Review of hummingbirds SSD

I have read the MS by Avalos, Triana and Klank carefully. Overall, I find this a good and important paper for evolutionary study of hummingbirds. However, I have two main issues:

1. Some parts are unnecessarily long, and some sentences were unclear. The authors should re-organize this ms from the intro, methods to the discussion. Specifically,

a) title: delete “45 species of”

b) intro, both SSD and Rensch’s rule are correlated, especially about the causes, the authors divided them into two parts, and which means their causes would be divided. I suggested combined them (Lines 59-70, Lines 81-96) together.

Besides, the authors even did not introduce well the SSD and Rensch rule studies about birds in the intro. As far as I know, there are a lot of birds studies.

So the format I (just) suggest is: Definition of SSD/Rensch rule — causes/hypotheses of such phenomenon – hummingbirds introduction — aims/predictions.

c) in the discussion, I suggested that the authors discuss the SSD and Renshch’s rule together. For example, Rensch’s rule, the authors discussed the Male-biased SSD in large-sized taxa. But NOT discuss the female-biased SSD (or less male-biased SSD) for small-sized species. These two parts **together** result in Pattern follow Rensch’s rule. However, the author referred to reproductive limits, and agility (mostly explain) at lines 321-338.

d) line 271 Does SSD vary with body size? line 299 Causes of variation in SSD. I think these two parts (and maybe also 319) could be mixed together, Besides, I think the discussion should focus on the causes (line 299) rather than line 271.

2. **Analysis**: About Rensch rule, although non-phylogenetic method and phylogenetic method have similar results based on a plenty of published paper across many taxa. I think, however, phylogenetic RMA is still necessary for this paper (phytools packages, etc.), because the authors including 45 species. Please added phylogenetic analysis information in the methods and results. I think there are phylogenetic trees about hummingbirds even for the global birds. The authors donot have to build trees by themselves, just use published tree.

Besides, about RMA, maybe you can also try “smatr” package, I personally think this is good than lmodel package, But the results are same.

Please see the details below:

Intro:

Line 58: delete “abbreviated”

Lines 79-80: I think here need to say that constraints produce sex-specific upper and lower sizes. Otherwise, it couldnot result in sexual size dimorphism allometry. Noted that this would produce patterns that consistent with both Rensch’s Rule and the inverse one, at least, in theory.

Lines 83-84: So, this would result in what kind of pattern? Please add it

Lines 114-18: I suggested the authors could introduced questions/ predictions here point by points.

Lines 118-128: I suggested the authors introduce their questions and predictions (or others) point by point.

Lines: 128-130: Belong to discussion/conclusion.

Methods:

Lines 165&171: Just mentioned that all morphological data was log-10 transformed for one time.

Lines 166-168: But see Kilmer & Rodríguez (2017) about different opinion in RMA, Noted that, we are still not sure which one is better (RMA or OLS) in terms of Rensch’s rule. So, maybe, at least, we could refer to this here.

Line 199: change “Log10” to “log-10” here and elsewhere. And besides, you already mentioned data were log10 transformed, so you donnot have to mention the log 10 transformed body mass any more.

Results:

Line 190-191:the first sentence was belong to methods.

Line 191: change “size” to “ body mass”

Lines 191-195: I suggest report SDI index is much better than report mass. Also, the authors already provided the mass values in the table. Also,

Lines 208-213, could move to the first paragraph.

Lines 199-205: I suggested move the equations to the plot, and only report the slope (95%CI) and if it is significantly larger/smaller than 1 (and P-values) or not (Isometry)，which is consistent with or Not consistent with Rensch’s rule. That would be much clear.

Lines 214-215: I suggested the authors report Rensch’s rule together with 45-species.

Discussion:

Line 304: what is reverse sexual size dimorphism?

Lines 307-309: the authors explained the male-biased SSD in larger taxa, what about small-bodied taxa, why they exhibited female-biased SSD? Because of (Lines 319 - ) reproductive limits (Lines 329-330) or/and agility hypotheses (lines 331-338)?

Line 327: change “sucess” to “success”.

Lines 353-356 the authors talked a lot about mass (which belong to above discussion), delete or move or use fewer senetnces.

Conclusion

Line 278: “sexual selection”: The authors even did not refer to sexual selection (which is important) in the discussion (they already discussed it, but they did not refer to “sexual selection”).

Lines 387-395: move to the discussion

Plot:

Both x and y axis were range from 0~1.2, why the plots look like a rectangle

Please added an isometric line (slope=1) in both plots.

Line 546: why ln? I thought all data were log-10 transformed based on the method.