

Supplementary Material

1 Supplementary Figures and Tables

Table S1. Summary of mean carbonate chemistry in the experimental treatments. $p\text{CO}_2$, HCO_3^- , and CO_3^{2-} were calculated using the R package seacarb inputting measured pH_T , total alkalinity (TA), temperature (Temp °C), and a salinity of 35.5 ± 0.2 . All values are mean \pm standard error (SE). High-Mg calcite was calculated for 16.4% calcite following methods from Diaz-Pulido et al. (2012).

Treatment [Target]	Temp °C	pH _r	TA $\mu\text{mol kg}^{-1}$	$p\text{CO}_2$ μatm	HCO_3^- $\mu\text{mol kg}^{-1}$	CO_3^{2-} $\mu\text{mol kg}^{-1}$	$\Omega_{\text{High-Mg Calcite}}$
27.2 °C + pH 8.0	27.12 \pm 0.060	8.00 \pm 0.005	2291.49 \pm 0.653	454.19 \pm 8.178	1777.70 \pm 4.330	209.14 \pm 1.780	1.088 \pm 0.010
29.5 °C + pH 8.0	29.29 \pm 0.071	7.99 \pm 0.003	2290.71 \pm 0.875	477.26 \pm 3.982	1768.71 \pm 2.980	212.72 \pm 1.340	1.135 \pm 0.030
27.2 °C + pH 7.7	27.18 \pm 0.051	7.70 \pm 0.002	2290.91 \pm 0.811	1020.44 \pm 7.297	2005.62 \pm 1.860	116.54 \pm 7.970	0.606 \pm 0.020
29.5 °C + pH 7.7	29.48 \pm 0.071	7.69 \pm 0.003	2290.31 \pm 0.722	1028.482 \pm 7.076	1984.58 \pm 1.540	125.02 \pm 6.850	0.672 \pm 0.030

Table S2. Summary of two-way ANOVA results for the effects of acclimation temperature and pH on average net photosynthesis ($\mu\text{mol O}_2 \text{ cm}^{-2} \text{ h}^{-1}$) of *Porolithon* cf. *onkodes* at respective acclimation temperatures (27.2 °C or 29.5 °C) following 6 weeks in treatment.

Factor	Average net photosynthesis ($\mu\text{mol O}_2 \text{ cm}^{-2} \text{ h}^{-1}$)			
	Df	MS	F	p
Temperature	1	1.147	0.665	0.427
pH	1	5.221	3.028	0.102
Temperature * pH	1	5.147	2.985	0.105
Residuals	15	1.724		

