

Table S1 Weekly measurements of carbonate system parameters for the experimental $p\text{CO}_2$ system. Temperature, salinity, DIC and TA were measured in situ, and both $p\text{CO}_2$ and aragonite saturation state (Ω_{Ar}) were calculated using the CO2Sys Macros Excel sheet (Version 2.1, 18 September 2012). P⁻ and P⁺ symbolize predator absent (control), and predator present treatments, respectively.

$p\text{CO}_2$ treatment	Predator treatment	Week	Tank	Salinity	Temp (C)	DIC	TA	$p\text{CO}_2$	Ω_{Ar}
Elevated	P+	0	1	36.7	29.8	2171.7	2395.5	799.7	2.68
Elevated	P+	0	2	36.5	29.7	2188.6	2395.5	866.1	2.31
Elevated	P+	0	3	36.5	30.1	2172.8	2386.2	843.7	2.52
Elevated	P+	0	4	36.4	30	2162.6	2386.2	795.1	2.31
Elevated	P-	0	5	36.5	29.7	2211.1	2395.5	978.4	2.59
Elevated	P-	0	6	36.5	29.8	2210.8	2395.5	980.4	2.5
Elevated	P-	0	7	36.5	30.1	2181.8	2386.2	884.8	2.69
Elevated	P-	0	8	36.6	30.2	2190.5	2386.2	932.9	2.42
Ambient	P+	0	9	36.7	29.6	2022.3	2388.7	405	4.11
Ambient	P+	0	10	36.6	29.5	2018.4	2388.7	395.7	3.73
Ambient	P+	0	11	37	28.9	2050.4	2382.5	459.2	4.15
Ambient	P+	0	12	36.9	28.8	2024.1	2382.5	406.3	3.89
Ambient	P-	0	13	36.6	29.5	2059.5	2388.7	473.7	3.72
Ambient	P-	0	14	36.7	29.4	2043.2	2388.7	440.1	3.61
Ambient	P-	0	15	37	28.9	2061.2	2382.5	482	3.99
Ambient	P-	0	16	36.9	29.1	2075.3	2382.5	516.7	3.48
Elevated	P+	1	1	36.9	27.7	2149.5	2368.2	746.5	2.57
Elevated	P+	1	2	36.2	27.4	2346.3	2420.6	1780.3	2.36
Elevated	P+	1	3	37.1	28	2170.2	2366.3	855	1.34
Elevated	P+	1	4	37	29.2	2098	2390.6	559.8	2.51

Elevated	P-	1	5	37.1	27.7	2191.6	2387.3	860.4	2.35
Elevated	P-	1	6	37.1	27.5	2182.9	2394.5	788.3	2.1
Elevated	P-	1	7	36.7	27.9	2186.5	2355.1	976.8	3.34
Elevated	P-	1	8	36.4	27.7	2113.6	2306.7	808.6	2.31
Ambient	P+	1	9	37	28.2	1964	2364.4	326.8	4.38
Ambient	P+	1	10	37	28.1	1969.3	2386.1	310.4	3.93
Ambient	P+	1	11	37.1	28.1	1971.6	2365.6	335.8	4.56
Ambient	P+	1	12	37	28	1955.6	2382.5	295.5	4.4
Ambient	P-	1	13	36.9	27.6	2017.7	2373.6	388.7	4.31
Ambient	P-	1	14	37	28.2	1981.4	2382.6	331.4	5.03
Ambient	P-	1	15	35.9	27.6	1818.3	2284.1	217.1	4.66
Ambient	P-	1	16	37.1	27.9	1958.7	2386	295.8	4.66
Elevated	P+	2	1	38.2	30.4	2049.1	2216.8	1008.4	2.03
Elevated	P+	2	2	38.2	30.3	2072.2	2218	1146.8	1.73
Elevated	P+	2	3	38.2	30.5	2064.7	2221.7	1082.3	1.84
Elevated	P+	2	4	38.1	31.5	2029.3	2210.8	962.3	1.79
Elevated	P-	2	5	38.2	30.3	2085.6	2219.4	1236.9	1.94
Elevated	P-	2	6	38.2	30.3	2077.7	2218.5	1183.3	1.82
Elevated	P-	2	7	38.2	30.5	2079.4	2223	1175.5	2.17
Elevated	P-	2	8	38.2	30.4	2121.1	2242.2	1365.9	1.64
Ambient	P+	2	9	38.3	29.8	1902.3	2226.6	442.5	3.5
Ambient	P+	2	10	38.2	30.2	1894.7	2216.7	448.9	3.12
Ambient	P+	2	11	38.2	30.1	1885	2221.6	420	3.48
Ambient	P+	2	12	38.2	30.1	1888.7	2221.7	427	3.27
Ambient	P-	2	13	38.2	29.9	1945	2229.1	537.6	3.62

