water

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Supplementary materials

The Effects of Temperature, Light, and Feeding on the Physiology of *Pocillopora damicornis*, *Stylophora pistillata*, and *Turbinaria reniformis* Corals

Dobson KL [1,*], Ferrier–Pagès C [2], Saup CM [1] and Grottoli AG [1,†]

[1] School of Earth Sciences, The Ohio State University, Columbus, OH, 43210, USA; saup.4@osu.edu (C.M.S.); grottoli.1@osu.edu (A.G.G.)
[2] Centre Scientifique de Monaco, MC 98000 Monaco, Principality of Monaco; ferrier@centrescientifique.mc
* Correspondence: dobson.77@osu.edu
† Co–correspondence and senior author.

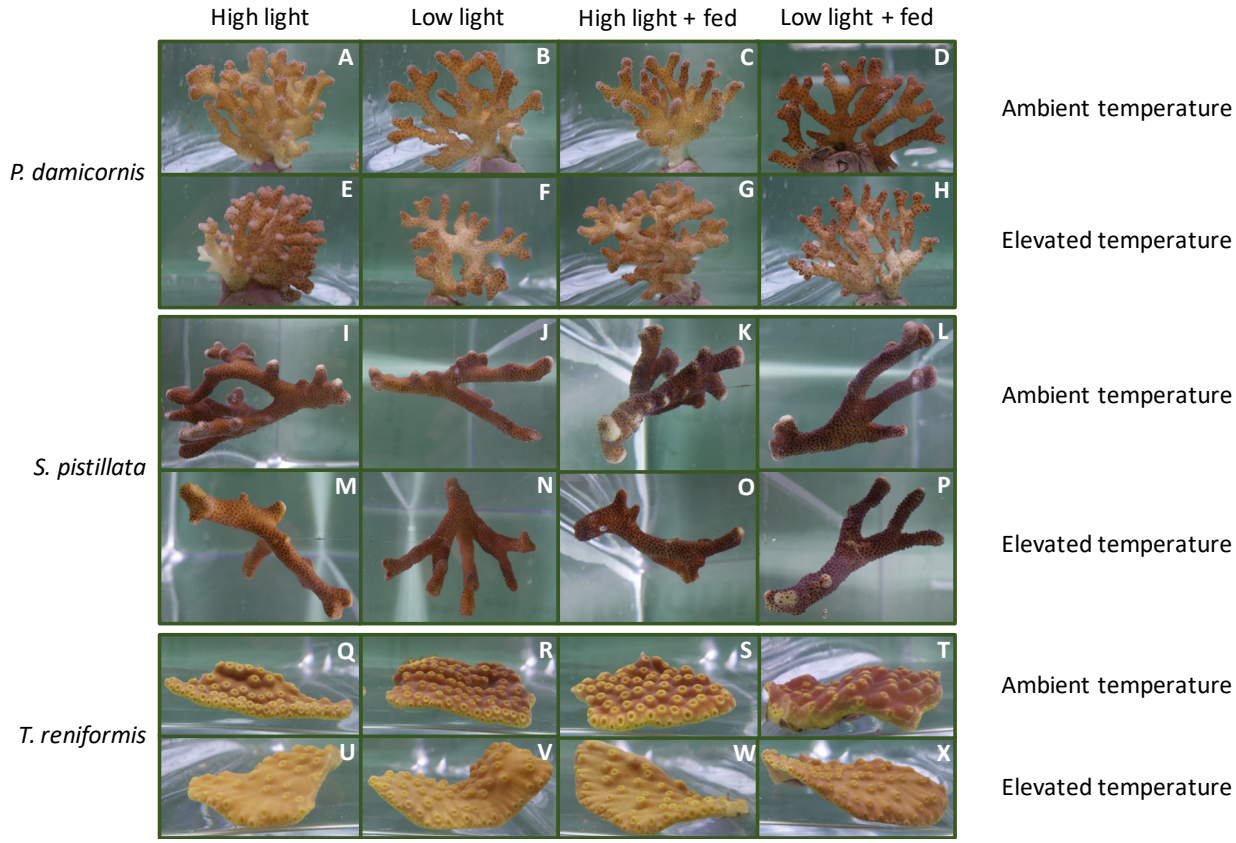


Figure S1. Representative images of (A–H) *Pocillopora damicornis*, (I–P) *Stylophora pistillata*, and (Q–X) *Turbinaria reniformis* from each treatment: high light (300 µmol photons m^{-2} s^{-1}, unfed), low light (150 µmol photons m^{-2} s^{-1}, unfed), high light + fed (300 µmol photons m^{-2} s^{-1}, fed), and low light + fed (150 µmol photons m^{-2} s^{-1}, fed), under ambient temperature (25°C) or elevated temperature (30°). These images were recorded on the last day of the experiment, 30 May 2013, prior to removal and preservation.

Table S1. Project metadata. Modified Table 2 from Grottoli et al. [55].

