

Thank you for inviting me to review this manuscript by Evers et al. It provides an important contribution to the field by correcting the scientific record, rectifying erroneous conclusions put forth by a previous study (Lichtig & Lucas, 2018). I reviewed not only this paper, but the original article to which this study serves as a reply, and I agree with the conclusions of the current authors that the original study contains numerous errors and resulting unsubstantiated conclusions.

It occurs to me that maybe there is another opportunity here to discuss the utility of making a dichotomous (arguably oversimplified) categorization of aquatic vs terrestrial habitus in turtles. As the authors demonstrate, there are several aquatic “morphs”, many of which correspond to varying degrees of obligate “aquaticness”. While many box turtles may be more aquatic than terrestrial, they rarely swim and can flourish on (wet) land.

How are the impactful the primary outliers, especially *Malacochersus*, *Homopus*, and *Terrapene coahuila*, to the revised analyses? The reason I’m curious is that *Malacochersus*, in particular, is extremely unusual with a shell full of fontanelles, and I can concede understanding the inclination of Lichtig & Lucas to omit it. Perhaps there is even a statistical argument for doing so. I’m not arguing that it necessarily should be omitted, but I would be curious to know how its presence (and those of the other “outliers”) impacts the analysis.

In looking at Table 1 in Lichtig & Lucas, it appears to me that the column headings are switched for all taxa for: 1) Plastron width and Carapace width; 2) Height and Length. Thus, it is not only the values for *Basilemys* that are backwards (as the authors note), but also the data for the adocids and baenids that were included in the Lichtig & Lucas sample. For example, the plastron in *Scabremys* is decidedly not wider than the carapace, nor is its shell taller than it is long. Since the current authors do not include *Adocus* or baenids in their analyses, this Lichtig & Lucas error doesn’t affect the current analyses, but it might be worth pointing out in order to further correct the record.

A 3D model of *Basilemys morrinensis* is available on Morphosource should the authors wish to use it rather than calculating dimensions based on the figures from Mallon & Brinkman (2018).

https://www.morphosource.org/index.php/Detail/MediaDetail/Show/media_file_id/31637).

The first paragraph of the Results indicates that there are general patterns of higher doming in terrestrial versus aquatic turtles, even if the statistical findings are not significant and should not be used predictively. I think this point is worthy of discussion, if only to avoid throwing away the proverbial “baby with the bath water”.

Minor points:

The Introduction is quite succinct. It addresses the primary purpose of the paper, which is to test and ultimately rebut the Lichtig & Lucas (2018) paper. However, I think there is a potential opportunity here to expand the discussion of shell shape and its relation to aquatic versus terrestrial habitus beyond the Lichtig & Lucas study.

P6, second paragraph: Suggest changing “pFDA allows to test if a predictor can...” to “pFDA allows the test of whether a predictor can...”

P7, second sentence: Suggest changing “as was already done by...” to “following” or “as in”.

P7, final sentence: Suggest changing “This is caused by..” to something more precise such as “This pattern is caused by..”

P9, last sentence, “Variation between..” should be “Variation among..”. Between = 2, among = more than 2.

P11, suggest changing “no further support” to “no longer support”.

P11, last sentence: I was a bit surprised to see Naomichelys listed as having a narrow plastron. I tend to think of their plastral as being relatively wide (see Joyce et al., 2014, fig 8). Perhaps it is comparatively narrow in relation to the particularly broad carapace of this taxon? Also, the reference here to Rollot et al. 2022 appears to be a mis-citation to an unrelated paper.

P12, suggest changing “as already said by..” to “as already described by..” or “already indicated by..”

Sincerely,

Heather Smith