Ambient	P-	2	14	38.2	30.2	1915.9	2216.6	496.3	3.3
Ambient	P-	2	15	38.3	29.9	1944.2	2246.7	501.3	3.59
Ambient	P-	2	16	38.2	30	1919.7	2213.5	507.8	3.2
Elevated	P+	3	1	37.5	30.9	2091.3	2259	1042.3	2.08
Elevated	P+	3	2	38	30.9	2109.8	2262.3	1156.3	1.78
Elevated	P+	3	3	38.1	31	2093.5	2260	1069.1	1.93
Elevated	P+	3	4	38	31.7	2058.3	2258.1	905.5	1.94
Elevated	P-	3	5	37.9	30.8	2126.1	2261.4	1275.1	2.05
Elevated	P-	3	6	38.1	30.8	2105.2	2259.4	1140.3	1.73
Elevated	P-	3	7	38.1	31	2129.6	2259.5	1332.3	2.37
Elevated	P-	3	8	38	31	2106.5	2267.1	1109.5	2.01
Ambient	P+	3	9	38.2	30.3	1929.9	2259.1	453.5	3.58
Ambient	P+	3	10	38.2	30.8	1918.9	2240.3	471	3.39
Ambient	P+	3	11	38.2	30.6	1911.4	2253.8	429.9	3.5
Ambient	P+	3	12	38.2	30.6	1905.8	2246.5	430.3	3.45
Ambient	P-	3	13	38.2	30.5	1941.6	2251.1	497	3.71
Ambient	P-	3	14	38.3	30.9	1925	2241.2	485.9	3.2
Ambient	P-	3	15	38.2	30.6	1958.6	2249	545	3.69
Ambient	P-	3	16	38.2	30.5	1910.7	2251.2	430.8	3.69
Elevated	P+	4	1	38.3	30.7	2128.3	2277.2	1192.8	1.9
Elevated	P+	4	2	38.3	30.6	2143.3	2279.2	1282.7	1.79
Elevated	P+	4	3	38.2	30.8	2131	2279.4	1287.6	1.78
Elevated	P+	4	4	38.2	30.9	2136	2279.4	1263.5	1.82
Elevated	P-	4	5	38.2	30.6	2144.9	2281.3	1199.8	1.9
Elevated	P-	4	6	38.2	30.6	2147.5	2287	1343.9	1.78

Elevated	P-	4	7	38.1	31.4	2148.5	2281.7	1240.8	1.86
Elevated	P-	4	8	38.2	30.7	2194.5	2326.2	1365.7	1.77
Ambient	P+	4	9	38	30.6	1985.4	2286.9	531.9	3.35
Ambient	P+	4	10	37.9	30.7	1979.7	2286.2	587.1	3.13
Ambient	P+	4	11	38	30.5	1973.3	2286.8	520	3.4
Ambient	P+	4	12	38.2	30.4	1955.6	2283.4	468.3	3.38
Ambient	P-	4	13	38.2	30.5	2005.1	2286	525.6	3.46
Ambient	P-	4	14	38	30.6	1985.2	2289.8	565.9	3.23
Ambient	P-	4	15	37.9	30.6	2002.2	2290.8	501.1	3.59
Ambient	P-	4	16	38	30.5	1983.6	2295.2	509.2	3.45

Table S2 Carbonate system parameters for the experimental $p\text{CO}_2$ system. DIC and TA were measured in situ, and both $p\text{CO}_2$ and Ω_{Ar} were calculated using the CO2Sys Macros Excel sheet (Version 2.1, 18 September 2012). Data sample means (± 1 SD) taken weekly from each experimental tank. Predator presence is shown as P⁻ (absent) and P⁺ (present).

Treatment	Salinity	Temperature (°C)	DIC	TA	$p\text{CO}_2$	Ω_{Ar}
Ambient $p\text{CO}_2$ P ⁻	37.5 \pm 0.8	29.9 \pm 1.8	1972.6 \pm 60.9	2301.4 \pm 66.7	466.8 \pm 95.9	3.62 \pm 0.54
Ambient $p\text{CO}_2$ P ⁺	37.6 \pm 0.7	29.6 \pm 1.0	1955.3 \pm 49.6	2303.5 \pm 67.8	423.9 \pm 65.8	3.82 \pm 0.41
Elevated $p\text{CO}_2$ P ⁻	37.6 \pm 0.7	29.8 \pm 1.1	2146.8 \pm 44.4	2306.7 \pm 65.6	1114.2 \pm 196.4	2.02 \pm 0.30
Elevated $p\text{CO}_2$ P ⁺	37.5 \pm 0.7	30.0 \pm 1.1	2128.3 \pm 69.1	2306.6 \pm 72.6	1027.0 \pm 260.1	2.20 \pm 0.45

