

## ***Interactive comment on “Simultaneous shifts in stoichiometric and fatty acid composition of *Emiliana huxleyi* in response to environmental changes” by Rong Bi et al.***

### **Anonymous Referee #1**

Received and published: 7 June 2017

General comments: This study is an important step in understanding the interactive effects of environmental factors on coccolithophores. The paper has been well written. My general comments are as follows:

Line 30: “PIC” for the first appearance, should be marked it’s the abbreviation of “particulate inorganic carbon”. Also for “POC”. Line 31-32: “10:1, 24:1 and 63:1” are the ratios of N:P, the unite ”mol mol<sup>-1</sup>”, not necessarily shown. Line 87-92: “*E.huxleyi* is expanding its range poleward”, why then gave an example of the subtropical area. Line 149-151: “The target values were chosen to reflect a present and future regime of each factor”, however, the pCO<sub>2</sub> concentrations 560 and 2400  $\mu$ atm they used, can hardly

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be considered reasonable. An explanation why a gap in the CO<sub>2</sub> concentrations was so big. Line 172: Can they write in detail about how “the specific growth rate of 20% of  $\mu_{\max}$  was applied”. I’m curious and puzzled about the reason and methods of how the 20% of  $\mu_{\max}$  ( $\mu$ ) was realized. Usually, specific growth rate is not expressed by %. Line 175-176: They said that the incubation water was exchanged with fresh seawater, since the culture medium was partially renewed according to the renewal rate D, the N:P ratios might deviate the target supply ratios in the remained medium due to differential consumption of N and P, can they give some information to show that the N:P supply ratios are stable after several rounds of renewal. Line 178: It seems that the cell concentration was extremely high, the cell concentration range should be provided. Line 180: What do the authors mean by “the net growth rate (r)”, what’s the difference between r and  $\mu$ ? Confusing wordings or mis-understood definitions? Line 203: Here “was” should be “were”. Line 241: Is this theory applicable in all species and in any conditions. Line 1103: Why there is no panel for the pCO<sub>2</sub> effect in Fig. 2. Line 1112: As I read from the “experimental setup” part, this study investigates the combined effects of temperature, pCO<sub>2</sub> and N:P supply ratios on *E.huxleyi*. Why in Fig 3. the combined effects of N:P supply ratio and pCO<sub>2</sub> are not considered, i.e. pCO<sub>2</sub> is not considered in panel (a), (b), (c), and N:P supply ratio is not considered in panel (d), (e) and (f). The same question for Fig. 4, 5 and 6.

Major revision is needed

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Line 172: Can they write in detail about how "the specific growth rate of 20% of  $\mu_{max}$  was applied". I'm curious and puzzled about the reason and methods of how the 20% of  $\mu_{max}$  ( $\mu$ ) was realized. Usually, specific growth rate is not expressed by %.

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Line 1103: Why there is no panel for the pCO<sub>2</sub> effect in Fig. 2.

Fig. 1.