Dear Dr. Marsicano,

Below are my responses to comments of the two reviewers of my manuscript (Article ID 15937). Many thanks for your time and efforts on this paper.

Nicholas J Czaplewski PhD

RESPONSES TO REVIEWER 1 (Horacek):

COMMENT: “a detailed comparison with extant [Parastrellus] hesperus would be needed.”

RESPONSE: (now lines 357-359): The fossil ETMNH 19285 does have a relatively large p2, and myotodont, unreduced m3 with relatively long talonid somewhat like *Parastrellus* as Reviewer 1 noted. However, the m3 actually is not ‘almost without any hypoconulid’ as the Reviewer thought; instead, the fossil has a well developed hypoconulid as originally described and unlike *Parastrellus*. I re-examined and remade my comparisons of the fossil with *Parastrellus hesperus* and added a few measurements to the manuscript to indicate the size difference between them, but as the Reviewer himself noted, there were not enough similarities to warrant a more detailed comparison between these two.

COMMENT: “row 305 replace 12.5 mm with 1.25 mm”

RESPONSE: (now line 325) Done.

RESPONSES TO REVIEWER 2 (Gunnell):

COMMENT: “(I think it would benefit the paper to have Micro-Ct scans of the petrosal described here in order to better see the detail but this is not a requirement).”

RESPONSE: Reviewer 2 is correct that microCT scans of the petrosal would be preferable to photos of this element. The same could be said for replacing all of the tooth and jaw photographs with scans. Unfortunately, my institution does not have a microCT scanner and I have no funds available to have that petrosal scanned, nor the software or know-how to process the scans. My photographs were produced using a bellows camera with stackshot rig followed by stacking the photos with Helicon Focus software to produce the best photos I can with the resources I have. Given that the reviewer also said “this is not a requirement” under Basic Reporting, I ask not to have to find the funds and scanner to have the petrosal scanned, and that the photographs be considered adequate.

COMMENT: “The only relatively major remark I have is on the discussion of the petrosal - as the author rightly points out, very little work has been done documenting petrosal morphology in vespertilionids or for most other bats for that matter. I found the description relatively difficult to follow based on the illustrations presented - additionally I think the detailed comparative anatomy presented in the discussion section goes far beyond what most readers would be able to discern or understand. It seems clear that this author is working on a more in-depth analysis of bat petrosal anatomy (citing two in prep/review papers) and thus clearly grasps this topic better than most would. Perhaps a scaled down version of the petrosal section would be warranted for this paper since the details of petrosal anatomy across bats has not yet been presented elsewhere.”

RESPONSE: This comment is in strong contrast to Reviewer 1 (who said “The comparison of the cochlear characters is impressive”) and who thus apparently appreciated the detailed discussion of the petrosal rather than asking to reduce it. Regarding Reviewer 2’s comments on the description of the petrosal, understanding the anatomy of the petrosal is definitely difficult (including for me!) for several reasons. In part it is because little previous work has been done on them, especially for bats; the most pertinent references I could find are already cited, and the best of these is old (Stanek 1933), hard to get, and written in the Czech language, which I do not read without a translator. Another problem is orienting oneself to the petrosal bones relative to the axis of symmetry of the cranium; because each petrosal, right and left, has no symmetry itself but only as a mirror image of its contralateral partner, petrosals can be difficult to keep oriented correctly while examining them. This problem is exacerbated by their loose attachment to the skull and the fact that most of each petrosal is hidden from view within the cranium, requiring them to be removed in order to be examined in a manner akin to the fossils. Petrosals are not regularly studied and thus are unfamiliar to anatomists, paleontologists, and mammalogists like myself who more often study teeth or external bones of the skull whose surficial morphology is simpler, easier to see, and is widely illustrated. What is needed is a well-illustrated general overview of the anatomy of intact petrosals from a wide range of bat families, which could be used by paleontologists who discover fossil petrosals like this one, but such an overview is beyond the scope of the present study. Even within the single family Vespertilionidae represented in this manuscript, comparisons of the fossil petrosal with petrosals of all relevant genera would be even more exhaustive and differing among them only in minor esoteric details; thus I had already tried to limit my discussion to a few major descriptive points that I thought would be informative to the average reader, not the specialist.

Possibly for these reasons Reviewer 2 had problems following my discussion of the broken element and wanted it shortened, and why Reviewer 1 contrastingly appreciated the discussion of them. Reviewer 2 is correct that the other in prep/in press articles I am working on have detailed descriptions of petrosals for other fossil bats. Because the petrosal described in this manuscript is broken and less useful for systematic research, in the original manuscript I had tried to keep the discussion of the petrosal succinct for these same reasons. It is necessary to use much unfamiliar but specific terminology for the various petrosal structures and openings in order to describe it in a manner that is consistent with the other literature available for them.

Thus, to accommodate these criticisms and concerns, in the revised version (paragraph in lines 145-188) I tried to reword and simplify the petrosal discussion for Reviewer 2 yet retain some of its usefulness to Reviewer 1 and other readers who might be more familiar with petrosals. I did this primarily by beginning each sentence mentioning some of the major structures followed by details about their condition. I also tried to use parallel sentence construction and active voice throughout the paragraph. I also deleted one sentence and a few other phrases or wording (e.g., regarding breakage) that I thought might cause distraction or confusion.

COMMENT 1): I found the wording of first sentence of the abstract to be very confusing - perhaps it would be best to break this down into two sentences (for example the first line mentions "vertebrate fossils" and then the second line mentions "eight fossils" - no need to repeat "fossils" twice).

RESPONSE: Wording has been changed to clarify, and broken into two sentences.

COMMENT 2): line 43 - should this read "ponds and small streams" instead

RESPONSE: (now line 47) Done.

COMMENT 3): line 67 - in Methods section - some short mention should be made in this section about upper teeth being designated with an upper case letter and lower teeth with a lower case letter

RESPONSE: (now lines 79-80) Done.

COMMENT 4): line 148 - funnel-like (add hyphen)

RESPONSE: (now line 153) Done.

COMMENT 5): line 380 - I think adding some citations for the geographic range and taxonomic makeup of Eptesicus would be appropriate here

RESPONSE: (now lines 403-404) Several citations added here and to References.

COMMENT 6): line 391 - I think it might be good to begin a new paragraph starting with "In any case,"

RESPONSE: (now line 416) Done.

COMMENT 7): line 405 - please add in some citations to support the habitat range of Eptesicus

RESPONSE: (now lines 429-430) Several references added here and to References.

COMMENT 8): line 608 - the Wallace et al. reference is incomplete (no publication information included)

RESPONSE: (now lines 649-650) Wallace et al. reference is completed.