Table S3 Two-way npANOVA results for the effects of $p\text{CO}_2$ and predator treatments on the measured carbonate system parameters DIC and TA ($n = 80$); bold depicts significance at the $\alpha = 0.05$ level

System Parameter	Treatment	df	F	p-value
DIC	$p\text{CO}_2$	1	138.8	< 0.001
	Predator	1	1.949	0.153
	$p\text{CO}_2$ *Predator	1	0.002	0.965
TA	$p\text{CO}_2$	1	0.074	0.780
	Predator	1	0.004	0.946
	$p\text{CO}_2$ *Predator	1	0.005	0.947

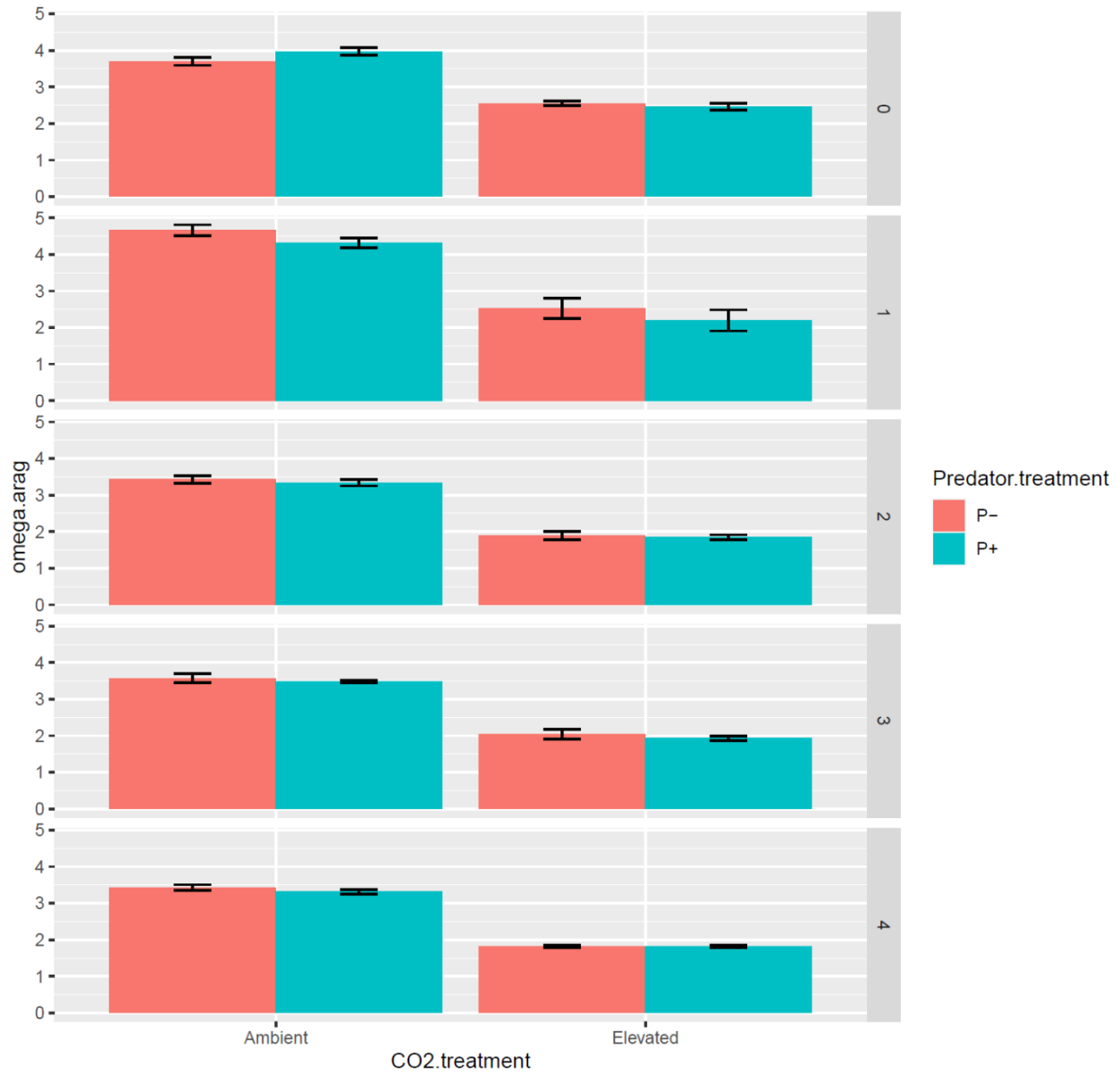


Figure S1 Mean \pm standard error of omega aragonite showing differences between ambient (left column) and elevated (right column) CO₂ treatments in the predator absent (P-) and present (P+) tanks by week (rows).