Metadata type	Data type	Conditions/methods, and units
Coral collection	Latitude and longitude at collection site	Unknown (Northern Red Sea)
	Collection depth	~5–10m
	Collection dates	Unknown
	Coral species and morphology	*Pocillopora damicornis* (branching), *Stylophora pistillata* (branching), *Turbinaria reniformis* (plating)
	Symbiodiniaceae for all coral colonies	Unknown
	Acclimation post collection prior to experiment	>5 years
Experimental design	Name of location	Centre Scientifique de Monaco
	Bleaching stress temperature period	30 days
	System type (flow–through or recirculating, outdoor or indoor)	Flow–through indoor
	No. tanks per treatment	1
	No. coral genets/colonies per treatment	3–5
	No. recovery days post heat–stress	0
Experimental temperature conditions	Control temperature	25°C
	Baseline temperature (MMM)	30°C
	Temperature ramp–up rate	0.5°C per day
	Duration at heat stress temperature	30 days
Other experimental conditions	Light conditions	150/300 μmol photons m^{-2} s^{-1}
	Light cycle	12:12 hour day:night cycle
	Water flow velocity	14.4 L hr^{-1}
	Tank size	17 L
	Seawater filtration	Yes
	Seawater source	Mediterranean seawater
	Salinity	Unknown
	Feeding	Fed treatments were fed *ad libitum* twice a week for approximately 70 minutes with two–day old *Artemia* nauplii at an average concentration of 12.3 *Artemia* nauplii ml^{-1}

Table S2. *Pocillopora damicornis* results from three–way PERMANOVA, testing for the effects of temperature (Temp), light, and feeding on the coral holobiont physiological profile based on chlorophyll *a*, $\delta^{13}C_h$, calcification, and biomass. Significant effects are in bold.

PERMANOVA	Mean squares	Significance level
Temp	16.348	**0.006**
Light	6.1047	0.157
Feeding	9.5559	**0.049**
Temp x Light	3.0288	0.453
Temp x Feeding	1.9043	0.676
Light x Feeding	3.7882	0.366
Temp x Light x Feeding	0.7099	0.931

Table S3. *Pocillopora damicornis* results from three–way ANOVAs testing the effect of temperature (Temp), light, and feeding on chlorophyll *a*, $\delta^{13}C_h$, calcification, and biomass. Effects of temperature, light, and feeding were fixed and fully crossed. Significant effects are in bold. Df = degrees of freedom, Mean Sq = mean squares. Tukey test indicates which mean is significantly different from another, for ambient temperature (ambT), elevated temperature (elevT), high light (hiL), low light (lowL), fed (F), and unfed (UF).

Three–way ANOVA	Effect	Df	Mean Sq	F–statistic	p–value	Tukey test
Chlorophyll *a*	Model	7	3.1139	2.74	**0.0318**	ambT > elevT lowL > hiL
	Temp	1	8.5755	7.55	**0.0115**	
	Light	1	5.3075	4.67	**0.0413**	
	Feeding	1	3.1431	2.77	0.1098	
	Temp*Light	1	0.0065	0.01	0.9405	
	Light*Feeding	1	3.0082	2.65	0.1173	
	Temp*Feeding	1	0.9663	0.85	0.3660	
	Temp*Light*Feeding	1	0.0051	0.00	0.9469	
$\delta^{13}C_h$	Model	7	1.4029	1.25	0.3169	
	Temp	1	5.0894	4.53	**0.0439**	
	Light	1	0.6016	0.53	0.4716	
	Feeding	1	3.7675	3.35	0.0796	
	Temp*Light	1	0.0238	0.02	0.8856	
	Light*Feeding	1	0.1720	0.15	0.6992	
	Temp*Feeding	1	0.1646	0.15	0.7053	
	Temp*Light*Feeding	1	0.0013	0.00	0.9732	
Calcification	Model	7	0.1876	2.92	**0.0243**	
	Temp	1	0.0738	1.15	0.2947	
	Light	1	0.2532	3.94	0.0591	
	Feeding	1	0.3436	5.35	**0.0300**	
	Temp*Light	1	0.2033	3.17	0.0884	
	Light*Feeding	1	0.3268	5.09	**0.0339**	
	Temp*Feeding	1	0.0756	1.18	0.2891	
	Temp*Light*Feeding	1	0.0220	0.34	0.5636	
Biomass	Model	7	0.4649	1.43	0.2429	
	Temp	1	1.5660	4.80	**0.0388**	
	Light	1	0.0109	0.03	0.8568	
	Feeding	1	1.2143	3.72	0.0660	
	Temp*Light	1	0.3616	1.11	0.3033	
	Light*Feeding	1	0.0544	0.17	0.6866	
	Temp*Feeding	1	0.0250	0.08	0.7844	
	Temp*Light*Feeding	1	0.2927	0.90	0.3532	

Table S4. *Pocillopora damicornis* results from three–way ANOVAs testing the effect of temperature (Temp), light, and feeding on photosynthesis, respiration, feeding rate, Contribution of Zooxanthellae (Symbiodiniaceae) to Animal Respiration (CZAR), Contribution of Heterotrophy to Animal Respiration (CHAR), and Contribution of Total acquired fixed carbon relative to Animal Respiration (CTAR). Effects of temperature, light, and feeding were fixed and fully crossed. Significant effects are in bold. Df = degrees of freedom, Mean Sq = mean squares.

