Supplementary Information

Table S1. Mean day and night temperatures in the different treatments and experimental phases. Note: Treatment "31_Day" only comprised of 2 tanks. Also, temperatures recorded in the transition phase (7 am – 8 am and 7 pm –8 pm) during which temperatures were changed manually (see Fig. S2) were excluded from this analysis. Additionally, the impact phase only represents temperatures recorded at the peak of the heatwaves (see Fig. S2) as we excluded the on- and offset period (~2 weeks each).

Treatment	Day/Night	Experimental period	Temperature (°C) ± SE	n
31	Day	pre-impact	31.65 ± 0.01	4752.00
	Night	pre-impact	31.63 ± <0.01	4644.00
	Day	impact	31.62 ± <0.01	3168.00
	Night	impact	31.57 ± <0.01	3168.00
	Day	recovery	31.62 ± <0.01	4356.00
	Night	recovery	31.57 ± <0.01	4356.00
31_Day	Day	pre-impact	33.26 ± 0.02	3168.00
	Night	pre-impact	30.23 ± 0.01	3096.00
	Day	impact	33.42 ± 0.01	2112.00
	Night	impact	30.23 ± 0.01	2112.00
	Day	recovery	33.28 ± 0.01	2904.00
	Night	recovery	30.30 ± 0.01	2904.00
31_Night	Day	pre-impact	30.45 ± 0.01	4752.00
	Night	pre-impact	33.43 ± 0.01	4644.00
	Day	impact	30.36 ± 0.01	3168.00
	Night	impact	33.36 ± <0.01	3168.00
	Day	recovery	30.49 ± 0.01	4356.00
	Night	recovery	33.31 ± 0.01	4356.00
34	Day	pre-impact	31.79 ± 0.01	4752.00
	Night	pre-impact	31.81 ± 0.01	4644.00
	Day	impact	34.80 ± <0.01	3168.00
	Night	impact	34.76 ± <0.01	3168.00
	Day	recovery	31.87 ± <0.01	2904.00
	Night	recovery	31.55 ± 0.06	2904.00
34_Day	Day	pre-impact	32.95 ± 0.01	4752.00
	Night	pre-impact	30.07 ± <0.01	4644.00
	Day	impact	35.97 ± 0.01	3168.00
	Night	impact	33.16 ± 0.01	3168.00
	Day	recovery	33.18 ± <0.01	4356.00
	Night	recovery	30.19 ± 0.06	4356.00
34_Night	Day	pre-impact	30.73 ± 0.01	4752.00
	Night	pre-impact	33.62 ± <0.01	4644.00
	Day	impact	33.16 ± 0.01	3168.00
	Night	impact	36.48 ± <0.01	3168.00
	Day	recovery	30.49 ± 0.01	4356.00
	Night	recovery	33.32 ± 0.01	4356.00

Tables S2. Mean duration, average, maximum, cumulative intensity, onset and number of events within each strength category of historic and contemporary marine heatwaves at Al-Fahal (climatological period 1982-01-01–2012-01-01).

Mean duration (d)	Mean average intensity (°C)	Mean Maximum intensity (°C)	Mean cumulative intensity (°C d)	Mean onset (°C d^{-1})	Events Cat. I (n)	Events Cat. II (n)	Events Cat. III (n)	Events Cat. VI (n)
13.67	1.43	1.78	20.28	0.22	93	17	0	0

Table S3. Intensity metrics, duration, and rate of onset of the simulated marine heatwave. Calculation is based on mean August climatology and the data from the actual experimental tanks (Fig. S7) but only from tanks assigned to the heatwave/no-variability treatment. Adjusted climatology and thresholds include a 0.7 °C bias-adjustment based on the mean annual offset we observed between in-situ loggers and satellite data (Fig. S5). Note: Maximum monthly mean (30.76 °C) and the respective coral bleaching thresholds (MMM + 1 °C) was obtained directly from Coral Reef Watch. Bias adjustment was performed by adding 0.7 °C to the bleaching threshold but since the satellite product differs from the one, we used for the calculation of the regional heatwaves (OISST v2.1) the respective offset is likely different.

Threshold	Duration (d)	Maximum intensity (°C) relative to climatology	Mean intensity (°C) relative to climatology	Cumulative intensity (°C d) relative to climatology	Degree Heating Week (°C week)	Onset (°C d^{-1})
Unadjusted	37	3.77	2.83	104.84	10.87	0.17
Adjusted	30	3.07	2.41	74.42	7.11	0.16

Table S4. Strength category of the simulated heatwave. Calculation is based on average August climatology and the data from the actual experimental tanks (Fig. S7) but only from tanks assigned to the heatwave/no-variability treatment. Adjusted climatology and thresholds include a 0.7 °C bias-adjustment based on the mean annual offset we observed between in-situ loggers and satellite data (Fig. S5).

Threshold	Category	Days over 1st thresh. (%)	Days over 2nd thresh. (%)	Days over 3rd thresh. (%)	Days over 4th thresh. (%)
Unadjusted	III Severe	27	30	43	0
Adjusted	III Severe	27	43	30	0

Table S5. Total number of samples available for each species in each experimental phase.

