

Review of: THE FIRST TETRAPOD FROM THE MID-MIOCENE CLARKIA LAGERSTÄTTE (IDAHO, USA) by Jonathan J. M. Caledo, John D. Orcutt, Winifred A. Kehl, Bill D. Richards

Reviewer: Dale A. Hanson, Asst. Collections Manager (Paleontology), Museum of the Rockies, Montana State University, Bozeman, MT

General comments:

Overall, I thought the paper was a good description of a very unique specimen. It was good that the authors stressed that the specimen is difficult to describe because it is mostly a carbonaceous film, rather than trying to read details that may not be present.

I think it would be helpful to provide a brief discussion of the other skeletal elements besides the skull, dentary and forelimb. Granted this would be very brief due to the lack of preservation of these elements, but there may be information that would add support to the tentative identification, and also add to the robustness of the paper in general. Not being a rodent worker, I don't know if details of the sternum, scapula or general thoracic region would be taxonomically helpful, but that information, however brief, would probably be useful at some point.

A quick sentence or two in the taxonomic section beginning the discussion that put this specimen into Sciuridae rather than other rodent families would be helpful. Lines 132-133 describe why the specimen is a rodent in a brief statement. In similar fashion, it might clarify the ensuing discussion to simply list the possible families before beginning the details of the comparisons. That would help set the stage for the discussion for the readers. Something along the lines of "The specimen exhibits some general characters that appear in the rodent families X-idae, Y-idae, and Z-idae." Consideration should then be made to reorganize the ensuing discussion to follow the characters of these families that were considered. The reader is left to assume the characters discussed are keys for those families.

In a similar approach, it would be helpful before discussions of the tribes to clarify this taxonomic separation. The ground squirrels mentioned beginning at line 146 represent a different tribe (as I understand it) than tree squirrels - this should be clearly identified, which would aid in explaining the apparent distinction for the reader. In fact, consideration should be made to moving this tribal discussion from the Description section to the Comparison section, following the family discussion.

I would suggest, throughout the paper, de-emphasizing the use of size as an apparent main characteristic. Many of the discussion points begin with size, then proceed with the key anatomical characters that are more significant in determining the taxonomy. It is probably better to begin with the taxonomic characters, and discuss size as a less significant but important point.

It might be useful to specifically confine your geographic area to something more identifiable, such as localities west of the Continental Divide (lines 45-54). There are some localities in western Montana on the east side of the Divide that discuss, at least in part, some mid-Miocene climatic information, such as Barnosky's work on Hepburn's Mesa, Sutton and Dorr on Anceney, maybe others.

Although skull and dentary measurements are usually present in the text, it might be useful to include a small spreadsheet listing these. It would be handy for quick reference purposes when discussing them later, such as in lines 215 through 248. Presently, it's difficult to find these in the text when reading about the comparisons. And clearly identify them (as appropriate) as estimates.

Specific comments:

line 19 - should use 'associated with' rather than 'associated to'

line 45 - Might want to re-word or reconsider the sentence about "Much of this work..." There have been numerous papers on the mid-Miocene of Nebraska, California, New Mexico, and the Gulf Coast. Explain why the Inland Northwest has more information than these other areas.

line 79 (and elsewhere) - probably should qualify this statement here and throughout to state the first known occurrence.

line 87 - should state what river the basalt flow dammed, and what state St. Maries is in.

line 126-128 - should clarify that the specimen is mostly a carb. film, since this section is the 'official' listing of elements.

line 141 - if the skull is primarily a carbonaceous film, how can you tell the nasals are ventrally directed?

lines 141-142 - the sentence "The bones posterior to the diastema cannot be identified" is ambiguous. Do you mean that there are bones but they can't be identified, or there are no bones posterior to the diastema?

lines 142-143 - for us non-rodent people, are you referring to the maxillary diastema or the mandibular diastema.

lines 143-145 - similarly ambiguous; "...cannot be described..." because it is not visible or because it is not there.

line 148-150 - should include quick mention of the similarities to tree squirrel forelimbs, rather than just dissimilarity to ground squirrels.

lines 149-150 - if you intend to merely cite the taxonomic level Tribe Sciurini, you should probably include McKenna & Bell, 1997 (and add to References). If not, need to clarify that these listed authors were discussing the categorization.

lines 150-153 - "...the robustness of the forelimb..." The meaning is unclear. Are you saying the UWBM specimen is more robust, or more gracile, since you mention that the ground squirrel is robust.

line 159-161 - can you include an estimate of body length, in addition to the weight?

various - should spell out full name of subfamilies/tribes, such as geomorpha in line 163, scurini in line 281, and avoid using geomorph, sciurin.

line 166 - reword this sentence to avoid "during the Barstovian did."

lines 167-168 - can you include the actual weight for *G.(N.) paenebursarius*?

line 182 - how did you measure the diastema length? Or is this just a visual observation?

line 220 - "An older species..." Does this mean outdated taxonomy or an older individual?

line 222 - "*Spermophilus*-grade sciurids..." Does this refer to the genus or to tribe Marmota or some other categorization. This needs some elaboration/explanation.

line 236-237 - "UWBM 113209 displays a long and shallow diastemal depression (Fig. 2), a characteristic of *Arctomyoides*..." This sentence states this is a characteristic for the genus, but then in lines 242-243 it states "...the Clarkia sciurid is not a member of the genus..." Need to resolve this apparent contradiction.

lines 238, 239 - should you use 'unlike' rather than 'alike'?

line 248-252 - several characteristics of *Protospermophilus* are cited, and an exception is noted for striations of the incisors, but then the conclusion is this specimen is not part of this genus. This needs elaboration to explain why one character excludes it when the other characters argue for inclusion.

lines 266-268 - this may be misleading, per my General Comment about size being a character. Although slim, there's always a possibility for a giant species within another genus. Need to reconsider this statement.

line 280 - "as most localities of comparable age do not preserve forest ecosystems." How do you know this?

line 310-311 - might be useful to include '(tribe sciurini)' in this sentence. Should also spell out Sciuridae instead of "sciurid."

lines 385, 429 in References - need to include the title of the article.

line 417 in References - Need to format this citation to match other authors from this publication, i.e. your Flynn & Jacobs (2008).

Figure 1 - You show a very detailed locality map inset. Is this locality extremely well-known so that its exact location is common knowledge, or should a more generalized map be incorporated as the inset map? Has the Burke Museum approved this detailed map for one of their localities?