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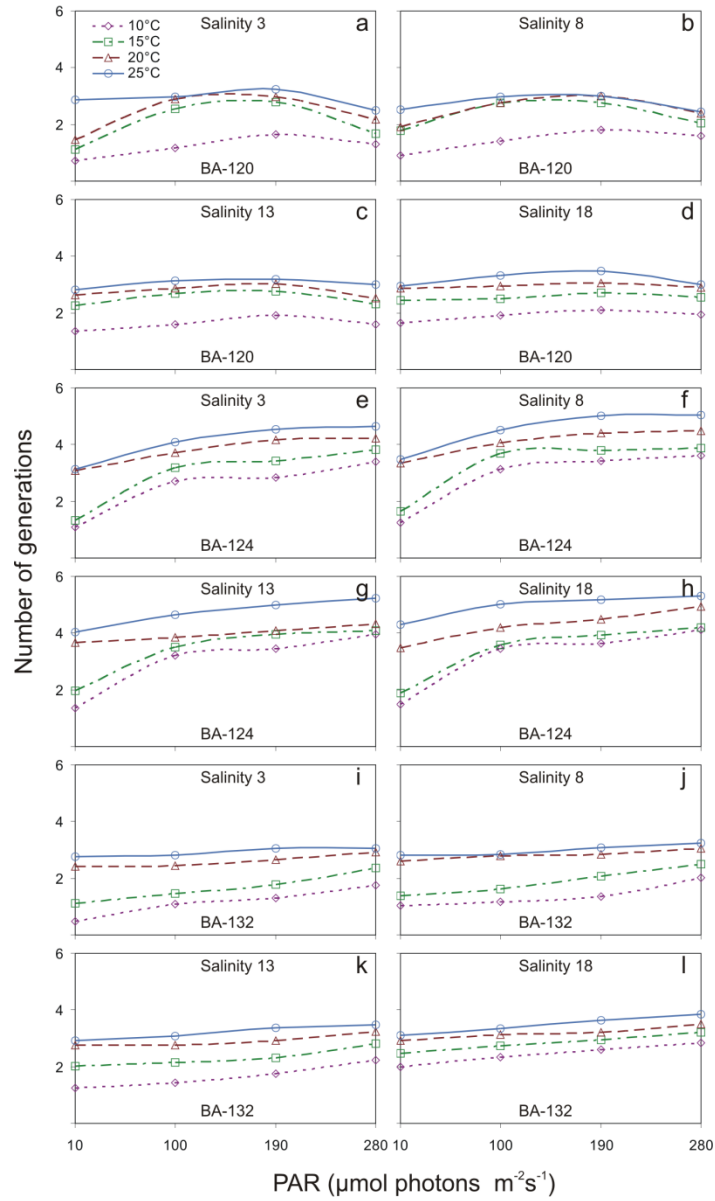
*Supplement of*

## **Ecophysiological characteristics of red, green, and brown strains of the Baltic picocyanobacterium *Synechococcus* sp. – a laboratory study**

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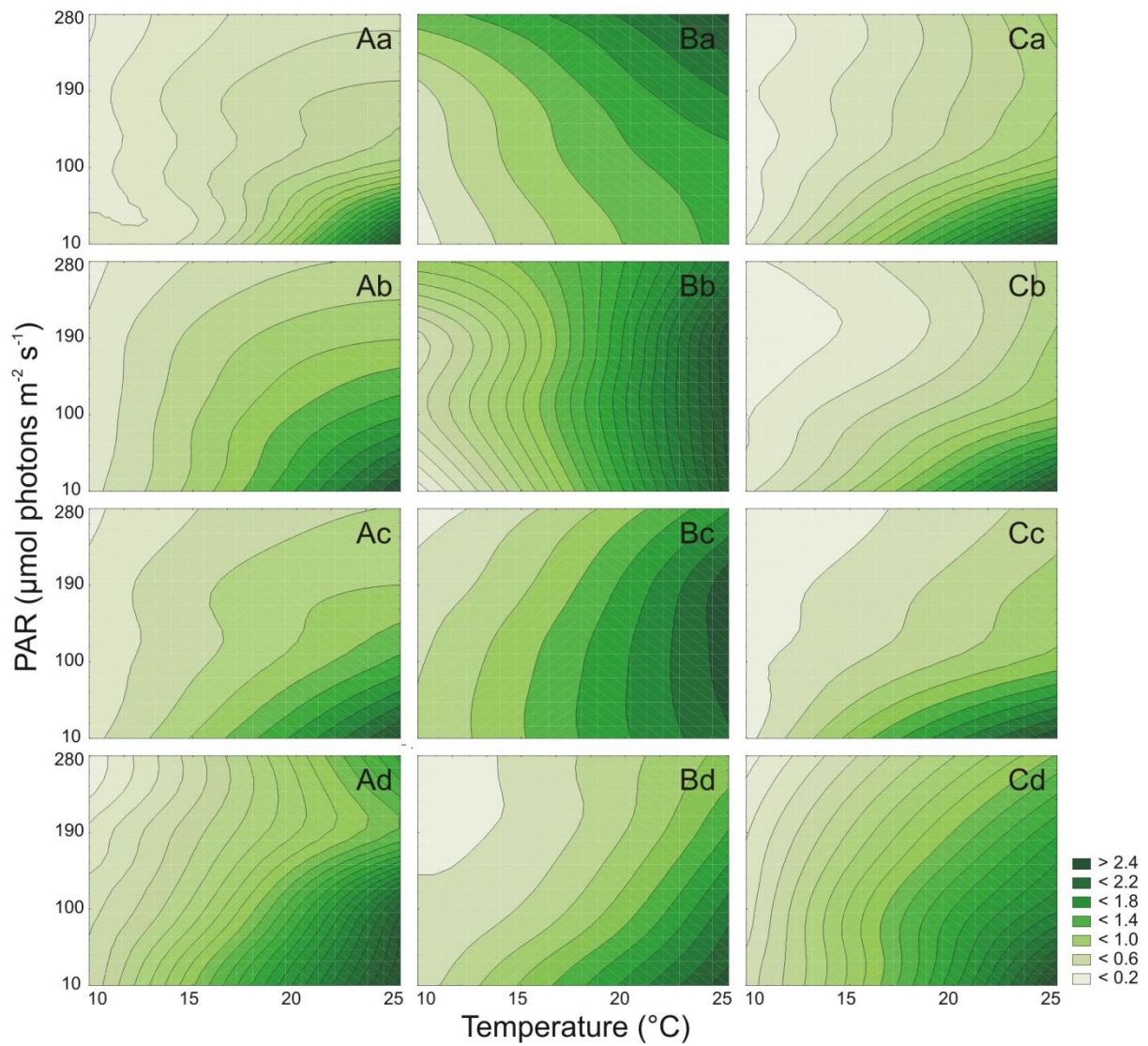


