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Resilience to temperature and pH changes in a future climate change scenario in six strains of the polar diatom *Fragilariopsis cylindrus*

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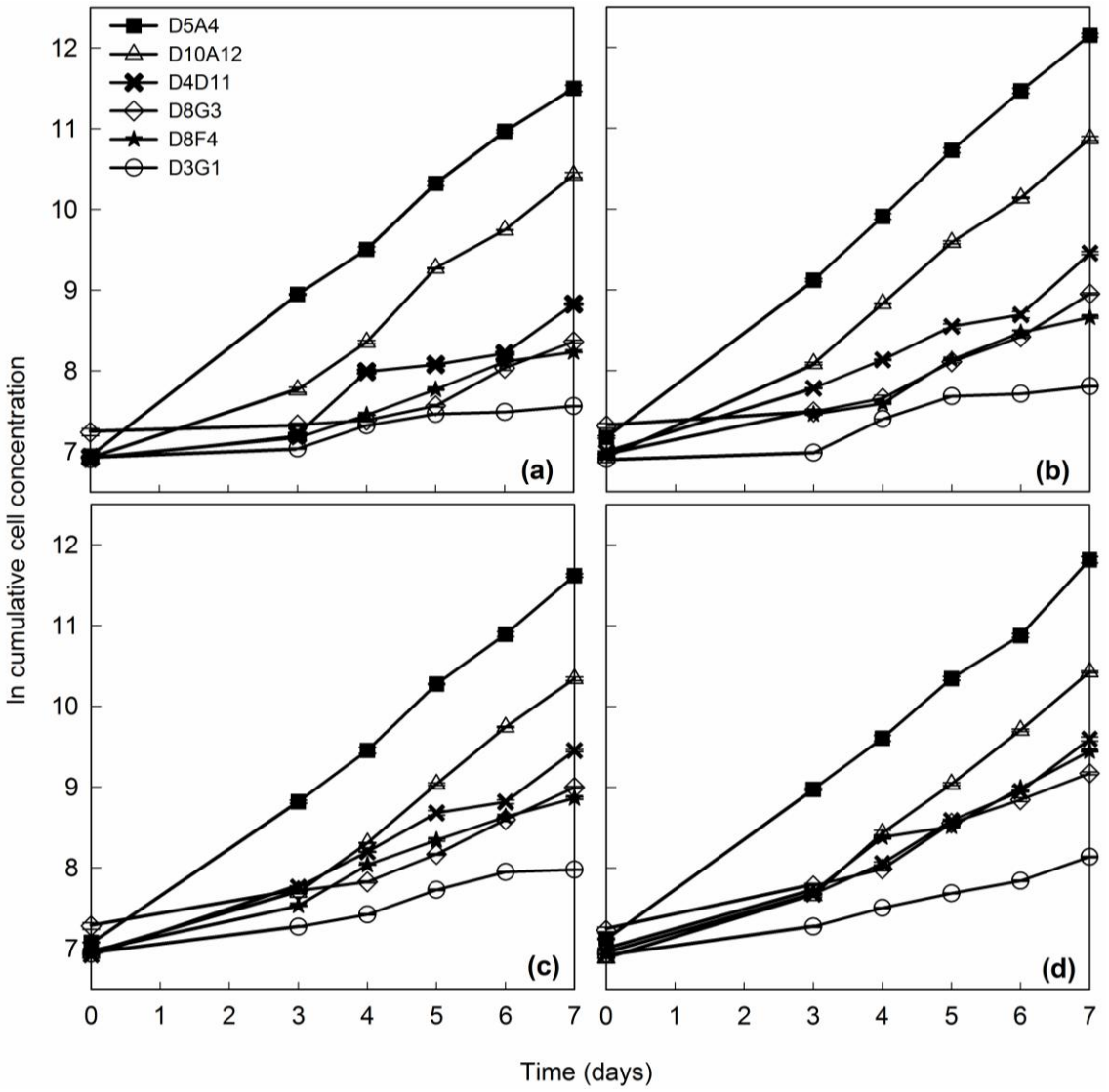


Figure S1. An example of cumulative logarithmic cell concentration versus time for strains D5A4, D10A12, D4D1, D8G3, D8F4 and D3G1, cultivated at 5 °C and a pH treatment of **(a)** 7.1, **(b)** 7.4, **(c)** 7.7, and **(d)** 8.0. Day 0 to day 3 were set as part of the acclimation period and not included in the results. Error bars represent ± one SD.

