

1 Supplementary Materials

2 Text S1

3 The coral maintenance facility was located at Phuket Marine Biological Center (Cape Panwa, Phuket,
4 Thailand) within an hour by speed boat from the most distant sampling site. Collected coral fragments
5 (*Pocillopora*: length ~ 5 cm; *Porites*: \varnothing ~ 6 cm) were maintained in two large 500 L flow-through tanks
6 with a flow rate of 2.8 ± 1.31 L/min and the average ambient *in situ* temperature of the season for 2-12
7 days before used in the experiments. A 500 L source tank constantly supplied 5 μ m-filtered seawater
8 from the reef adjacent to the facilities and temperature was held at constant 29.43 ± 0.32 °C using a
9 chiller, a heater, and a temperature-control device (Aqua Medic Titan 1500 Chiller, Germany; Titanium
10 Heater 100 W, Schego, Germany; Temperature Switch TS 125, HTRONIC, Germany). During
11 experiments, i.e., heat tolerance assessment, the large flow-through tanks served as temperature-
12 stabilizing baths for four 40 L experimental tanks, two per water bath. Experimental tanks were supplied
13 through daily manual water change (twice daily 50%) from the source tank. Each experimental tank
14 was equipped with a temperature-control device, one heater, air supply, a small current pump, and a
15 temperature logger (Titanium Heater 100 W, Schego, Germany; Temperature Switch TS 125,
16 HTRONIC, Germany; HOBO Pendant Temperature/Light 8K Data Logger, Onset, USA; Koralia nano
17 900 L/h, Hydor, Italy). Each of the four experimental tanks as well as the flow-through tanks were
18 equipped with LED lights (135 W, Hydra Fiftytwo HD LED, Aqua Illumination, USA) that mimicked
19 the average light conditions of the sampling sites. Tanks were monitored regularly by measuring a suite
20 of environmental parameters (temperature, oxygen, light intensity, and salinity). Briefly, temperature
21 was measured continuously with loggers (HOBO Pendant® Temperature/Light 64K Data Logger,
22 Onset, USA). Other parameters were monitored at regular time intervals, i.e., photosynthetically active
23 radiation (PAR) measured by a quantum meter (MQ-210 Underwater Quantum Meter, Apogee
24 Instruments, USA), dissolved oxygen and salinity measured by a hand-held multimeter (Multi3430,
25 FDO®925, and TetraCon®925, WTW, Germany). Physico-chemical parameters of tank conditions are
26 provided in Tables S2.

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Table S1 Replicate numbers of coral colonies tested per reef sites and seasons.

Coral species	Site of origin	Season of stimulusS presence	Season of stimulusS absence
<i>Porites</i> sp.	West High variability site	N=12	N=12
	East Low variability site	N=13	N=14
<i>Pocillopora</i> sp.	West High variability site	N=10	N=18
	East Low variability site	N=9	N=13

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*stimulus = environmental priming stimulus of high thermal variability generated by internal waves

32 **Table S2 Summary of tank conditions during the heat stress assays.** Temperature, oxygen, light
 33 intensity and salinity data (mean \pm SD) are presented for the duration of the assay for both coral species.
 34 Temperature is specifically summarized for the temperature-peak period for each treatment (i.e., ‘29
 35 °C’ and ‘34 °C’).

Coral species	Heat stress assay treatments	Temperature (°C)	Peak temperature (°C)	Dissolved oxygen (mg/L)	Light intensity ($\mu\text{mol m}^{-2} \text{s}^{-2}$)	Salinity (PSU)
<i>Pocillopora</i> sp.	‘29 °C’	29.82 \pm 0.35	30.08 \pm 0.19	7.61 \pm 0.02	74 \pm 3	32.7 \pm 0.1
	‘34 °C’	30.99 \pm 2.03	33.89 \pm 0.56	7.63 \pm 0.01	75 \pm 5	32.4 \pm 0.1
<i>Porites</i> sp.	‘29 °C’	29.14 \pm 0.18	29.35 \pm 0.18	8.20 \pm 0.27	83 \pm 8	NA
	‘34 °C’	30.46 \pm 2.01	34.27 \pm 0.16	8.16 \pm 0.29	84 \pm 9	NA