**Fig. S1.** Number of generations achieved under each treatment for three *Synechococcus* sp. strains: BA-120 (a-d), BA-124 (e-h), BA-132 (i-l) under different PAR and temperature conditions in 4 salinity mediums: 3 PSU (a, e, i), 8 PSU (b, f, j), 13 PSU (c, g, k) and 18 PSU (d, h, l). Number of generations achieved under each treatment is the time of the experiment (elapsed time,  $t$ ) over the doubling time,  $d$  (EQ. S2). Doubling time is directly connected with the growth rate,  $\mu$  (EQ. S1).

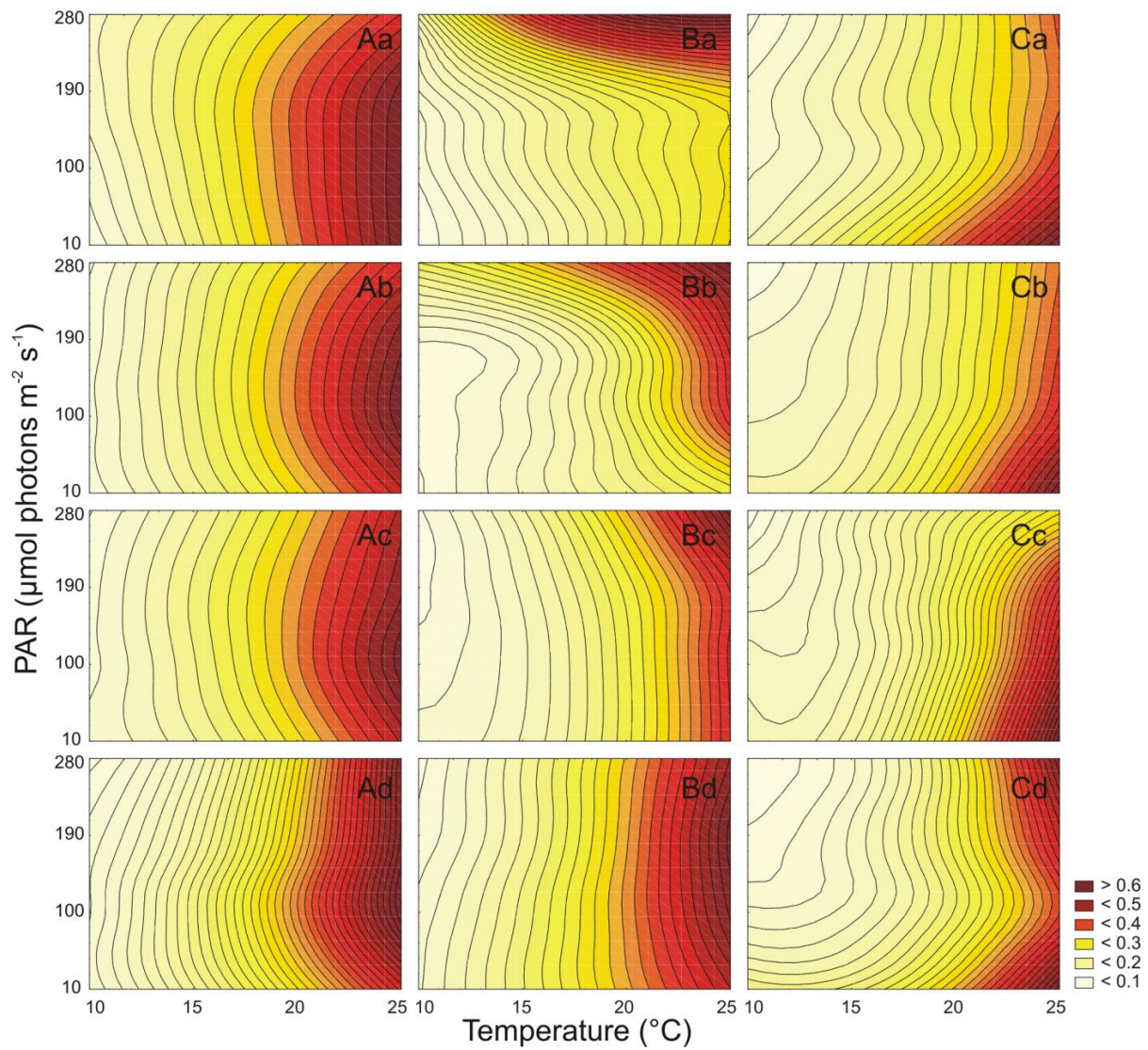
$$\mu = (\ln(A_f) - \ln(A_i))t^{-1} \quad \text{EQ. S1}$$

The EQ. S1 assumes a steady exponential growth over the entire time window, where  $A_f$  and  $A_i$  are final and initial abundances, respectively.