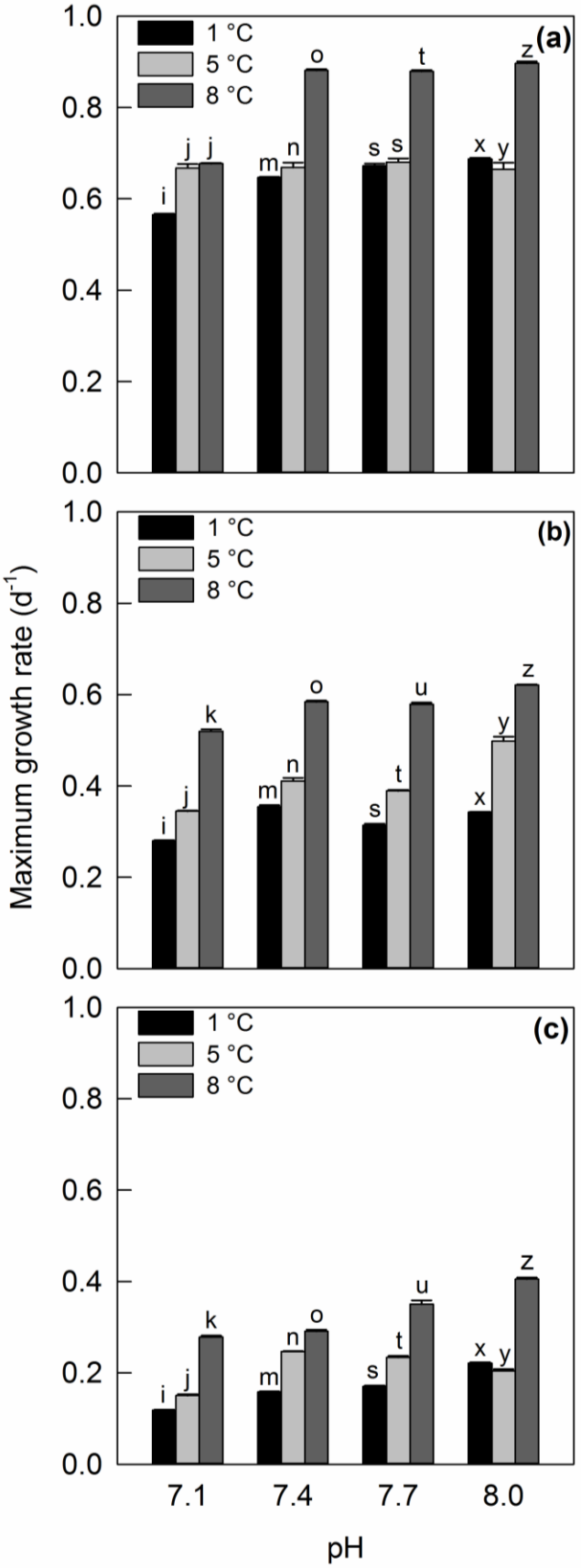
