

Review on 'Hyposalinity tolerance in the coccolithophorid *Emiliana huxleyi* under the influence of ocean acidification involves enhanced photosynthetic performance' by Xu et al. (2019, BGD)

Reviewer #1 has already written a detailed review which contains most of my concerns and I have only few comments to add. I was not able to reproduce the calculated carbonate system parameters given in Tables 1 and 2.

p. 6, L108: If the manuscript by Wulff et al. (2016, BGD) is cited at all, it should be clearly stated that it has never been accepted by Biogeosciences.

p. 6, L116: "Sterilized seawater was enriched with Aquil medium (Sunda et al., 2005)." How much Aquil medium did you add to sterilized seawater?

p. 7, L127-128: "... the salinity of our artificial seawater (Harrison, 2005) ..." Which culture medium (sterilized seawater or artificial seawater) was used for the experiments?

p. 41 Table 1: I have used the MATLAB version of CO2SYS (CO2SYS originally by Lewis and Wallace 1998; Converted to MATLAB by Denis Pierrot at CIMAS, University of Miami, Miami, Florida; Vectorization, internal refinements and speed improvements by Steven van Heuven, University of Groningen, The Netherlands. Uploaded to CDIAC (<http://cdiac.ornl.gov/oceans/co2rp.html>) at June 11th, 2009.) and obtained results that are different from the ones given in Table 1 (same for Table 2, data not shown). My input parameters are listed in the MATLAB script given below. The differences might be caused by deviations in nutrients or salt composition of the culture medium from seawater, however, I could not find any information about such deviations in the manuscript.

The last column of Table 1 gives $p\text{CO}_2$ in ppm: it should either read $p\text{CO}_2$ or $f\text{CO}_2$ in μatm or mixing ratio, $x\text{CO}_2$, in ppm.

25	25	30	30	35	35	salinity	input
8.01	7.61	8.07	7.68	8.09	7.71	pH (NBS)	input
1480	1511	1735	1787	1978	2019	TA	input

1402	1515	1609	1765	1807	1973	DIC	output
1361	1479	1555	1725	1749	1931	DIC	Table 1
16.9	46.2	15.5	42.5	15.4	41.4	CO2	output
12.2	33.2	11.0	31.0	11.4	31.5	CO2	Table 1
435	1190	410	1125	420	1129	xCO2 (ppm)	output
388	1036	360	998	384	1045	pCO2 or xCO2? (ppm)	Table 1

My MATLAB script:

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pHNBS1 = [8.01,7.61,8.07,7.68,8.09,7.71];
S1 = [25,25,30,30,35,35];
TA1 = [1480,1511,1735,1787,1978,2019];
L = length(S1);
for j = 1:L
par1type = 1; % The first parameter supplied is of type '1', which is 'alkalinity'
par1 = TA1(j); % value of the first parameter
par2type = 3; % The first parameter supplied is of type '3', which is 'pH'
par2 = pHNBS1(j); % value of the second parameter
sal = S1(j); % Salinity of the sample
tempin = 15; % Temperature at input conditions
presin = 0; % Pressure at input conditions
tempout = 15; % Temperature at output conditions
presout = 0; % Pressure at output conditions
sil = 10; % Concentration of silicate in the sample (in umol/kg)
po4 = 2; % Concentration of phosphate in the sample (in umol/kg)
pHscale = 4; % pH scale at which the input pH is reported ('1' means 'Total Scale')
k1k2c = 4; % Choice of H2CO3 and HCO3- dissociation constants K1 and K2 ('4' means 'K1 and K2')
kso4c = 1; % Choice of HSO4- dissociation constants KS04 ('1' means 'Dickson')
% Do the calculation. See CO2SYS's help for syntax and output format
A=CO2SYS(par1,par2,par1type,par2type,sal,tempin,tempout,presin,presout,sil,po4,pHscale,k1k2c,kso4c);
DIC1(j) = A(2); % disp('DIC (mumol/kg)')
HCO31(j) = A(21); % disp('HCO3out (mumol/kg=')
CO31(j) = A(22); % disp('CO3out (mumol/kg=')
CO21(j) = A(23); % disp('CO2out (mumol/kg)')
xCO21(j) = A(32); % disp('xCO2out (ppm)')
pHSWS1(j) = A(38); % disp('pHout_SWS')
end

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