

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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Revision notes to SC1 bg-2019-94 Distribution and degradation of terrestrial organic matter in the sediments of peat-draining rivers, Sarawak, Malaysian Borneo” by Ying Wu et al.

Comments: 1. Influences of source vegetation on lignin composition should be considered. Line121: Details of soil and plant sampling are not given. For instance, what is the depth of sampling for soil samples? What are the dominant plant species (trees, grasses, shrubs)? A distinct difference between tropical and (sub)arctic peatlands is that vegetation is dominated by woody species in the former versus by Sphagnum in

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the latter. This also explains the high abundance of lignin phenols in the studied river sediments (Line 265). Line 269: Again, I think the discussion of Ad/AI values should be put in the context of vegetation differences. Some grasses in the alpine grasslands of Qinghai- Tibetan Plateau are found to have high Ad/AI values in their roots, for instance (Zhu et al., 2019, Plant and Soil, doi: 10.1007/s11104-019-04035-8).

Reply: Thanks for the great comment, following your suggestion, we explored the literature about the impact of sources of vegetation on lignin composition and the revision is quite benefited from it. The missing information of soil and plant sampling is added in 2.1 study region and sample collection section. The discussion of Ad/AI values in P13 is also revised by considering the vegetation differences as suggested.

Revised: P2 L26-: The selective sorption of acid relative to aldehyde phenols might explain the variations in the (Ad/AI)_v ratio. Elevated (Ad/AI)_V values observed from the Maludam’s sediments may be also attributed to source plant variations. P6 L139- , L144-: The surface sediments were sampled at the middle stream of river using grab samplers from a small boat at each station and then 0 - 5 cm subsamples were collected and frozen (–20°C) until they were dried for subsequent analysis in the laboratory. Soil sampling was conducted at the same time along the Rajang river bank where the sites have minimal human disturbances and short soil cores were collected and mixed in situ as one composite sample for the depth of 0-10cm by getting rid of visible roots and detritus. The vegetation of tropical peat swamp forest is dominated by trees, e.g. the Anacardiaceae, Annonaceae and Euphobiaceae etc. (Page et al., 2006). Fresh, typical vegetations (listed in Table S2) were separately collected by leave, stem and roots, some detritus, which floating at the surface layer of the rivers were also collected for the comparison study. P13L315-: The (Ad/AI)_V values of the sediments sampled here are comparable to fresh and only low to medium oxidized. Elevated (Ad/AI)_V values observed from the Maludam’s sediments (March, 2017) may be also attributed to source plant variations as observed in other study case (Zhu et al., 2019). Comments: 2. Statistics. Tables: Do errors represent standard errors or

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standard deviation? Is comparison of mean values tested by statistical analysis?

Reply: Errors listed in the tables represent standard deviations, the comparison of mean values tested in Figures has been tested by statistical analysis, p values are listed for the information. We add some words in statistics part for the clearness.

Revised: P9 L207-: Errors listed in tables represent standard deviations for the analytical data. Differences and correlations were evaluated as significant at the level of $p < 0.01$.

References: Page, S.E., Reiley, J.O., and Wust, R.: Lowland tropical peatland of Southeast Asia. In: Peatlands: Evolution and Records of Environmental and Climate Changes (eds., by Martini, I.P., etc.) Elsevier, pp145-171, 2006. Zaccone, C., Said-Pullicino, D., Gigliotti, G., Miano, T.M.: Diagenetic trends in the phenolic constituents of Sphagnum-dominated peat and its corresponding humic acid fraction, *Org. Geochem.*, 39, 830-838, 2008. Zhu, S., Dai, G., MA, T., Chen, L., Chen, D., Lu, X. ...Feng X.J.: Distribution of lignin phenols in comparison with plant-derived lipids in the alpine versus temperate grasslands soils, *Plant and Soil*, 1-14, 2019.

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2019-94/bg-2019-94-AC2-supplement.pdf>

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