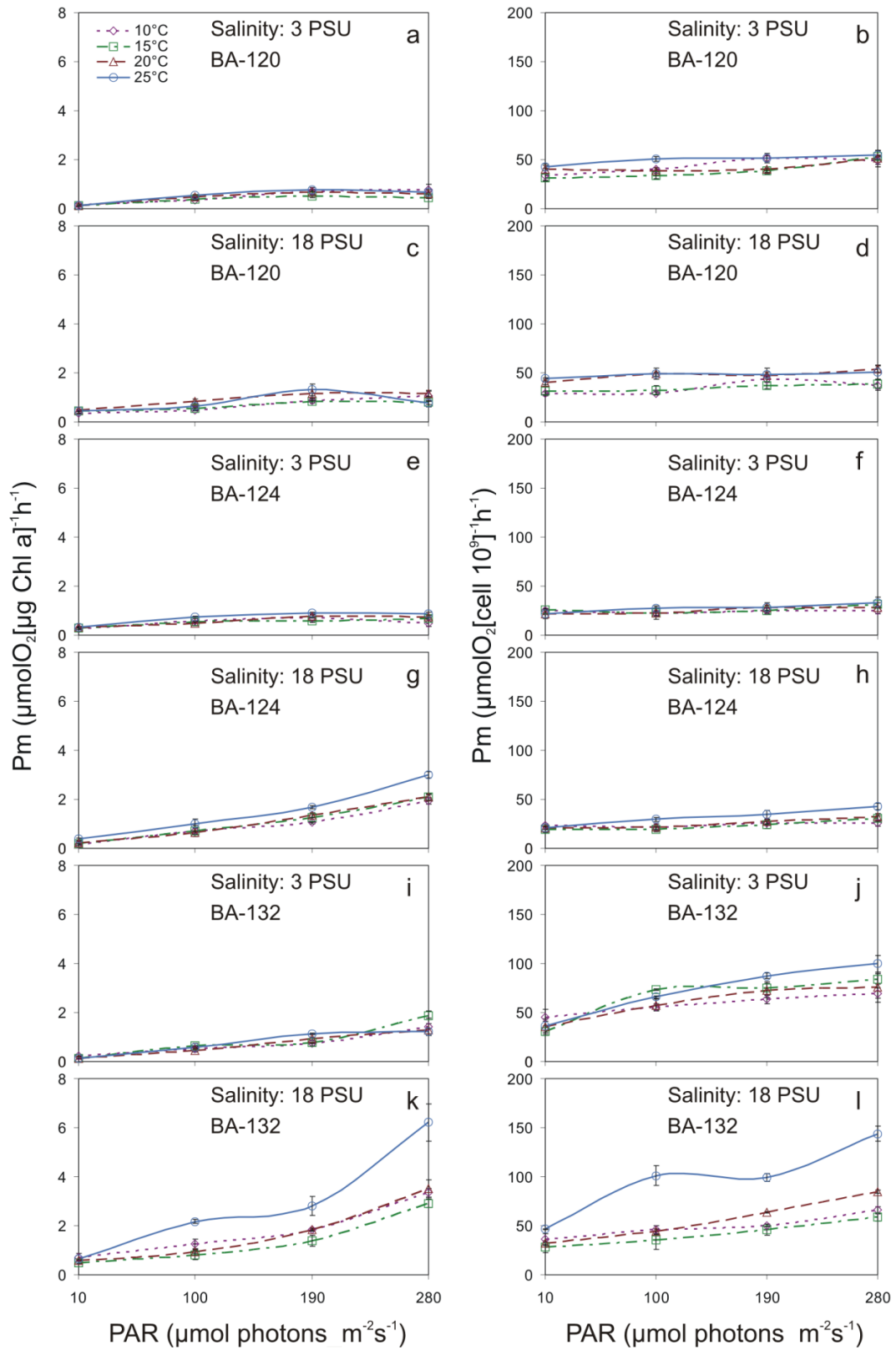
$$d = \ln 2 \mu^{-1} \quad \text{EQ. S2}$$



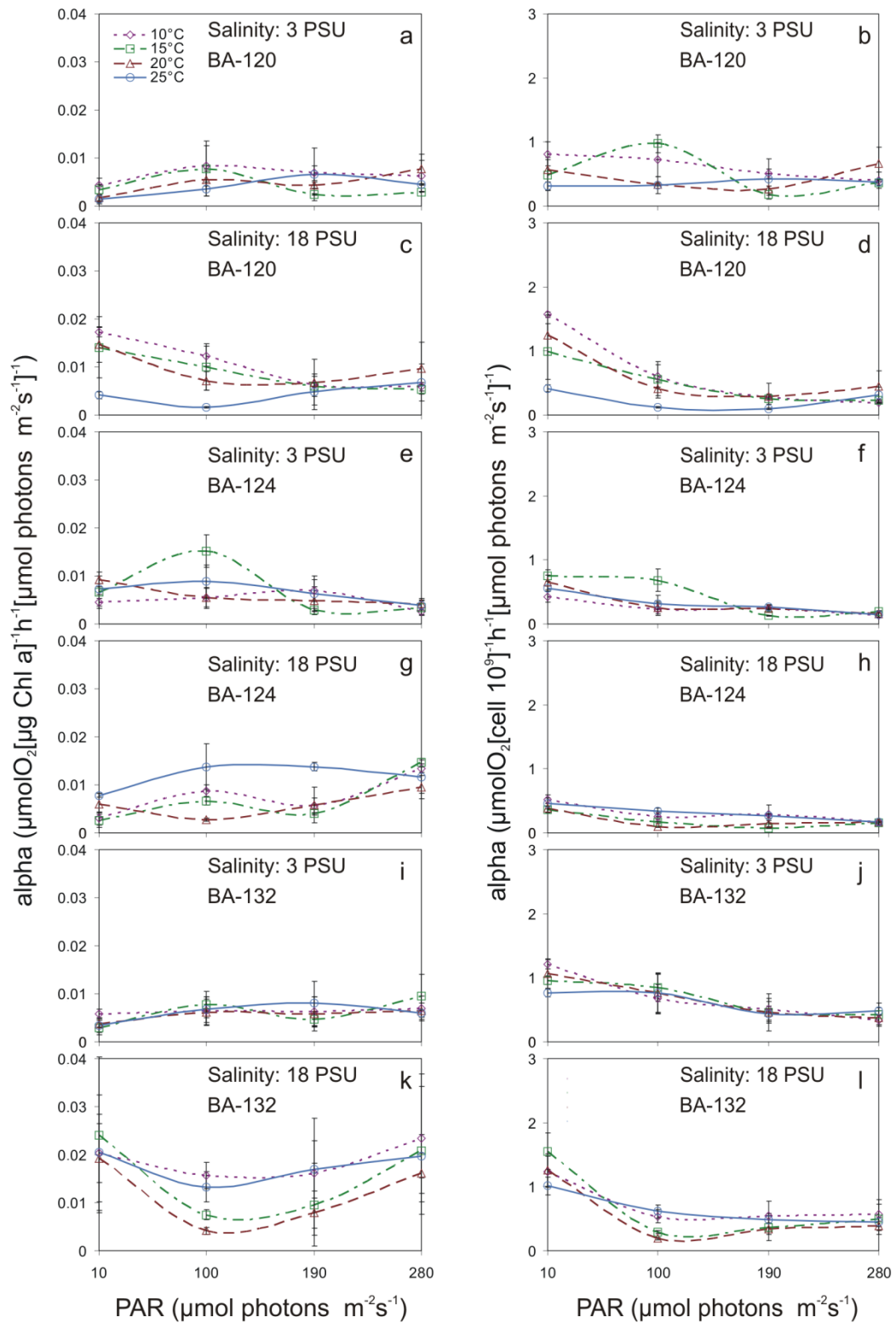
**Figure S2:** Chl *a* ( $\mu\text{g mL}^{-1}$ ) changes for three *Synechococcus* sp. strains: BA-120 (A), BA-124 (B) and BA-132 (C) under different PAR and temperature conditions in 4 salinity mediums: 3 PSU (a), 8 PSU (b), 13 PSU (c) and 18 PSU (d).