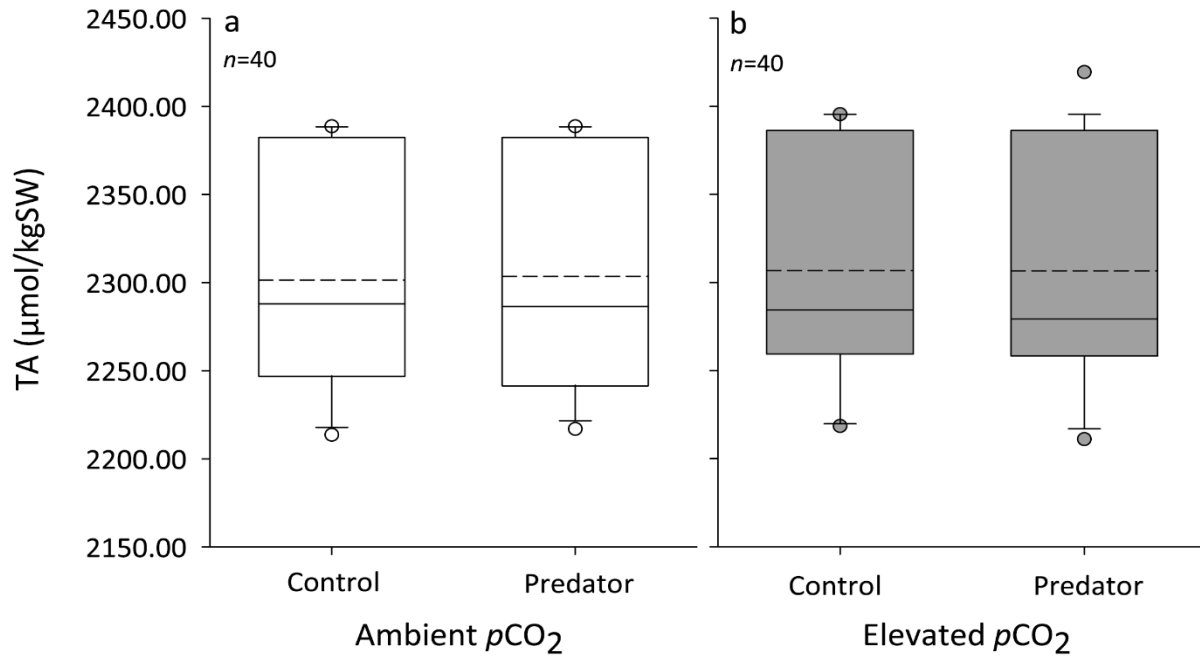


Figure S2 Boxplots a and b show comparisons of TA between predator absent (P^-) and predator present (P^+) treatments at ambient and elevated $p\text{CO}_2$ treatment levels, respectively. Dashed lines represent the mean, solid lines represent the median, and dots represent outliers at the 95th percentile. Shading represents $p\text{CO}_2$ level: white (ambient) and grey (elevated). Sample sizes reflect the total number of measurements taken during the experiment.

