Dear authors,

sorry for the delay, but it took me some times to carefully check your statistical analysis. I was particularly worried by your fig 10. You mention that the PCA analysis allows to discriminate between three different faunal assemblages. You justify this result by the possibility of grouping the data points of fig 10 into three shaded areas. The problem I see is that these three shaded area have been drawn by hand, and do not seem to be delimited by statistical criteria. Using your dataset, I calculated the ellipse containing 95% of the data points for each group (upper Paleocene, lower eocene and PETM. If you proceed like this, group 3 (PETM) is not clearly distinguishable from group 1. This similarity is sustained by further analyses (e.g., cluster) even if some of the traditional statistical tests attest their significant difference (variance test). The conclusion should then be that the faunal assemblages of group 1 and 3 are similar, although group 3 displays a greater variability.This point must be clarified. I suggest you to use discriminant analysis methods, like the LDA, or variance tests (such as MANOVA). This would really strengthen your conclusions.
Also, it is not clear whether the "reworking" data should be included in the analysis, since you lost the stratigraphical signal. In addition, I fully understand the reasons of log-transforming the raw dataset. However I question the validity of the replacing values at -0.698970004 as 0 is an informative value in your study. This must be clarified.
I would finally suggest you to use abundance data, despite their numerous biases, in the calculation of diversity indices of similarity between the different groups. This should help to discuss about the faunal turnover through the PETM.
Regarding fig 6, what are the dashed lines representing ?

Finally, the abbreviations used in the data tables are not described in the text and all cells must be filled.

Best regards.

My PCA analysis, with the ellipses containing 95% of the data points. The green envelop is fully included in the red one. Compare with your fig 10.