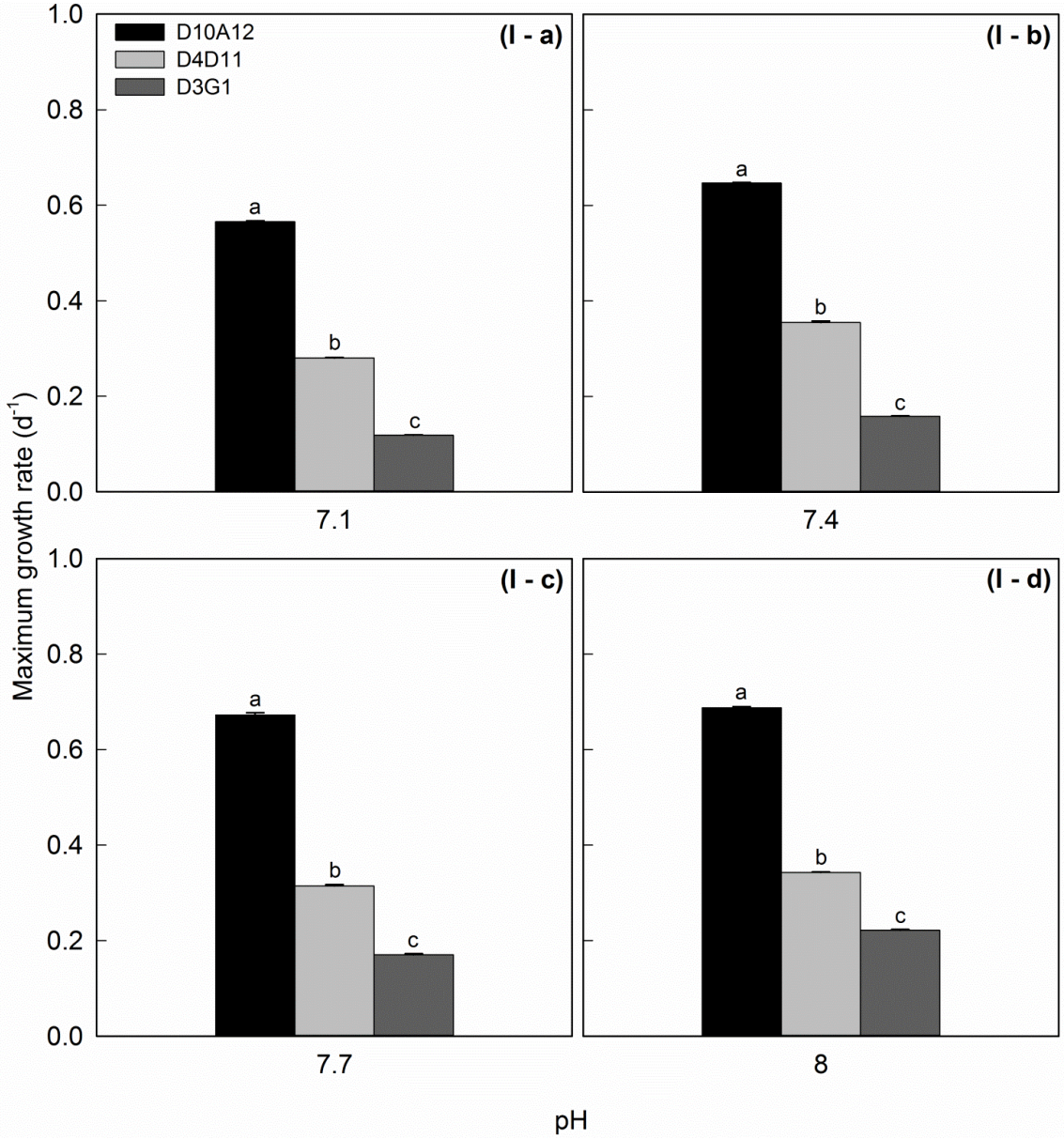