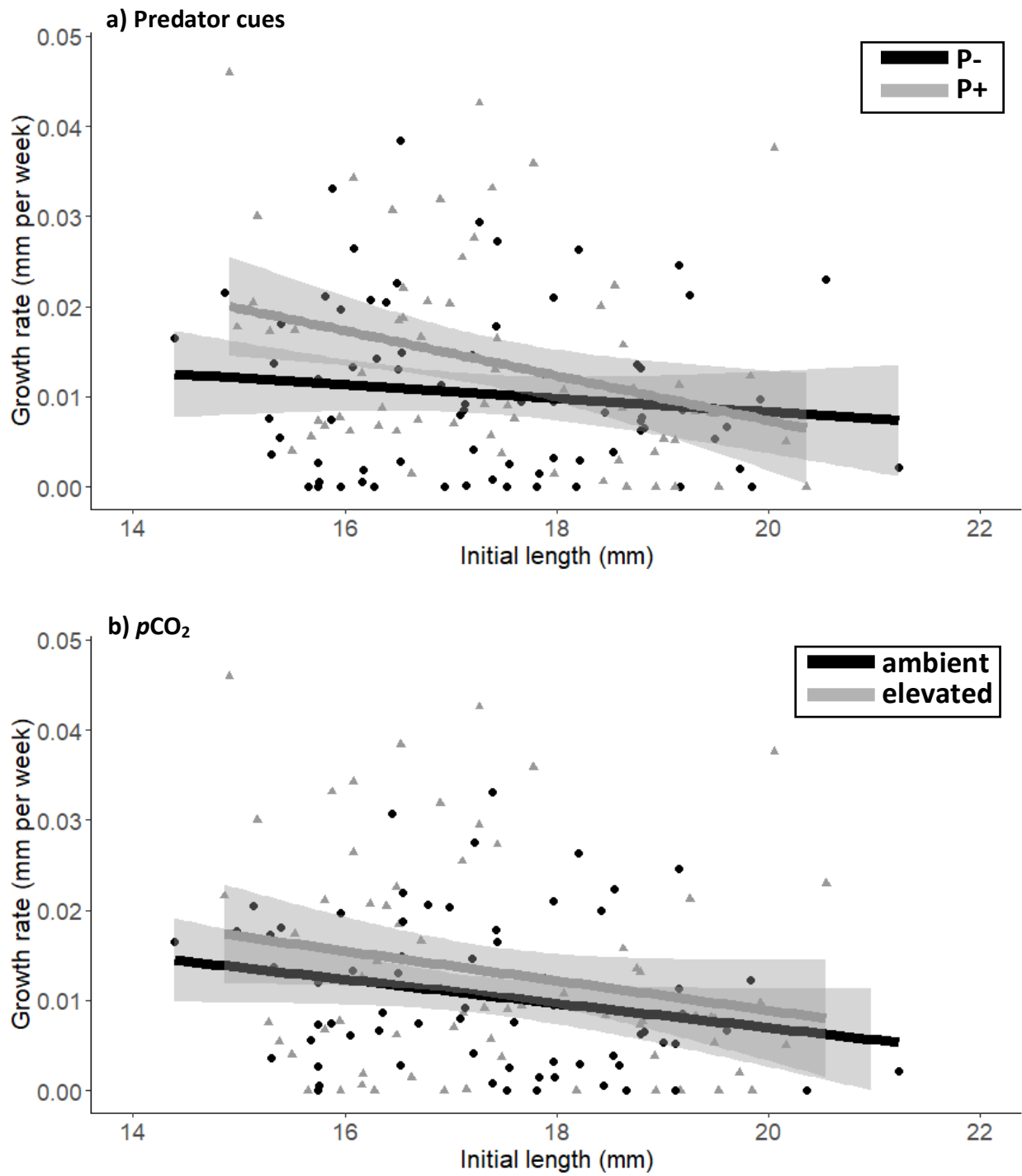


Figure S3 npANCOVA models of the growth rate of shell length in response to the predator cue (a) and $p\text{CO}_2$ (b) experimental manipulations.

