

## ***Interactive comment on “Distribution and degradation of terrestrial organic matter in the sediments of peat-draining rivers, Sarawak, Malaysian Borneo” by Ying Wu et al.***

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Received and published: 26 July 2019

In this manuscript Wu et al present data on organic matter distribution in tropical peatlands and rivers in Borneo, focusing on the use of lignin phenols to understand the transformations of terrestrial organic matter. The manuscript is reasonably well-written although there are a few places where the language and grammar could use some cleaning up. I have tried to indicate some of these places in my comments below, although the authors should probably have a native English-speaker go through the manuscript before sending the revised version back to the journal.

In the end I think this will be a useful contribution to the literature. However, I do have a

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number of questions and comments about some aspects of their discussions and the interpretations of their data.

As a general comment, I have a concern that much of the literature data discussed here is (I believe) for POM suspended in rivers, and the data collected here is mainly from surface river sediments. As a result, there may be a little bit of a problem with these comparisons. Organic matter in sediments is processed differently than that which is suspended in the water column because of differences in the two settings in their solid:solution ratios as well as their exposure to oxygen. Therefore, depending on how “stable” the bottom sediments are (i.e., how often they are resuspended into the river, how long they spend in the river before being re-deposited, and then how long they remain deposited as sediments) these differences in environmental settings may impact the conclusions drawn in the comparisons presented here. I will try and point out specific places in the text where I think this needs to be looked at a bit more carefully.

Numbers in parentheses refer to line numbers.

1. (26) – add “phenols” after “aldehyde”.
2. (28-9) – Here and in the conclusions (line 428) and the text (line 395) they refer to “slower degradation”. I think they are really talking about material that shows less evidence of degradation since it’s not clear to me how rates of processes can be inferred from any of the results presented here.
3. (38) - Add “is” before “derived”.
4. (39) – I think “disturb” should be “disturbance”.
5. (59) – While the presence of lignin is an indication of the presence of OC<sub>terr</sub>, its absence is not necessarily an indication of the lack of terrestrial organic matter, since highly degraded soil organic matter may be devoid of any apparent lignin. Perhaps this is a subtlety the authors don’t want to get into, but I wonder if this is worth at least

mentioning?

6. (145) – A microwave “oven”?

7. (154) – I found this whole paragraph very confusing.

8. (160) – A reference or two, and some additional discussion is needed about this index. For example, what kinds of values do you typically see among different end-member materials, fresh versus degraded materials, etc.

9. (203) – Detritus samples are mentioned here for the first time. It’s not clear to me from reading the methods section what they represent and how they were collected. This needs to be clarified.

10. (204-7) – By river “samples” do you mean river “sediments”? Also, I’m not sure I would be willing to say that there were differences between the  $\delta^{13}\text{C}$  values in the peat-draining rivers versus the Rajang.

11. (209- ) – I think Sum8 is defined as per 10 g dw (not 10 mg). Otherwise, many of the values presented here suggest you have more lignin carbon than total material.

12. (257) - The discussion of results in Table 3 is a place where I have concerns about comparing literature data for suspended river POM and data here for bottom river sediments.

13. (270) – The transition here to discussing Arctic sediments is rather abrupt, and the point here is not clear to me.

14. (272) – This sentence (“This study . . .”) says very little and seems out of place here.

15. (287) – The phrase “. . . sediment samples . . . phase” doesn’t make sense to me.

16. (295-6) – I don’t see how these relationships between  $\delta^{13}\text{C}$  and Sum8 relate to Fig. 3.

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17. (303-4) – This is a place where additional information about the LPVI index would be useful.
18. (329) – The correlation in Fig. 4b is very weak at best, and in fact, if you include the sample collected from the Maludam in March 2017 you would probably get just as strong an inverse correlation.
19. (331-8) – Why is there no discussion of the positive relationship between (Ad/Al)<sub>v</sub> and grain size in the Rajang (Fig. 4c)?
20. (343) – I’m not entirely convinced there is a non-linear relationship in Fig. 5b. Fitting a straight line through the data might show a correlation just as good as some of the linear correlations in Fig. 4.
21. (351) – What does “no clear trend” mean, especially in light of the linear correlation discussed on the next line.
22. (359-362) – I think that it would be good to provide a little more detail to support this statement. The fact that the PC analysis says that lignin degradation is different in the Rajang versus the peat-draining rivers is interesting, but it’s not clear to me what that means, and what new information it is giving us about how terrestrial organic matter is processed in these systems.
23. (363- ) – This is another place where I have concerns about comparing literature data for suspended river POM and data here for bottom river sediments.
24. (387) – The phrase “. . . when the conditions microbial preferred . . .” doesn’t make sense to me.
25. (392) – “relative” should be “related”.

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Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-94>, 2019.

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