

Dear Dr., Cédric Hubas,

Please find attached a revised version of the manuscript entitled “Clumpy coexistence in phytoplankton: the role of functional similarity in community assembly” by Caio Graco-Roza et al. Thank you for considering our manuscript for resubmission in PCI Ecology. We would also like to thank the reviewers for the very thorough review. We have now considered the comments and suggestions made by the reviewers and made corresponding changes to the manuscript or explained otherwise the reasons not to incorporate their suggestions. Below we present a point-by-point response to reviewers. We believe the manuscript has now improved substantially.

Yours sincerely,

Caio Graco-Roza

Review of Graco-Roza et al. - Comments to the Authors

Reviewer – In the revised version of their manuscript entitled “Clumpy coexistence in phytoplankton: the role of functional similarity in community assembly”, the authors have addressed most of my comments and made substantial changes to clarify the paper. I would like to thank them for this new version. The ‘Results’ section is now better documented, and the analysis have been detailed to help the reader better understand the study. Although I trust that this paper has the potential to be of interest to the community, the manuscript is still perfectible in both its content and style.

Authors – We thank you for your comments and suggestions. We believe they helped us to make a better and clear point. Below we provide you with a point-by-point response to your new suggestions.

Reviewer – About the form: When I have to review a paper, the main points to evaluate are both the interest for the scientific community and the scientific accuracy and rigour. From my point of view, it is not crucial and fair to evaluate a paper on writing, especially as I am not an English native speaker. I would suggest that the authors get editing help to improve and clarify their manuscript, however. The text is not fluent, with shortcomings; frequent typos, missing

words, ~sentence fragments lead to an annoying manuscript: e.g., lines 86, 92, 96, 99, 106 (x2), 115, 132, 168, 184, 196, 256, 263, 376, 387, 432.

Authors – We agree that the paper deserved much more careful in writing and formatting and we have done much more precise work in this version. Also, the language was checked using a premium version of Grammarly to avoid typos.

Reviewer – It would be useful to ensure homogeneity in the text. For example, the words volume/biovolume is used alternatively in the document; I think the use of “biovolume” when reference is done to the volume of species, would be more correct.

Authors – We now checked the consistency throughout the text. The terms “volume” and “biovolume” have a different meaning in this manuscript. The “volume” stands for the description of individual body size while “biovolume” stands for an estimate for the biomass of the population (i.e., individual volume multiplied by the number of individuals). We now ensure that both terms are not interchanged and provide a precise definition in M&M (lines 190-194).

Reviewer – About the methodology and the results: The use of ‘functional traits’ (see line 187) is not correct. By definition – in a numerical way, at least - a trait is called functional if a relation with the environment is found.

Authors – We removed the word “functional” from the sentence as suggested by the reviewer (now in line 215, 220). However, we would like to stress that the morphological traits used in the present study were evaluated in the effect on functional responses for freshwater phytoplankton (in growth rate, sinking rate, population abundance, etc, e.g., in Kruk et al 2010; Edwards et al 2012) and thus can be termed “functional traits”. The relationship with the environment is mediated by a change in the gain or loss terms related to better fitness in particular environmental conditions, that are ultimately reflected in increased performance (e.g., abundance). The approach here tries to disentangle specific relationships of those traits with the environment.

Reviewer – This is the interest of the RLQ method: to study the relationships between species traits, species abundances and environmental conditions (Dolédec et al. 1996). The RLQ

method is therefore applied to first identify the traits responding to the environment, and consequently being functional, assessing the significance of the R and Q relationship by a randomization test. And then, only the functional traits must be used to calculate functional community metrics.

Authors – We performed an RLQ test combined with the fourth corner method to evaluate the relationship between environmental variables and traits. We now explain the M&M lines 214 to 257.

Reviewer – A minor comment: why did the authors apply different numbers of permutations for their tests: 999; 49999; 99999?

Authors – We set the number of permutations to 999 (line 244) in all tests as it provided similar results.

Reviewer – I wonder why the authors applied first an RLQ and the fourth-corner method, and then the approach that combines both analyses; why not applying directly the second method?

Authors – We agree with the reviewer point. We have now used only the combined RLQ and fourth corner.

Reviewer – A sketch diagram describing the different steps of the methodology used for analysis would certainly help the reader to better understand (see, for example, Breton et al. 2017, in MEPS; 10.3354/meps11974).

Authors – We now provide a sketch diagram with the flow of the analysis as supplementary material (Figure S1).