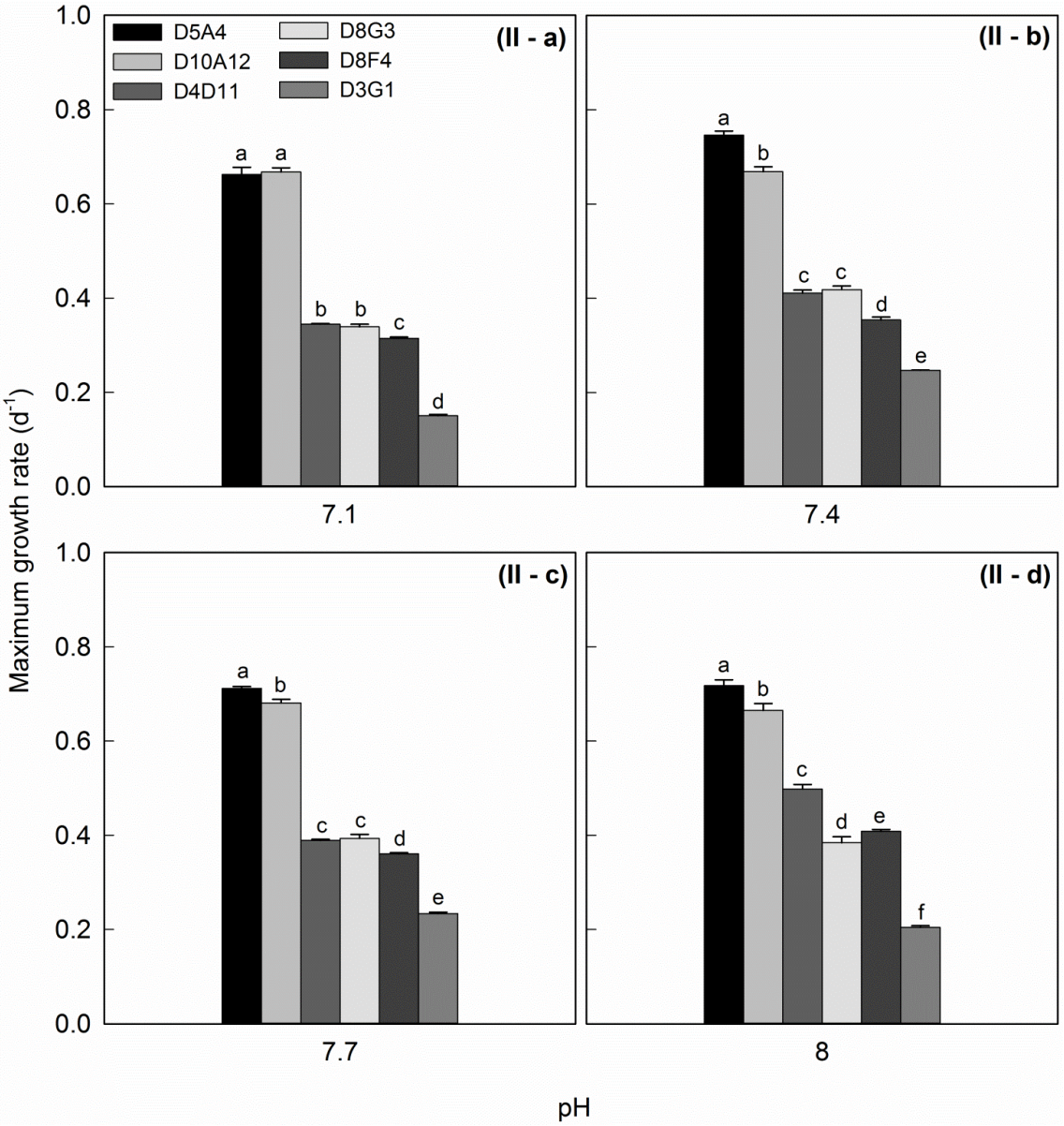