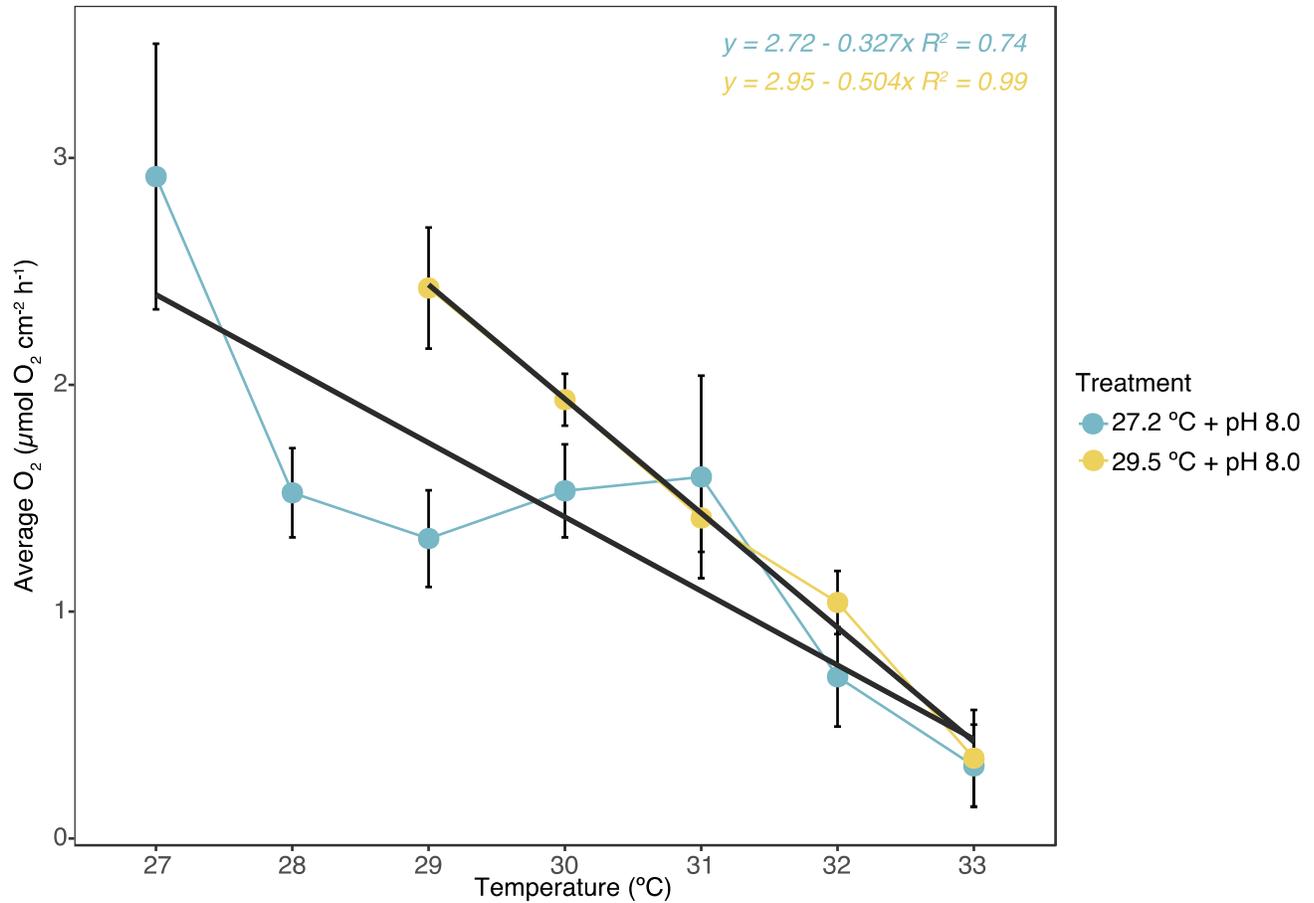
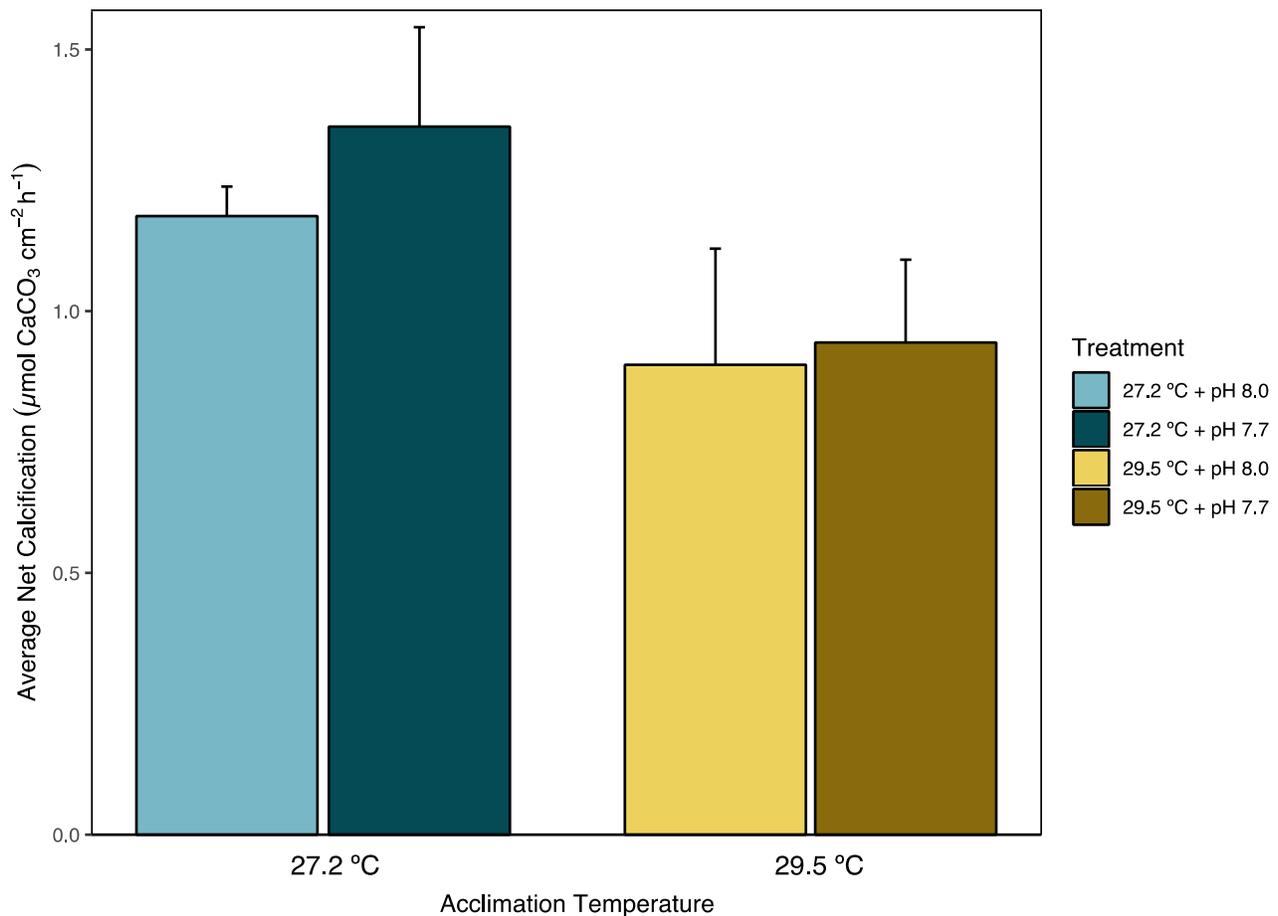


