

Table S1. Effects of $p\text{CO}_2$ stress exposures on mean respiration rate and shell growth of *P. generosa*. A Welch's t-test tested for effects of $p\text{CO}_2$ stress acclimation prior to the 21-day experiment. Linear mixed effects models assessed treatments as fixed effects with the random effect of time under the second exposure, recovery, and third exposure periods. Significant effects are bolded for $P < 0.05$.

Effect	Respiration rate			Shell length		
	df	F	P	df	F	P
Pre-experiment	<i>t-test</i>					
$p\text{CO}_2$ primary	31.725	-	0.552	2884	-	<0.0001
Days 1-7	<i>Three-way ANOVA</i>					
$p\text{CO}_2$ primary	1,99	3.503	0.064	1,316	3.489	<i>0.063</i>
$p\text{CO}_2$ second	2,99	0.593	0.554	2,316	0.139	0.871
$p\text{CO}_2$ primary \times $p\text{CO}_2$ second	2,99	2.870	0.067	2,316	0.238	0.788
Days 8-14	<i>Three-way ANOVA</i>					
$p\text{CO}_2$ primary	1,97	0.112	0.739	1,316	1.678	0.196
$p\text{CO}_2$ second	2,97	2.232	0.113	2,316	0.656	0.520
$p\text{CO}_2$ primary \times $p\text{CO}_2$ second	2,97	0.969	0.383	2,316	0.052	0.950
Days 15-21	<i>Four-way ANOVA</i>					
$p\text{CO}_2$ primary	1,198	0.019	0.890	1,628	7.786	0.005
$p\text{CO}_2$ second	2,198	0.728	0.484	2,628	1.200	0.302
$p\text{CO}_2$ third	1,198	0.544	0.462	1,628	0.296	0.587
$p\text{CO}_2$ primary \times $p\text{CO}_2$ second	2,198	3.810	0.024	2,628	0.412	0.662
$p\text{CO}_2$ primary \times $p\text{CO}_2$ third	1,198	0.891	0.347	1,628	8.399	0.004
$p\text{CO}_2$ second \times $p\text{CO}_2$ third	2,198	0.340	0.671	2,628	3.853	0.022
$p\text{CO}_2$ primary \times $p\text{CO}_2$ second \times $p\text{CO}_2$ third	2,198	1.772	0.173	2,628	6.360	0.002
Significant P-values (< 0.05) are bolded; marginal P-values (< 0.1) in <i>italics</i>						

Table S2. Effects of $p\text{CO}_2$ stress exposures on antioxidant capacity, total protein, and organic biomass (AFDW) of *P. generosa*. Two-way and three-way ANOVA tests for differences in physiological and cellular status on days 7 and 21 of the 21-day exposure period, respectively. Significant effects are bolded for $P < 0.05$.

Effect	Antioxidant capacity			Total protein			AFDW		
	<i>df</i>	<i>F</i>	<i>P</i>	<i>df</i>	<i>F</i>	<i>P</i>	<i>df</i>	<i>F</i>	<i>P</i>
DAY 7	<i>Two-way ANOVA</i>								
$p\text{CO}_2$ primary	1,30	0.005	0.942	1,30	0.003	0.959	1,30	9.313	0.0047
$p\text{CO}_2$ second	2,30	0.143	0.867	2,30	0.866	0.431	2,30	2.536	0.096
$p\text{CO}_2$ primary \times $p\text{CO}_2$ second	2,30	1.007	0.377	2,30	2.136	0.136	2,30	0.158	0.8546
DAY 21	<i>Three-way ANOVA</i>								
$p\text{CO}_2$ primary	1,56	8.069	0.0063	1,56	0.009	0.926	1,56	12.899	<0.001
$p\text{CO}_2$ second	2,56	0.164	0.849	2,56	0.018	0.983	2,56	1.578	0.2153
$p\text{CO}_2$ third	1,56	2.161	0.1471	1,56	135.1	0.245	1,56	3.298	0.0747
$p\text{CO}_2$ primary \times $p\text{CO}_2$ second	2,56	1.43	0.248	2,56	0.309	0.735	2,56	1.756	0.1822
$p\text{CO}_2$ primary \times $p\text{CO}_2$ third	1,56	0.678	0.4136	1,56	3.605	<i>0.063</i>	1,56	0.453	0.5036
$p\text{CO}_2$ second \times $p\text{CO}_2$ third	2,56	0.752	0.476	2,56	0.038	0.963	2,56	0.166	0.8906
$p\text{CO}_2$ primary \times $p\text{CO}_2$ second \times $p\text{CO}_2$ third	2,56	0.141	0.8688	2,56	0.105	0.901	2,56	0.181	0.8353
Significant P-values (< 0.05) are bolded; marginal P-values (<0.1) in <i>italics</i>									