**Figure S3:** Car ( $\mu\text{g mL}^{-1}$ ) changes for three *Synechococcus* sp. strains: BA-120 (A), BA-124 (B) and BA-132 (C) under different PAR and temperature conditions in 4 salinity mediums: 3 PSU (a), 8 PSU (b), 13 PSU (c) and 18 PSU (d).



**Figure S4:** The Chl *a*-specific (left side panel) and cell-specific (right side panel) photosynthesis capacity ( $P_m$ ) at two extreme salinities (3 and 18 PSU) under different PAR and temperature conditions for three *Synechococcus* sp. strains: BA-120 (a-d), BA-124 (e-h) and BA-132 (i-l).



**Figure S5:** The Chl *a*-specific (left side panel) and cell-specific (right side panel) photosynthetic efficiency at limiting irradiance ( $\alpha$ ) at two extreme salinities (3 and 18 PSU) under different PAR and temperature conditions for three *Synechococcus* sp. strains: BA-120 (a-d), BA-124 (e-h) and BA-132 (i-l).

**Table S1:** Two-way factorial ANOVA of the numbers of cells measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures (°C) and irradiances ( $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	197.509	65.836	675.3***
		irradiation	3	101.607	33.869	347.4***
		interaction	9	37.136	4.126	42.3***
		error	32	3.120	0.097	
	8	temperature	3	129.557	43.186	503.6***
		irradiation	3	72.429	24.143	281.5***
		interaction	9	17.546	1.950	22.7***
		error	32	2.744	0.086	
	13	temperature	3	201.238	67.079	1151.4***
		irradiation	3	29.072	9.691	166.3***
		interaction	9	5.056	0.562	9.6***
		error	32	1.864	0.058	
18	temperature	3	224.858	74.953	728.8***	
	irradiation	3	18.983	6.328	61.5***	
	interaction	9	11.293	1.255	12.2***	
	error	32	3.291	0.103		
BA-124	3	temperature	3	1208.590	402.863	236.8***
		irradiation	3	1095.546	365.182	214.7***
		interaction	9	121.813	13.535	8.0***
		error	32	54.431	1.701	
	8	temperature	3	2205.020	735.007	325.5***
		irradiation	3	1654.435	551.478	244.3***
		interaction	9	276.872	30.764	13.6***
		error	32	72.248	2.258	
	13	temperature	3	2673.022	891.007	272.3***
		irradiation	3	1478.589	492.863	150.6***
		interaction	9	246.916	27.435	8.4***
		error	32	104.691	3.272	
18	temperature	3	4445.393	1481.798	288.5***	
	irradiation	3	2131.171	710.390	138.3***	
	interaction	9	131.132	14.570	2,8***	
	error	32	164.374	5.137		
BA-132	3	temperature	3	235.890	78.630	1052.5***
		irradiation	3	55.404	18.468	247.2***
		interaction	9	4.536	0.504	6.7***
		error	32	2.391	0.075	
	8	temperature	3	253.151	84.384	933.8***
		irradiation	3	69.598	23.199	256.7***
		interaction	9	4.417	0.491	5.4***
		error	32	2.892	0.090	
	13	temperature	3	293.530	97.843	543.7***
		irradiation	3	98.697	32.899	182.8***
		interaction	9	9.083	1.009	5.6***
		error	32	5.759	0.180	
18	temperature	3	340.964	113.655	1154.1***	
	irradiation	3	132.498	44.166	448.5***	
	interaction	9	11.030	1.226	12.4***	
	error	32	3.151	0.098		

**Table S2:** Two-way factorial ANOVA of cell-specific Chl *a* (pg cell<sup>-1</sup>) measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures (°C) and irradiances (μmol photons m<sup>-2</sup>s<sup>-1</sup>) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	0.004	0.001	10.9***
		irradiation	3	0.367	0.122	1102.4***
		interaction	9	0.034	0.004	33.7***
		error	32	0.004	0.000	
	8	temperature	3	0.009	0.003	13.0***
		irradiation	3	0.124	0.041	170.8***
		interaction	9	0.012	0.001	5.3***
		error	32	0.008	0.000	
	13	temperature	3	0.002	0.001	11.5***
		irradiation	3	0.039	0.013	238.2***
		interaction	9	0.008	0.001	15.6***
		error	32	0.002	0.000	
18	temperature	3	0.001	0.000	12.4***	
	irradiation	3	0.012	0.004	117.9***	
	interaction	9	0.002	0.000	5.7***	
	error	32	0.001	0.000		
BA-124	3	temperature	3	0.001	0.000	9.2***
		irradiation	3	0.015	0.005	100.6***
		interaction	9	0.001	0.000	3.3**
		error	32	0.002	0.000	
	8	temperature	3	0.002	0.001	17.5***
		irradiation	3	0.024	0.008	274.8***
		interaction	9	0.002	0.000	8.3***
		error	32	0.001	0.000	
	13	temperature	3	0.005	0.002	50.4***
		irradiation	3	0.052	0.017	488.7***
		interaction	9	0.022	0.002	69.8***
		error	32	0.001	0.000	
18	temperature	3	0.004	0.001	20.0***	
	irradiation	3	0.057	0.019	310.1***	
	interaction	9	0.010	0.001	17.5***	
	error	32	0.002	0.000		
BA-132	3	temperature	3	0.006	0.002	8.7***
		irradiation	3	0.296	0.099	410.8***
		interaction	9	0.014	0.002	6.5***
		error	32	0.008	0.000	
	8	temperature	3	0.004	0.001	11.9***
		irradiation	3	0.165	0.055	442.4***
		interaction	9	0.012	0.001	11.1***
		error	32	0.004	0.000	
	13	temperature	3	0.002	0.001	10.8***
		irradiation	3	0.061	0.020	391.9***
		interaction	9	0.010	0.001	21.5***
		error	32	0.002	0.000	
18	temperature	3	0.001	0.000	24.0***	
	irradiation	3	0.009	0.003	363.8***	
	interaction	9	0.000	0.000	6.6***	
	error	32	0.000	0.000		