(a)
(b)
(c)
1 °C
5 °C
8 °C
Maximum growth rate (d-1)
pH
7.1
7.4
7.7
8.0
0.0
0.2
0.4
0.6
0.8
1.0
i
j
j
m
n
o
s
s
t
x
y
z
i
j
k
m
n
o
s
t
u
x
y
z
i
j
k
m
n
o
s
t
u
x
y
z

Figure S2. The mean maximum growth rates (d^{-1}) for strain **(a)** D10A12, **(b)** D4D11, and **(c)** D3G1 cultured at temperatures of 1 °C, 5 °C and 8 °C, and four pH treatments. Error bars represent ± one SD. Different letters above the bars represent significant differences in growth rates within the specific strain (two-way ANOVA, $P \leq 0.05$).

Table S1. The mean maximum growth rates ± SD (d^{-1}) of D5A4, D10A12, D4D11, D8F4, D8G3 and D3G1 strains cultivated at 5 °C and all four pH treatments.

	D5A4	D10A12	D4D11	D8G3	D8F4	D3G1
7.1	0.66 ± 0.02	0.67 ± 0.01	0.34 ± 0.00	0.34 ± 0.01	0.31 ± 0.00	0.15 ± 0.00
7.4	0.75 ± 0.01	0.67 ± 0.01	0.41 ± 0.01	0.42 ± 0.01	0.35 ± 0.01	0.25 ± 0.00
7.7	0.71 ± 0.00	0.68 ± 0.01	0.39 ± 0.00	0.39 ± 0.01	0.36 ± 0.00	0.23 ± 0.00
8.0	0.72 ± 0.01	0.67 ± 0.01	0.50 ± 0.01	0.38 ± 0.01	0.41 ± 0.00	0.20 ± 0.00


D10A12
D4D11
D3G1
(I - a)
(I - b)
(I - c)
(I - d)
Maximum growth rate (d-1)
1.0
0.8
0.6
0.4
0.2
0.0
a
b
c
7.1
7.4
7.7
8
pH


D5A4
D10A12
D4D11
D8G3
D8F4
D3G1
(II - a)
(II - b)
(II - c)
(II - d)
Maximum growth rate (d-1)
1.0
0.8
0.6
0.4
0.2
0.0
a a b b c d
a b c c d e
a b c c d e
a b c d e f
7.1
7.4
7.7
8
pH