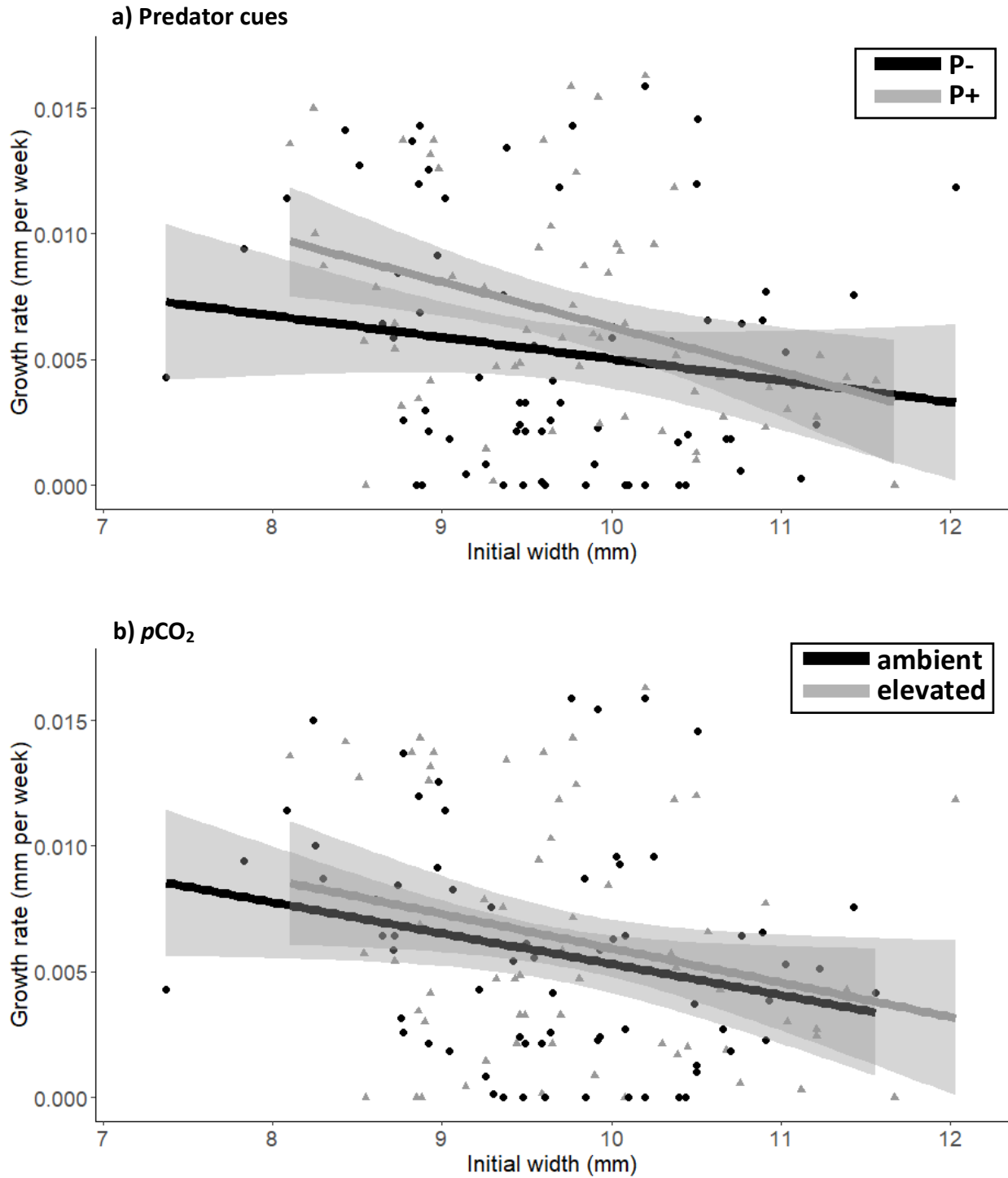


Figure S4 npANCOVA models of the growth rate of shell width in response to the predator cue (a) and $p\text{CO}_2$ (b) experimental manipulations.

