

Dear Editor,

We have thoroughly checked the text of the whole manuscript and correct grammar/typing error as well as improve the clarity of sentences that were long. We would like to thank you for the few textual issues you pointed out; they have all been considered (as detailed below). We would be really happy to have our paper published in *Biogeosciences* because we believe our manuscript to be very well in the scope of this journal, and thus of interest for the readers of this journal.

Sincerely yours,

On the behalf of my co-authors, Julie Tolu

Answer to the textual issues noted by the Editor:

Line 59: Why not replace bacterial with micro-organisms? Probably it will need to be “derived from residues of plants, animals, fungi and micro-organisms”, that way it also includes archaea and viruses and it separates the micro algae from the plants.

=> Yes, the term “micro-organisms” is more appropriated here.

Line 111: the space after 2009 and no space after the ;

=> Corrected

Line 133: space between pathway and ,?

=> Corrected

Line 160: define Spheroidal Carbonaceous Particle.

=> SCP has been replaced by « Spheroidal Carbonaceous Particle ». We remove the abbreviations because we are not using it thereafter in the manuscript.

Line 220-224: Why not something like “Pyrolysis at 450 °C is preferred to pyrolysis as 650 °C because it avoids complete degradation of some source specific biomarkers and enables determination of degradation status by analysis of Py products of polysaccharides and/or cellulose, syringol lignin oligomers, for instance (Tolu et al., 2015)”?

=> We have re-written the sentence following the Editor recommendation.

Line 279: and to explore

=> Corrected

Line 291: they are instead of there are? They are not significantly correlated... or there are no significant correlations...

=> Corrected

Line 308: is not confined to a specific mineral phase without the s (phases)

=> Yes, the “s” has been removed

Line 319: the SI

=> Corrected accordingly everywhere in the manuscript

Line 331: northern, eastern and central areas

=> Corrected

Line 352: I think it's McClymont with a capital C, same for McInerney (line 466). Check the Mc's.

=> All "Mc's" have been checked and corrected

Line 362: side-chain is or side-chains are, in the first case I will remain contains, for the latter it would be contain (363).

=> The sentence has been corrected.

Line 364: "pyran" compounds have 5 C and 1 O atoms, the heterocycle of dianhydrorhamnose ... consist of.. 6 C's and 1 O. The levosugars ... and levoglucosenone contains a carbonyl group.

=> We have corrected the sentence by adding "atoms" after "5 C and 1 O" but we did not change "the heterocycle of pyran compounds has" by "pyran compounds have", because it is only the heterocycle of pyran compounds that has 5 C and 1 O atoms and not the entire structure of the pyran compounds we identified.

Line 370: in the SI

=> Corrected

Line 381: micro-organism exoskeletons , no s after micro-organism. Now micro-organism is typically used for micro algae, bacteria and archaea (and a few others). I have the impression you mean zooplankton here? Perhaps it would better to state that to avoid confusion. Chitin from small/micro zooplankton exoskeletons...

=> The sentences has been corrected as followed: "Pyrolytic compounds containing an acetamide functional group previously shown to be a good indicator of the presence of chitin, a component of fungi cell walls and arthropod exoskeletons, in biological and geological samples (Gupta et al., 2007)"

Line 384: present also in the highest abundances in the three deepest sampling locations.

=> The proposed correction is not what we want to say. The sentence has, however, been modified as follows: "These three deepest sampling locations also present the highest abundances of pyrolytic compounds containing an acetamide functional group previously shown to be a good indicator of the presence of chitin, a component of fungi cell walls and arthropod exoskeletons, in biological and geological samples (Gupta et al., 2007), phytadienes (i.e., pyrolytic products of chlorophylls; Nguyen et al., 2003), short-chain alkan-2-ones (2K C13-17) and steroids."

Line 405: you can delete existing

=> Corrected

Line 412: defined rather than extracted? Extracted in a paper on OM might be confusing.

=> the term "extracted" that was used to refer to the number of selected PCA to describe PCA outputs has been replaced with "retained"

Line 421: A short summary sentence on the positive loadings is missing. For all the loadings you end with a short "summary". It seems that the positive loading is correlated with.... and... Something like line 432 and 433: Thus, negative

=> The sentence “Therefore, positive PC1OM scores represent samples rich in degraded OM” has been added as a summary for PC1_{OM} positive side, as done for the negative side of PC1 and the others PC

Line 445: long chain n-alkanes are usually related to plant wax lipids not plant cell wall lipids and besides by water they can also be transported by air/wind.

=> Yes, this was an error. Now we have decided to employ the generic term “lipids”.

Line 452: hopanoids derived from prokaryotes, mainly bacteria.

=> Corrected as recommended.

Line 455: in lake algae and micro-organisms. I assume in lake micro algae, diatoms and such, and zooplankton. Micro-organisms also includes things like bacteria and archaea, a much broader term.

=> Here, we wanted to use the broad term. The PC4 positive side which is summarize in this sentence is associated to bacteria OM (see the sentence just above).

Line 466: Check the Mc... spelling

=> Mc’s spelling has been checked and corrected for the whole manuscript.

Line 492: to avoid confusion “these shallower and intermediate water depth sites in the south basin...

=> Instead, the sentence has been rewritten for better clarity.

Line 512: cell wall? Plant wax lipids!

=> corrected

Line 555 accumulation at the bottom? Accumulation bottoms?

=> Our writing is correct, we are talking about different sediment bottom types of sediment focusing model, i.e. erosion bottom, transportation bottom and accumulation bottom. However, we have changed this term to be sure readers will understand properly.

Line 558: such as the surrounding lakes....

=> Corrected

Line 567: is there no water column primary production that sinks to the bottom? At the deepest places this would integrate the largest water column and therefor the most “fresh” organic matter? Sinking particales!

=> Yes, this is also probably happening and we actually talked about it in the last (concluding paragraph) of the sub-section 3.3.1. In these specific lines, we want to mainly discuss the fact that even if there are substantial benthic algal production in shallower areas, as shown by bSi content and strongly supported by literature, the OM, including the algal derived OM, is strongly degraded.

Line 753: McInerney. Oh hey this paper is on leaf wax n-alkanes (not leaf cell wall n-alkanes).

=> Corrected (see comments above)

Line 848: McClymont

⇒ Corrected