Timepoint	Treatment	*Lithophyllum* sp.	*Neogoniolithon* sp.	*H. opuntia*	*H. discoidea*
Experiment start	34	16	15	15	13
	34_Day	15	15	15	15
	34_Night	14	15	15	15
	31_Day	15	15	15	15
	31_Night	15	14	15	15
	31	15	16	15	14
End of pre-impact/Start of MHW	34	15	13	13	11
	34_Day	15	15	13	13
	34_Night	15	15	14	14
	31_Day	10	8	6	9
	31_Night	15	14	13	12
	31	15	15	12	13
End of MHW/Start of recovery	34	15	13	8	8
	34_Day	15	15	7	10
	34_Night	15	15	4	10
	31_Day	10	8	3	7
	31_Night	15	14	10	7
	31	15	14	8	8
End recovery	34	15	13	6	4
	34_Day	15	15	7	8
	34_Night	15	15	2	6
	31_Day	10	8	2	5
	31_Night	15	14	8	6
	31	15	15	7	5

Table S6. Mean dissolved inorganic carbon (DIC) and pH on the total scale in the different treatments. Samples for DIC analysis and measurements of pH and were taken in all experimental phases (pre-impact, impact, recovery) from all tanks both during the day and night to capture both the long- and the short-term variability of these parameters. Note: Treatment "31_Day" only comprised of 2 tanks.

Treatment	DIC (µmol kg^{-1}) ± SE	pH_T ± SE	n
31	1974.32 ± 5.71	7.97 ± 0.01	27
31_Day	1974.13 ± 6.04	7.96 ± 0.01	18
31_Night	1973.88 ± 5.15	7.98 ± 0.01	27
34	1974.31 ± 4.58	7.96 ± 0.01	27
34_Day	1966.88 ± 5.52	7.96 ± 0.01	27
34_Night	1970.90 ± 4.96	7.97 ± 0.01	27

Table S7. Mean daily light dose in the different treatments. Treatment averages taken from doses calculated for 61 days for each of the three experimental tanks that comprised each treatment. Photoperiod was from 7 am to 7 pm. Data was obtained using PAR loggers placed in each tank. Loggers were calibrated against a handheld PAR meter (Apogee MQ-510) and logging interval was set to 5 min. Note: Treatment "31_Day" only comprised of 2 tanks. Loggers were placed into the experimental tanks one week after the start of the experiment.

Treatment	n	Daily dose (mol m^{-2} d^{-1}) ± SE	max PAR (µmol m^{-2} s^{-1}) ± SE
34	172	2.54 ± 0.02	113.3 ± 0.99
34_Day	183	2.35 ± 0.03	105.1 ± 1.24
34_Night	183	2.63 ± 0.04	118.3 ± 1.78
31	183	2.58 ± 0.03	114.9 ± 1.15
31_Day	122	2.78 ± 0.04	125.9 ± 1.83
31_Night	183	2.75 ± 0.02	123.2 ± 1.12

Table S8. Mean daily light dose and mean maximum PAR in the different treatment tanks. Photoperiod was from 7 am to 7 pm. Data was obtained using PAR loggers placed in each tank. Loggers were calibrated against a handheld PAR meter (Apogee MQ-510) and logging interval was set to 5 min. Note: Treatment "31_Day" only comprised of 2 tanks. Loggers were placed into the experimental tanks one week after the start of the experiment.

Treatment	Tank	n	Daily dose (mol m^{-2} d^{-1}) ± SE	max PAR (µmol m^{-2} s^{-1}) ± SE
31	1	61	2.54 ± 0.01	114.4 ± 0.53
34	2	61	2.47 ± 0.02	108.9 ± 0.73
34_Day	3	61	2.26 ± 0.04	100.0 ± 1.93
31_Day	4	61	2.59 ± 0.07	116.6 ± 2.97
34_Night	5	61	2.51 ± 0.10	112.5 ± 4.21
31_Night	6	61	2.86 ± 0.03	128.1 ± 1.19
31_Night	8	61	2.61 ± 0.05	115.3 ± 2.12
34_Night	9	61	2.44 ± 0.05	110.3 ± 2.32
34	10	50	2.21 ± 0.04	101.3 ± 1.43
34_Day	11	61	2.22 ± 0.04	99.8 ± 1.95
31	12	61	2.34 ± 0.04	103.2 ± 2.02
34_Night	13	61	2.93 ± 0.02	131.9 ± 1.06
31	14	61	2.86 ± 0.04	126.9 ± 1.72
34	15	61	2.86 ± 0.01	127.7 ± 0.47
31_Night	16	61	2.78 ± 0.04	126.2 ± 2.00
31_Day	17	61	2.98 ± 0.03	135.2 ± 1.34
34_Day	18	61	2.56 ± 0.04	115.6 ± 1.93

Table S9. Daily light dose and mean maximum photosynthetic active radiation (PAR) at Al-Fahal in three different microhabitats.

