

Table S1: Time series measurements for cultures of *Crocospaera watsonii* WH8501 grown under three $p\text{CO}_2$ treatments. Measured pH, calculated $p\text{CO}_2$ (μatm , see Methods) and concentrations of particulate carbon ($\mu\text{mol L}^{-1}$; PC), particulate nitrogen ($\mu\text{mol L}^{-1}$; PN), cells ($\# \text{mL}^{-1}$), and chlorophyll *a* (Chl *a*; $\mu\text{g L}^{-1}$) are provided for every time point available. Data are mean values from three replicate bottles; standard deviations are presented in parentheses. Dashes indicate no data available.

Time point	Low- CO_2 treatment						Mid- CO_2 treatment						High- CO_2 treatment					
	pH	$p\text{CO}_2$	PC	PN	Cells	Chl a	pH	$p\text{CO}_2$	PC	PN	Cells	Chl a	pH	$p\text{CO}_2$	PC	PN	Cells	Chl a
Day 0 L6	8.25 (0.01)	355 (14)	124 (12)	8.8 (1)	-	4.3 (0.6)	8.07 (0.01)	600 (21)	120 (4)	8.5 (0.7)	-	4.6 (0.3)	7.97 (0.01)	788 (11)	118 (2)	7.6 (0.1)	-	3.9 (0.4)
Day 0 L12	8.28 (0.03)	327 (35)	-	-	-	-	8.11 (0)	535 (3)	-	-	-	-	7.98 (0.01)	755 (11)	-	-	-	-
Day 1 D12	8.23 (0.01)	376 (10)	-	-	-	-	8.02 (0.01)	686 (16)	-	-	-	-	7.9 (0.02)	946 (40)	-	-	-	-
Day 1 L6	8.32 (0.01)	288 (8)	166 (24)	14.2 (2)	5.6E+05 (7.4E+04)	7.3 (1.6)	8.13 (0.02)	504 (22)	192 (1)	16.2 (0.2)	8.0E+05 (6.3E+04)	9 (0.4)	8.03 (0.02)	665 (28)	172 (21)	13.2 (2)	7.5E+05 (1.9E+04)	7.9 (0.4)
Day 1 L12	8.38 (0.02)	237 (14)	-	-	-	-	8.21 (0)	405 (6)	-	-	-	-	8.09 (0.02)	570 (38)	-	-	-	-
Day 2 D12	8.26 (0.02)	344 (18)	-	-	-	-	8.02 (0.01)	693 (19)	-	-	-	-	7.89 (0)	963 (4)	-	-	-	-
Day 2 L6	8.41 (0.02)	217 (12)	374 (145)	22 (4)	7.4E+05 (1.2E+05)	11.6 (1.5)	8.23 (0.02)	374 (20)	424 (73)	28.2 (3)	1.2E+06 (1.1E+05)	16.3 (3)	8.13 (0.01)	505 (17)	547 (63)	28.3 (2)	1.2E+06 (9.7E+03)	15.1 (1)
Day 2 L12	8.49 (0.03)	168 (16)	555 (88)	25.3 (3)	8.7E+05 (1.2E+05)	8.8E+05 (1.1E+05)	8.33 (0.02)	280 (19)	614 (78)	27.8 (0.5)	1.4E+06 (1.1E+05)	-	8.21 (0.06)	401 (73)	521 (80)	25.4 (3)	1.5E+06 (1.6E+05)	-
Day 3 D6	8.37 (0.02)	246 (13)	285 (4)	30.4 (0.7)	8.8E+05 (1.1E+05)	-	8.11 (0.03)	531 (50)	307 (40)	32.9 (5)	1.4E+06 (1.2E+05)	-	7.97 (0.05)	794 (104)	300 (33)	33.3 (4)	1.4E+06 (4.4E+04)	-
Day 3 D12	8.27 (0.01)	336 (12)	302 (57)	39.1 (6)	9.1E+05 (1.3E+05)	-	7.98 (0.01)	762 (13)	329 (38)	52.7 (7)	1.5E+06 (9.4E+04)	-	7.85 (0)	1083 (11)	312 (35)	56.2 (5)	1.5E+06 (7.9E+04)	-
Day 3 L6	8.48 (0.05)	176 (25)	542 (65)	42.5 (6)	1.4E+06 (2.5E+05)	24.8 (3)	8.35 (0.05)	265 (39)	706 (88)	55.4 (6)	2.4E+06 (1.9E+05)	39.6 (6)	8.26 (0.04)	342 (46)	740 (44)	55.9 (4)	2.6E+06 (1.3E+05)	35.3 (6)
Day 3 L12	8.62 (0.06)	111 (22)	821 (85)	44.2 (6)	1.5E+06 (1.9E+05)	-	8.53 (0.05)	149 (27)	843 (139)	49.9 (9)	2.6E+06 (2.9E+05)	-	8.41 (0.1)	226 (75)	970 (97)	55.3 (4)	2.7E+06 (1.4E+05)	-

Day 4 D6	8.43 (0.04)	204 (22)	494 (63)	48.1 (6)	1.6E+06 (2.2E+05)	-	8.19 (0.03)	425 (38)	622 (106)	69.2 (9)	2.8E+06 (3.1E+05)	-	7.99 (0.1)	768 (213)	595 (33)	72.5 (10)	3.0E+06 (1.7E+05)	-
Day 4 D12	8.27 (0.02)	335 (24)	465 (88)	65.6 (7)	-	-	7.96 (0)	816 (6)	670 (91)	95.3 (6)	-	-	7.83 (0.02)	1128 (55)	718 (43)	104 (6)	-	-
Day 4 L6	8.56 (0.05)	134 (23)	833 (121)	66 (7)	2.3E+06 (3.1E+05)	31.6 (2.6)	8.52 (0.05)	153 (25)	1144 (174)	91.7 (10)	3.6E+06 (1.5E+06)	50.6 (9)	8.47 (0.06)	180 (33)	1308 (121)	97.4 (7)	4.8E+06 (2.1E+05)	49.1 (9)
Day 4 L12	8.74 (0.08)	74 (20)	888 (96)	64.9 (8)	2.4E+06 (2.3E+05)	-	8.73 (0.05)	74 (13)	1226 (182)	88 (12)	4.6E+06 (5.1E+05)	-	8.65 (0.12)	104 (47)	1351 (118)	95.4 (10)	5.1E+06 (2.9E+05)	-
Day 5 D6	8.48 (0.07)	179 (38)	770 (93)	72.1 (9)	2.5E+06 (2.4E+05)	-	8.24 (0.07)	369 (74)	1105 (151)	109.3 (15)	5.0E+06 (5.8E+05)	-	8.03 (0.15)	694 (303)	1137 (153)	124.9 (8)	5.8E+06 (3.3E+05)	-
Day 5 D12	8.25 (0.05)	355 (51)	689 (64)	94.9 (6)	2.2E+06 (2.4E+05)	-	7.91 (0)	925 (8)	964 (119)	146.1 (12)	4.7E+06 (4.5E+05)	-	7.81 (0.04)	1216 (127)	1119 (96)	166.4 (5)	5.5E+06 (1.8E+05)	-
Day 5 L6	8.61 (0.04)	115 (15)	1037 (58)	84.2 (3)	3.3E+06 (2.9E+05)	55.4 (2.1)	8.59 (0.03)	119 (14)	1589 (186)	130.2 (12)	6.7E+06 (4.4E+05)	82.5 (8)	8.65 (0.02)	97 (8)	1852 (65)	155.1 (2)	8.1E+06 (3.8E+05)	101 (2)