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37 **Table S3 Effect sizes of coral stress responses.** Effect sizes are represented by the mean differences
 38 (response under ambient temperature minus response under heat treatment) calculated through
 39 bootstrap estimation (*dabestR* R-package). The 95% confidence intervals (95CI) are indicated in
 40 square brackets. 5000 bootstrap resamples were used and CIs are bias-corrected and accelerated.
 41 Negative values indicate the decline of holobiont tissue coloration (i.e., bleaching score) and symbiont
 42 photosynthetic efficiency (i.e., Effective Quantum Yield).

Site of origin	Season of	Δ Bleaching Score		Δ Effective Quantum Yield	
		<i>Pocillopora</i> sp.	<i>Porites</i> sp.	<i>Pocillopora</i> sp.	<i>Porites</i> sp.
West High variability site	Stimulus presence	-0.5 [95CI -1.06; -0.0556]	-0.667 [95CI -1.17; -0.167]	0.001 [95CI -0.016; 0.022]	-0.00656 [95CI -0.041; 0.020]
West High variability site	Stimulus absence	-0.806 [95CI -1.25; -0.444]	-0.583 [95CI -0.958; -0.292]	-0.0362 [95CI -0.060; -0.022]	-0.0193 [95CI -0.027; -0.012]
East Low variability site	Stimulus presence	-1.05 [95CI -1.75; -0.3]	-1.97 [95CI -2.63; -1.4]	-0.0246 [95CI -0.045; -0.009]	-0.0289 [95CI -0.078; 0.007]
East Low variability site	Stimulus absence	-1.77 [95CI -2.23; -1.38]	-1.14 [95CI -1.5; -0.75]	-0.041 [95CI -0.060; -0.024]	-0.0339 [95CI -0.048; -0.022]

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Table S4 Generalized Linear Mixed-Effects Models. Models were built based on the formula $data \sim site * treatment + (1 * site | colony)$ employing Gaussian or Gamma distribution. Eight models were generated, one per response variable (bleaching score and photosynthetic performance) for each coral species per season. data = full data set; data_rmout2 = data with outliers removed.

Response variable	Season	Cora species	Data	shapiro <i>p</i>	AIC	BIC	logLik	deviance	df.resid	Model	Distribution
Bleaching Score	Stimulus presence	Pocillopora	"data"	0.096	94.4	104.2	-41.2	82.4	32	glmerMod	Family: gaussian (identity)
		Porites	"data"	0.021	141.8	153.7	-64.9	129.8	48	glmerMod	Family: Gamma (log)
	Stimulus absence	Pocillopora	"data"	0.000	128	140.8	-58	116	56	glmerMod	Family: Gamma (log)
		Porites	"data"	0.001	80.4	92.1	-34.2	68.4	46	glmerMod	Family: Gamma (log)
Photosynthetic Efficiency	Stimulus presence	Pocillopora	"data_rmout2"	0.004	-182.1	-172.6	97.1	-194.1	30	glmerMod	Family: Gamma (log)
		Porites	"data"	0.000	-155.1	-143.2	83.5	-167.1	48	glmerMod	Family: Gamma (log)
	Stimulus absence	Pocillopora	"data_rmout2"	0.000	-300	-287.4	156	-312	54	glmerMod	Family: Gamma (log)
		Porites	"data"	0.000	-282.8	-271.1	147.4	-294.8	46	glmerMod	Family: Gamma (log)

Table S5 Fixed effects reported from generalized Linear Mixed-Effects Models for the bleaching score response variable. Statistics and *p*-values are reported for each coral species. Site = reef site of origin (East, West); treatment = treatment group of heat stress assay (ambient temperature control group, heat stress group 34 °C)