Location	Mean light dose ± SE	Mean maximun PAR ± SE	n
Cave	0.75 ± 0.02	30.02 ± 0.65	57
Crevice	2.58 ± 0.23	191.45 ± 18.83	57
Flat	41.54 ± 1.16	1737.02 ± 39.61	57

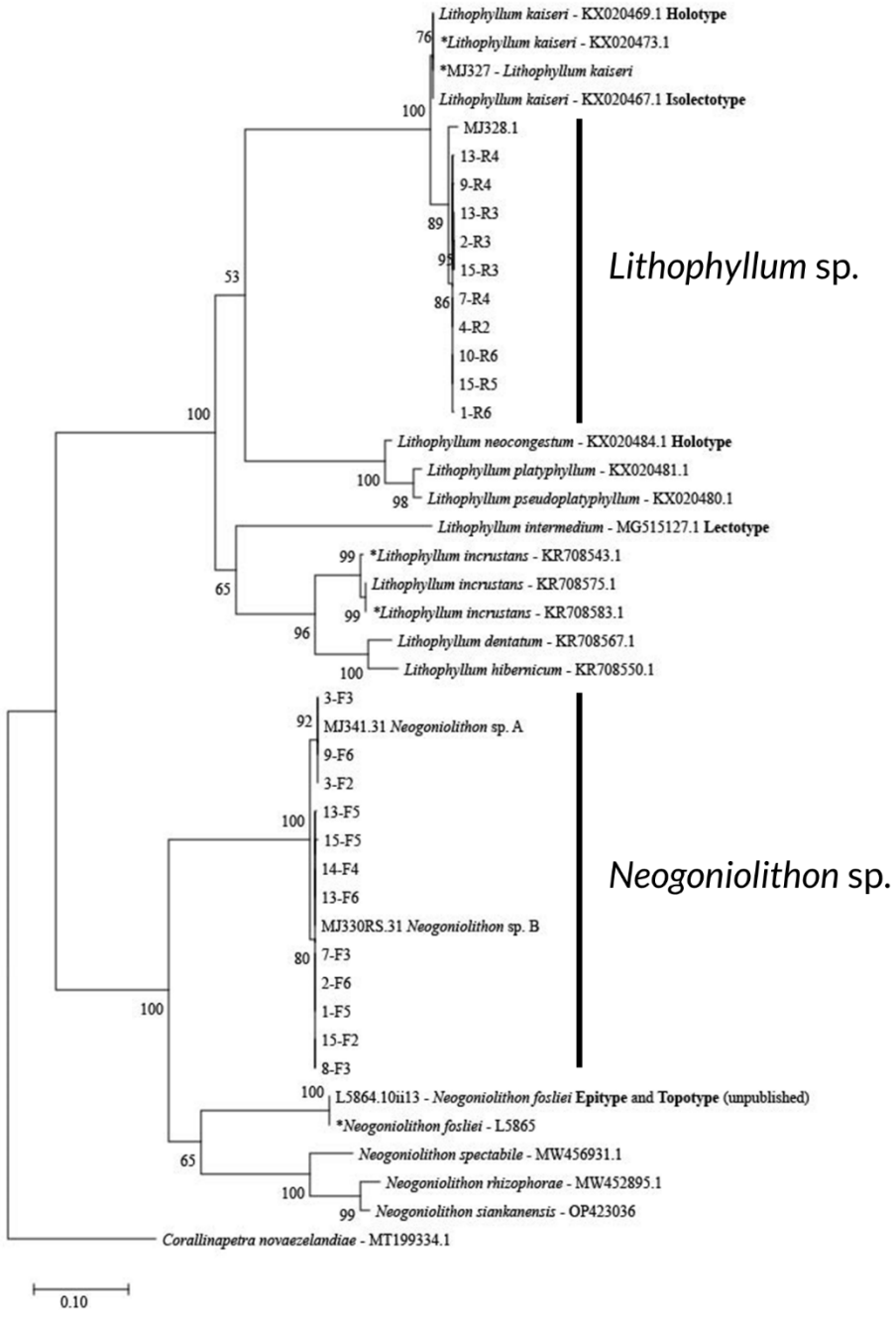


Figure S1. Taxonomic tree with samples from previous collections of the same morphologies of crustose coralline algae used in this study from the same sampling site.