Reviewer – When looking at the results from the RLQ analysis, I have major concerns about the low correlation values found when environmental values have been correlated to species traits, the highest correlation being $r=-0.10$ (p-value, for each correlation, are missing); such low values cannot be used to assess a patent relation between traits and environmental parameters (see, for example, Breton et al. 2017 for comparison). When looking at the literature, many authors performed data transformation on the environmental values before

performing the RLQ analysis (e.g., log-transformation, root-transformation), especially because environmental parameters show different units and/or range of variation; applying a preliminary transformation on the environmental dataset could help to clarify the results.

Authors – The values provided by the RLQ + fourth corner analysis are expected to be small because of its mathematical properties (as described in Peres-Neto et al., 2017), so in this new version we scaled (as suggested by Peres-Neto et al., 2017) the correlation to its maximum by dividing actual values by the square root of the eigenvalues of the correspondence analysis of L matrix. The largest significant trait correlation is now $r = 0.22$, and the weakest is $r = 0.12$. Regarding the comparison between the values in our study and those from Breton et al. 2017, we believe they are not comparable. Breton et al., used Pearson's and Spearman's correlation to show the relationship between their raw environmental variables or traits and the coordinates in RLQ axes. This approach differs from what RLQ + fourth corner provides. For example, in our study, we found that individual volume and the first RLQ axis had $r = 0.14$ using the fourth corner method. However, when we apply the same method as Breton et al., we get $r = 0.79$. This is because the fourth corner provides a weighted correlation (by species richness) while the Pearson correlation is not weighted (see Dray et al., 2014; Peres-Neto et al., 2017).

Peres-Neto, P. R., Dray, S., & ter Braak, C. J. F. (2017). Linking trait variation to the environment: Critical issues with community-weighted mean correlation resolved by the fourth-corner approach. *Ecography*, 40(7), 806–816. <https://doi.org/10.1111/ecog.02302>.

Reviewer – “[...] we first calculated the functional redundancy (FRed)”: here, only functional traits have been used for calculation, but please, clarify which/or the number of traits. If all traits have been considered (cf. the ‘Results’ section), the low correlations, values considered to assess a trait as functional must be clearly discussed. This possible limitation needs also be discussed when functional distinctiveness has been calculated (Lines 240-259).

“We did not weight the clump-centroid by species abundance and 254 calculated FDis using all species pertaining to the significant clumps”. Could the authors explain why they have proceeded in that way?

Authors – In the current version, only traits with significant relationships were used for distance metrics calculations (L 284 – 286). We did not weight the centroid by species abundance

because this would artificially make species with low biovolume to be more distinct and thus introduce some bias in our analysis (L 309 – 310).

Reviewers – “We thus tested **H2** by conducting Mantel tests with 1000 randomizations, whenever possible [...]”. Could they authors better explain why “whenever possible” as the possible restriction is not clear”? As mentioned above for Pearson correlations, Mantel correlation values are quite low. This must also be interpreted and discussed in the manuscript.

Authors – We added the number of permutations of each test in the table results. It happens that when the number of observed species is small (e.g., five species) the number of total permutations may be smaller than 999 (e.g., $P = \frac{5!}{(5-2)!} = 20$). We also discuss the reasons why we do not find relationships for clump II. It is also noteworthy that riverine phytoplankton communities are highly stochastic and usually show low correlation values when Mantel tests are applied (Nabout et al. 2007; Rocha et al. 2011 for lakes). While we did not find other studies on phytoplankton using Mantel tests in the same context, the studies mentioned above provide evidence that Mantel r are often small for the freshwater phytoplankton community.

Nabout, J.C., de Nogueira, I.S., de Oliveira, L.G. *et al.* Phytoplankton diversity (alpha, beta, and gamma) from the Araguaia River tropical floodplain lakes (central Brazil). *Hydrobiologia* **575**, 455–461 (2007). <https://doi.org/10.1007/s10750-006-0393-8>

Rocha, Marcia R., Ursula Gaedke, and David A. Vasseur. "Functionally similar species have similar dynamics." *Journal of Ecology* 99.6 (2011): 1453-1459.

Reviewer – Figure 3: it would be helpful, for the readers, to explain “loess curves” in the ‘Methods’ section as no information has been given in the current version of the manuscript.

Authors – This figure was removed from the present version.