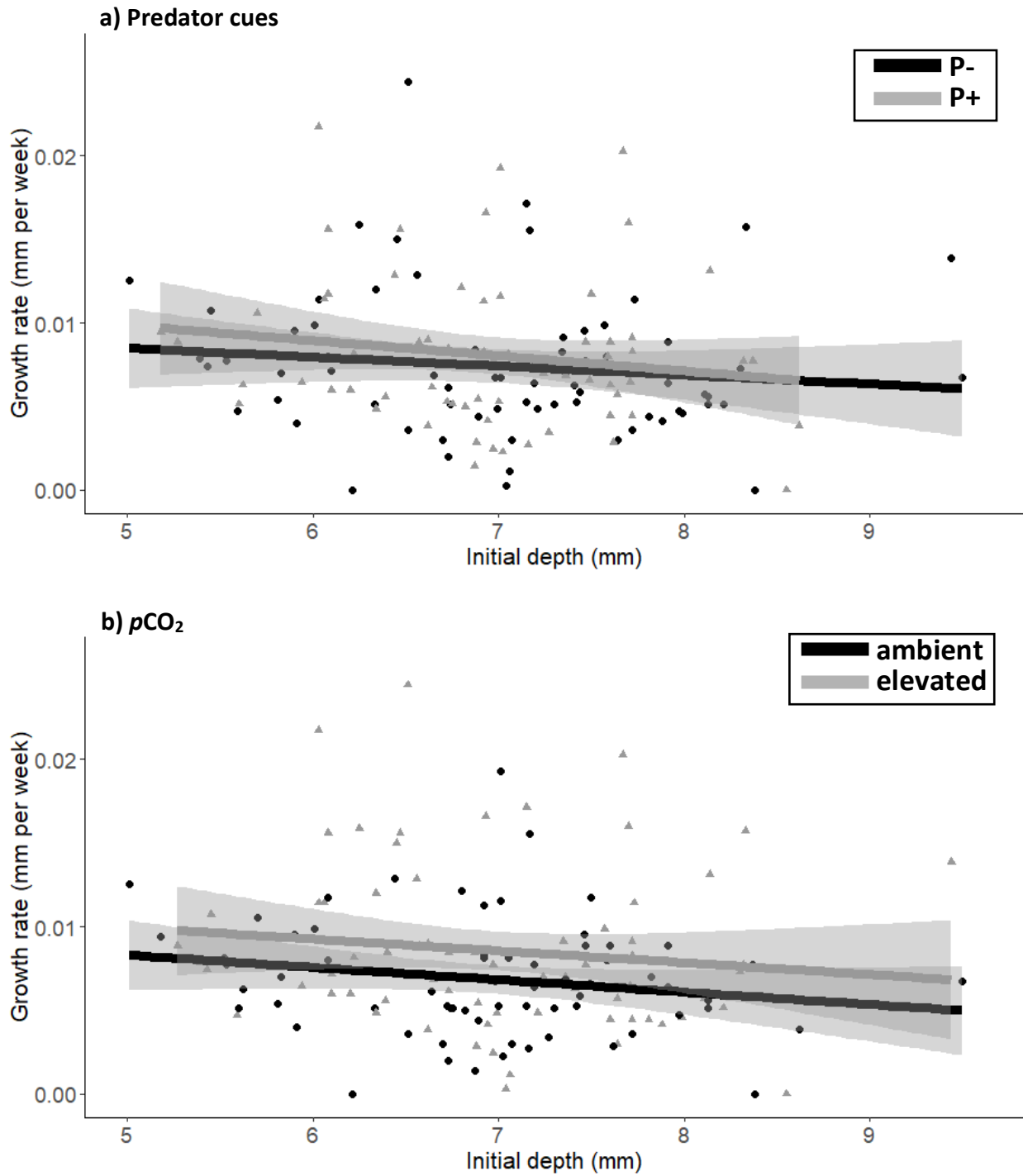


Figure S5 npANCOVA models of the growth rate of shell depth in response to the predator cue (a) and $p\text{CO}_2$ (b) experimental manipulations.

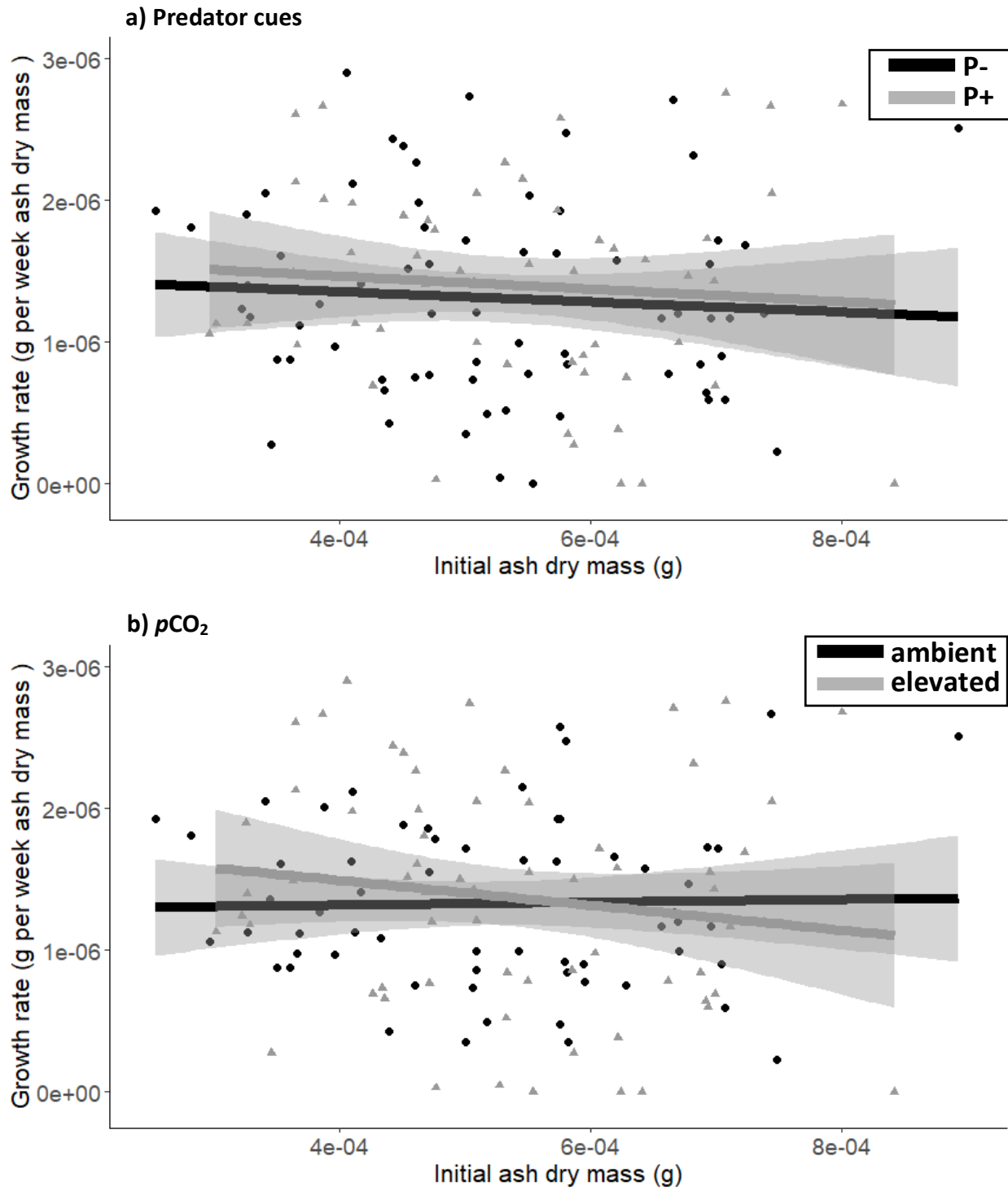


Figure S6 npANCOVA models of the growth rate of soft tissue mass in response to the predator cue (a) and $p\text{CO}_2$ (b) experimental manipulations.