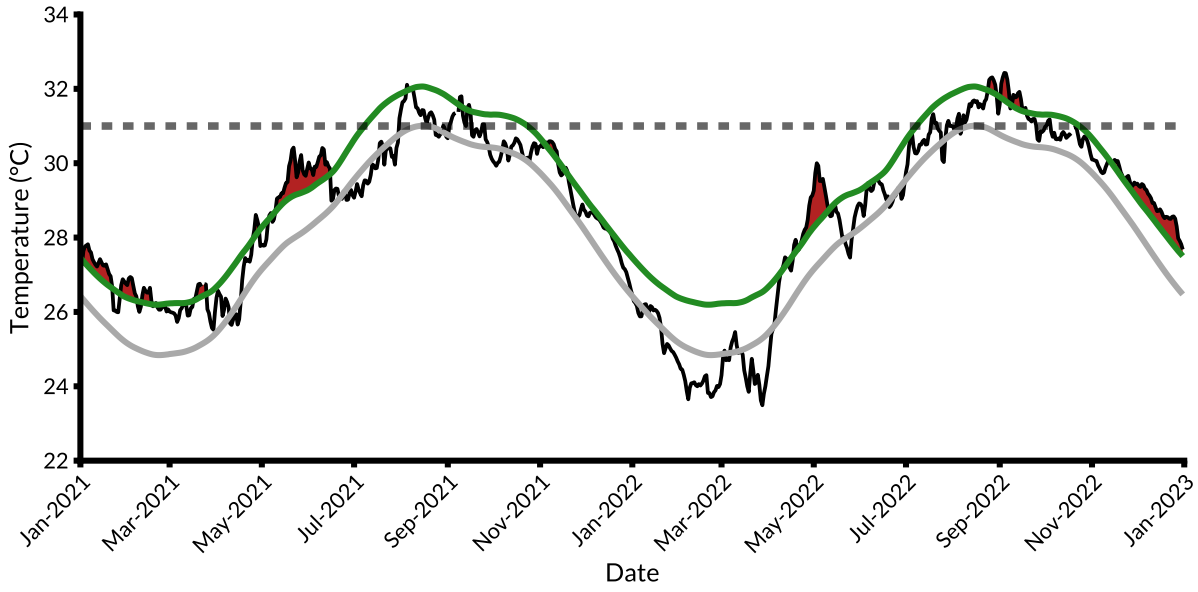
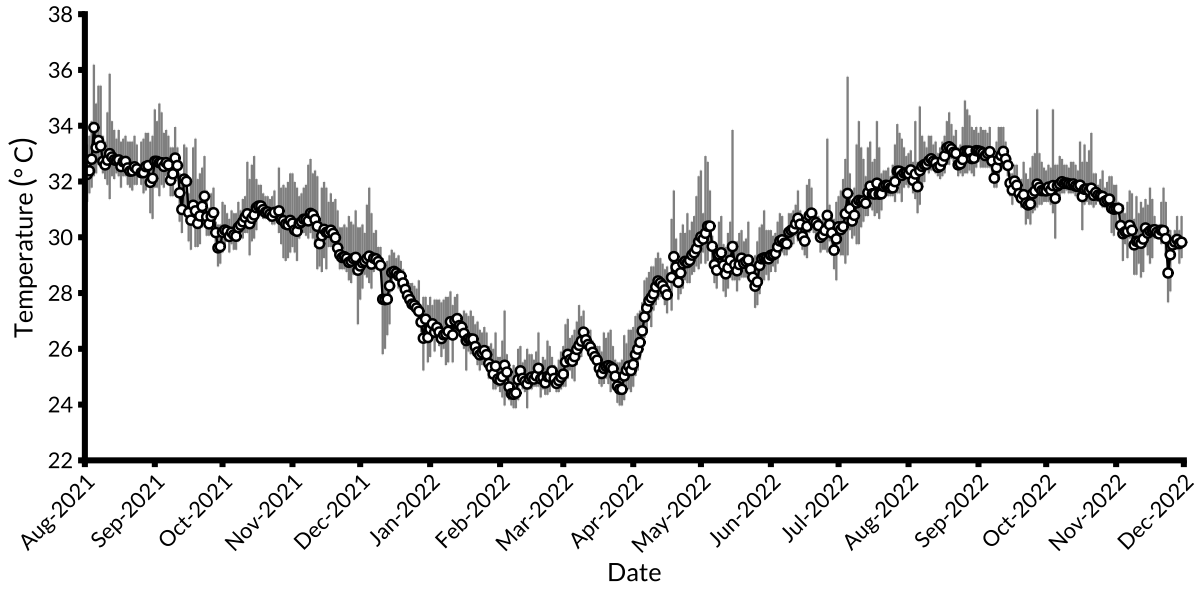


Figure S2. Local climatology (grey line), temperature threshold (green line) and satellited derived sea surface temperature (black line) at Al-Fahal in the period between January 2021 and 2023. Climatology based on the time between 1982-01-01 and 2012-01-01. Marine heatwaves (i.e., temperatures above the 90th percentile persisting for ≥ 5 days) are highlighted in red. Dashed line indicates the maximum monthly mean at the collection site (August long-term mean 30.93 °C).



F**igure S3.** Mean (points) daily and minimum and maximum (grey bars) temperatures recorded at Al-Fahal reef by in-situ temperature loggers (SBE 56, Sea-Bird Scientific, USA). Sampling interval was set to 10 minutes and sampling period was between August 2021 and December 2022.