Three–way ANOVA	Effect	Df	Mean Sq	F–statistic	p–value
Photosynthesis	Model	7	0.0006	1.52	0.2305
	Temp	1	0.0016	4.29	0.0549
	Light	1	0.0000	0.05	0.8267
	Feeding	1	0.0000	0.05	0.8325
	Temp*Light	1	0.0010	2.75	0.1166
	Light*Feeding	1	0.0001	0.33	0.5741
	Temp*Feeding	1	0.0012	3.15	0.0950
	Temp*Light*Feeding	1	0.0000	0.01	0.9098
Respiration	Model	7	0.0002	1.28	0.3220
	Temp	1	0.0001	1.05	0.3218
	Light	1	0.0000	0.01	0.9386
	Feeding	1	0.0002	2.15	0.1620
	Temp*Light	1	0.0004	2.92	0.1066
	Light*Feeding	1	0.0001	1.15	0.2989
	Temp*Feeding	1	0.0002	1.22	0.2864
	Temp*Light*Feeding	1	0.0000	0.44	0.5166
Feeding rate	Model	3	4.7262	0.73	0.5610
	Temp	1	0.0358	0.01	0.9425
	Light	1	6.1680	0.96	0.3567
	Temp*Light	1	7.9747	1.24	0.2984
CZAR	Model	7	981.4707	1.37	0.2846
	Temp	1	1320.9007	1.84	0.1939
	Light	1	157.3808	0.22	0.6461
	Feeding	1	2939.3429	4.09	0.0601
	Temp*Light	1	516.7446	0.72	0.4089
	Light*Feeding	1	711.8085	0.99	0.3344
	Temp*Feeding	1	742.7701	1.03	0.3244
	Temp*Light*Feeding	1	481.3473	0.67	0.4251
CHAR	Model	3	0.5135	0.40	0.7580
	Temp	1	0.4255	0.33	0.5814
	Light	1	0.3552	0.28	0.6139
	Temp*Light	1	0.7598	0.59	0.4647
CTAR	Model	7	1062.3629	1.47	0.2482
	Temp	1	1254.9273	1.73	0.2069
	Light	1	137.0121	0.19	0.6696
	Feeding	1	3792.0375	5.23	**0.0362**
	Temp*Light	1	462.4046	0.64	0.4362
	Light*Feeding	1	667.6956	0.92	0.3515
	Temp*Feeding	1	693.5093	0.96	0.3426
	Temp*Light*Feeding	1	428.9541	0.59	0.4530

Table S5. *Stylophora pistillata* results from three–way PERMANOVA, testing for the effect of temperature (Temp), light, and feeding on the coral holobiont physiological profile based on chlorophyll *a*, $\delta^{13}C_h$, calcification, biomass, and total lipids. Significant effects are in bold.

PERMANOVA	Mean squares	Significance level
Temp	14.58	**0.006**
Light	35.203	**0.001**
Feeding	15.641	**0.004**
Temp*Light	5.2395	0.222
Temp*Feeding	2.1237	0.724
Light*Feeding	1.9218	0.714
Temp*Light*Feeding	2.0394	0.720

Table S6. *Stylophora pistillata* results from three–way ANOVAs testing the effect of temperature (Temp), light, and feeding on chlorophyll *a*, $\delta^{13}C_h$, calcification, biomass, and total lipids. Effects of temperature, light, and feeding were fixed and fully crossed. Significant effects are in bold. Df = degrees of freedom, Mean Sq = mean squares. Tukey test indicates which mean is significantly different from another, for ambient temperature (ambT), elevated temperature (elevT), high light (hiL), low light (lowL), fed (F), and unfed (UF).

Three–way ANOVA	Effect	Df	Mean Sq	F–statistic	p–value	Tukey test
Chlorophyll *a*	Model	7	37.5523	10.68	**<0.0001**	lowL > hiL F > UF
	Temp	1	12.1901	3.47	0.0719	
	Light	1	109.9157	31.25	**<0.0001**	
	Feeding	1	118.6256	33.72	**<0.0001**	
	Temp*Light	1	2.8171	0.80	0.3775	
	Light*Feeding	1	12.7594	3.63	0.0659	
	Temp*Feeding	1	4.2936	1.22	0.2775	
	Temp*Light*Feeding	1	2.2646	0.64	0.4283	
$\delta^{13}C_h$	Model	7	2.7635	11.33	**<.0001**	
	Temp	1	3.1081	12.74	**0.0012**	
	Light	1	13.8651	56.84	**<.0001**	
	Feeding	1	0.0483	0.20	0.6593	
	Temp*Light	1	1.0857	4.45	**0.0428**	
	Light*Feeding	1	0.3553	1.46	0.2363	
	Temp*Feeding	1	0.8614	3.53	0.0694	
	Temp*Light*Feeding	1	0.0207	0.08	0.7727	
Calcification	Model	7	93.0695	1.80	0.1217	
	Temp	1	333.5146	6.45	**0.0162**	
	Light	1	100.9077	1.95	0.1721	
	Feeding	1	191.2850	3.70	0.0634	
	Temp*Light	1	17.7260	0.34	0.5624	
	Light*Feeding	1	3.1007	0.06	0.8081	
	Temp*Feeding	1	4.7984	0.09	0.7626	
	Temp*Light*Feeding	1	0.1540	0.00	0.9567	
Biomass	Model	7	0.4248	0.44	0.8707	
	Temp	1	0.0517	0.05	0.8189	
	Light	1	0.5350	0.55	0.4630	
	Feeding	1	0.0097	0.01	0.9208	
	Temp*Light	1	1.6735	1.73	0.1982	
	Light*Feeding	1	0.0215	0.02	0.8826	
	Temp*Feeding	1	0.2829	0.29	0.5928	
	Temp*Light*Feeding	1	0.3994	0.41	0.5255	
Total lipids	Model	7	0.0190	1.37	0.2500	
	Temp	1	0.0693	5.02	**0.0321**	
	Light	1	0.0271	1.96	0.1708	
	Feeding	1	0.0000	0.00	0.9763	
	Temp*Light	1	0.0091	0.66	0.4234	
	Light*Feeding	1	0.0018	0.13	0.7184	
	Temp*Feeding	1	0.0000	0.00	0.9881	
	Temp*Light*Feeding	1	0.0255	1.84	0.1839	