Reviewer – “[...] by applying a Principal Coordinates Analysis (PCoA) in the species-by-traits data table”. how many axes were retained from the PCoA?

Authors – All PCoA axes were retained as stated in M&M (L 303 – 304).

Reviewer – About the Discussion: Because this study is rich in analyses, results and concepts, it would greatly help if the authors could put into context their results; for example, by adding the numerical values or by referring the reader to the corresponding figures that explain how they conclude on their preliminary hypotheses. In some parts of the Discussion, vague sentence could be redrafted to improve that sections. For example: Line 390. “[...] comprised species from the same MBFG found in previous studies from different systems”. Add more information about this statement: which species? Which ecosystems? Could this information be more relevant by drawing possible hypotheses that explain why such a similarity has been observed?

Authors – Thank you. We have followed the reviewer suggestions and checked the discussion section. We also added some references to figures and tables.

Reviewer – Lines 100-102. “Despite the importance of body size, the use of a single trait as a proxy for the niche may not evidence species differences generated by hidden niches and impair the understanding of clumpy patterns”. My apologies, but this sentence is still not clear (from my viewpoint) because of a short-cut. Feel free to correct me if I am wrong, but my interpretation of the concept is that body size can be used as a proxy for niche difference, not a proxy for the niche (see Wilson 1975, *The American Naturalist* and references therein); When the authors state that “generated by hidden niches”, I wonder if it isn't rather: “generated by hidden/unknown niche axes (i.e. ecological dimensions of the niche), i.e. considering body size only is not sufficient.

Authors – We agree with the reviewer. The sentence was misleading, and we now corrected it (L 105, 111).

Reviewer – Lines 172-185. Phytoplankton samples. First, please avoid the use of biovolume and volume when they both refer to biovolume. Could the authors clarify how they have calculated the significance of their counting as I do not understand the meaning of the p-value and which test has been performed to calculate the significance. When using ‘density’, please add the unit (i.e., cells L⁻¹). “using the appropriate geometrical forms”: please clarify how

you have inferred the appropriate form to each species. Finally, more information about the use of the “Morphological Based Functional Groups” would be helpful (in the Appendixes?)

Authors – We have ensured that the words volume and biovolume are not used with the same meaning. We also removed the significance of the counting methods as we did not estimate it. We included the units of density and explained that the volume of each species was estimated by measuring geometrical dimensions and approximating to defined geometrical forms following Hillebrand et al. (1999) (L 192 – 194). Finally, we included a brief explanation of the morphology-based functional groups in the methods section (L 200 – 207).

Reviewer – Lines 54-56. “[...] *at small spatial scales, [...], as the environmental heterogeneity is expected to be small*”: I am not convinced that environmental heterogeneity is small at small spatial scales, especially when considering the cardinal influence of micro-habitats, physical turbulence processes, advective forces, vertical stratification, etc... Physical factors often vary substantially at small spatial scales: e.g., Bell et al. 1993 (and references therein).

Authors – We agree. We now rephrased the sentence and add local communities instead of a specific mention to spatial scale (Line 56).

Reviewer – Lines 76-77. “However, within a clump, trait differences may be important to species performance in the niche space”: please, clarify this sentence.

Authors – We have developed this idea more thoroughly. (Lines 75–87)

Reviewer – Lines 84-86. “However, although two functionally redundant species most likely show high similarity in trait combination, functional distinctiveness is not directly linked to redundancy, and such metrics are often”. Please, finish that sentence.

Authors – Done (Line 94).

Reviewer – Line 99. “[...] and other eco-evolutionary processes”. Please, clarify this statement.

Authors – Done (Line 108–109).

Reviewer – Line 116. “[...] water flow that affects the morphology, sedimentation patterns”:
what is morphology in this context?

Authors – We have given one example in the text (Lines 124–126).

Reviewer – Line 132. “[...] scales positively [...]”: “are positively related to [...]” or “increase with functional redundancy”?

Authors – The terms are consistent throughout the text in the present version.

Reviewer – Figure 1. Please explain “Posse” and “Bingen” (the weather stations?)

Authors – Posse and Bingen are the weather stations, and now they are correctly mentioned in the text (Lines 161 and 168).

Reviewer – Lines 139-141. “Therefore, species with the most distinct trait combinations with respect to their clump peers are less likely to share same ecological requirements, and by consequence, attain higher abundance.” Does this statement is in line with the Tilman’ concept (1982)?