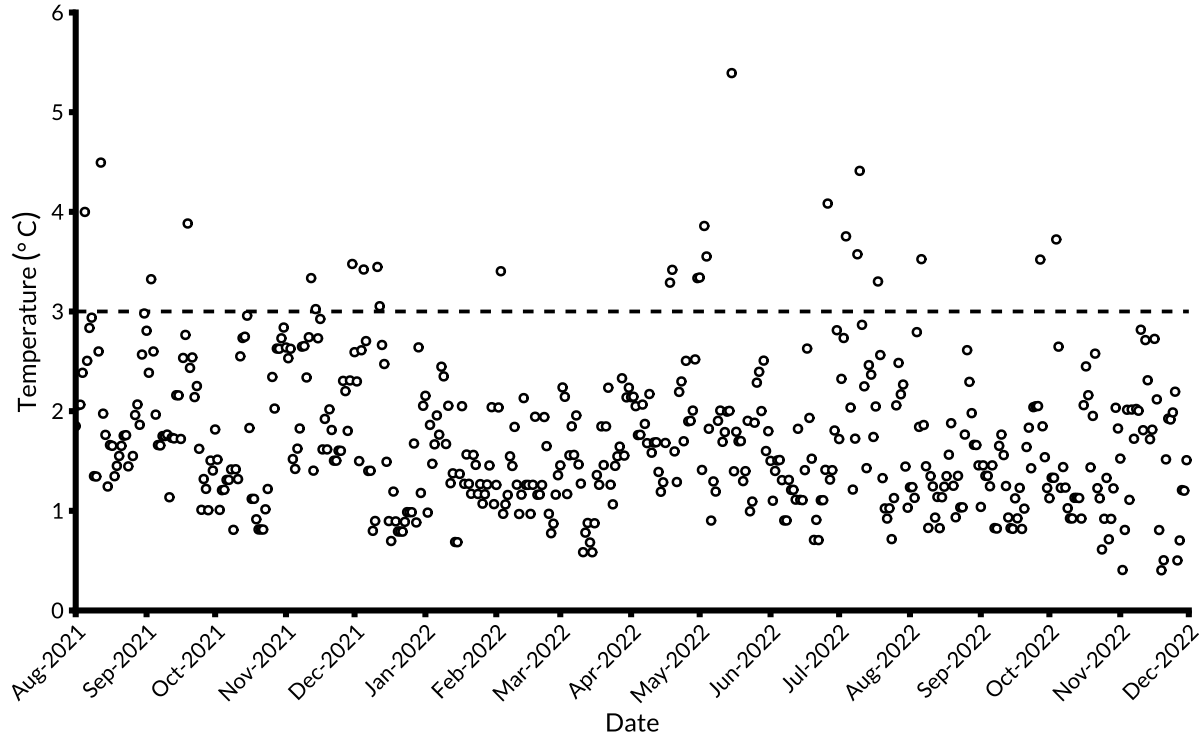


Figure S4. Daily absolute variability (maximum minus minimum recorded daily temperature) at Al-Fahal reef calculated from in-situ logger recordings (SBE 56, Sea-Bird Scientific, USA). Sampling period was between August 2021 and December 2022 and logging interval was set to 10 minutes. Dashed line indicates 3 ℃, equivalent to the variability in the designed experiment. Mean variability at the site 1.73 ℃.

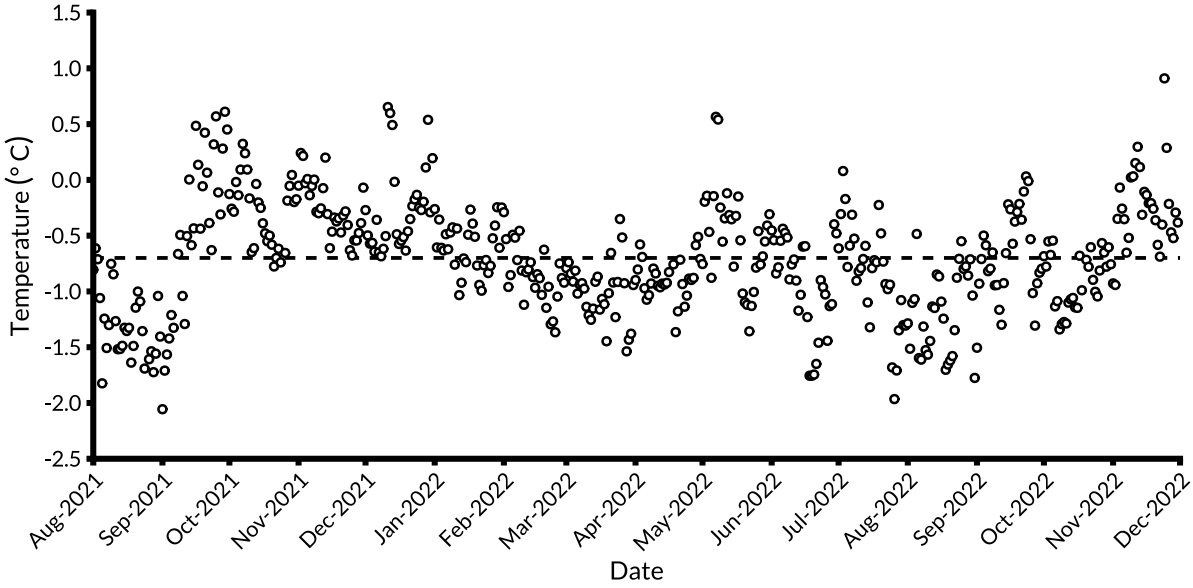


Figure S5. Temperature discrepancy between in-situ loggers (SBE 56, Sea-Bird Scientific, USA) and satellite derived sea surface temperature (OISST v2.1) shown as the overall difference in daily

means, with negative values indicating that satellite-derived SST is lower than logger temperatures. Dashed line indicates mean bias (-0.70°C). Loggers were set to record every 10 minutes and sampling period was between August 2021 and December 2022.