Table S7. *Stylophora pistillata* results from three–way ANOVAs testing the effect of temperature (Temp), light, and feeding on photosynthesis, respiration, feeding rate, Contribution of Zooxanthellae (Symbiodiniaceae) to Animal Respiration (CZAR), Contribution of Heterotrophy to Animal Respiration (CHAR), and Contribution of Total acquired fixed carbon relative to Animal Respiration (CTAR). Effects of temperature, light, and feeding were fixed and fully crossed. Significant effects are in bold. Df = degrees of freedom, Mean Sq = mean squares. Tukey test indicates which mean is significantly different from another, for ambient temperature (ambT), elevated temperature (elevT), high light (hiL), low light (lowL), fed (F), and unfed (UF).

Three–way ANOVA	Effect	Df	Mean Sq	F–statistic	p–value	Tukey test
Photosynthesis	Model	7	0.0070	3.60	**0.0161**	ambT > elevT
	Temp	1	0.0381	19.45	**0.0004**	
	Light	1	0.0009	0.49	0.4962	
	Feeding	1	0.0003	0.15	0.7079	
	Temp*Light	1	0.0000	0.02	0.8839	
	Light*Feeding	1	0.0020	1.04	0.3238	
	Temp*Feeding	1	0.0078	3.98	0.0633	
	Temp*Light*Feeding	1	0.0001	0.07	0.7995	
Respiration	Model	7	0.0021	3.43	**0.0195**	
	Temp	1	0.0086	14.02	**0.0018**	
	Light	1	0.0002	0.36	0.5563	
	Feeding	1	0.0002	0.25	0.6231	
	Temp*Light	1	0.0005	0.75	0.3983	
	Light*Feeding	1	0.0000	0.02	0.8841	
	Temp*Feeding	1	0.0053	8.62	**0.0097**	
	Temp*Light*Feeding	1	0.0000	0.01	0.9414	
Feeding rate	Model	3	63.7312	3.33	0.0770	
	Temp	1	149.3516	7.81	**0.0234**	
	Light	1	13.0190	0.68	0.4333	
	Temp*Light	1	28.8231	1.51	0.2545	
CZAR	Model	7	554.0428	8.10	**0.0003**	
	Temp	1	1588.7170	23.22	**0.0002**	
	Light	1	56.8956	0.83	0.3753	
	Feeding	1	543.0762	7.94	**0.0124**	
	Temp*Light	1	604.1281	8.83	**0.0090**	
	Light*Feeding	1	674.6836	9.86	**0.0063**	
	Temp*Feeding	1	353.2210	5.16	**0.0372**	
	Temp*Light*Feeding	1	57.5781	0.84	0.3726	
CHAR	Model	3	2.6393	2.15	0.1714	
	Temp	1	7.1443	5.83	**0.0422**	
	Light	1	0.7370	0.60	0.4602	
	Temp*Light	1	0.0367	0.03	0.8668	
CTAR	Model	7	648.6197	9.59	**0.0001**	
	Temp	1	1302.6191	19.26	**0.0005**	
	Light	1	40.1080	0.59	0.4525	
	Feeding	1	1296.9371	19.17	**0.0005**	
	Temp*Light	1	590.9242	8.74	**0.0093**	
	Light*Feeding	1	738.9973	10.92	**0.0045**	
	Temp*Feeding	1	509.0019	7.52	**0.0144**	
	Temp*Light*Feeding	1	61.7499	0.91	0.3536	

Table S8. *Turbinaria reniformis* results from three–way PERMANOVA, testing for the effect of temperature (Temp), light, and feeding on the coral holobiont physiological profile based on chlorophyll *a*, $\delta^{13}C_h$, calcification, biomass, and total lipid. Significant effects are in bold.

PERMANOVA	Mean squares	Significance level
Temp	15.978	**0.003**
Light	13.583	**0.007**
Feeding	8.5966	0.075
Temp*Light	8.546	0.068
Temp*Feeding	4.8431	0.326
Light*Feeding	7.8354	0.093
Temp*Light*Feeding	3.7578	0.467

Table S9. *Turbinaria reniformis* results from three–way ANOVAs testing the effect of temperature (Temp), light, and feeding on chlorophyll *a*, $\delta^{13}C_h$, calcification, biomass, and total lipids. Effects of temperature, light, and feeding were fixed and fully crossed. Significant effects are in bold. Df = degrees of freedom, Mean Sq = mean squares. Tukey test indicates which mean is significantly different from another, for ambient temperature (ambT), elevated temperature (elevT), high light (hiL), low light (lowL), fed (F), and unfed (UF).