Authors – As stated, the hypothesis refers to species within clumps, which can present functional distinctiveness. The higher the functional distinctiveness among species, the lower the strength of interaction for resources using different fractions of the niche bar.

Reviewer – Lines 170-171. “[...] can be found elsewhere (Graco-Roza et al. 2020)”. “can be found in Graco-Roza et al. 2020”

Authors – Done.

Reviewer – Lines 183-185. “Species were then classified into Morphological Based Functional Groups (MBFG) according to (Kruk et al. 2010)” More information about the MBFG (i.e. the main criteria added in Table 1) would help to better understand how the authors have classified the species.

Authors – Done.

Reviewer – Lines 195-196. “The p-values were corrected with 49999 permutations of the sites and the species. I do not understand this sentence and permutations “of the sites and the species”. Please clarify or revise this sentence.

Authors – Done (Line 246 – 251).

Reviewer –Line 263. “RLQ analysis; Figure 3; $P < 0.05$ ”. The authors must refer to Figure 2, not Fig. 3.

Authors – Done.

Reviewer – Line 312. “[...] Pseudanabaena sp. 4”. Please, clarify the meaning of ‘4’ for that species.

Authors – We corrected the sentence.

Reviewer – Figure 3. Using cumulative curves or cumulative histograms would help the reading.

Authors – We removed the figure as suggested by the second reviewer.

Reviewer – Figure 4. The legend of this figure is – from my viewpoint – too detailed when comparing with the description of the Results in the current version of the manuscript.

Authors – We would prefer to keep the figure legend as it is, as we believe the figure is complex and the text explores all the elements of the figure.

2nd review of the manuscript written by Graco-Roza et al., entitled “Clumpy coexistence in phytoplankton: The role of functional similarity in community assembly” for PCI Ecology.

Reviewer – I thank the authors for completing a thorough revision, and carefully replying to my comments. I especially appreciate the clarifications on some methods and definitions, and a more complete description of the results than in the previous version. The authors have indeed added a statistical analysis (the RLQ + fourth corner analysis), in order to better analyze the relationships between environmental variables and species traits.

The results section is clearer, and the authors have added a better exploitation of their results. However, there is still room for improvement, and I still have comments to add. Some results would need a better description, in order to be better discussed, and to help the reader to decipher between the results brought by the study compared to what was done before.

Authors – We thank the reviewer for their very careful review. We have addressed the issues pointed by the reviewer. Please find below the answers point by point.

Reviewer – L21-23: “Such a scenario results in a multimodal distribution of species abundance along the niche axis (e.g., body size), namely clumps”. The term “clump” still deserves a clearer definition in the abstract L21-23.

Authors – We have included a more precise description in the abstract (L 21 – 24).

Reviewer – L76: Please avoid the term “important”; does it mean large, relevant, essential...? L84 – 87. Please finish and clarify the sentence. Maybe the sentence should be cut: the first part should be associated with the next example from Coux et al. 2016, then some words on the use of these metrics.

Authors – Thank you. We have followed your suggestions and modified this sentence (Lines 97 – 99).

Reviewer – L101: Add Barabas et al. 2013?

Authors – Done (Line 112).

Reviewer – L169: APHA 2005: please check this reference

Authors – Done (Line 182).

Reviewer – L176: A p-value is indicated, but I do not figure out to which test this refers to ?

Authors – Thank you. We removed the p-value as it referred to the accuracy of the counting method and it was not estimated by ourselves.

Reviewer – L201-202: could you please better explain the combined framework of RLQ + fourth-corner analysis? How are they combined? Hence why is it necessary to apply RLQ, then fourth corner, then combined version of RLQ+fourth corner?

Authors – We agree with the reviewer. We improved the whole RLQ explanation now in lines 214 to 258.

Reviewer – L204-227: I thank the authors for adding some more information to define the “clumpy patterns”. However, in this part, the term “clump” is never explicitly named. I would add a more explicit explanation, answering this question: what did you exactly consider as the clumps?

Authors – After testing the significance of size segments, we considered a significant segment or two consecutive significant segments as a clump. (Lines 277 – 278)

Reviewer – L228: Please add “we first calculated the functional redundancy (FRed) and the differences in biovolume between pairs of species (DiffBiov)...”

Authors – We rephrased the sentence for clarity (Lines 280 – 283)

Reviewer – L229-230: “the functional redundancy was obtained by calculating Gower’s general dissimilarity...”?

Authors – Done (Line 283).