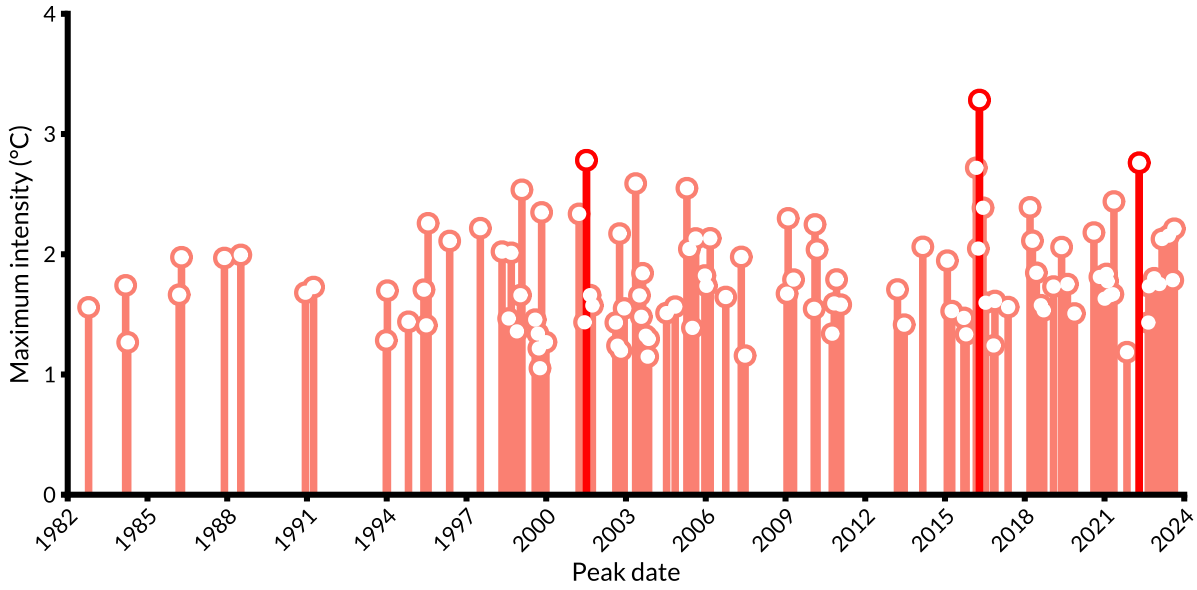


Figure S6. Maximum intensity of past MHWs at Al-Fahal calculated from satellite derived sea surface temperatures (OISST v2.1) and using a climatology based on the time between 1982-01-01 and 2012-01-01. Strongest three events in darker red. Maximum intensity of the simulated MHW was 3 °C.

