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Discussions

Interactive comment on "Multi-molecular tracers of terrestrial carbon transfer across the pan-Arctic – Part 1: Comparison of hydrolysable components with plant wax lipids and lignin phenols" *by X. Feng et al.*

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Feng et al., manuscript presented the compositions and distribution of terrestrial organic matter in the Pan-Arctic. The multi-molecular tracers were applied to investigate the molecular composition and source, degradation of hydrolysable compounds from the Arctic region, especially addressed the distribution and fate of suberin- and cutin-derived organic carbon and did the comparison of them with plant wax lipids and lignin phenols. There is very limited information available about the behavior of terrestrial organic matter in Pan-Arctic scale, especially with such detailed studies. The paper

is well written and organized based on their data sets and successfully provided the comprehensive, multi-molecular informants related to the terrestrial organic matter. I have some comments and suggestion about some points: 1) The sediments samples were collected from different years as presented in method part, and more detailed information (e.g., which month which year) may be helpful to improve the reliability of PCA analysis results in discussion part. 2) The information of suberin-signal indicated the root-derived organic matter is more dominant in North American Arctic rivers, how about the hydrodynamic process from the North American Arctic rivers to GRARs? If there is some grain size information available, it will be really helpful. 3) The data of Kalix is quite different from other system, including PCA results, better to well addressed for the reason. 4) Based on the Figure 7, authors summarized (Ad/Al)s can be regarded as source indicators instead of diagenetic parameters, I think the point is not so convincible, since the parameters listed in this figures, all related to the diagenetic status, even root input indicator also has the relation with short chain FA ratios, as discussed in this paper. 5) The implication of Figure 5 is not well organized, I could not see what the main points for those plots are and how to prove it.

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