Member (though the Kane Springs has produced vertebrates as well). In addition, Martz et al. (2014) review Utah's Triassic record, stating that it is not well studied with the exception of Lisbon Valley. In Lisbon Valley fossils are abundant in the Church Rock Member of the Chinle Formation (p. 411). If there are fossils found elsewhere in the Chinle Formation in abundance from Utah we have not seen publications on them, nor apparently have Martz et al. As a result we have left in our statement about the significance of an earlier, diverse assemblage from outside of Lisbon Valley. If Reviewer 1 has additional data to share we would be happy to amend our statement.

We also left our section on future work in, since this isn't a work in isolation and since Reviewer 1 and you have both suggested a larger faunal assemblage paper. That is something we are currently working on.

The remainder of Reviewer 1's comments on the annotated manuscript were incorporated into the manuscript as appropriate or have been merged with suggestions from Sterling Nesbitt. This includes reducing and working to eliminate the majority of the colloquial terminology from the paper.

In the summary of Reviewer 1's suggestions they mention that the figures need improvement. We have adjusted them in the following ways: added labels to all figures previously lacking to indicate anatomical features, adjusted the coloration of missing enamel vs. wear facet, added additional views of the juvenile phytosaur teeth in question, and expanded the lithology figure to include more of a look at the site and provided a directional arrow as well as circling the in-situ tooth. Reviewer 1's comments on this figure were slightly ambiguous as to whether they wanted the figure to be improved or eliminated altogether since no specific ways to improve were offered, only (valid) problems with the figure as it stood. If you feel the figure isn't appropriate to the paper we can remove it but we wanted to try and at least provide one geologically contextual photograph of the fossiliferous layer as it had not been identified in earlier publications.

We also retained Figure 1, despite Reviewer 1's comments. This is due partly to the fact that the review by Nesbitt did not mention any issues with that figure and partly because this is a figure from a paper previously published in this journal about a specimen from the same locality in 2015. Its detail was deemed sufficient during the review process for that manuscript.

We agree with Reviewer 1's comments about figures of the phytosaur fossils. We have added several figures (6-8) showing more detail on the teeth that we comparing to MNA V10668. These include details of the teeth in lateral and occlusal views showing both tooth profile and cross section. We agree that the sample size is limited with the presumed juvenile phytosaur jaws but considering that they are the only samples available to examine, a comparison, no matter how limited, is worthwhile.

Reviewer 1 suggested that we needed to include a systematic paleontology section, which we have done. We did not include a chart with character states but instead have created an actual diagnosis section where we compare the synapomorphies of archosauriform teeth listed by Godefroit and Cuny (1997) to the character states seen in MNA V10668. This is something that Nesbitt's review also suggested. We can certainly make this into a chart if you feel that would present the data in a clearer manner but we also did not find examples of this sort of data presentation in other papers that were not explicitly using a phylogenetic analysis.

To this point, Reviewer 1 makes some very good points about the conclusions we drew, especially in light of the limited data we can get from this fossil and the lack of a phylogenetic analysis. We have taken this into consideration and reworded our conclusions section accordingly. Instead of proposing a new clade of diapsid, we instead make it clear that we consider it a previously example of tooth Morphotype T, which has not been previously reported from Utah. We agree that speculation as to the taxonomic affinities of MNA V10668 outside of Archosauriformes is premature and may not be resolvable at any point.

Reviewer 1 takes issue with the stratigraphic assessment of the specimen. We have greatly expanded the geological setting section of the paper to better demonstrate what is known (and not known yet) about the stratigraphy of the Chinle Formation at Comb Ridge.

Lastly, Reviewer 1 makes a point of saying that material should not be published on for the sake of publishing. We agree and would like to point out that this was only one of two out of nearly 50 tooth specimens collected in 2014 that could not be readily identified as either a phytosaur, temnospondyl, or hybodont shark. We do not plan on publishing one paper for every tooth collected. It would be impractical if nothing else, and we agree with the assessment that a faunal analysis paper is in the works. As we discussed in our introduction to our rebuttal, however, we would like this contribution to stand on its own merit as that is what PeerJ stands for (as you noted in your decision).

Sterling Nesbitt:

Sterling Nesbitt's comments were incorporated into the revised manuscript. We removed the majority of the "story telling" and added more to the description of the tooth, including of the wear facet. We have now included more information as to why certain more exclusive clades were rejected in our comparisons. Measurements were added were suggested throughout the manuscript. We include a discussion of the lack of a mesial keel and whether that is a taphonomic feature or not. Tooth comparisons to the phytosaur jaws have been improved with specifics on shape, serration count, etc. to help eliminate these portions of the tooth rows as possible sources for MNA V10668. We have supported our assignment of the tooth to Archosauriformes with synapomorphies from the published literature and an enhanced discussion of tooth row variation. We are pleased to hear that he finds the paper generally well put together and can see it being published with some revisions.

Nesbitt also made specific recommendations about the figures. Our responses are listed below:

Figure 2 has been replaced, as indicated above. The legend has also been updated to add more information.

Figure 3 has been updated, as indicated above.

Figure 4 has been updated to include a different color for the wear facet. The caption previously indicated that we had purposely omitted the missing enamel. We have edited the caption to clarify that.

We opted to keep Figure 5 so that readers could have a better idea of what portion of the jaw the measured teeth are from. If you feel that is not adding value to the paper we will move it to the supplemental data section since we find it has some utility. Since the published record of juvenile phytosaurs is limited we think having the complete view available for future workers is also a consideration.

We appreciate both the reviewers and your helpful comments. We look forward to hearing back from you and moving forward with (we hope) eventual publication.

Sincerely,

Rob Gay