**Table S3:** Two-way factorial ANOVA of cell-specific Car (pg cell<sup>-1</sup>) measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures (°C) and irradiances (μmol photons m<sup>-2</sup>s<sup>-1</sup>) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	0.002	0.001	14.3***
		irradiation	3	0.022	0.007	150.2***
		interaction	9	0.012	0.001	25.8***
		error	32	0.002	0.000	
	8	temperature	3	0.007	0.002	99.5***
		irradiation	3	0.006	0.002	79.5***
		interaction	9	0.002	0.000	7.5***
		error	32	0.001	0.000	
	13	temperature	3	0.004	0.001	83.3***
		irradiation	3	0.001	0.000	28.4***
		interaction	9	0.001	0.000	7.3***
		error	32	0.000	0.000	
18	temperature	3	0.002	0.001	104.1***	
	irradiation	3	0.001	0.000	29.4***	
	interaction	9	0.001	0.000	12.0***	
	error	32	0.000	0.000		
BA-124	3	temperature	3	0.000	0.000	2.8
		irradiation	3	0.005	0.002	91.1***
		interaction	9	0.001	0.000	4.6***
		error	32	0.001	0.000	
	8	temperature	3	0.001	0.000	46.0***
		irradiation	3	0.007	0.002	564.6***
		interaction	9	0.003	0.000	65.5***
		error	32	0.000	0.000	
	13	temperature	3	0.001	0.000	26.0***
		irradiation	3	0.011	0.004	467.1***
		interaction	9	0.006	0.001	83.1***
		error	32	0.000	0.000	
18	temperature	3	0.001	0.000	19.2***	
	irradiation	3	0.013	0.004	377.5***	
	interaction	9	0.004	0.000	43.2***	
	error	32	0.000	0.000		
BA-132	3	temperature	3	0.010	0.003	28.2***
		irradiation	3	0.057	0.019	169.1***
		interaction	9	0.009	0.001	8.6***
		error	32	0.004	0.000	
	8	temperature	3	0.006	0.002	47.4***
		irradiation	3	0.029	0.010	229.5***
		interaction	9	0.004	0.000	9.7***
		error	32	0.001	0.000	
	13	temperature	3	0.005	0.002	46.3***
		irradiation	3	0.012	0.004	106.1***
		interaction	9	0.002	0.000	4.6***
		error	32	0.001	0.000	
18	temperature	3	0.001	0.000	105.4***	
	irradiation	3	0.004	0.001	438.8***	
	interaction	9	0.001	0.000	26.8***	
	error	32	0.000	0.000		

**Table S4:** Two-way factorial ANOVA of cell-specific Chl *a* ( $\mu\text{g mL}^{-1}$ ) measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures ( $^{\circ}\text{C}$ ) and irradiances ( $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	4.817	1.606	1816.9***
		irradiation	3	4.081	1.360	1539.3***
		interaction	9	5.330	0.592	670.2***
		error	32	0.028	0.001	
	8	temperature	3	2.365	0.788	266.0***
		irradiation	3	1.378	0.459	155.0***
		interaction	9	0.854	0.095	32.0***
		error	32	0.095	0.003	
	13	temperature	3	1.487	0.496	604.2***
		irradiation	3	1.046	0.349	425.1***
		interaction	9	0.636	0.071	86.2***
		error	32	0.026	0.001	
18	temperature	3	1.160	0.387	880.0***	
	irradiation	3	0.327	0.109	248.4***	
	interaction	9	0.156	0.017	39.4***	
	error	32	0.014	0.000		
BA-124	3	temperature	3	1.559	0.520	553.6***
		irradiation	3	0.891	0.297	316.2***
		interaction	9	0.135	0.015	15.9***
		error	32	0.030	0.001	
	8	temperature	3	1.733	0.578	439.2***
		irradiation	3	0.031	0.010	7.8***
		interaction	9	0.154	0.017	13.0***
		error	32	0.042	0.001	
	13	temperature	3	2.725	0.908	490.5***
		irradiation	3	0.340	0.113	61.2***
		interaction	9	0.133	0.015	8.0***
		error	32	0.059	0.002	
18	temperature	3	2.963	0.988	261.8***	
	irradiation	3	0.973	0.324	86.0***	
	interaction	9	0.425	0.047	12.5***	
	error	32	0.121	0.004		
BA-132	3	temperature	3	5.444	1.815	2327.2***
		irradiation	3	3.862	1.287	1650.9***
		interaction	9	2.409	0.268	343.3***
		error	32	0.025	0.001	
	8	temperature	3	3.414	1.138	1360.7***
		irradiation	3	2.871	0.957	1144.2***
		interaction	9	1.680	0.187	223.2***
		error	32	0.027	0.001	
	13	temperature	3	1.487	0.496	467.6***
		irradiation	3	1.501	0.500	471.9***
		interaction	9	0.842	0.094	88.2***
		error	32	0.034	0.001	
18	temperature	3	0.785	0.262	324.1***	
	irradiation	3	0.202	0.067	83.4***	
	interaction	9	0.071	0.008	9.8***	
	error	32	0.026	0.001		