<i>Pocillopora</i> Season of stimulus presence	Estimate	Std. Error	t value	Pr(> z)	Significance level
## (Intercept)	10.20152	0.22569	45.202	< 2e-16	***
## site	0.04221	0.30743	0.137	0.890805	
## treatment	-1.05001	0.29206	-3.595	0.000324	***
## site:treatment	0.52232	0.42828	1.22	0.222621	
<i>Porites</i> Season of stimulus presence	Estimate	Std. Error	t value	Pr(> z)	Significance level
(Intercept)	2.35095	0.02267	103.72	< 2e-16	***
site	-0.01902	0.0311	-0.612	0.54079	
treatment	-0.20899	0.02901	-7.204	5.85E-13	***

site:treatment	0.1419	0.0435	3.262	0.00111	**
<i>Pocillopora</i> Season of stimulus absence	Estimate	Std. Error	t value	Pr(> z)	Significance level
(Intercept)	2.34647	0.01831	128.173	< 2e-16	***
site	-0.01468	0.02334	-0.629	0.52942	
treatment	-0.18671	0.02375	-7.862	3.78E-15	***
site:treatment	0.10486	0.03114	3.367	0.00076	***
<i>Porites</i> Season of stimulus absence	Estimate	Std. Error	t value	Pr(> z)	Significance level
(Intercept)	2.27299	0.0147	154.663	< 2e-16	***
site	0.02266	0.01825	1.242	0.2144	
treatment	-0.12531	0.01736	-7.218	5.28E-13	***
site:treatment	0.06478	0.02555	2.535	0.0112	*

Table S6 Fixed effects reported from generalized Linear Mixed-Effects Models for the photosynthetic efficiency variable. Statistics and *p*-values are reported for each coral species. Site = reef site of origin (East, West); treatment = treatment group of heat stress assay (ambient temperature control group, heat stress group 34 °C)

<i>Pocillopora</i> Season of stimulus presence	Estimate	Std. Error	t value	Pr(> z)	Significance level
(Intercept)	0.6925552	0.0048485	142.839	< 2e-16	***
site	0.0001751	0.0031736	0.055	0.95599	
treatment	-0.0123004	0.003027	-4.064	4.83E-05	***
site:treatment	0.0112807	0.0042945	2.627	0.00862	**
<i>Porites</i> Season of stimulus presence	Estimate	Std. Error	t value	Pr(> z)	Significance level
(Intercept)	0.678404	0.007378	91.949	<2e-16	***
site	0.011163	0.009615	1.161	0.2456	
treatment	-0.014834	0.008922	-1.663	0.0964	.
site:treatment	0.011486	0.013382	0.858	0.3907	

<i>Pocillopora</i> Season of stimulus absence	Estimate	Std. Error	t value	Pr(> z)	Significance level
(Intercept)	0.6936882	0.0027356	253.582	< 2e-16	***
site	-0.0006219	0.003258	-0.191	0.849	
treatment	-0.0206975	0.0033106	-6.252	4.05E-10	***
site:treatment	0.0064631	0.0043289	1.493	0.135	
<i>Porites</i> Season of stimulus absence	Estimate	Std. Error	t value	Pr(> z)	Significance level
(Intercept)	0.689365	0.002219	310.641	< 2e-16	***
site	0.002844	0.002583	1.101	0.2709	
treatment	-0.017184	0.002453	-7.005	2.48E-12	***
site:treatment	0.007466	0.003611	2.068	0.0387	*

Table S7 Post Hoc comparisons for bleaching score data. Statistics and *p*-values are reported for each coral species per season. Reef sites of origin: RE = East shore reef, RW = West shore reef; Groups of heat stress assays: A = ambient temperature control group, H = heat stress group 34 °C.

contrast	estimate	SE	df	z-ratio	p-value
<i>Pocillopora</i> Season of stimulus presence					
RE A - RW A	-0.0422	0.307	Inf	-0.137	0.9991
RE A - RE H	1.05	0.292	Inf	3.595	0.0018
RE A - RW H	0.4855	0.306	Inf	1.584	0.3875
RW A - RE H	1.0922	0.307	Inf	3.553	0.0022
RW A - RW H	0.5277	0.313	Inf	1.685	0.3318
RE H - RW H	-0.5645	0.306	Inf	-1.842	0.2534
<i>Porites</i> Season of stimulus presence					
contrast	estimate	SE	df	z.ratio	p.value
RE A - RW A	0.019	0.0311	Inf	0.612	0.9284
RE A - RE H	0.209	0.029	Inf	7.204	<.0001