Reviewer – L234: could you please explain how FRed is thus obtained from dj_k ?

Authors – Done (Line 291).

Reviewer – L249: could you please explain how FDist is thus obtained from zcij ?

Authors – We explained it thoroughly in lines 304 – 309.

Reviewer – L256: Could you please explain how is used the variable “clump position”

Authors – The variable clump position is included in the linear model as a fixed categorical factor. The clump position indicated the clump to which a species belongs, in our study, this means whether a species belongs to clump I or II (Line 315).

Reviewer – L266 (and others): what is the p-value associated with this $r = -0.10$? Is there an explanation to obtain such low r values?

Authors – We have changed this to be consistent with the modifications in the methods. We have included the p values of all significant relationships (Lines 326 – 259). Please see the answer to Reviewer one about low correlations.

Reviewer – L272: here, r seems to be equal to 0.09 rather than 0.9

Authors – Done.

Reviewer – L261-L294: The presence of mucilage and aerotopes do not correlate with any of the environmental variables. How could you explain that? Won't it be interesting to mention these results and discuss them?

Authors – Aerotopes and mucilage are structures that allow species to access the euphotic zone of the water column. In a turbulent system such as rivers, the water mixing promoted by river flow inserts species in the euphotic zone making that traits such as aerotopes and mucilage do not confer any advantage to the species and are therefore filtered. However, it is possible that we still find a few species with such traits due to dispersal and mass effects. Those are not expected to relate to environmental variables though. We add a sentence in the discussion with this point (lines 518 – 520).

Reviewer – Table 1: the total number of species is here 150, but this is 148 in Table S1.

Authors – Thank you for this. We included the two missing species in Table S1.

Reviewer – L285-294, Figure 2: Please add in the legend that asterisks reveal the only significant relations.

Authors – This figure has been modified and p-values are now given in the text.

Reviewer – L296-301, Figure 3: What is the rationale to show this figure? This figure is not well described here in the results section and is not exploited in the discussion section.

Please add indications of “upper course”, “medium course” and “low course” under the x-axis of figure A, and “dry” and “wet” under the x-axis of Figure B. This would help the reader to interpret your figure. A maybe naïve question: we can see that MBFG groups IV and VI evolved in an opposite pattern (as a mirror image): when group IV declines group VI arises, and inversely. Won't it be interesting to describe and discuss? The loess method would deserve some words in the methods section.

Authors – Thank you for this very interesting comment. We removed figure 3 as we agree it was out of place in the results and most of the information could be extracted by figure 2. Also, we included in the discussion a possible explanation for the dominance of MBFG IV and VI across the seasons and stretches (Lines 483 – 489).

Reviewer – L318-331, Figure 4: Do the link between the circles mean that species belong to the same clumps? I would add the name of the species together with their code on the figure.

Figure 4C: Apply the same scale on the mean biovolume for the five graphs (from 0 to 0.04 mm³ L⁻¹).

Answer: Yes, the link between circles and the centre indicates that species belong to the same clump, we added this information to the figure legend (L 409, 433). We used codes in figures because the species name would take too much space. At this stage, we prefer to keep the figure showing species codes. Regarding the axis limits, we now applied the same limits for all of the figures.

Reviewer – L332-338: Please add the species code together with the species name: “...Pseudoanabaena sp. 4 (spp 28) and Pseudoanabaena catenata (spp 12)....” to help read the figure.

Authors – Done (Lines 393 – 397; 414 – 420)

Reviewer – L337: “Only ...” instead of “specifically...” since S14 is the only segment with significant entropy values at the lower course.

Authors – Done (Line 419).

L356-358: Could you please precise where (which figure) did you observe that?

Authors – This result is in table 4. We have mentioned it in the present version (Line 443 – 450).

Reviewer – L358-362: Could you explain what is “The upscaling of biovolume”

This sentence should be cut, and please clarify the description of Table 3, and the “take-home message” you want the reader to keep. “The upscaling of biovolume with functional distinctiveness....was particularly different in the wet season” Different from what? In which way is it different? What are the values below each coefficient?

Authors – Thank you for showing this. We have revised the whole paragraph (L 438 – 450).

Reviewer – A lot of details are given in the table (df, residual standard...). If the values are not entirely necessary to understand the analysis, delete them.

Authors – Done. We still keep F-value and df because these are needed for model validation (Table 4).

L364: Maybe you can precise: “... and significant clumps (see Figures 4 and 5)”

Authors – Done (Line 453).

