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Interactive comment on “The role of iron species on the competition of two coastal diatoms, *Skeletonema costatum* and *Thalassosira weissflogii*” by S.-X. Li et al.

Anonymous Referee #2

Received and published: 14 February 2014

General Comments: This study investigated the effects of N, P and Fe enrichment on the growth of, and competition between, two diatom species: *S. costatum* and *T. weissflogii*. It also looked at how these enriched macronutrient concentrations affected the solubility, and by extension bioavailability, of different Fe species. The nature of the Fe species was a stronger determinant of algal cell density and growth, and organically complexed dissolved Fe was the most bioavailable species. This article requires significant editing and proofreading before its scientific merit can even be considered. In its current form, the poor writing detracts from what is otherwise an interesting study.

Since much of the text needs major revision, I have only highlighted the words and passages that warrant the most attention. In general the authors should devote more

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attention to the interpretation of their results. They also need to be consistent with their units of concentration and be clearer when discussing the significance, or lack thereof, of their findings.

Specific Comments for the MS: - Page 19607, Section 2.1, Lines 1 - 2: How did you test for biological and/or trace element contamination? Be more specific.

- Page 19607, Section 2.2: This needs to be rewritten. A simple list of all the instrumentation that was used is not acceptable.

- Page 19607, Section 2.3, Lines 16 - 17: You should provide a reference, or several, for your FIA methodology.

- Page 19607, Section 2.3, Lines 19 - 21: What ICP-MS methodology did you use to measure the Fe concentration? Standard additions? Isotope dilution? Again, you need to be more specific or at least provide a reference.

- Page 19607, Section 2.3, Lines 1 - 2: How could you accurately measure this Fe concentration if your detection limit was 0.4 nM?

- Page 19608, Section 2.4, Lines 11 - 12: Why did you not add trace metals to the culture medium?

- Page 19609, Section 2.5, Lines 8 - 9: How were N, P, and Fe concentrations in the medium tracked over the time course of the experiments?

- Page 19609, Section 2.5, Line 10: What is the distinction between Fe absorption and Fe uptake? Or does Fe uptake represent the sum total of Fe absorption and adsorption?

- Page 19610, Section 2.6, Lines 6 - 8: Why were the filters rinsed with NaOH and HCl?

- Page 19610, Section 2.6, Lines 10 - 11: The equation should be separated from the rest of the text to make it easier to read.

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- Page 19610, Section 2.6, Lines 13 - 16: I assume that you mean that these different Fe size fractions were added to different vessels containing acid?
- Page 19610, Section 2.6, Lines 16 - 17: What were those concentrations?
- Page 19610, Section 2.6, Line 23: How did you obtain an exact concentration of 1.8 μM for all the different Fe species that you added?
- Page 19612, Section 3.2, Line 5: Why might Fe adsorption at 64 μM N decrease for *T. weissflogii*, but not *S. costatum*?
- Page 19615, Section 3.5, Lines 12 - 18: This passage is confusing. Rewrite it so as to make it clearer what relationships were, or were not, statistically significant. Given these results, you should also consider toning down the language in the previous paragraphs to convey your results' general statistical insignificance.
- Page 19615, Section 3.6, Lines 26 - 28: How would macronutrient enrichment potentially affect diatoms' production of extracellular organic compounds?
- Page 19616, Section 3.6, Lines 13 - 17: Again, you need to be clearer about what particular relationship is statistically significant—I would drop the word “extremely.”
- Page 19617, Section 3.7, Line 7: “Severest” is a poor word choice; I would rephrase this passage.
- Page 19617, Section 3.7, Lines 24 - 26: You need to explain, and provide a reference (or several) for, how particulate Fe might “enrich the macronutrients.”
- Page 19617, Section 3.7, Lines 27 - 29: Why might higher P concentrations lead to *S. costatum* cultures entering the stationary phase more quickly?
- Page 19618, Section 3.7, Line 7: You need to define in the text what C1, C2, C3, and C4 represent.

Specific Comments for the Tables/Figures: - The caption for Table 5 is unclear and

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needs to be rewritten.

- You should use the same colors/patterns to represent the Fe fractions of coastal algae A and B in Fig. 3 and 4 to avoid confusion.

Technical Comments: - Page 19610, Section 2.6, Line 26: Change “0.165 μM ” to “0.165 nM.”

- Page 19612, Section 3.2, Line 22: Add “respectively” at the end of the sentence.

- Page 19613, Section 3.3, Line 11: Replace *P. donghaiense* with *T. weissflogii*.

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