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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 #1

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"The role of iron species on the competition of two coastal diatoms, Skeletonema costatum and Thalassosira weissflogii" by Li et al.

This paper presents the iron adsorption and absorption by the cells of T. weissflogii and S. costatum under different nutrient regimes and the growth of T. weissflogii and S. costatum under different nutrient regimes by addition of different iron species (dissolved, colloidal, and particulate Fe) from their culture medium. The data presented in the current paper is of good quality and the interpretations for the influences of N and P addition on iron adsorption and absorption by two coastal diatoms and of different iron

species addition from their culture media on the growth of their diatoms are of interest to marine chemistry and biology community. However, I have a few most important comments as described below.

General comments (a) Line 16 on page 19609: Authors have to indicate what kind of trace metals clean reagent to remove surface-bound Fe you used and references for the trace metals clean reagent. (b) 3.1, 3.2, 3.3, 3.4 in 3 Results and discussion (Pages 19612, 19613, and 19614): Without indicating the cell density (growth rate) and cell size after culture experiment for 4 days, authors should not discuss the iron adsorption and absorption by the cells of T. weissflogii and S. costatum under different nutrient regimes. After culture experiments for 4 days, the cell density (1x104 cells/ml at start) and cell size of T. weissflogii and S. costatum may be remarkably different under different nutrient regimes and the cell density and cell size of T. weissflogii may be remarkably different from those of S. costatum. Therefore, authors need to present the cell density and iron adsorption and absorption per cell surface area and per cell volume, as new Figures, in addition to the cellular iron (fmol/cell, Figs 1 and 2) for the culture experiments of T. weissflogii and S. costatum under different nutrient regimes. So, you can suggest that "the degree of influence of macronutrient additions on the cell size of S. costatum was more significant than that of T. weissflogii, ——" (Line 22–25 on page 19612) and "Fe adsorption was most likely to be affected by the following five factors: (1) the amount of surface basic groups on the cell surface, (2) the cell size, ——" (from line 25 on page 19612 to line 2 on page 19613). (c) 3.6 in 3 Results and discussion (Pages 19615 and 19616, Table 1): We are very interested in the distribution (Table 1) of iron species (dissolved, colloidal and particulate Fe concentrations) from the culture medium under different nutrient regimes. We would like to know each iron species amount per cell, which is calculated from each iron concentration and the cell density after culture experiment for 4 days under different nutrient regime. So, we can know which culture media can produce more extracellular organic ligands complexing with iron per cell. Please add the data (cell density and each iron species amount per cell) into Table 1.

Minor comments (a) Line 20 on page 19606: Cancda (Ottawa, Canada) –» Canada ((Ottawa, Canada) (b) Line 21-22 on page 19612: Iron diffusion decrease (or an increase) with a decreasinge (or increasing) of cell size. —-» Iron diffusion decreases (or increases) with decreasing (or increasing) cell size. (c) Line 11 on page 19613: P. donghaiense —-» T. weissflogii (d) Line 24 on page 19614: Fig. 3 —-» Fig. 2

Interactive comment on Biogeosciences Discuss., 10, 19603, 2013.