RE A - RW H	0.0861	0.0311	Inf	2.768	0.0289
RW A - RE H	0.19	0.0311	Inf	6.111	<.0001
RW A - RW H	0.0671	0.0324	Inf	2.07	0.1631
RE H - RW H	-0.1229	0.0311	Inf	-3.952	0.0005
<i>Pocillopora</i> Season of stimulus absence					
RE A - RW A	0.0147	0.0233	Inf	0.629	0.9228
RE A - RE H	0.1867	0.0237	Inf	7.862	<.0001
RE A - RW H	0.0965	0.0235	Inf	4.109	0.0002
RW A - RE H	0.172	0.0232	Inf	7.424	<.0001
RW A - RW H	0.0818	0.0202	Inf	4.057	0.0003
RE H - RW H	-0.0902	0.0233	Inf	-3.87	0.0006
<i>Porites</i> Season of stimulus absence					

RE A - RW A	-0.0227	0.0183	Inf	-1.242	0.6003
RE A - RE H	0.1253	0.0174	Inf	7.218	<.0001
RE A - RW H	0.0379	0.0183	Inf	2.074	0.1615
RW A - RE H	0.148	0.0182	Inf	8.109	<.0001
RW A - RW H	0.0605	0.0187	Inf	3.228	0.0068
RE H - RW H	-0.0874	0.0183	Inf	-4.79	<.0001

Table S8 Post Hoc comparisons for photosynthetic efficiency data. Statistics and *p*-values are reported for each coral species per season. Reef sites of origin: RE = East shore reef, RW = West shore reef; Groups of heat stress assays: A = ambient temperature control group, H = heat stress group 34 °C.

contrast	estimate	SE	df	z.ratio	p.value
<i>Pocillopora</i> Season of stimulus presence					
RE A - RW A	-0.00018	0.00317	Inf	-0.055	0.9999
RE A - RE H	0.0123	0.00303	Inf	4.064	0.0003

RE A - RW H	0.000845	0.00314	Inf	0.269	0.9932
RW A - RE H	0.012475	0.00333	Inf	3.743	0.001
RW A - RW H	0.00102	0.00307	Inf	0.333	0.9873
RE H - RW H	-0.01146	0.00328	Inf	-3.49	0.0027
<i>Porites</i> Season of stimulus presence					
RE A - RW A	-0.01116	0.00961	Inf	-1.161	0.6515
RE A - RE H	0.01483	0.00892	Inf	1.663	0.3436
RE A - RW H	-0.00781	0.00961	Inf	-0.813	0.8485
RW A - RE H	0.026	0.00961	Inf	2.705	0.0345
RW A - RW H	0.00335	0.00997	Inf	0.336	0.987
RE H - RW H	-0.02265	0.00961	Inf	-2.356	0.0857
<i>Pocillopora</i> Season of stimulus absence					

RE A - RW A	0.000622	0.00326	Inf	0.191	0.9975
RE A - RE H	0.020697	0.00331	Inf	6.252	<.0001
RE A - RW H	0.014856	0.00332	Inf	4.473	<.0001
RW A - RE H	0.020076	0.00332	Inf	6.041	<.0001
RW A - RW H	0.014234	0.00279	Inf	5.104	<.0001
RE H - RW H	-0.00584	0.00339	Inf	-1.725	0.3104
<i>Porites</i> Season of stimulus absence					
RE A - RW A	-0.00284	0.00258	Inf	-1.101	0.6889
RE A - RE H	0.01718	0.00245	Inf	7.005	<.0001
RE A - RW H	0.00687	0.00258	Inf	2.661	0.039
RW A - RE H	0.02003	0.00258	Inf	7.752	<.0001
RW A - RW H	0.00972	0.00265	Inf	3.667	0.0014

RE H - RW H	-0.01031	0.00258	Inf	-3.991	0.0004
RE H - RW H	-0.01031	0.00258	Inf	-3.991	0.0004