Three–way ANOVA	Effect	Df	Mean Sq	F–statistic	p–value	Tukey test
Chlorophyll *a*	Model	7	0.0450	3.65	**0.0061**	
	Temp	1	0.1753	14.21	**0.0007**	ambT > elevT
	Light	1	0.1022	8.28	**0.0074**	lowL > hiL
	Feeding	1	0.0268	2.18	0.1510	
	Temp*Light	1	0.0008	0.07	0.7977	
	Light*Feeding	1	0.0037	0.30	0.5878	
	Temp*Feeding	1	0.0016	0.13	0.7244	
	Temp*Light*Feeding	1	0.0013	0.11	0.7460	
$\delta^{13}C_h$	Model	7	0.4131	1.71	0.1440	
	Temp	1	0.2660	1.10	0.3021	
	Light	1	1.6708	6.92	**0.0133**	
	Feeding	1	0.0542	0.22	0.6389	
	Temp*Light	1	0.0369	0.15	0.6984	
	Light*Feeding	1	0.5301	2.20	0.1488	
	Temp*Feeding	1	0.4004	1.66	0.2076	
	Temp*Light*Feeding	1	0.0004	0.00	0.9689	
Calcification	Model	7	0.0668	2.13	0.0725	
	Temp	1	0.1270	4.04	0.0538	
	Light	1	0.0012	0.04	0.8455	
	Feeding	1	0.0324	1.03	0.3184	
	Temp*Light	1	0.0041	0.13	0.7202	
	Light*Feeding	1	0.0936	2.98	0.0949	
	Temp*Feeding	1	0.0944	3.00	0.0936	
	Temp*Light*Feeding	1	0.0955	3.04	0.0918	
Biomass	Model	7	4.9140	0.87	0.5440	
	Temp	1	0.0408	0.01	0.9330	
	Light	1	5.9806	1.05	0.3129	
	Feeding	1	18.954	3.34	0.0778	
	Temp*Light	1	1.7895	0.32	0.5786	
	Light*Feeding	1	0.2783	0.05	0.8262	
	Temp*Feeding	1	0.5275	0.09	0.7626	
	Temp*Light*Feeding	1	7.1735	1.26	0.2699	
Total lipids	Model	7	9.0601	6.15	**0.0002**	
	Temp	1	13.168	8.94	**0.0056**	
	Light	1	2.3266	1.58	0.2188	
	Feeding	1	9.5413	6.48	**0.0165**	
	Temp*Light	1	22.721	15.43	**0.0005**	
	Light*Feeding	1	9.9706	6.77	**0.0144**	
	Temp*Feeding	1	4.2989	2.92	0.0982	
	Temp*Light*Feeding	1	0.4331	0.29	0.5918	

Table S10. *Turbinaria reniformis* results from three–way ANOVAs testing the effect of temperature (Temp), light, and feeding on photosynthesis, respiration, feeding rate, Contribution of Zooxanthellae (Symbiodiniaceae) to Animal Respiration (CZAR), Contribution of Heterotrophy to Animal Respiration (CHAR), and Contribution of Total acquired fixed carbon relative to Animal Respiration (CTAR). Effects of temperature, light, and feeding were fixed and fully crossed. Significant effects are in bold. Df = degrees of freedom, Mean Sq = mean squares. Tukey test indicates which mean is significantly different from another, for ambient temperature (ambT), elevated temperature (elevT), high light (hiL), low light (lowL), fed (F), and unfed (UF).

Three–way ANOVA	Effect	Df	Mean Sq	F–statistic	p–value	Tukey test
Photosynthesis	Model	7	0.0007	3.23	**0.0247**	ambT > elevT
	Temp	1	0.0038	18.59	**0.0005**	
	Light	1	0.0001	0.35	0.5637	
	Feeding	1	0.0005	2.42	0.1391	
	Temp*Light	1	0.0000	0.00	0.9958	
	Light*Feeding	1	0.0001	0.32	0.5805	
	Temp*Feeding	1	0.0002	0.89	0.3596	
	Temp*Light*Feeding	1	0.0000	0.04	0.8367	
Respiration	Model	7	0.0001	3.13	**0.0278**	
	Temp	1	0.0004	9.92	**0.0062**	
	Light	1	0.0000	0.52	0.4800	
	Feeding	1	0.0001	2.03	0.1734	
	Temp*Light	1	0.0000	0.10	0.7561	
	Light*Feeding	1	0.0000	1.06	0.3189	
	Temp*Feeding	1	0.0003	8.02	**0.0120**	
	Temp*Light*Feeding	1	0.0000	0.25	0.6239	
Feeding rate	Model	3	17.6767	1.81	0.2224	
	Temp	1	17.4630	1.79	0.2174	
	Light	1	25.9907	2.67	0.1410	
	Temp*Light	1	9.5766	0.98	0.3504	
CZAR	Model	7	1110.6476	2.45	0.0651	
	Temp	1	4625.1107	10.21	**0.0056**	
	Light	1	20.7667	0.05	0.8331	
	Feeding	1	257.7466	0.57	0.4615	
	Temp*Light	1	101.8786	0.22	0.6417	
	Light*Feeding	1	157.8211	0.35	0.5632	
	Temp*Feeding	1	2411.3078	5.33	**0.0347**	
	Temp*Light*Feeding	1	199.9017	0.44	0.5159	
CHAR	Model	3	69.2463	12.37	**0.0023**	elevT > ambT
	Temp	1	194.6322	34.77	**0.0004**	
	Light	1	12.2138	2.18	0.1779	
	Temp*Light	1	0.8927	0.16	0.7001	
CTAR	Model	7	1191.362	2.63	0.0519	
	Temp	1	2337.4214	5.15	**0.0374**	
	Light	1	89.9143	0.20	0.6621	
	Feeding	1	507.6962	1.12	0.3057	
	Temp*Light	1	130.5322	0.29	0.5990	
	Light*Feeding	1	305.8284	0.67	0.4236	
	Temp*Feeding	1	4728.8108	10.43	**0.0052**	
	Temp*Light*Feeding	1	239.3283	0.53	0.4780	

