Author's Response

1. Editor Initial Decision: Publish subject to technical corrections (05 Mar 2014) by Dr. Koji Suzuki

Comments to the Author:

Thank you very much for submitting your manuscript to Biogoesciences. Before it is published on the website of Biogeosciences Discussions, please consider my technical suggestions below.

L95: Cite a reference for the modified f/2 medium.

Response: Added "(Si not enriched)" after it.

L113 and thereafter: The middle dot between the units (i.e., cells and mL) is unnecessary.

Response: turn the dot into a blank space.

L113: Concentrations of Chl a, …

Response: Added "(Concentrations of Chl a were 0.23–0.64 pg cell-1)".

L137: Indicate the types of LEDs for Water-PAM.

Response: Replaced "(WATER-PAM, Walz, Germany)" with "(WATER-ED-PAM, Walz, Germany)".

L199 and thereafter: Use en dash, not tilde for the ranges (e.g., 0.732−0.751).

Response: Replaced all tildes with dashes.

L411: Remove the underline for the doi number.

Response: Done.

Table 1: Use black lines, not green ones.

Response: Done.

Table 2: Use single lines, not doublets.

Response: Done.

2. Remarks from the Typesetter in discussions-typeset manuscript version1

p16 ln 15: Please update if possible.

Response: Done.

p17 ln 29: Please check url.

Response: Done.

p17 ln 29: Please provide last access date.

Response: Done.

Table 1, 2, 3: Please provide explanation for superscripts.

Response: Done.

3. Response to anonymous referee 1:

Biogeosciences Discuss., 11, C2294–C2295, 2014
www.biogeosciences-discuss.net/11/C2294/2014/

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Discussions
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Interactive comment on "A red tide alga grown under ocean acidification up-regulates its tolerance to lower pH by increasing its photophysiological functions" *by* S.-W. Chen et al.

Anonymous Referee #1

Received and published: 9 June 2014

This paper provides interesting and useful information on the photosynthetic physiology of a red tide algal species, Phaeocystis globosa, to different pH levels induced by CO2 enrichment. The authors suggested that that P. globosa is able to acclimate to seawater acidification by increasing its energy capture and decreasing its non-photochemcial energy loss. This paper is given in a sufficiently clear way. The experiments were reasonably performed. The data analysis was satisfactory and the results were clearly presented. The figures and tables were all adequate. The authors discussed their results reasonably within a physiological and ecological context. The conclusions were justified. Therefore, in my opinion, this paper is acceptable for final publication in BIOGEOSCIENCES.

Response: We are pleased to receive such positive comments on our paper and are grateful for the referee's positive feedback. Clearly no changes to the manuscript are required in response to these comments.

4. Response to anonymous referee 2:

Biogeosciences Discuss., 11, C2595–C2596, 2014
www.biogeosciences-discuss.net/11/C2595/2014/

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Interactive comment on "A red tide alga grown under ocean acidification up-regulates its tolerance to lower pH by increasing its photophysiological functions" *by* S.-W. Chen et al.

Anonymous Referee #2

Received and published: 17 June 2014

The study of Chen et al. helps to explain some of the heterogeneity in the responses of non-calcifying algae to elevated pCO2. It clearly states that the used irradiance and the acclimation state towards elevated pCO2 are crucial for the observed response to OA. The underlying physiology is well examined and the findings should be considered for all subsequent studies in ocean acidification research. Consequently, the findings are a clear step forward in OA-research. The objectives of the study and the state of the art are well introduced and the experiments precisely described, easily allowing a reproduction. The results are clearly presented and the discussion is rational and logical. The discussion is taking in to account the positive effects of elevated pCO2 and the negative effects of a lowered pH, a very valuable approach. Since the authors also discuss the constitutive CCM-type of Phaeocystis globosa and are able to relate their findings to the current scientific knowledge the physiological discussion of the results is sound and inspiring. The conclusion of the ecological impact, which the observed findings will have, are modest and careful expressed. In my opinion this study is publishable without any changes and should be accepted.

Response: We are glad that our study was seen in such a positive light by this reviewer. It is clear that no further modification of the paper is necessary.

5. Our final author comments

We were delighted that the referees' comments on our study and manuscript were so positive. Since neither referee pointed to matters for changes and improvement, we wish to submit our paper for publication in *Biogeoscience* in its present state.

A list of changed parts

1. Changes after editor initial decision (05 Mar 2014) by Dr. Koji Suzuki

L95: Added "(Si not enriched)" after "the modified f/2 medium".

L113 and thereafter: turn the middle dot between the units into a blank space.

L113: Added "(Concentrations of Chl a were 0.23–0.64 pg cell-1)" after "0.9–1.1×10^5 cells·mL^{-1}".

L137: Replaced "(WATER-PAM, Walz, Germany)" with "(WATER-ED-PAM, Walz, Germany)".

L199 and thereafter: Replaced all tildes with dashes.

L411: Remove the underline for the doi number.

Table 1: Turned green lines into black ones.

Table 2: Turned doublets into single lines.

2. Changes after the typesetter in discussions-typeset manuscript version1

L6: "S-W. Chen[1,2], J. Beardall[3] and K-S. Gao[2]*" has been extended as "Shanwen Chen[1,2], John Beardall[3] and Kunshan Gao[2]*".

L457: "in press" has been updated as "doi.org/10.1071/FP13247 (Published online)".

L487: "http://cdiac.ornl.gov/oceans/CO2rprt.html, 1998" has been updated as "http://cdiac.ornl.gov/ftp/co2sys/CO2SYS_calc_DOS_v1.05/. Accessed 21-Dec-2012".

L581: "Different superscripted letters indicate significant differences" has been modified as "Superscripts with different letters indicate significant differences between groups".

L586: "Superscripts with different letters indicate significant differences between groups" has been added between "respectively" and "The data".

L597: "Superscripts with different letters represent significant differences among treatments" has been modified as "Superscripts with different letters indicate significant differences between groups"

3. Changes after the typesetter in discussions-typeset manuscript version2

L95: 'riched' has been modified as'enriched'

L185-186: 'the significant difference' has been modified as 'the significance of differences'.

L257: ‘Discussions' has been modified as ‘Discussion’.

L413: ‘*coccolithophores*’ has been modified as ‘coccolithophores’.

4. Changes after the Interactive Public Discussion

p16: Acknowledgements was changed as follows:

This study was supported by Joint project of NSFC and Shandong province (Grant No. U1406403), National Natural Science Foundation (No. 40930846, No. 41120164007), Strategic Priority Research Program of CAS (Grant No. XDA11020302), National Basic Research Program of China (2011CB200902), Program for Changjiang Scholars and Innovative Research Team (IRT0941) and China-Japan collaboration project from MOST (S2012GR0290). JB’s work on climate change effects on algae has been funded by the Australian Research Council and his visit to Xiamen was supported by “111” project from Minstry of Education.