

Supplement information

- 1 **Table S1:** concentration of hydroxocobalamin (OHB12) and cyanocobalamin (CNB12)
- 2 in seawater samples corresponding to the initial time of the experiments. Abbreviations:
- 3 Not detected (nd) and lower concentration of the quantification limit (<LOQ).

Sample ID	Station	Depth	Month	OHB12 pM	CNB 2 pM
1602_st3_d1_p1	coast	surface	February	0.21	nd
1602_st3_d3_p1	coast	surface	February	0.20	nd
1602_st3_d5_p1	coast	surface	February	0.26	nd
1604_st3_d1_p1	coast	surface	April	0.47	nd
1604_st3_d3_p1	coast	surface	April	0.66	nd
1604_st3_d5_p1	coast	surface	April	0.23	nd
1608_st3_d1_p1	coast	surface	August	0.30	nd
1608_st3_d3_p1	coast	surface	August	0.38	nd
1608_st3_d5_p1	coast	surface	August	0.19	nd
1602_st3_d1_p2	coast	SCM	February	0.36	nd
1602_st3_d3_p2	coast	SCM	February	0.10	nd
1602_st3_d5_p2	coast	SCM	February	0.41	nd
1604_st3_d1_p2	coast	SCM	April	0.32	nd
1604_st3_d3_p2	coast	SCM	April	0.27	nd
1604_st3_d5_p3	coast	SCM	April	0.15	nd
1608_st3_d1_p2	coast	SCM	August	0.46	nd
1608_st3_d3_p2	coast	SCM	August	0.21	nd
1608_st3_d5_p2	coast	SCM	August	0.39	nd
1602_st6_d1_p1	ocean	surface	February	0.31	nd
1602_st6_d3_p1	ocean	surface	February	0.09	nd
1602_st6_d5_p1	ocean	surface	February	0.06	nd
1604_st6_d1_p1	ocean	surface	April	0.13	nd
1604_st6_d3_p1	ocean	surface	April	0.09	nd
1604_st6_d6_p1	ocean	surface	April	0.04	nd
1608_st6_d1_p1	ocean	surface	August	0.20	nd
1608_st6_d3_p1	ocean	surface	August	0.09	nd
1608_st6_d6_p1	ocean	surface	August	0.14	nd
1602_st6_d1_p3	ocean	SCM	February	0.21	0.55
1602_st6_d3_p2	ocean	SCM	February	0.08	nd
1604_st6_d1_p2	ocean	SCM	April	nd	nd
1604_st6_d3_p2	ocean	SCM	April	0.07	nd
1604_st6_d6_p2	ocean	SCM	April	0.05	nd
1608_st6_d1_p2	ocean	SCM	August	0.19	nd
1608_st6_d3_p2	ocean	SCM	August	0.09	nd
1608_st6_d6_p2	ocean	SCM	August	0.16	nd

8 **Table S2:** Summary of initial conditions for each experiment (expt). Sampling months
 9 were February (Feb), April (Apr) and August (Aug).