Table S11. Raw physiology and biochemistry data: chlorophyll *a* (Chl a), carbon isotope data for host tissue ($\delta^{13}C_h$), calcification (calc), biomass, photosynthesis (P), respiration (R), feeding rate (FR), Contribution of Zooxanthellae to Animal Respiration (CZAR), Contribution of Heterotrophy to Animal Repsiration (CHAR), and Contribution of Total carbon to Animal Respiration (CTAR) for *Pocillopora damicornis* (P), *Stylophora pistillata* (S), and *Turbinaria reniformis* (T). Coral ID consists of species (P, S, or T), genotype (A–E), and treatment (1= 25°C, 150 μmol photons m^{-2} s^{-1}, fed; 2= 30°C, 150 μmol photons m^{-2} s^{-1}, fed; 3= 30°C, 150 μmol photons m^{-2} s^{-1}, unfed; 4= 25°C, 150 μmol photons m^{-2} s^{-1}, unfed; 5= 30°C, 300 μmol photons m^{-2} s^{-1}, unfed; 6= 25°C, 300 μmol photons m^{-2} s^{-1}, unfed; 7= 30°C, 300 μmol photons m^{-2} s^{-1}, fed; 8= 25°C, 300 μmol photons m^{-2} s^{-1}, fed). Dots indicate missing measurements due to insufficient sample material.

ID	Chl *a* (ug cm^{-2})	$\delta^{13}C_h$ (‰, v–pdb)	Calc (mg day^{-1} cm^{-2})	Biomass (mg cm^{-2})	P (umol min^{-1} cm^{-2})	R (umol min^{-1} cm^{-2})	FR (brine shrimp nauplii hr^{-1} cm^{-2})	CZAR (%)	CHAR (%)	CTAR (%)
P–A1	4.6770	–20.1601	3.8261	2.6170	0.1062	–0.0590	3.0057	89.9913	1.1590	91.1503
P–B1	4.2149	–22.0417	1.2195	2.2052	0.0575	–0.0238	4.5128	120.5826	5.9659	126.5485
P–C1	3.0737	–22.0792	0.9569	1.5928	0.0453	–0.0226	4.3861	100.1157	4.0060	104.1217
P–E1	4.3147	–21.2439	0.5678	1.7542	.	.	.	.	.	.
P–A2	2.0052	–19.4624	1.4634	3.3007	0.0426	–0.0266	9.1525	80.1673	7.8368	88.0041
P–B2	3.0631	–21.5414	4.9899	1.4211	.	.	.	.	.	.
P–C2	5.2248	–21.3228	1.3936	2.2558	0.0365	–0.0196	0.7913	93.2769	0.9200	94.1969
P–E2	0.3290	–20.3129	1.8460	0.8061	0.0015	–0.0159	7.1796	4.6427	10.2688	14.9115
P–A3	2.2633	–19.9742	4.1446	1.5923	0.0414	–0.0274	.	75.4833	.	75.4833
P–B3	2.4008	–21.9752	6.2665	1.2665	.	.	.	.	.	.
P–C3	1.9459	–22.2405	2.4036	1.4868	0.0364	–0.0268	.	68.0003	.	68.0003
P–E3	0.2649	–21.2581	3.4547	0.9579	0.0235	–0.0192	.	61.1282	.	61.1282
P–A4	3.1526	–20.4859	4.6098	1.9767	0.0536	–0.0412	.	64.9812	.	64.9812
P–B4	2.2368	–22.7424	5.2857	1.9797	.	.	.	.	.	.
P–C4	1.6646	–22.8017	3.3168	1.1853	0.0278	–0.0186	.	74.7464	.	74.7464
P–E4	2.8486	–23.3494	6.0102	1.6531	0.0693	–0.0450	.	76.9880	.	76.9880
P–A5	2.9130	–19.1374	2.4855	2.1069	0.0616	–0.0439	.	70.0873	.	70.0873
P–B5	1.1313	–21.9780	3.4790	1.6016	.	.	.	.	.	.
P–C5	1.0634	–21.6718	3.1475	1.1204	0.0600	–0.0489	.	61.3922	.	61.3922
P–E5	1.1650	–21.1445	2.3103	0.8747	0.0304	–0.0267	.	56.7915	.	56.7915
P–A6	2.5620	–20.2596	4.4361	2.2886	0.0427	–0.0320	.	66.8388	.	66.8388
P–B6	1.6259	–22.4038	7.2781	1.3525	.	.	.	.	.	.
P–C6	1.4722	–22.4194	4.1307	1.2269	0.0221	–0.0201	.	54.9819	.	54.9819
P–E6	3.2010	–22.4459	7.9261	2.5009	0.0519	–0.0339	.	76.6132	.	76.6132
P–A7	1.9754	–19.6310	9.4296	2.0354	0.0431	–0.0242	2.3379	89.0803	2.1982	91.2785
P–B7	1.3818	–21.4929	1.0041	1.3354	.	.	.	.	.	.
P–C7	1.3353	–20.2940	4.3021	1.3369	0.0345	–0.0115	3.8582	149.9975	7.6408	157.6384
P–E7	0.1134	–20.9800	2.2402	1.2409	0.0208	–0.0249	1.7345	41.7608	1.5835	43.3443
P–A8	1.8393	–19.6081	3.4038	2.2194	0.0670	–0.0334	2.1434	100.4369	1.4623	101.8992