**Table S5:** Two-way factorial ANOVA of cell-specific Car ( $\mu\text{g mL}^{-1}$ ) measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures ( $^{\circ}\text{C}$ ) and irradiances ( $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	1.075	0.358	1336.8***
		irradiation	3	0.020	0.007	25.3***
		interaction	9	0.033	0.004	13.7***
		error	32	0.009	0.000	
	8	temperature	3	1.217	0.406	700.4***
		irradiation	3	0.031	0.010	18.1***
		interaction	9	0.022	0.002	4.2**
		error	32	0.019	0.001	
	13	temperature	3	1.096	0.365	2899.4***
		irradiation	3	0.016	0.005	42.8***
		interaction	9	0.016	0.002	14.2***
		error	32	0.004	0.000	
18	temperature	3	0.814	0.271	912.4***	
	irradiation	3	0.012	0.004	13.5***	
	interaction	9	0.019	0.002	6.9***	
	error	32	0.010	0.000		
BA-124	3	temperature	3	1.227	0.409	392.9***
		irradiation	3	1.183	0.394	379.1***
		interaction	9	0.211	0.023	22.6***
		error	32	0.033	0.001	
	8	temperature	3	1.220	0.407	1328.7***
		irradiation	3	0.591	0.197	643.7***
		interaction	9	0.102	0.011	37.2***
		error	32	0.010	0.000	
	13	temperature	3	1.628	0.543	3186.0***
		irradiation	3	0.047	0.016	91.6***
		interaction	9	0.053	0.006	34.6***
		error	32	0.005	0.000	
18	temperature	3	1.864	0.621	3395.8***	
	irradiation	3	0.007	0.002	13.6***	
	interaction	9	0.035	0.004	21.0***	
	error	32	0.006	0.000		
BA-132	3	temperature	3	1.116	0.372	2458.7***
		irradiation	3	0.160	0.053	351.5***
		interaction	9	0.044	0.005	32.6***
		error	32	0.005	0.000	
	8	temperature	3	1.087	0.362	2551.4***
		irradiation	3	0.118	0.039	277.5***
		interaction	9	0.037	0.004	28.7***
		error	32	0.005	0.000	
	13	temperature	3	0.512	0.171	545.7***
		irradiation	3	0.056	0.019	60.1***
		interaction	9	0.044	0.005	15.6***
		error	32	0.010	0.000	
18	temperature	3	0.345	0.115	497.5***	
	irradiation	3	0.033	0.011	48.2***	
	interaction	9	0.024	0.003	11.7***	
	error	32	0.007	0.000		

**Table S6:** Two-way factorial ANOVA of  $F_v/F_m$  measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures (°C) and irradiances ( $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	0.241	0.080	222.4***
		irradiation	3	0.086	0.029	79.7***
		interaction	9	0.017	0.002	5.2***
		error	32	0.012	0.000	
	8	temperature	3	0.242	0.081	152.2***
		irradiation	3	0.018	0.006	11.6***
		interaction	9	0.027	0.003	5.6***
		error	32	0.017	0.001	
	13	temperature	3	0.292	0.097	186.3***
		irradiation	3	0.114	0.038	72.8***
		interaction	9	0.022	0.002	4.7***
		error	32	0.017	0.001	
18	temperature	3	0.171	0.057	265.1***	
	irradiation	3	0.073	0.024	112.8***	
	interaction	9	0.065	0.007	33.9***	
	error	32	0.007	0.000		
BA-124	3	temperature	3	0.367	0.122	1068.7***
		irradiation	3	0.187	0.062	545.5***
		interaction	9	0.048	0.005	46.2***
		error	32	0.004	0.000	
	8	temperature	3	0.326	0.109	481.5***
		irradiation	3	0.077	0.026	112.8***
		interaction	9	0.010	0.001	5.1***
		error	32	0.007	0.000	
	13	temperature	3	0.193	0.064	347.7***
		irradiation	3	0.062	0.021	111.7***
		interaction	9	0.008	0.001	5.0***
		error	32	0.006	0.000	
18	temperature	3	0.126	0.042	273.2***	
	irradiation	3	0.071	0.024	153.6***	
	interaction	9	0.028	0.003	20.6***	
	error	32	0.005	0.000		
BA-132	3	temperature	3	0.473	0.158	269.1***
		irradiation	3	0.252	0.084	143.5***
		interaction	9	0.023	0.003	4.3***
		error	32	0.019	0.001	
	8	temperature	3	0.683	0.228	823.9***
		irradiation	3	0.020	0.007	23.8***
		interaction	9	0.012	0.001	4.8***
		error	32	0.009	0.000	
	13	temperature	3	1.161	0.387	432.4***
		irradiation	3	0.401	0.134	149.3***
		interaction	9	0.036	0.004	4.5***
		error	32	0.029	0.001	
18	temperature	3	0.382	0.127	493.1***	
	irradiation	3	0.215	0.072	277.8***	
	interaction	9	0.013	0.001	5.7***	
	error	32	0.008	0.000		