Station	Depth	Month	Expt	Temp °C	Sal	NO ₃ ⁻ μM	NO ₂ ⁻ μM	NH ₄ ⁺ μM	HPO ₄ ²⁻ μM	DIN:P	SiO ₄ ²⁻ μM	Chl-a μg l ⁻¹	BB μgC l ⁻¹		
Coast	surface	Feb	3a	13.75	35.02	2.86	0.19	0.35	0.17	19.65	3.62	1.39	1.84		
			3b	13.22	34.27	4.89	0.36	0.51	0.33	17.25	6.77	0.73	1.91		
			3c	13.43	34.21	4.63	0.19	0.09	0.18	27.68	8.57	4.86	3.45		
		Apr	3a	12.96	34.58	2.21	0.24	0.32	0.19	14.55	5.24	2.73	7.88		
			3b	13.31	34.25	12.46	0.36	0.54	0.41	32.73	12.57	1.40	9.17		
			3c	14.04	31.83	4.18	0.16	0.55	0.19	25.90	10.52	2.18	4.30		
		Aug	3a	14.14	35.60	0.50	0.10	0.84	0.12	11.77	1.11	5.73	14.64		
			3b	14.36	35.61	0.81	0.08	1.08	0.20	9.95	0.28	5.52	6.39		
			3c	13.66	35.16	3.93	0.17	0.12	0.33	12.78	3.86	5.64	10.61		
SCM		Feb	3a	13.73	35.71	3.58	0.14	0.04	0.31	12.13	5.25	0.21	1.30		
			3b	13.91	35.27	4.16	0.15	0.07	0.37	11.91	4.63	0.99	1.83		
			3c	13.45	34.66	2.94	0.09	0.10	0.17	18.37	6.13	4.98	2.36		
		Apr	3a	12.80	35.34	3.22	0.34	0.46	0.28	14.34	4.39	0.99	5.90		
			3b	13.22	35.28	0.24	0.07	0.12	0.04	10.19	2.83	2.15	9.47		
			3c	13.92	34.95	0.21	0.07	0.10	0.06	6.52	3.41	2.18	9.51		
		Aug	3a	13.58	35.62	0.91	0.13	0.23	0.15	8.32	1.68	20.75	12.71		
			3b	13.82	35.61	1.40	0.16	0.14	0.23	7.49	1.40	20.07	1.73		
			3c	13.38	35.63	5.29	0.13	0.14	0.41	13.47	3.93	4.63	9.21		
Ocean	surface	Feb	6a	13.98	30.20	1.32	0.18	0.11	0.16	10.07	3.23	0.82	2.38		
			6b	14.16	35.86	0.90	0.11	0.04	0.12	9.15	2.29	1.20	2.98		
			6c	14.10	35.40	1.03	0.15	0.13	0.16	8.43	2.97	2.08	2.92		
		Apr	6a	13.44	35.68	0.95	0.11	0.06	0.12	9.63	2.31	1.51	6.58		
			6b	13.59	35.66	0.47	0.11	0.06	0.08	8.33	2.71	1.29	7.37		
			6c	13.93	35.57	0.12	0.03	0.06	0.04	4.90	2.08	0.75	11.76		
		Aug	6a	15.97	35.61	0.05	0.01	0.06	0.02	4.88	1.46	0.65	39.38		
			6b	16.04	35.59	0.26	0.01	0.09	0.05	7.46	3.21	0.99	11.46		
			6c	15.34	35.53	0.45	0.04	0.05	0.07	7.38	1.37	1.30	5.63		
		SCM		Feb	6a	14.08	35.75	1.73	0.20	0.04	0.18	11.18	3.47	0.88	2.28
					6b	14.10	35.76	1.60	0.19	0.02	0.15	11.75	2.86	1.22	3.18
					6c	14.13	35.82	1.13	0.18	0.12	0.16	9.17	2.92	2.39	3.49
				Apr	6a	13.28	35.69	1.63	0.31	0.10	0.18	11.51	3.16	1.61	5.38
					6b	13.28	35.68	1.45	0.33	0.12	0.16	11.88	2.42	1.50	6.96
					6c	13.72	35.60	0.03	0.06	0.07	0.05	3.01	1.89	1.45	11.74
Aug	6a			14.90	35.60	0.00	0.04	0.10	0.03	4.20	1.44	0.84	26.55		
	6b			15.95	35.60	0.27	0.00	0.07	0.05	6.45	2.79	1.11	6.04		
	6c			15.41	35.62	0.35	0.06	0.06	0.07	6.51	1.66	1.41	5.45		

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12 **Figure S1:** A multidimensional scaling (MDS) showing the distance according to
13 similarity in the microbial plankton composition at the beginning of each experiment
14 (each symbol). Filled and open symbols represent samples from coastal and oceanic
15 station, respectively, numbers correspond to the sampling station, triangles and circles
16 represent samples from surface and SCM, respectively, and colours correspond to the
17 months: (green) February, (blue) April and (pink) August.

18 **Figure S2:** Response ratio (RR) to inorganic nutrient addition (averaged biomass at the
19 end of the experiments by the averaged value in the control) of total phytoplankton
20 community (smooth bars) and of bacterial biomass (striped bars) at (a) coastal and (b)
21 oceanic station. Each bar corresponds to one of the 3 experiments (a, b or c) performed
22 in each depth and station during February, April and August. Colours represent samples
23 from (light grey) surface and (dark grey) SCM. Horizontal line represents a response
24 equal to 1, that means no change relative to control. Asterisks indicate phytoplankton
25 significant response relative to control (t-test; * $p < 0.05$) and circle indicate bacterial
26 significant response relative to the control (t-test; ⁰ $p < 0.05$). Note that different scales
27 were used.