P–C8	2.3958	–21.7401	11.3802	2.2904	.	.	.	.	.	.
P–C8	3.5941	–21.4121	3.3678	2.7139	0.0326	–0.0167	3.8592	97.8029	5.2731	103.0759
P–E8	.	–21.9853	.	.	0.0537	–0.0254	6.4916	105.7789	5.8236	111.6025
S–A1	12.3878	–20.9339	7.8483	6.4256	0.1757	–0.1075	20.6743	81.7120	4.3755	86.0874
S–B1	10.7411	–21.4208	7.6100	5.9126	0.0913	–0.0511	22.6479	89.2624	10.0782	99.3407
S–C1	8.9554	–21.9961	13.6104	5.4314	.	.	.	.	.	.
S–D1	11.6866	–21.3155	7.3206	8.5149	.	.	.	.	.	.
S–E1	7.3440	–21.2837	14.8315	5.6397	0.2276	–0.1192	19.4359	95.4504	3.7089	99.1593
S–A2	13.5320	–21.6891	6.2507	7.6284	0.0483	–0.0339	17.6469	71.2121	11.8488	83.0609
S–B2	13.9061	–21.6732	10.0171	7.7547	0.0452	–0.0327	11.6105	68.9934	8.0681	77.0615
S–C2	14.1265	–21.3055	6.9530	4.6522	.	.	.	.	.	.
S–D2	9.0378	–20.9309	7.4754	6.2862	.	.	.	.	.	.
S–E2	14.3424	–21.4546	2.3902	7.4470	0.0599	–0.0376	21.6323	79.6110	13.0854	92.6963
S–A3	7.6973	–20.4847	8.7335	7.1819	0.0541	–0.0596	.	45.3525	.	45.3525
S–B3	7.6115	–20.5707	7.2431	6.2323	0.0784	–0.0918	.	42.7041	.	42.7041
S–C3	6.6959	–21.3343	11.1930	6.6368	.	.	.	.	.	.
S–D3	8.3597	–20.8335	9.0033	7.3308	.	.	.	.	.	.
S–E3	6.0558	–21.3134	17.4817	6.3040	0.0392	–0.0501	.	39.0946	.	39.0946
S–A4	6.9277	–20.7758	17.4374	7.5208	0.1141	–0.0681	.	83.7746	.	83.7746
S–B4	5.2973	–20.5588	12.1379	6.3614	0.0766	–0.0608	.	62.9306	.	62.9306
S–C4	11.1474	–21.2307	14.3786	7.2438	.	.	.	.	.	.
S–D4	6.1807	–22.0829	23.5572	6.1957	.	.	.	.	.	.
S–E4	4.3486	–22.2482	12.4461	4.8364	0.1339	–0.0730	.	91.6772	.	91.6772
S–A5	5.8869	–20.1765	16.1036	6.5210	0.0526	–0.0427	.	61.5826	.	61.5826
S–B5	4.7519	–19.0974	6.3409	6.5789	0.1529	–0.0974	.	78.4730	.	78.4730
S–C5	6.6792	–20.1348	14.7531	6.9278	.	.	.	.	.	.
S–D5	4.0793	–19.2927	16.3888	7.1737	.	.	.	.	.	.
S–E5	3.8197	–18.9989	7.1306	6.3631	0.0811	–0.0601	.	67.5425	.	67.5425
S–A6	3.7059	–20.6942	15.1478	6.4034	0.1559	–0.0987	.	78.9886	.	78.9886
S–B6	3.4649	–20.3942	15.6380	6.6331	0.0964	–0.0578	.	83.3852	.	83.3852
S–C6	6.5372	–20.9536	22.4345	6.7637	.	.	.	.	.	.
S–D6	6.4336	–20.8125	7.1460	8.0890	.	.	.	.	.	.
S–E6	3.1056	–20.9903	38.7260	6.2399	0.1431	–0.0922	.	77.6627	.	77.6627
S–A7	7.8174	–20.3554	19.7422	6.8554	0.0370	–0.0277	18.0492	66.8885	14.8388	81.7273
S–B7	8.6816	–19.5744	6.6879	6.8718	0.0450	–0.0325	9.3682	69.2224	6.5611	75.7835
S–C7	6.1253	–20.5661	–9.5928	6.4446		.	.	.	.	.
S–D7	5.7966	–19.1869	17.5173	4.7870		.	.	.	.	.
S–E7	9.2661	–19.1104	10.1216	7.1533	0.0479	–0.0293	7.9239	81.9410	6.1623	88.1033

