

Supplementary Material

The photosynthetic response of ice algae varies with sample melt procedure

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Supplementary Tables

Table S1 Average values with standard deviation (brackets) for chlorophyll *a* (chl *a*), dissolved inorganic carbon (DIC), and salinity for the respective melt treatments (see text for definitions) assessed during field sampling in Dease Strait.

Melt Treatment	Chl <i>a</i> ($\mu\text{g L}^{-1}$)	DIC ($\mu\text{mol kg}^{-1}$)	Salinity
FSW _{8:1}	575.2 (70.4)	1910.9 (22.2)	27.0 (0.16)
FSW _{3:1}	198.2 (39.0)	1724.1 (13.12)	24.1 (0.28)
FSW _{zero}	79.6 (25.8)	673.6 (94.6)	9.8 (1.12)

Table S2 Averages with standard deviation (brackets) of 1, 4, 24 and 48 h time points for variables of experimental treatments of salinities 30 (S30), 20 (S20) and 12 (S12) exposed to illuminated ($30 \mu\text{mol m}^{-2} \text{s}^{-1}$) or dark ($0 \mu\text{mol m}^{-2} \text{s}^{-1}$) growth conditions, including: chlorophyll *a* (chl *a*), maximum quantum efficiency of PSII (Fv/Fm), theoretical concentration of dissolved inorganic carbon (DIC) and salinity

Experimental Treatment		Chl <i>a</i> ($\mu\text{g L}^{-1}$)	Fv/Fm	DIC ($\mu\text{mol kg}^{-1}$)	Salinity
$30 \mu\text{mol m}^{-2} \text{s}^{-1}$	S30	28.6 (12.7)	0.317 (0.098)	1806.3 (17.7)	29.4 (0.3)
	S20	27.8 (4.4)	0.338 (0.069)	1233.4 (5.3)	20.19 (0.1)
	S12	33.7 (8.3)	0.222 (0.045)	692.0 (2.9)	11.6 (0.1)
$0 \mu\text{mol m}^{-2} \text{s}^{-1}$	S30	31.7 (5.7)	0.204 (0.088)	1808.1 (7.7)	29.5 (0.1)
	S20	25.0 (2.3)	0.209 (0.072)	1226.3 (4.3)	20.04 (0.1)
	S12	43.4 (8.9)	0.128 (0.062)	695.7 (2.8)	11.6 (0.0)

Table S3 Averages with standard deviation (brackets) of 1, 4, 24 and 48 h time points for photosynthesis-irradiance parameters of experimental treatments at salinities 30 (S30), 20 (S20) and 12 (S12) exposed to illuminated ($30 \mu\text{mol m}^{-2} \text{s}^{-1}$) or dark ($0 \mu\text{mol m}^{-2} \text{s}^{-1}$) growth conditions.

		$30 \mu\text{mol m}^{-2} \text{s}^{-1}$			$0 \mu\text{mol m}^{-2} \text{s}^{-1}$		
		S30	S20	S12	S30	S20	S12
Photosynthesis-irradiance	P^B_s	4.84 (0.69)	2.89 (0.51)	0.81 (0.62)	4.28 (1.08)	2.37 (0.38)	0.29 (0.18)
	α^B	0.108 (0.016)	0.073 (0.025)	0.027 (0.016)	0.134 (0.033)	0.072 (0.023)	0.014 (0.012)
	P_0	0.718 (0.109)	0.497 (0.199)	0.195 (0.129)	0.670 (0.242)	0.348 (0.135)	0.067 (0.060)
	E_c	6.65 (0.60)	6.74 (0.71)	6.87 (1.17)	5.11 (0.92)	4.81 (1.45)	4.99 (1.51)
	E_s	45.25 (7.14)	43.49 (14.47)	28.60 (10.50)	33.88 (11.14)	35.54 (10.61)	23.59 (6.72)

Table S4 Average abundance (\pm standard deviation) of pennate and centric diatoms in each of the melt treatments for sample collection dates. Values were determined by inverted light microscopy (Campbell et al. 2018) and are reported as $\times 10^6$ cells L^{-1} or as a percentage of all cells enumerated.

FSW _{8:1}				
Date	$\times 10^6$ Cells L^{-1}		Percent (%)	
	Pennate	Centric	Pennate	Centric
May 17	266.2	159.7	62.5	37.5
21	279.0	291.7	48.9	51.1
26	257.2	392.9	39.6	60.4
30	235.5	433.4	35.2	64.8
June 5				
Average	259.5	344.4	46.5	53.5
\pm	18.3	82.1	12.1	12.1
FSW _{3:1}				
May 17	106.2	132.9	44.4	55.6
21	118.5	130.3	47.6	52.4
26	78.2	174.8	30.9	69.1
30	105.5	218.6	32.6	67.4
June 5	89.0	72.6	55.1	44.9
Average	99.5	145.8	42.1	57.9
\pm	15.8	54.6	10.3	10.3
FSW _{zero}				
May 17	131.6	133.5	49.6	50.4
21	78.5	152.6	34.0	66.0
26	90.5	175.2	34.1	65.9
30	97.6	179.7	35.2	64.8
June 5	76.5	135.8	36.1	63.9
Average	94.9	155.4	37.8	62.2
\pm	22.2	21.6	6.7	6.7