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Biogeosciences Discussions

Interactive comment on "Distributions of low molecular weight dicarboxylic acids, ketoacids and α-dicarbonyls in the marine aerosols collected over the Arctic Ocean during late summer" *by* K. Kawamura et al.

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Anonymous Referee #2

We thank the anonymous referee #2 for the helpful comments on our manuscript. Below are the point-by-point replies to the comments.

General comments This paper studies molecular distribution and stable carbon isotopic composition of low molecular weight dicarboxylic acids and related water-soluble

organic compounds in the atmospheric aerosols collected over the Arctic Ocean. Similar research has not been reported for the region. It provides new and useful data and knowledge for better understanding the sources and atmospheric processes of these important organics. The methodology used is robust and well documented, their analysis is generally good, and related work is properly cited. The paper is also well structured.

Reply: Thank your for your comments.

Specific comments

Discussion about the sources of these organic aerosols seems to be a bit inconsistent throughout the whole paper. Some clarification might be needed, e.g. whether these organics are produced mainly by sea-to-air emissions or the contribution of atmospheric transport of terrestrial organics is also significant? Alternatively, is it the case that both sources are important but their relative strength varies by samples?

Reply: Yes, both sources are important. To clarify this point, we added a few phrases in the Conclusion section as "This study suggests the Arctic marine organic aerosols are influenced by sea-to-air emissions of marine organic materials and long-range transport of continental aerosols and their precursors followed by photochemical processing in the atmosphere." Please see lines 363-366 in the revised MS

Page 10132, lines 2-4: "These meteorological conditions suggest that degradation of oxalic acid may be overwhelmed by its production in aqueous phase of aerosols possibly in the presence of Fe". This sentence is confusing. You are discussing depletion of oxalic acid here. Did you want to say "These meteorological conditions suggest that degradation of oxalic acid in aqueous phase of aerosols possibly in the presence of Fe may have overwhelmed its production"?

Reply: Based on the comment, I modified the sentence. Please see lines 308-310 in the revised MS.

BGD

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It would be good if medians can be provided for TC and TN concentrations (page 10127) as well as for δ13C (Table 2). A median is more representative than a mean especially for a small sample size.

Reply: Median values are now added in the text and Table 2.

Technical correction Page 10131, line 25: “succinic diacid” should be read as “succinic acid”.

Reply: Corrected.

Interactive comment on Biogeosciences Discuss., 9, 10121, 2012.