S–A8	6.4770	–20.2908	24.9824	7.3387	0.1151	–0.0907	21.2657	63.4674	5.3356	68.8030
S–B8	5.2701	–20.7529	13.6071	5.8855	0.1179	–0.0750	18.0171	78.5860	5.4636	84.0496
S–C8	10.5103	–19.7692	11.1092	8.6246	.	.	.	.	.	.
S–D8	5.9758	–20.2173	6.8779	6.1340	.	.	.	.	.	.
S–E8	5.6903	–20.5129	20.5888	8.3744	0.2501	–0.1544	26.5247	80.9876	3.9089	84.8965
T–A1	11.2849	–21.0201	2.0229	12.3463	0.0442	–0.0252	10.1598	87.5367	9.0128	96.5494
T–B1	17.7862	–21.1414	3.5074	18.0360	0.0404	–0.0169	7.8224	119.2852	10.3559	129.6411
T–C1	9.6511	–20.6206	2.9254	10.7904	.	.	.	.	.	.
T–D1	12.4781	–21.6665	2.6902	9.9624	.	.	.	.	.	.
T–E1	10.2408	–21.0337	3.7052	10.4412	0.0630	–0.0339	13.3704	92.8422	8.8104	101.6526
T–A2	5.6899	–20.3332	2.0936	10.6009	0.0126	–0.0081	13.5660	78.1721	37.5839	115.7559
T–B2	14.1555	–19.8955	2.5712	13.9678	0.0208	–0.0116	12.4889	90.1230	24.1986	114.3216
T–C2	8.9446	–20.7210	1.9765	14.3376	.	.	.	.	.	.
T–D2	8.1235	–21.4373	1.7037	11.3968	.	.	.	.	.	.
T–E2	7.7929	–21.5681	3.7782	9.9231	0.0186	–0.0118	17.8957	78.5393	33.7756	112.3148
T–A3	7.7988	–20.9431	2.4234	9.7882	0.0142	–0.0146	.	48.5930	.	48.5930
T–B3	8.6323	–21.1991	1.9142	15.1504	0.0529	–0.0225	.	117.7541	.	117.7541
T–C3	6.4663	–20.7618	2.1409	11.1383	.	.	.	.	.	.
T–D3	6.1220	–22.3128	2.0057	8.2292	.	.	.	.	.	.
T–E3	.	.	.	.	0.0224	–0.0154	.	72.7110	.	72.7110
T–A4	12.2869	–20.9995	2.7708	12. 1238	0.0712	–0.0301	.	118.1372	.	118.1372
T–B4	12.4853	–21.1898	2.6292	12.7243	0.0234	–0.0077	.	152.0712	.	152.0712
T–C4	9.4047	–21.5265	2.6443	7.5676	.	.	.	.	.	.
T–D4	7.7699	–20.9521	1.5988	8.2958	.	.	.	.	.	.
T–E4	9.5014	–21.3807	4.1871	9.5652	0.0501	–0.0234	.	107.3293	.	107.3293
T–A5	.	–20.5235	.	.	0.0253	–0.0289	.	43.7885	.	43.7885
T–B5	9.9551	–19.9238	3.2788	5.3708	0.0548	–0.0264	.	103.6670	.	103.6670
T–C5	5.1080	–20.6905	5.0944	11.6748	.	.	.	.	.	.
T–D5	6.3212	–21.3794	2.4106	10.1469	.	.	.	.	.	.
T–E5	3.6825	–20.4289	2.9464	9.2635	0.0259	–0.0169	.	76.8435	.	76.8435
T–A6	6.8355	–20.6403	4.5161	13.1177	0.0664	–0.0286	.	116.1059	.	116.1059
T–B6	12.1798	–20.0420	1.9949	11.8317	0.0528	–0.0196	.	134.3064	.	134.3064
T–C6	.	.	.	.	.	.	.	.	.	.
T–D6	8.1745	–20.7107	2.4028	9.0964	.	.	.	.	.	.
T–E6	7.1888	–21.0366	3.0179	8.9511	0.0493	–0.0201	.	122.2748	.	122.2748
T–A7	5.7258	–20.5011	1.6724	12.3473	0.0108	–0.0066	13.4497	82.5978	45.9493	128.5471
T–B7	9.5886	–19.7025	3.9101	8.1973	0.0234	–0.0111	12.6732	105.4080	25.5523	130.9603
T–C7	6.6329	–20.4048	1.0371	12.1475	.	.	.	.	.	.

T–D7	5.6574	–21.0353	0.4381	13.7239	.	.	.	.	.	.
T–E7	6.6579	–21.0466	1.9823	11.1108	0.0221	–0.0101	21.2979	109.4740	47.0562	156.5302
T–A8	8.8343	–20.9275	3.2480	10.4440	0.0398	–0.0225	15.0493	88.3618	14.9060	103.2678
T–B8	9.6931	–20.9091	3.2019	12.9405	0.0538	–0.0229	15.7298	117.3831	15.3603	132.7434
T–C8	6.6417	–20.8187	4.6921	10.2808	.	.	.	.	.	.
T–D8	8.8529	–21.2331	1.9251	10.0114	.	.	.	.	.	.
T–E8	9.0087	–21.0185	3.2486	10.7664	0.0506	–0.0297	14.7637	85.2082	11.1231	96.3312