**Table S7:** Two-way factorial ANOVA of  $\Phi$ PSII measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures ( $^{\circ}$ C) and irradiances ( $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	0.149	0.050	189.5***
		irradiation	3	1.000	0.333	1270.9***
		interaction	9	0.011	0.001	4.5***
		error	32	0.008	0.000	
	8	temperature	3	0.106	0.035	117.3***
		irradiation	3	0.681	0.227	752.5***
		interaction	9	0.015	0.002	5.7***
		error	32	0.010	0.000	
	13	temperature	3	0.255	0.085	139.0***
		irradiation	3	0.447	0.149	242.9***
		interaction	9	0.035	0.004	6.3***
		error	32	0.020	0.001	
18	temperature	3	0.137	0.046	141.1***	
	irradiation	3	0.585	0.195	602.6***	
	interaction	9	0.007	0.001	2.3*	
	error	32	0.010	0.000		
BA-124	3	temperature	3	0.178	0.059	254.7***
		irradiation	3	0.566	0.189	810.7***
		interaction	9	0.052	0.006	25.0***
		error	32	0.007	0.000	
	8	temperature	3	0.149	0.050	198.1***
		irradiation	3	0.365	0.122	486.5***
		interaction	9	0.026	0.003	11.6***
		error	32	0.008	0.000	
	13	temperature	3	0.080	0.027	164.8***
		irradiation	3	0.403	0.134	830.5***
		interaction	9	0.022	0.002	15.4***
		error	32	0.005	0.000	
18	temperature	3	0.059	0.020	95.3***	
	irradiation	3	0.251	0.084	404.5***	
	interaction	9	0.010	0.001	5.2***	
	error	32	0.007	0.000		
BA-132	3	temperature	3	0.158	0.053	164.7***
		irradiation	3	0.641	0.214	669.1***
		interaction	9	0.029	0.003	10.2***
		error	32	0.010	0.000	
	8	temperature	3	0.132	0.044	382.8***
		irradiation	3	0.483	0.161	1401.4***
		interaction	9	0.008	0.001	7.7***
		error	32	0.004	0.000	
	13	temperature	3	0.094	0.031	128.3***
		irradiation	3	0.187	0.062	255.2***
		interaction	9	0.010	0.001	4.7***
		error	32	0.008	0.000	
18	temperature	3	0.131	0.044	200.5***	
	irradiation	3	0.550	0.183	840.2***	
	interaction	9	0.014	0.002	7.0***	
	error	32	0.007	0.000		

**Table S8:** Two-way factorial ANOVA of  $P_m$  ( $\mu\text{mol O}_2 [\mu\text{ Chl } a]^{-1}\text{h}^{-1}$ ) measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures ( $^{\circ}\text{C}$ ) and irradiances ( $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	2.088	0.696	91.5***
		irradiation	3	0.189	0.063	8.3***
		interaction	9	0.167	0.019	2.4*
		error	32	0.243	0.008	
	8	temperature	3	2.102	0.701	114.2***
		irradiation	3	0.067	0.022	3.7*
		interaction	9	0.175	0.019	3.2**
		error	32	0.196	0.006	
	13	temperature	3	2.679	0.893	174.7***
		irradiation	3	0.082	0.027	5.4**
		interaction	9	0.095	0.011	2.1
		error	32	0.164	0.005	
18	temperature	3	2.908	0.969	82.5***	
	irradiation	3	0.442	0.147	12.5***	
	interaction	9	0.554	0.062	5.2***	
	error	32	0.376	0.012		
BA-124	3	temperature	3	1.431	0.477	90.7***
		irradiation	3	0.299	0.100	18.9***
		interaction	9	0.229	0.025	4.8***
		error	32	0.168	0.005	
	8	temperature	3	8.158	2.719	123.7***
		irradiation	3	3.930	1.310	59.6***
		interaction	9	3.894	0.433	19.7***
		error	32	0.703	0.022	
	13	temperature	3	14.319	4.773	273.0***
		irradiation	3	2.751	0.917	52.4***
		interaction	9	1.439	0.160	9.1***
		error	32	0.560	0.017	
18	temperature	3	27.372	9.124	591.7***	
	irradiation	3	2.204	0.735	47.6***	
	interaction	9	0.906	0.101	6.5***	
	error	32	0.493	0.015		
BA-132	3	temperature	3	11.049	3.683	212.9***
		irradiation	3	0.173	0.058	3.3*
		interaction	9	0.973	0.108	6.2***
		error	32	0.554	0.017	
	8	temperature	3	24.430	8.143	490.8***
		irradiation	3	4.116	1.372	82.7***
		interaction	9	3.452	0.384	23.1***
		error	32	0.531	0.017	
	13	temperature	3	86.262	28.754	635.1***
		irradiation	3	12.746	4.249	93.8***
		interaction	9	10.263	1.140	25.2***
		error	32	1.449	0.045	
18	temperature	3	77.322	25.774	365.7***	
	irradiation	3	16.761	5.587	79.3***	
	interaction	9	10.162	1.129	16.0***	
	error	32	2.256	0.070		

**Table S9:** Two-way factorial ANOVA of  $P_m$  ( $\mu\text{mol O}_2 [\text{cell } 10^9]^{-1}\text{h}^{-1}$ ) measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures ( $^{\circ}\text{C}$ ) and irradiances ( $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	1526.092	508.697	31.0***
		irradiation	3	710.911	236.970	14.4***
		interaction	9	524.191	58.243	3.5**
		error	32	525.591	16.425	
	8	temperature	3	880.266	293.422	20.7***
		irradiation	3	720.808	240.269	16.9***
		interaction	9	337.712	37.524	2.6*
		error	32	453.698	14.178	
	13	temperature	3	1480.545	493.515	34.8***
		irradiation	3	254.923	84.974	6.0**
		interaction	9	383.820	42.647	3.0*
		error	32	453.474	14.171	
18	temperature	3	617.360	205.787	12.5***	
	irradiation	3	2049.203	683.068	41.6***	
	interaction	9	285.640	31.738	1.9	
	error	32	524.918	16.404		
BA-124	3	temperature	3	291.831	97.277	9.0***
		irradiation	3	66.150	22.050	2.0
		interaction	9	169.025	18.781	1.7
		error	32	345.226	10.788	
	8	temperature	3	759.553	253.184	19.6***
		irradiation	3	1516.647	505.549	39.2***
		interaction	9	865.577	96.175	7.5***
		error	32	412.923	12.904	
	13	temperature	3	740.100	246.700	14.1***
		irradiation	3	1200.677	400.226	22.8***
		interaction	9	966.207	107.356	6.1***
		error	32	561.481	17.546	
18	temperature	3	975.435	325.145	41.6***	
	irradiation	3	528.387	176.129	22.5***	
	interaction	9	304.309	33.812	4.3***	
	error	32	250.411	7.825		
BA-132	3	temperature	3	14331.281	4777.094	105.7***
		irradiation	3	1421.619	473.873	10.5***
		interaction	9	1943.318	215.924	4.8***
		error	32	1446.789	45.212	
	8	temperature	3	22945.063	7648.354	207.0***
		irradiation	3	25863.993	8621.331	233.3***
		interaction	9	8084.030	898.226	24.3***
		error	32	1182.526	36.954	
	13	temperature	3	17400.195	5800.065	194.9***
		irradiation	3	20434.864	6811.621	228.9***
		interaction	9	6500.106	722.234	24.3***
		error	32	952.392	29.762	
18	temperature	3	16945.781	5648.594	215.2***	
	irradiation	3	22384.004	7461.335	284.2***	
	interaction	9	5017.477	557.497	21.2***	
	error	32	840.124	26.254		