Figure S1. Slope comparison for significant interaction of ramp temperature and experimental acclimation temperature found from the linear mixed effects model run on relative change in O₂ production for temperature treatments at control pH (8.0 pH) of *Porolithon cf. onkodes*. Each point is mean O₂ production per treatment \pm standard error (SE). $n = 4 - 5$. Graph is fitted with best fit lines for each treatment. Regression line equation and R^2 value for the control treatment was $y = 2.72 - 0.327x$ $R^2 = 0.74$ and for the elevated temperature treatment $y = 2.95 - 0.504x$ $R^2 = 0.99$. Blue points equate to control temperature, 27.2 °C, and yellow points to elevated temperature, 29.5 °C.

Table S3. Summary of two-way ANOVA results for the effects of temperature and pH levels on net calcification ($\mu\text{mol CaCO}_3 \text{ cm}^{-2} \text{ h}^{-1}$) of *Porolithon cf. onkodes*.

Average net calcification ($\mu\text{mol CaCO}_3 \text{ cm}^{-2} \text{ h}^{-1}$)				
Factor	Df	MS	F	p
Temperature	1	0.637	3.496	0.079
pH	1	0.124	0.683	0.402
Temperature * pH	1	0.021	0.115	0.738
Residuals	17	0.182		

**Figure S2.** Mean net calcification values of *Porolithon cf. onkodes* for each treatment condition after temperature ramp experiment. Each bar represents mean net calcification \pm standard error (SE) for each treatment. $n = 4 - 5$. Blue bars equate to control temperature, 27.2 °C, and yellow hued bars to elevated temperature, 29.5 °C, with pH treatment shown as different shades within temperature treatment.