

Interactive comment on “Effects of varied nitrate and phosphate supply on polysaccharidic and proteinaceous gel particles production during tropical phytoplankton bloom experiments” by A. Engel et al.

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Anonymous Referee #2: General comments: Very little is still known about CSP formation and dynamics and even for TEP many questions about their dynamics remain. This paper is generally well written and indeed addresses a noteworthy issue as to what effects varying nutrient supply and stoichiometry will have on marine gel particles. However, I fully agree with the general comments made by the anonymous reviewer #1, especially regarding the disconnection between the abstract introducing the potential for increased OMZ zones, global change impacts, etc, and the main body

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of the manuscript itself. Reading the abstract would lead the reader to believe quite a different story would follow. If the decision is made to keep this reasoning, then it will have to be fully integrated and explained also in the introduction and discussion parts. We are, however, clearly shown how TEP and CSP particles behave differently and relate differently to the other measured biogeochemical parameters. Despite it being a mesocosm approach with inherent difficulties we can observe these differences already over this short time period. However, it needs to become clearer as to whether potential changes in phytoplankton community (see below) could have affected this. Overall, this certainly brings forward the field on marine gels in relation to CSP formation and dynamics in comparison to TEP since very little data has still been published on these particles.

Response: As mentioned in the response to referee 1, we will adopt this suggestion and expand the discussion on the impact of altered nutrient concentration and stoichiometry on marine gel particles with respect to biogeochemical consequences of oxygen minimum zones.

Referee: Specific comments: Comments by reviewer #1 also reflect my concerns. In particular, I would like to see some information given on the phytoplankton community composition.

Response: The species composition of the phytoplankton communities was not assessed quantitatively. However, we did not notice obvious differences between mesocosm of each experiment. Small initial differences with respect to the cyanobacterial population were determined and are included in Meyer et al (2015, BGD doi:10.5194/bgd-12-9991-2015).

Referee: Already stated by anonymous reviewer #1: a mesh was used I presume? What size was the mesh and if no mesh was used, what is the reasoning behind this, as this would have serious consequences for these mesocosm experiments.

Response: A mesh was not used in order to avoid changes of the community com-

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position tested, compared to the natural situation. Moreover, cells may break during mesh filtration, which would potential lead to higher DOM release and bias gel particles formation.

Referee: P6594 L23: So only one beaker was taken from which all subsamples for the various analyses were obtained? What volume did the beaker have? Also where was this sampled i.e. was it thus only surface water? Was the water in the tank mixed before sampling? Please clarify this for the reader. This would have an impact on how representative the sample is. If there was any mixing then this would have had to be very gentle to not influence gel particle formation, etc., so I presume there wasn't any? The depth of sampling would also affect gel particle abundance since it can be expected that particles will potentially settle out as they aggregate and bloom dynamics change.

Response: The beaker had a 10 L volume and 5.5-7 liter were sampled from each mesocosm at the surface. The mesocosms were gently mixed prior to sampling to obtain representative samples for the entire mesocosm. We will add this information to the manuscript.

We thank the referee for carefully reading our manuscript and for providing specific and very helpful comments. We will adopt these suggestions where appropriate.

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