**Table S10:** Two-way factorial ANOVA of  $\alpha$  ( $\mu\text{mol O}_2 [\mu\text{ Chl } a]^{-1}\text{h}^{-1} [\mu\text{mol photons m}^{-2}\text{s}^{-1}]^{-1}$ ) measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures ( $^{\circ}\text{C}$ ) and irradiances ( $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	0.000	0.000	3.8*
		irradiation	3	0.000	0.000	2.1
		interaction	9	0.000	0.000	1.4
		error	32	0.000	0.000	
	8	temperature	3	0.000	0.000	1.3
		irradiation	3	0.000	0.000	2.4
		interaction	9	0.000	0.000	3.3
		error	32	0.000	0.000	
	13	temperature	3	0.000	0.000	0.8
		irradiation	3	0.000	0.000	1.4
		interaction	9	0.000	0.000	2.2
		error	32	0.000	0.000	
	18	temperature	3	0.000	0.000	9.2***
		irradiation	3	0.000	0.000	7.9***
		interaction	9	0.000	0.000	2.7*
		error	32	0.000	0.000	
BA-124	3	temperature	3	0.000	0.000	12.0***
		irradiation	3	0.000	0.000	2.1
		interaction	9	0.000	0.000	5.0***
		error	32	0.000	0.000	
	8	temperature	3	0.000	0.000	2.4
		irradiation	3	0.000	0.000	1.4
		interaction	9	0.000	0.000	3.3**
		error	32	0.000	0.000	
	13	temperature	3	0.000	0.000	3.2*
		irradiation	3	0.000	0.000	3.4*
		interaction	9	0.000	0.000	1.8
		error	32	0.000	0.000	
	18	temperature	3	0.000	0.000	16.8***
		irradiation	3	0.000	0.000	11.1***
		interaction	9	0.000	0.000	3.8**
		error	32	0.000	0.000	
BA-132	3	temperature	3	0.000	0.000	3.5*
		irradiation	3	0.000	0.000	0.2
		interaction	9	0.000	0.000	0.9
		error	32	0.000	0.000	
	8	temperature	3	0.000	0.000	0.6
		irradiation	3	0.000	0.000	1.4
		interaction	9	0.000	0.000	2.7*
		error	32	0.000	0.000	
	13	temperature	3	0.000	0.000	1.0
		irradiation	3	0.000	0.000	1.2
		interaction	9	0.000	0.000	1.2
		error	32	0.000	0.000	
	18	temperature	3	0.000	0.000	1.0
		irradiation	3	0.000	0.000	1.2
		interaction	9	0.000	0.000	1.2
		error	32	0.000	0.000	



**Table S11:** Two-way factorial ANOVA of  $\alpha$  ( $\mu\text{mol O}_2 [\text{cell } 10^9]^{-1}\text{h}^{-1} [\mu\text{mol photons m}^{-2}\text{s}^{-1}]^{-1}$ ) measured in *Synechococcus* sp. strains: BA-120, BA-124 and BA-132 growing at different temperatures ( $^{\circ}\text{C}$ ) and irradiances ( $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) in each tested salinity (psu): df – degrees of freedom; F – Fisher's F-test statistic; Mss – mean sum of squares; Ss – sum of squares. Levels of significance were: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Strain	Salinity	Source of variation	Df	Ss	Mss	F
BA-120	3	temperature	3	0.440	0.147	5.3**
		irradiation	3	0.386	0.129	4.7**
		interaction	9	1.265	0.141	5.1***
		error	32	0.878	0.027	
	8	temperature	3	0.848	0.283	12.2***
		irradiation	3	0.065	0.022	0.9
		interaction	9	0.602	0.067	2.9*
		error	32	0.743	0.023	
	13	temperature	3	3.311	1.104	23.8***
		irradiation	3	0.502	0.167	3.6*
		interaction	9	1.045	0.116	2.5*
		error	32	1.484	0.046	
18	temperature	3	5.143	1.714	50.3***	
	irradiation	3	1.255	0.418	12.3***	
	interaction	9	1.478	0.164	4.8***	
	error	32	1.092	0.034		
BA-124	3	temperature	3	1.360	0.453	65.8***
		irradiation	3	0.209	0.070	10.1***
		interaction	9	0.408	0.045	6.6***
		error	32	0.221	0.007	
	8	temperature	3	0.484	0.161	64.5***
		irradiation	3	0.217	0.072	28.9***
		interaction	9	0.402	0.045	17.9***
		error	32	0.080	0.002	
	13	temperature	3	2.916	0.972	54.8***
		irradiation	3	1.316	0.439	24.7***
		interaction	9	3.013	0.335	18.9***
		error	32	0.567	0.018	
18	temperature	3	0.546	0.182	59.3***	
	irradiation	3	0.157	0.052	17.1***	
	interaction	9	0.085	0.009	3.1**	
	error	32	0.098	0.003		
BA-132	3	temperature	3	2.731	0.910	25.8***
		irradiation	3	0.040	0.013	0.4
		interaction	9	0.369	0.041	1.2
		error	32	1.130	0.035	
	8	temperature	3	8.422	2.807	75.8***
		irradiation	3	0.285	0.095	2.6
		interaction	9	0.572	0.064	1.7
		error	32	1.186	0.037	
	13	temperature	3	8.189	2.730	73.2***
		irradiation	3	0.180	0.060	1.6
		interaction	9	1.087	0.121	3.2**
		error	32	1.193	0.037	
18	temperature	3	6.177	2.059	74.4***	
	irradiation	3	0.200	0.067	2.4	
	interaction	9	0.721	0.080	2.9*	
	error	32	0.886	0.028		