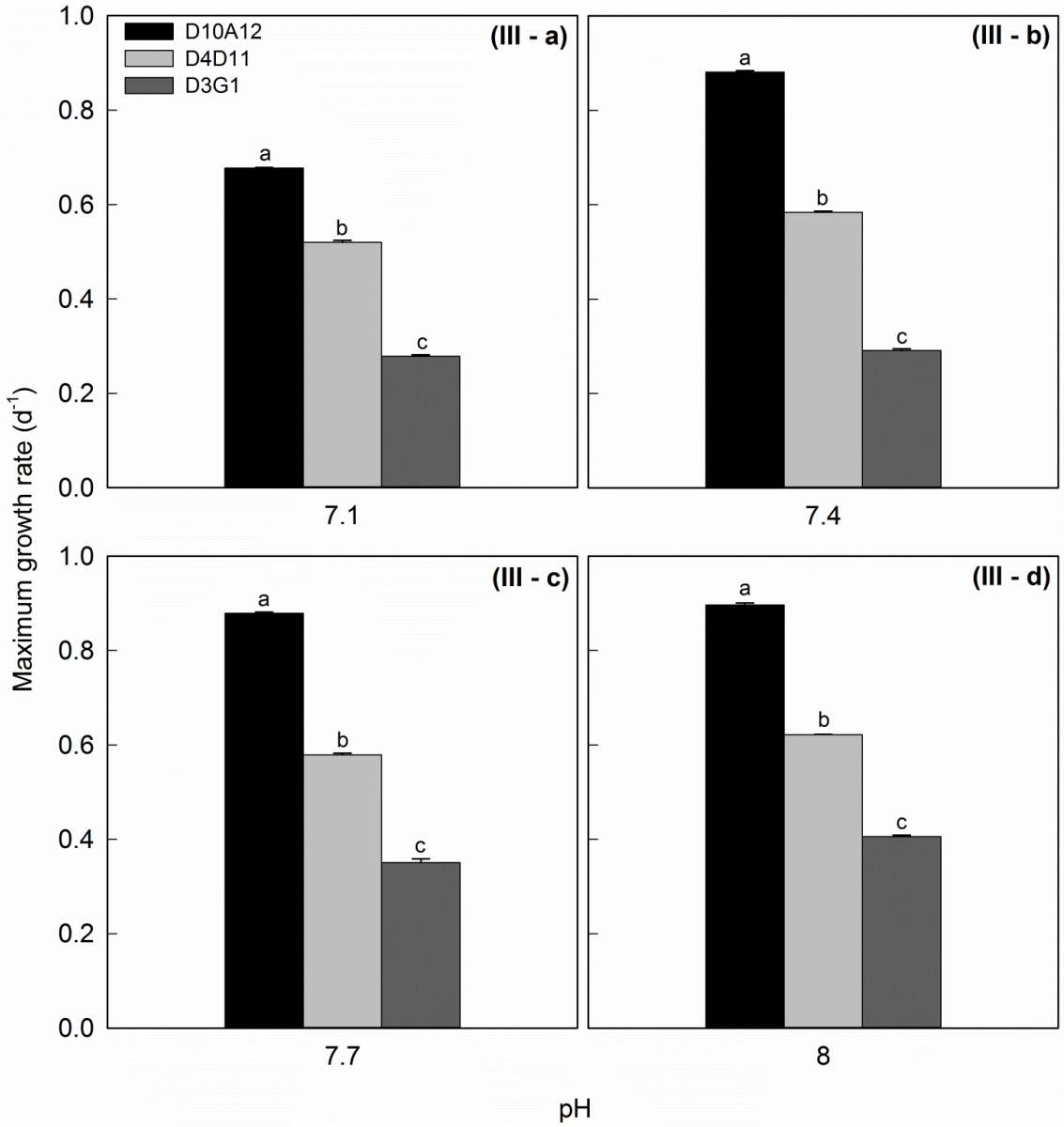


Figure S3. The mean maximum growth rates (d^{-1}) for strains D5A4, D10A12, D4D11, D8G3, D8F4 and D3G1 at a temperature of **(I)** 1 °C, **(II)** 5 °C and **(III)** 8 °C, and pH treatments **(a)** 7.1, **(b)** 7.4, **(c)** 7.7, and **(d)** 8.0. Error bars represent ± one SD. Different letters above the bars represent significant differences in growth rates within the specific treatment (two-way ANOVA, $P \leq 0.05$).

Table S2. The mean maximum growth rates ± SD (d^{-1}) of D10A12, D4D11 and D3G1 strains cultivated at 1 °C and all four pH treatments.

	D10A12	D4D11	D3G1
7.1	0.57 ± 0.00	0.28 ± 0.00	0.12 ± 0.00
7.4	0.65 ± 0.00	0.35 ± 0.00	0.16 ± 0.00
7.7	0.67 ± 0.00	0.31 ± 0.00	0.17 ± 0.00
8.0	0.69 ± 0.00	0.34 ± 0.00	0.22 ± 0.00

Table S3. The mean maximum growth rates ± SD (d^{-1}) of D10A12, D4D11 and D3G1 strains cultivated at 8 °C and all four pH treatments.

	D10A12	D4D11	D3G1
7.1	0.68 ± 0.00	0.52 ± 0.00	0.28 ± 0.00
7.4	0.88 ± 0.00	0.58 ± 0.00	0.29 ± 0.00
7.7	0.88 ± 0.00	0.58 ± 0.00	0.35 ± 0.01
8.0	0.90 ± 0.00	0.62 ± 0.00	0.41 ± 0.00

Table S4. The concentrations of DIC ± SD (mmol L^{-1}), HCO_3^- ± SD (mmol L^{-1}), CO_3^{2-} ± SD (µmol L^{-1}) and CO_2* ± SD (µmol L^{-1}) in all four pH treatments, measured[a] or calculated[b] in the end of the experiments. CO_2* is the concentration of CO_2 (aq) and H_2CO_3.

	7.1	7.4	7.7	8.0
DIC (mmol L^{-1})[a]	2.65 ± 0.00	2.55 ± 0.01	2.36 ± 0.01	2.15 ± 0.01
HCO_3^- (mmol L^{-1})[b]	2.43 ± 0.00	2.41 ± 0.00	2.25 ± 0.00	2.03 ± 0.00
CO_3^{2-} (µmol L^{-1})[b]	16.9 ± 0.4	32.2 ± 1.2	57.2 ± 2.7	96.7 ± 4.9
CO_2* (µmol L^{-1})[b]	199.8 ± 4.3	103.3 ± 3.5	50.6 ± 2.5	24.3 ± 1.4