

## 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 <sub>3</sub> <sup>-</sup> μM	NO <sub>2</sub> <sup>-</sup> μM	NH <sub>4</sub> <sup>+</sup> μM	HPO <sub>4</sub> <sup>2-</sup> μM	DIN:P	SiO <sub>4</sub> <sup>2-</sup> μM	Chl-a μg l <sup>-1</sup>	BB μgC l <sup>-1</sup>
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

10

11

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

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

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

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

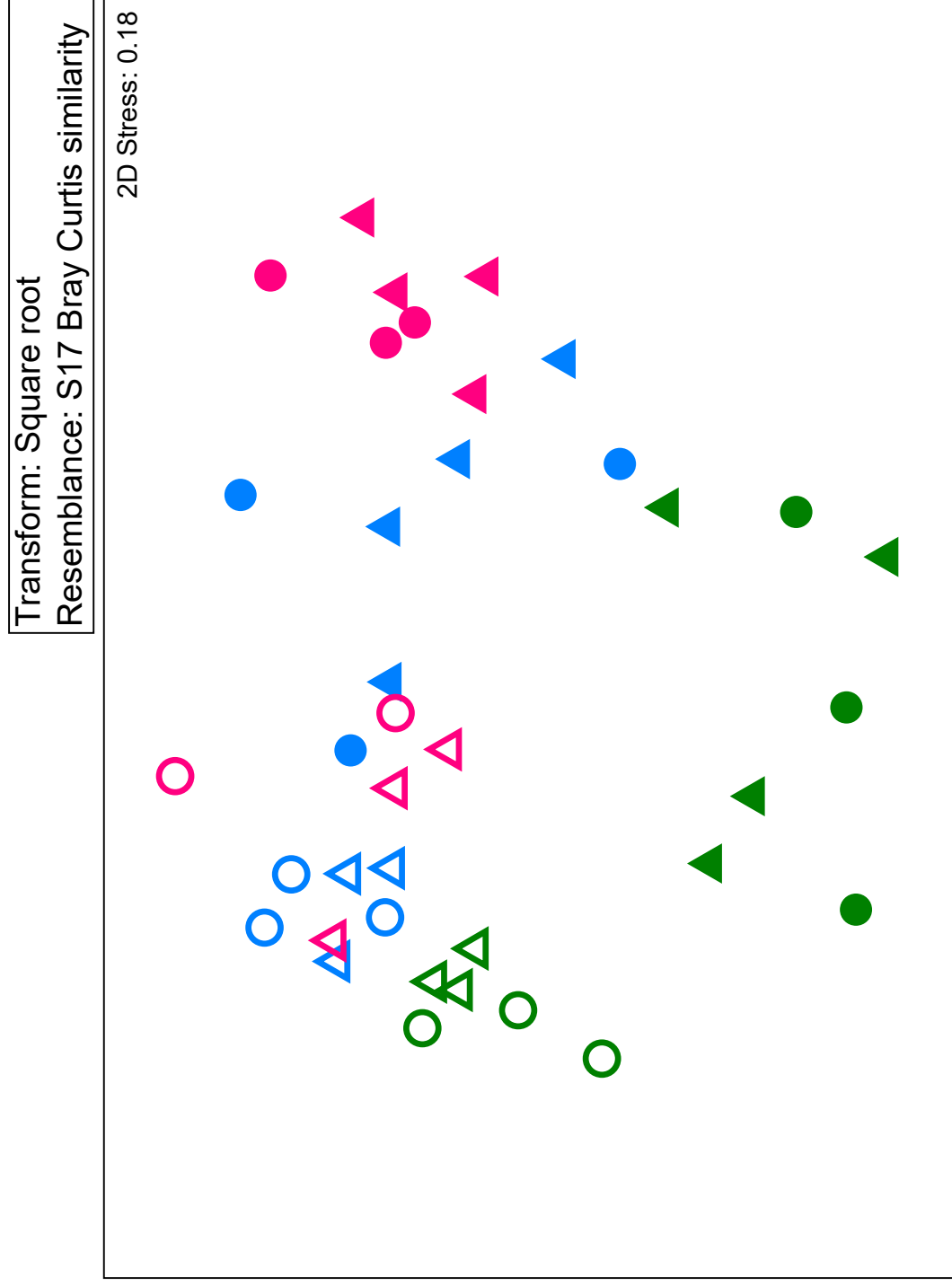


Figure S1