L363-365: Could you add the number of samples for each correlation? This could maybe explain why, for example, for the medium course, the $r = 0.171$ is significant in the overall

condition, while the $r = -0,168$ is not for the Clump II ?

Authors – Done (Table 3).

Reviewer – L367: How can your results, acquired in the Piabanha river, show “that the clumps in body size are a conspicuous feature of phytoplankton community structure in riverine systems...” ? Please moderate or precise that your results, combined with previous ones (e.g. references from Segura et al.), suggest that clumps could be a noticeable feature of the phytoplankton community in river systems.

Authors – We agree with the reviewer. The sentence was rephrased to be more precise (Line 459).

Reviewer – L377: as the abbreviation is used thereafter, L379 and L384, add it here: “...of high dimensional hypothesis (HDH, Clarke et al. 2007).

Authors – Done (Line 470).

Reviewer – L392: Could you please precise what could be these adaptations?

Answer: Thank you. We fixed the text to be more precise about the adaptations (L 483- 488).

Reviewer – L394: “...group IV dominated in low-flow waters with high nutrient input”; where is it described in the results section? SRP and DIN were (significantly?) correlated with Axis 2

Authors – We now included references to the figures in the discussion to help the reader finding the results (Lines 483 – 489).

Reviewer – L395: “group V and VI show different adaptations to survive in turbulent and mixed conditions”: are they different from each other, or different from group IV? Could this be linked to the “mirror” evolution pattern for IV and VI we observed in Figure 3?

Authors – We explained better the different adaptations of species to cope with turbulence in riverine ecosystems (L 483 – 489; 511 – 526).

Reviewer – L400: Maybe again moderate “evident”.

Authors – Done.

Reviewer – L403-405: It remains to be tested the trade-off...” please rephrase

Authors – Done (Lines 492 – 494).

Reviewer – L422-427: Please cut the sentence to make it clearer.

Authors – This sentence was removed from the present version.

Reviewer – L441-442: Please could you add the reference of this statement? Does it come from your results? (but see what is written L392-395 and L437)

Authors – This sentence was removed from the present version.

Reviewer – L418: “...were the main drivers of phytoplankton distribution”; maybe moderate : “..among the traits that we tested”. Would it be interesting to add some words on the presence of mucilage and aerotopes?

Authors – This sentence was rephrased to improve clarity. We also included a sentence about the presence of mucilage and aerotopes (Lines 518 – 520).

Reviewer – L434-437: This should be linked to what was written L392-395.

Authors – With the current modifications in the discussion. We believe this is not an issue anymore.

Reviewer – L437: see what is written L394: nutrient-rich environments were described for species from group IV ; is it also the case for species from group V and VI ? Please also clarify how to link elongated shape and nutrients-rich conditions?

Answer: The elongated shape provides an advantage under low-light environments such as rivers, and the presence of siliceous exoskeletal structures provides resistance to the abrasions caused by river flow. We discussed this results in lines 511 – 526

Reviewer – L63: add a space: “ecological requirements (Gravel al. 2006...)

Authors – Done (Line 64).

Reviewer – L92: “...offer an excellenta highly interesting.....” : please chose : “an excellent...” or “a highly interesting...” ?

Authors – Done (Line 100).

Reviewer – L93: what is speciose ?

Authors – Species-rich communities (Line 100).

Reviewer – L99: add a space : “Litchman et al. 2010) and ...”

Authors – Done (Lines 102)

Reviewer – L106: Please choose between ”uses a” or “is a ...”

Authors – Done (Line 116).

Reviewer – L115: remove “and” in “heterogeneous andsystems”

Authors – Done (Line 124).

Reviewer – L177: remove the bracket inside the bracket, before “Lund...” : “(...p < 0.05, Lund et al. 1998, ...)

Authors – Done (Line 189).

Reviewer – L184: remove the bracket : “...according to Kruk et al. (2010)”

Authors – Done (Line 201).

Reviewer – L282: Replace “WT” by “T”

Authors – Done. We use now the full names of variables in the results (lines 338 – 359).

Reviewer – L309: “Moreover...” instead of “However...” ?

Authors – Done (Line 386).

Reviewer – L376: Chose “hypothesis” or “explanations” in “hypothesisexplanations”

Authors – The sentence was rephrased (Lines 469 – 473).

Reviewer – L387: remove “energetics” in “energeticsenergetics”

Authors – The sentence was removed in the present version.