28 **Figure S3:** Response ratio (RR) of total phytoplankton community (smooth bars) and of
29 bacterial biomass (striped bars) at (a) surface and (b) SCM in the coastal station and at
30 (c) surface and (d) SCM in the oceanic waters. Treatments represented are: B12; B1;
31 B12+B1 in pink tones and I+B12/I; I+B1/I; I+B12+B1/I in green tones. Pink bars
32 represent primary responses to B vitamins and green bars represent secondary responses
33 to B vitamins. Horizontal line represents a response equal to 1, that means no change
34 relative to control in the primary responses, and no change relative to inorganic treatment
35 in the secondary responses. Asterisks indicate phytoplankton significant response (t-test;

- 36 * $p < 0.05$) and circle indicate bacterial significant response (t-test; ^o $p < 0.05$). Note that
- 37 different scales were used.

Transform: Square root
Resemblance: S17 Bray Curtis similarity

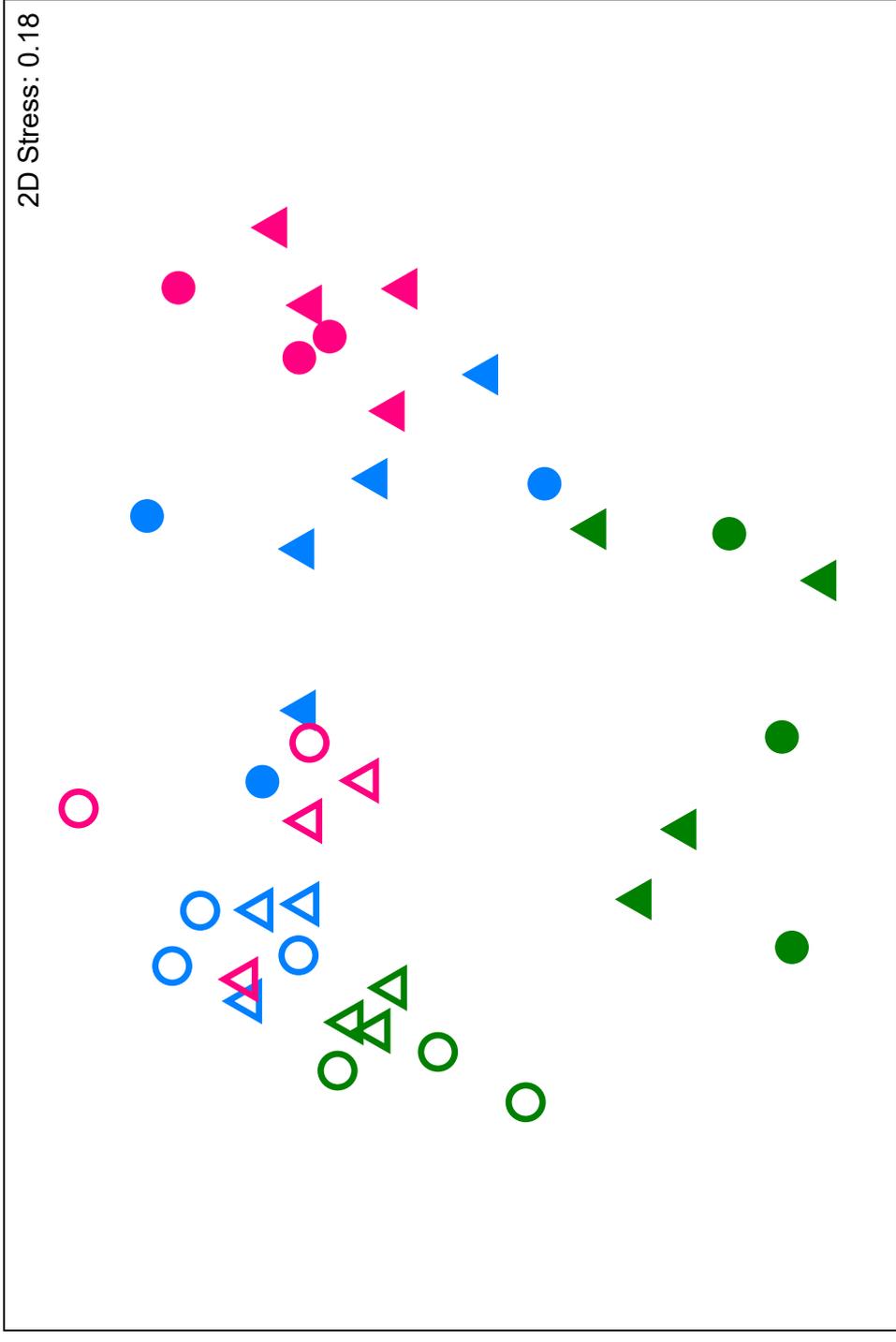


Figure S1

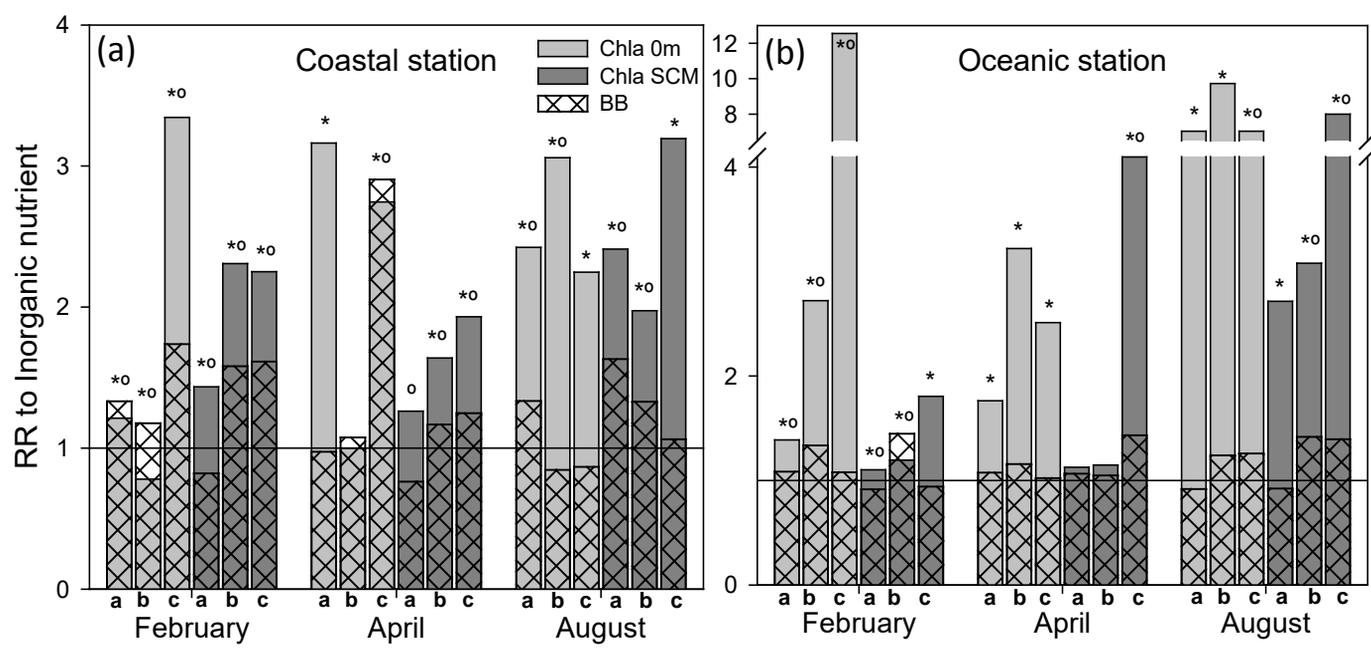


Figure S2

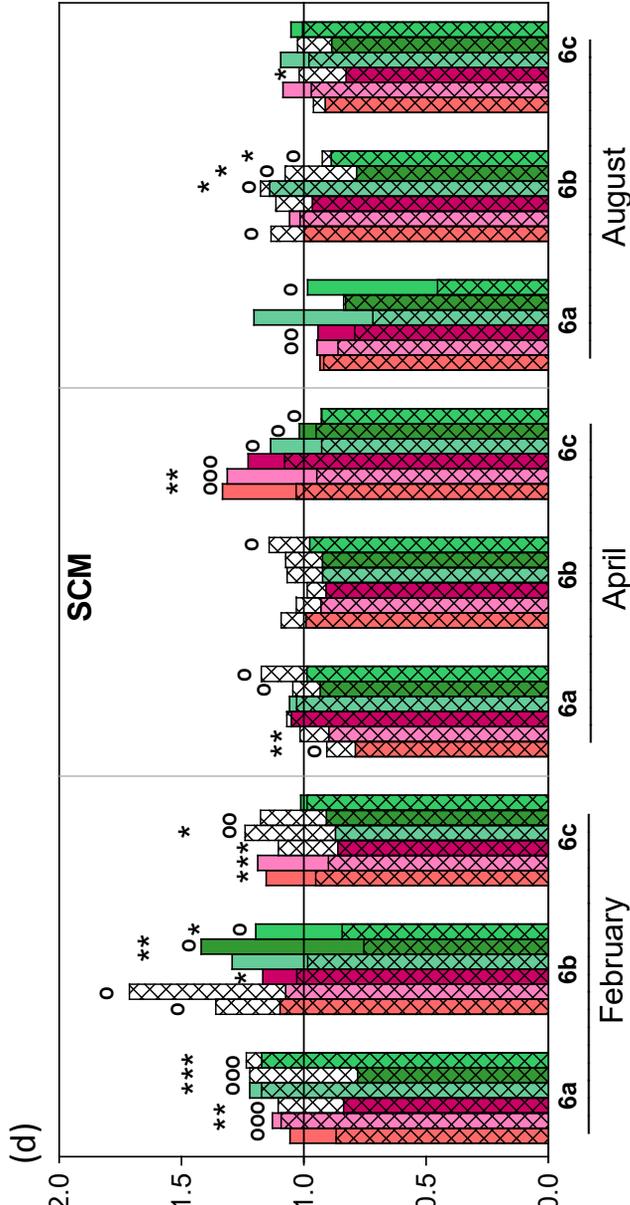
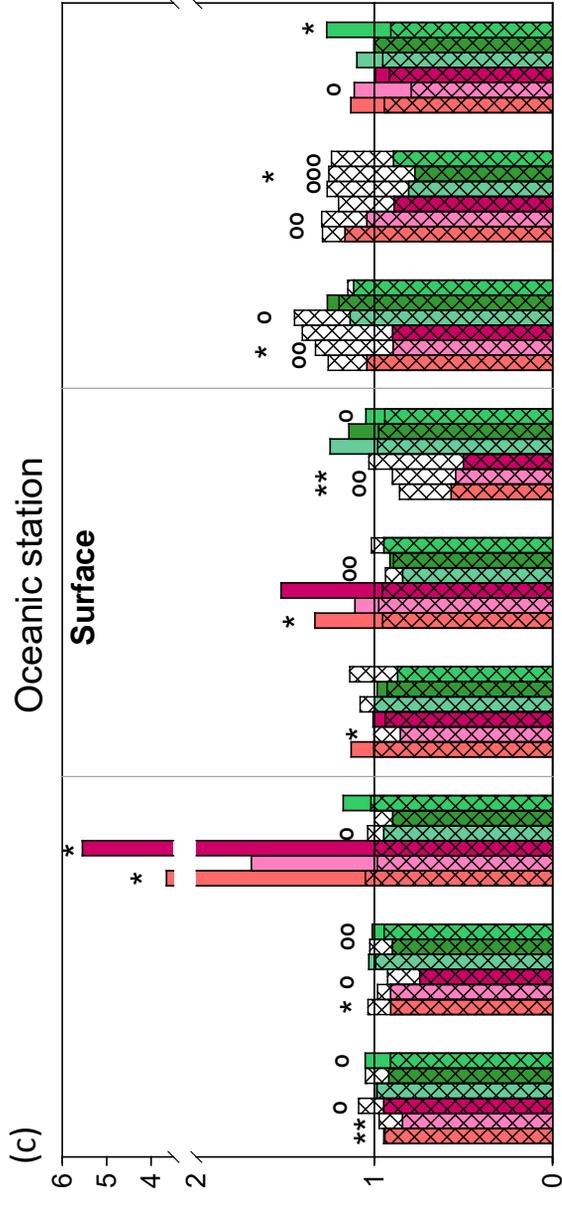
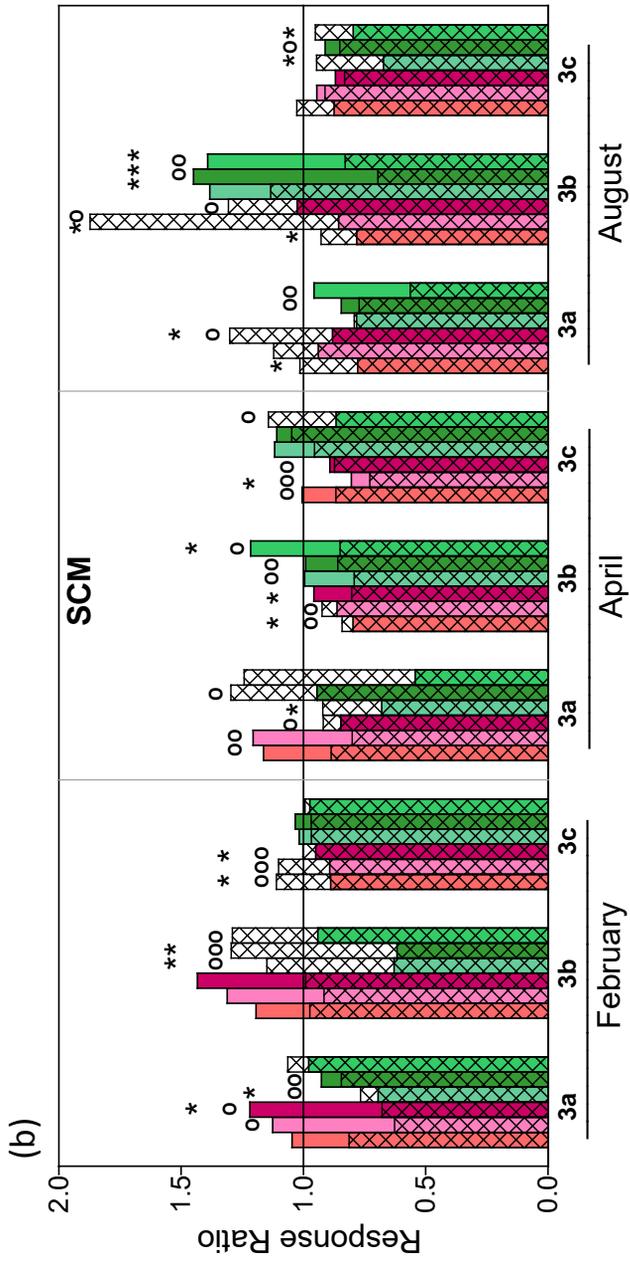
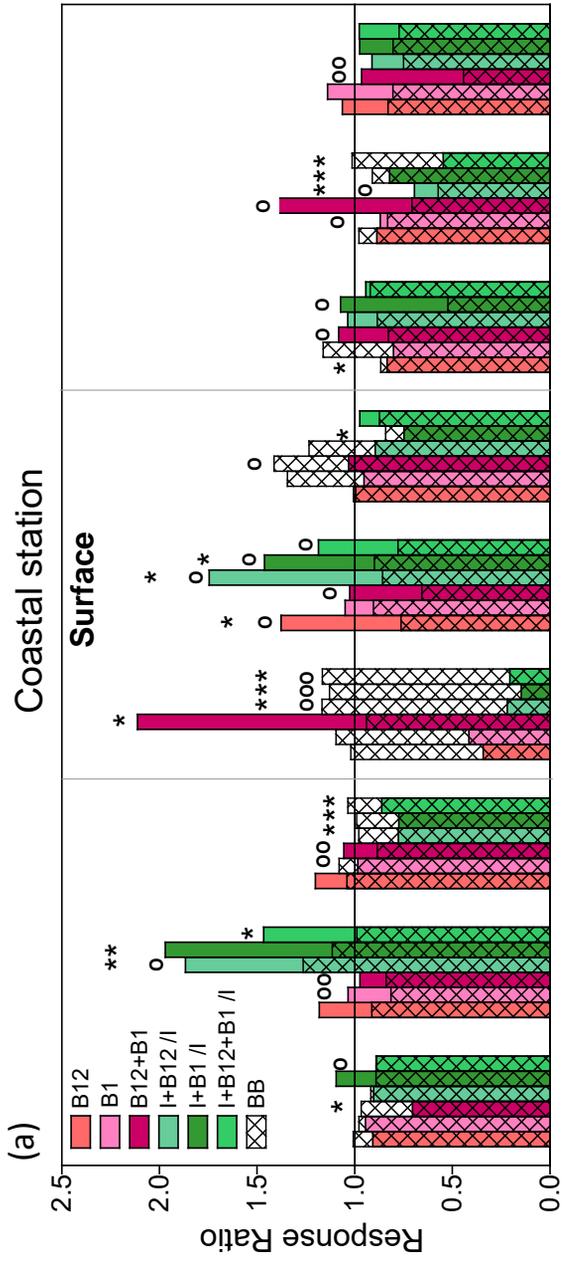


Figure S3