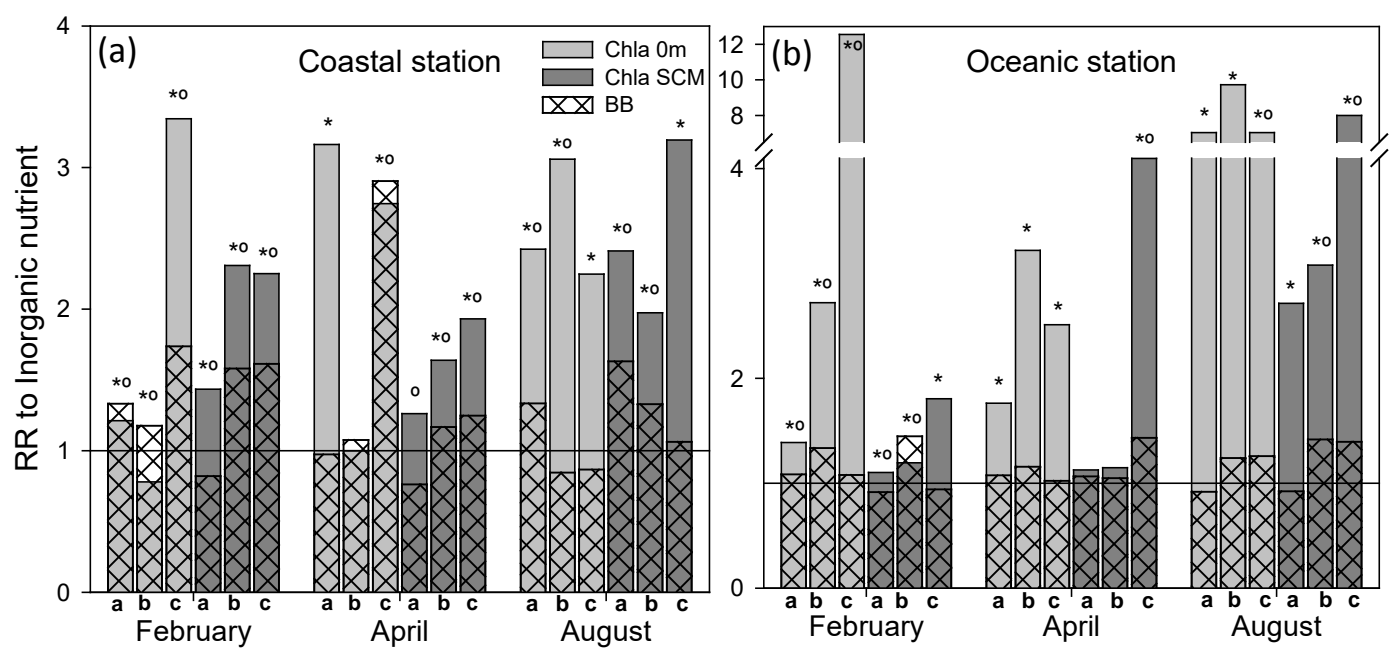


Figure S2

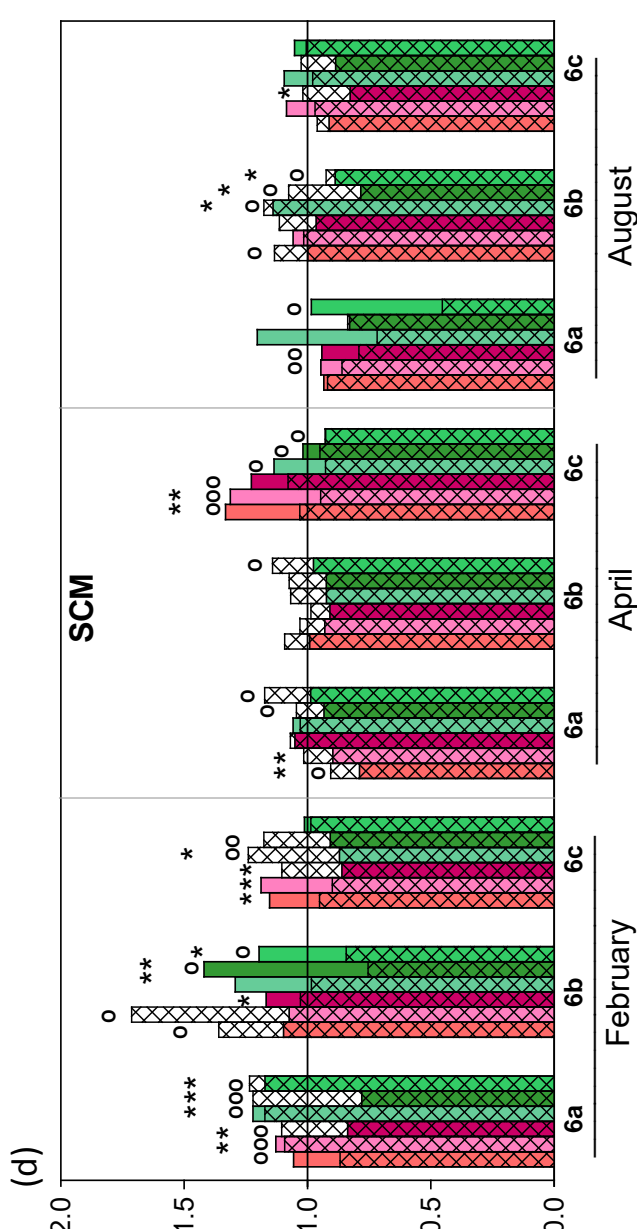
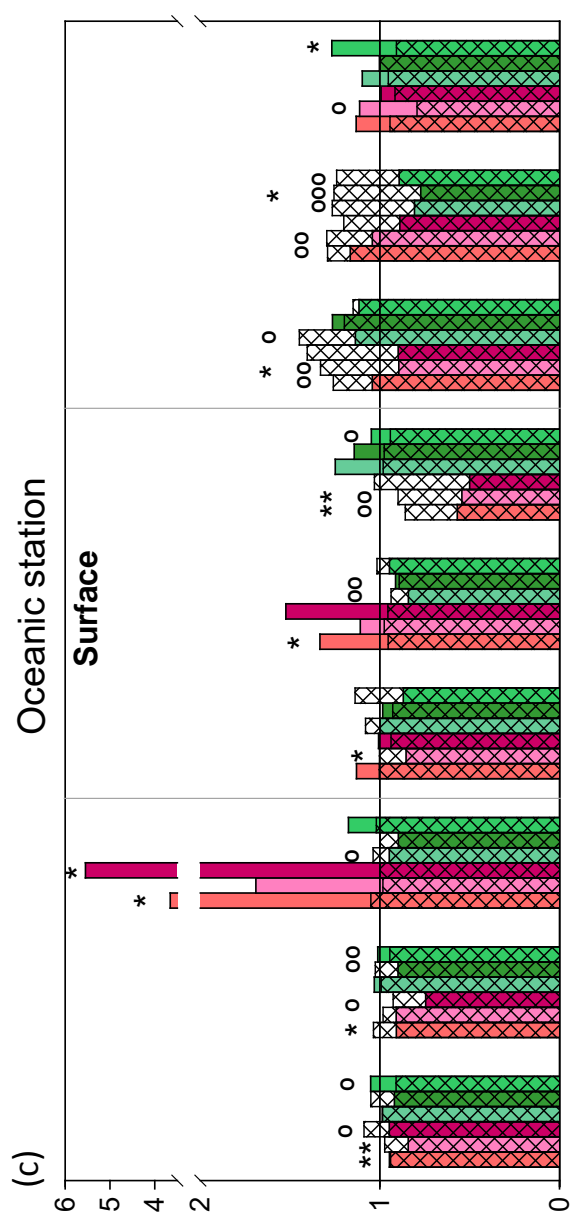
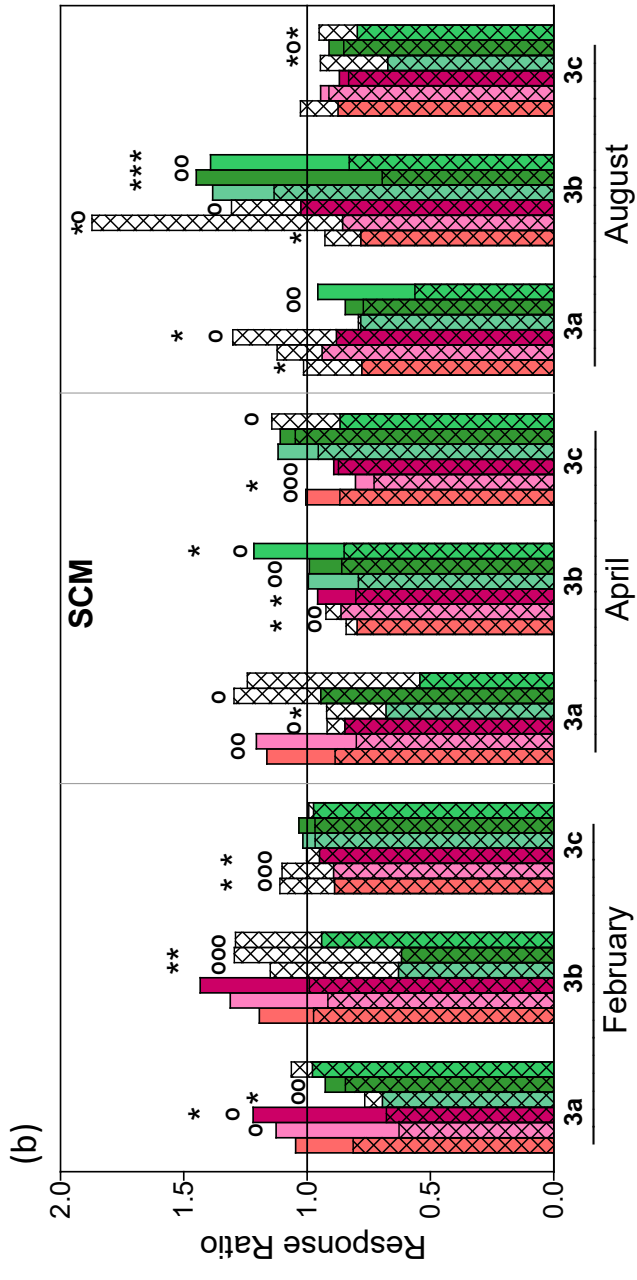
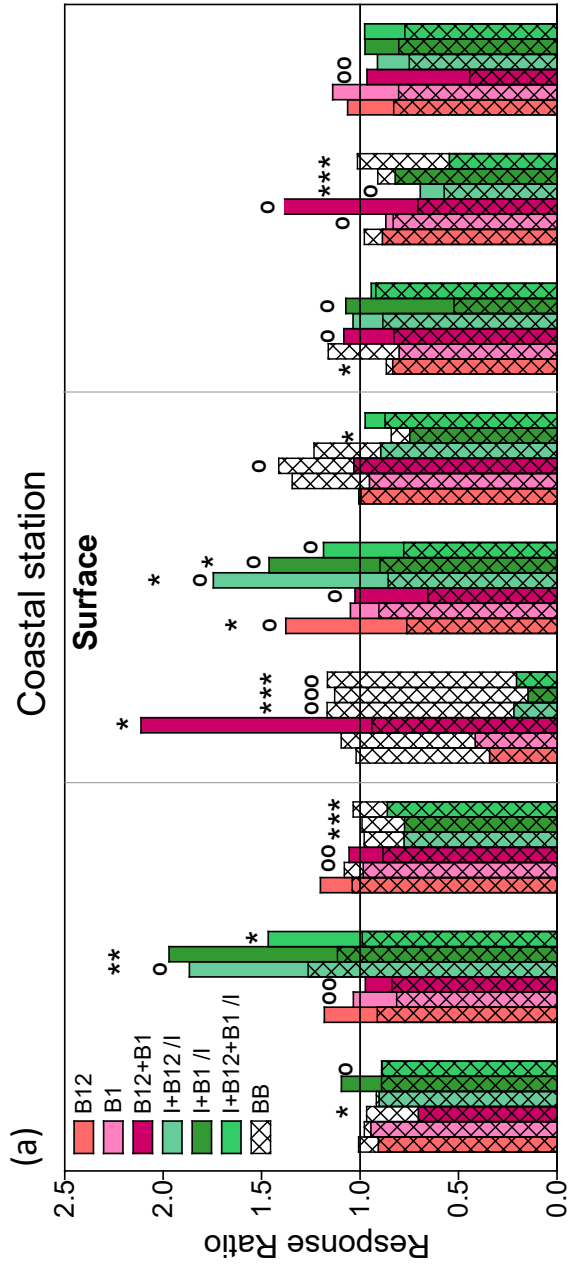


Figure S3