

Review of Gao et al., "Regulation of inorganic carbon acquisition in a red tide alga (*Skeletonema costatum*): the importance of phosphate availability.

This is a review of a resubmitted, revised manuscript, which I originally reviewed. The authors should be commended for taking the original reviews from myself and another reviewer and making substantial changes and additions to their manuscript. The revised manuscript is improved, and I believe is suitable for publications following some minor revisions I list below.

-One overarching question still remains to me: if P concentrations are important to these carbon concentrating mechanisms, which in turn promote bloom formation, what is the likelihood that these higher P concentrations will be available during a bloom, as P is drawn down along with CO₂ during a bloom? It seems that the P would become as unavailable as CO₂ during bloom formation, and thus not able to be utilized by in these CCMs, unless nutrient conditions are quite eutrophic. Perhaps the authors can speculate on this question in the discussion?

Minor Comments:

-P5L51: these common and unusual family notations (alpha, beta, sigma etc.) are not really explained, and unfamiliar to me

P5L54: remove "." after "fixation"

-P5L67 remove "in" from "that in S."

-P6L71 define ATP

-P6L90- change to "Our study provides helpful..."

-P7L98- change to "set as 200..."

-P7L109- change to "blooms"

-P8L114 change "till" to "until"

-P8L116 changes to "units"

-P8L122-134- these lines are all indented and do not need to be

-P8L130-132- this is a direct copy of the previous statement in P8L118-120

-P9L135- what is "photosystem II"?

-P9L139 change to e⁻¹

-P12L203- change to "no further"

-P18L337- change to "exactly the same"

-P18L348- change to "based on experiments"

-P18L352- change to “directly, and whose photosynthesis...”

-P19L366- change to “In the development of red tides, the pH in seawater can be...”

-P19L376- change to “*S. costatum* in order to overcome ...”

-P20L382- change to “overcome CO₂ limitation...”

-P20L385- change to “mechanisms that help *S. costatum* dominate algal blooms.”