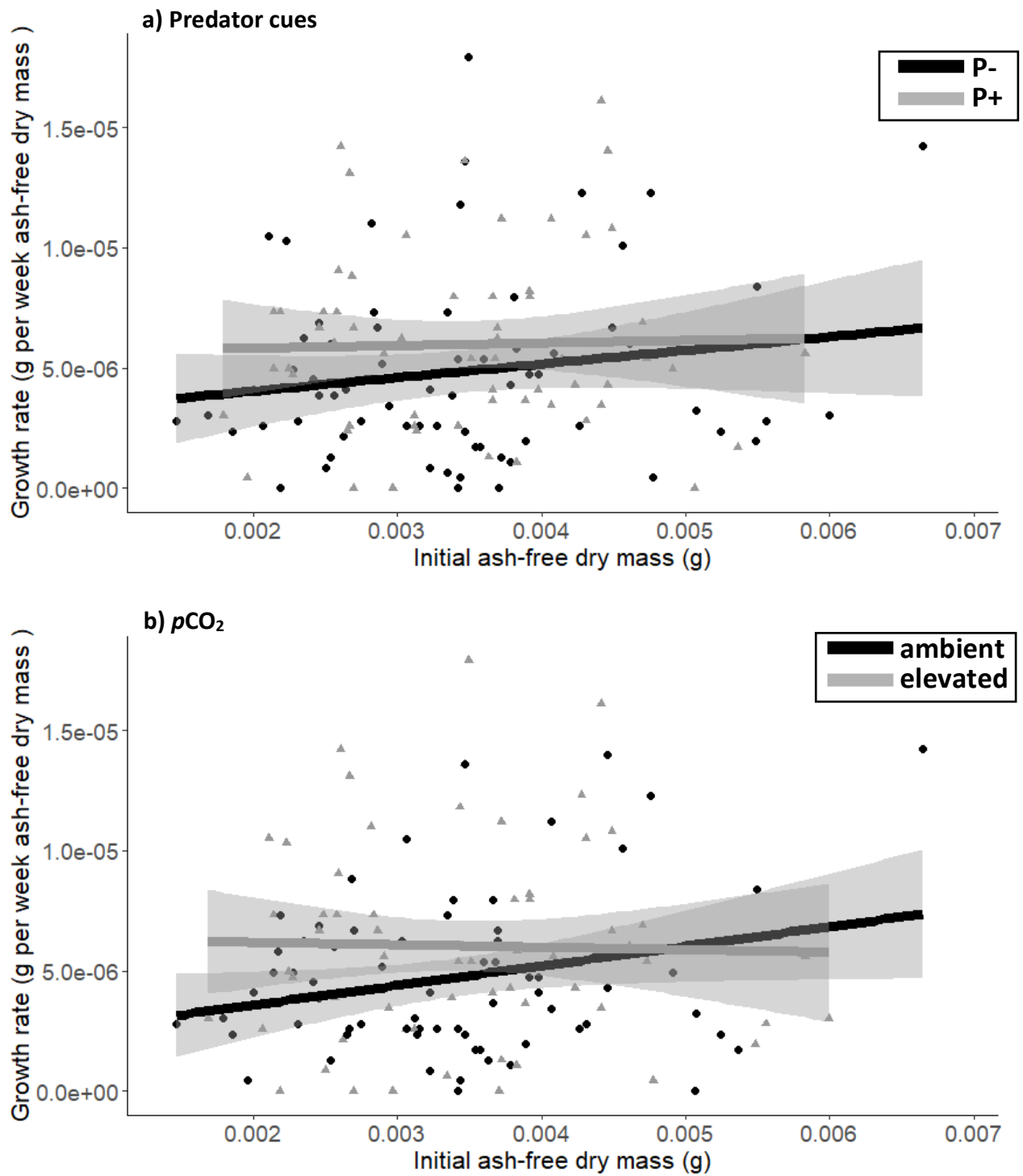


Figure S7 npANCOVA models of the growth rate of shell mass in response to the predator cue (a) and $p\text{CO}_2$ (b) experimental manipulations.