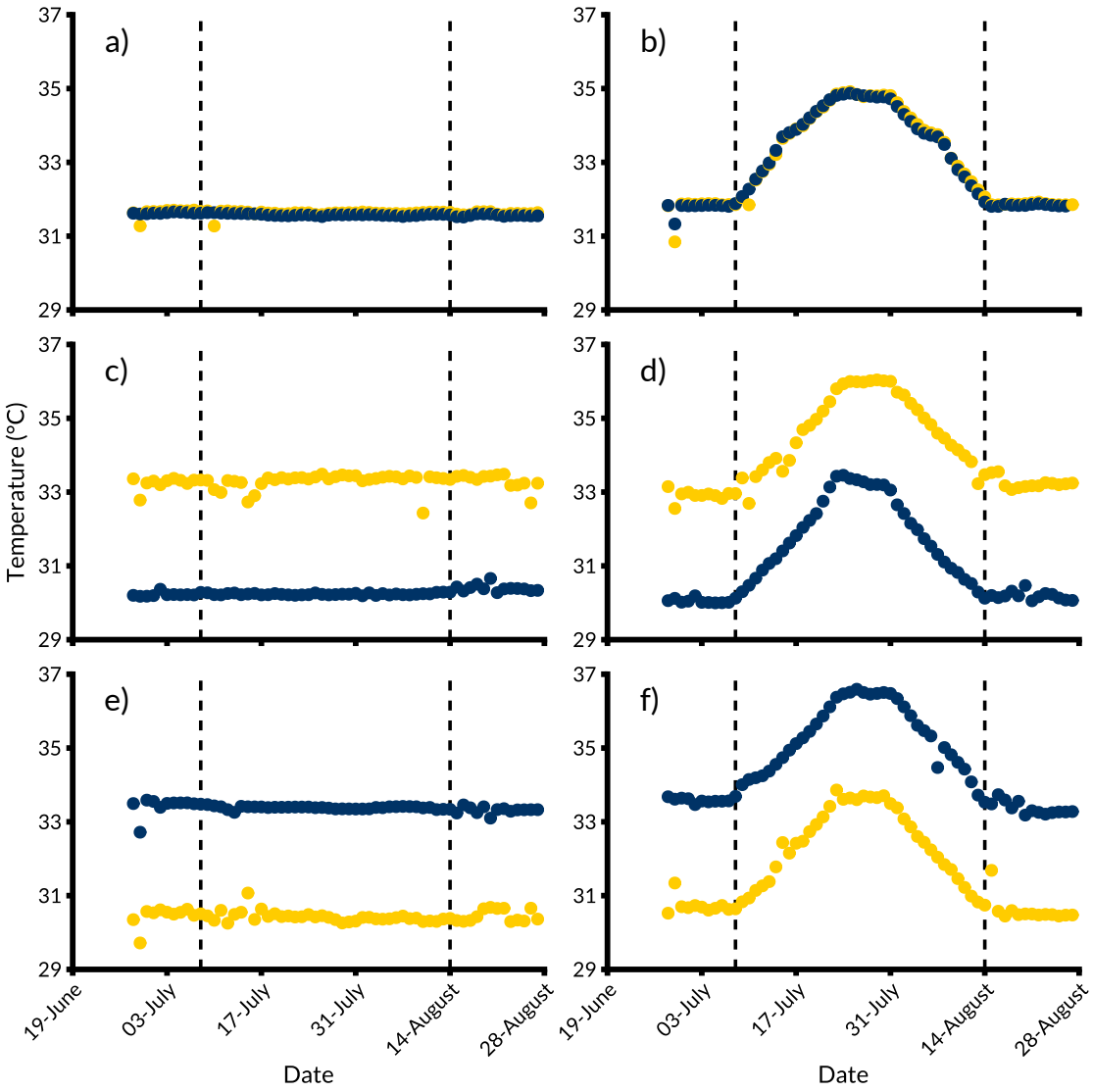


Figure S7. Mean day (yellow) and night (blue) temperatures in the six treatments ("31" = a; "34" = b; "31_Day" = c; "34_Day" = d; "31_Night" = e and "34_Night" = f). Dots represent mean temperatures and error bars the standard error. Dashed lines indicate the start and end of the impact phase which was preceded by the pre-impact and followed by the recovery phase. Means and standard errors for both day and night are calculated from 396 individual data points for each day/night taken from the 3 loggers that were placed in each tank of each treatment. Exceptions are only the first night (2023-06-28, n = 288) as the newly introduced loggers were set to start logging at 3 am and the treatment "31_Day" (middle-left) that comprised of two tanks only (n = 264). Logging interval was set to 5 min. Note: The times between 7 to 8 am and 7 to 8 pm were excluded from the calculation of the means as during these times the manual temperature changes occurred.

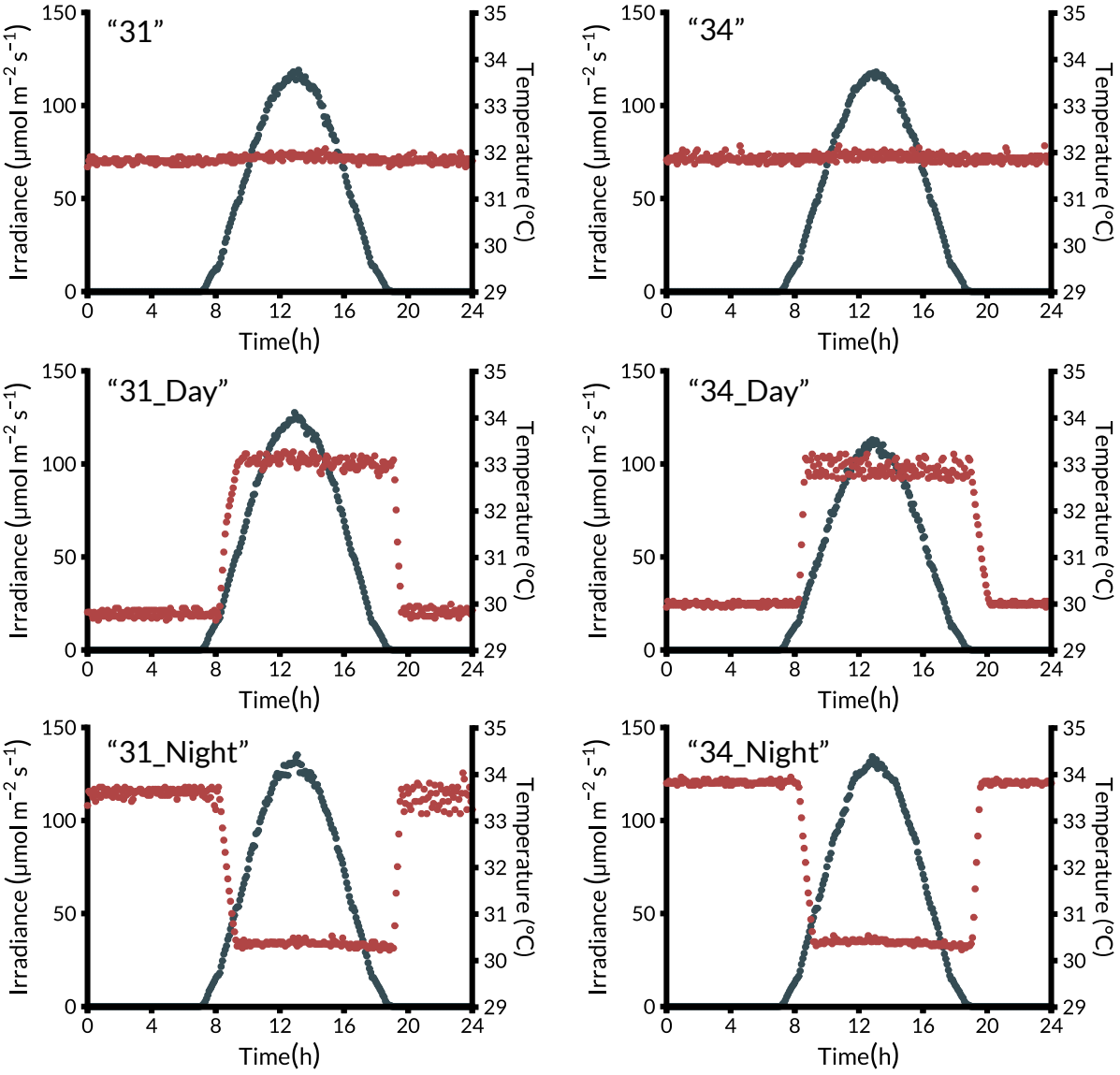


Figure S8. Temperatures (red) and irradiances (grey) on 30th June 2023 (pre-impact phase) in the experimental tanks one to six, each belonging to a different treatment. Dots indicate individual data points from loggers. Logging interval was set to 5 minutes.

