

Interactive comment on “Springtime phytoplankton dynamics in the Arctic Krossfjorden and Kongsfjorden (Spitsbergen) as a function of glacier proximity” by A. M.-T. Piquet et al.

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Dear reviewer,

On behalf of my co-authors and myself I would like to thank you for the constructive comments. We will respond to your comments on the following issues: origin of taxonomic groups with regard to Cyanobacteria and Chlorophytes; and the springtime abundance of dinoflagellate and diatom OTUs.

Origin of taxonomic groups: We had another look at our data, in particular the pigment

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data, in order to determine if our results could support a non-marine origin Cyanobacteria and Chlorophytes. Cyanobacteria: Surface and 20 m depth profiles showed highly similar relative cyanobacterial pigment abundances. Yet, we expect cyanobacteria with high buoyancy to stay confined within the upper water layer, so this finding does not provide any clear evidence for a freshwater origin. On the other hand, inner fjord locations did show relatively higher cyanobacterial pigment abundances, which could be an indication for a freshwater origin. Regarding the cyanobacteria, our data cannot provide any conclusive evidence for their origin. However, we should have included a section to their potential freshwater origin in the discussion, this issue will be addressed in the final version of the manuscript. Chlorophytes: We used the same approach for the Chlorophytes and looked at depth and spatial differences, to determine if our data could provide evidence for a non-marine origin of this class within the Kongs- and Krossfjorden system. Chlorophyte pigments were slightly more abundant in surface water samples than in 20m depth samples, in particular at inner fjord locations. However, highest Chlorophyte pigment abundances were found at the “Ocean” station. The relatively higher abundances in surface waters of the inner fjord locations could mean that either chlorophytes of freshwater origin are being fed into the fjord, or that Chlorophytes have a slight physiological advantage in less saline surface waters. On the other hand the relative higher abundance of chlorophytes at the ocean station, suggests a marine origin. Thus, our data do not provide any clear evidence for a freshwater origin of Chlorophytes found in the study area. It merely could suggest and indicate that marine as well as freshwater Chlorophytes were present in the study area. We will also elaborate on the case of Chlorophytes within the discussion section.

OTU dominance of dinoflagellate over diatoms: Although such a comparison is unusual we did provide ample discussion to this matter in the paper. Furthermore we wanted to underline that using different methodologies provide clearest insight in the true diversity, and care should be taken when interpreting molecular data alone to describe community composition.

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Specific comments: P19, L.18: Glaciers, and P 21. L.1 Oceanic will be corrected to non-capital letters. P.21, L.1-2: Yes, will be corrected. Table 2. Yes, we will correct the spelling of Gyrodinium cf. gutrula. P.34, L.5: will be corrected to “was based on”

Anouk Piquet

Interactive comment on Biogeosciences Discuss., 10, 15519, 2013.

BGD

10, C8168–C8170, 2014

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