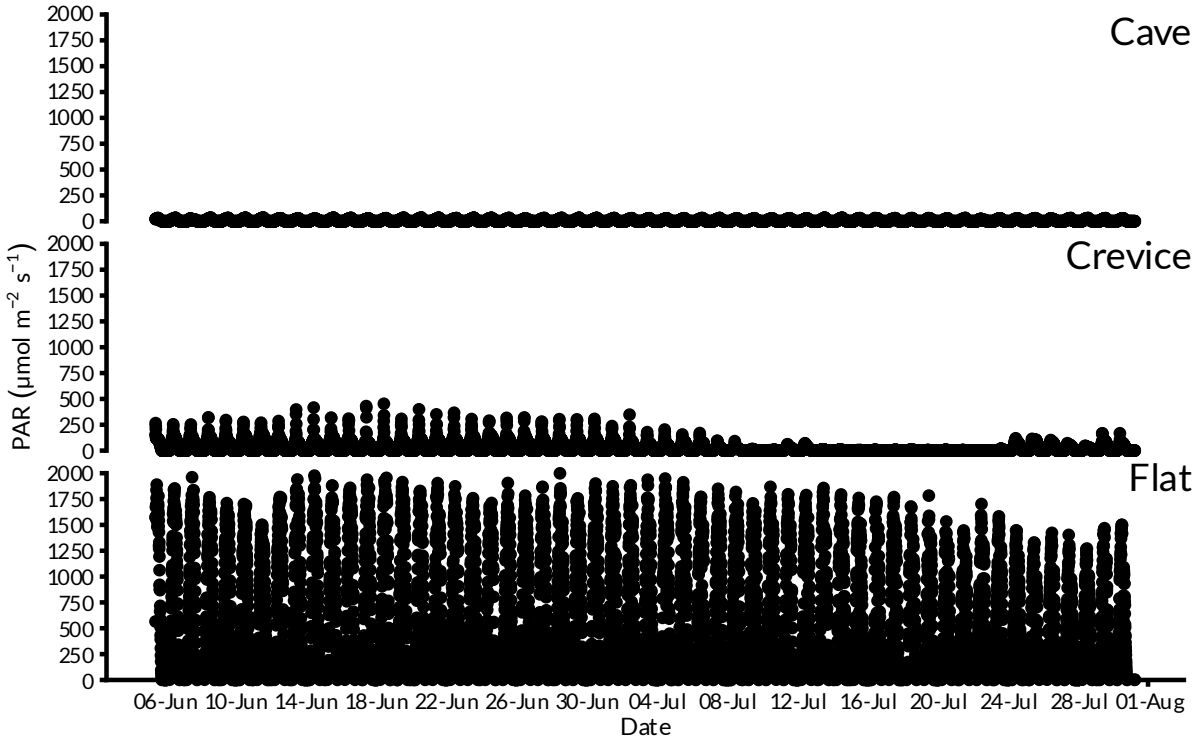


Figure S9. Diel photosynthetic active radiation (PAR) at Al-Fahal in three different microhabitats: a "cave" in the reef framework (top), a crevice (middle) and the flat (bottom).

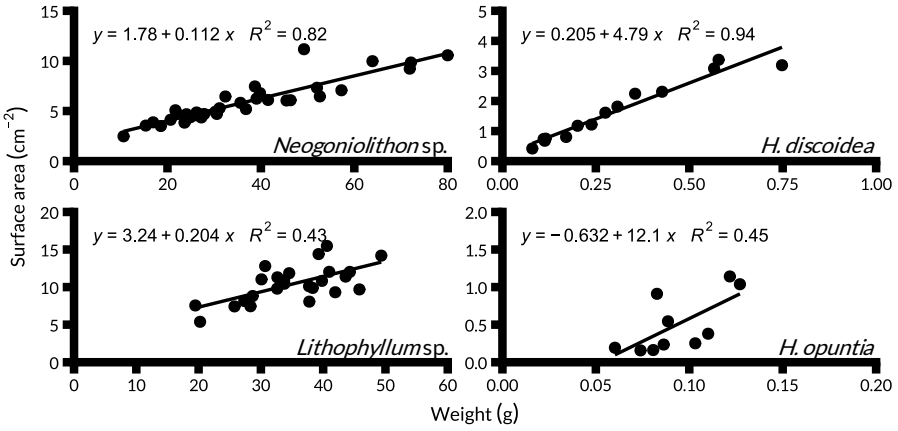


Figure S10. Surface-area-weight relationship in the four study species.

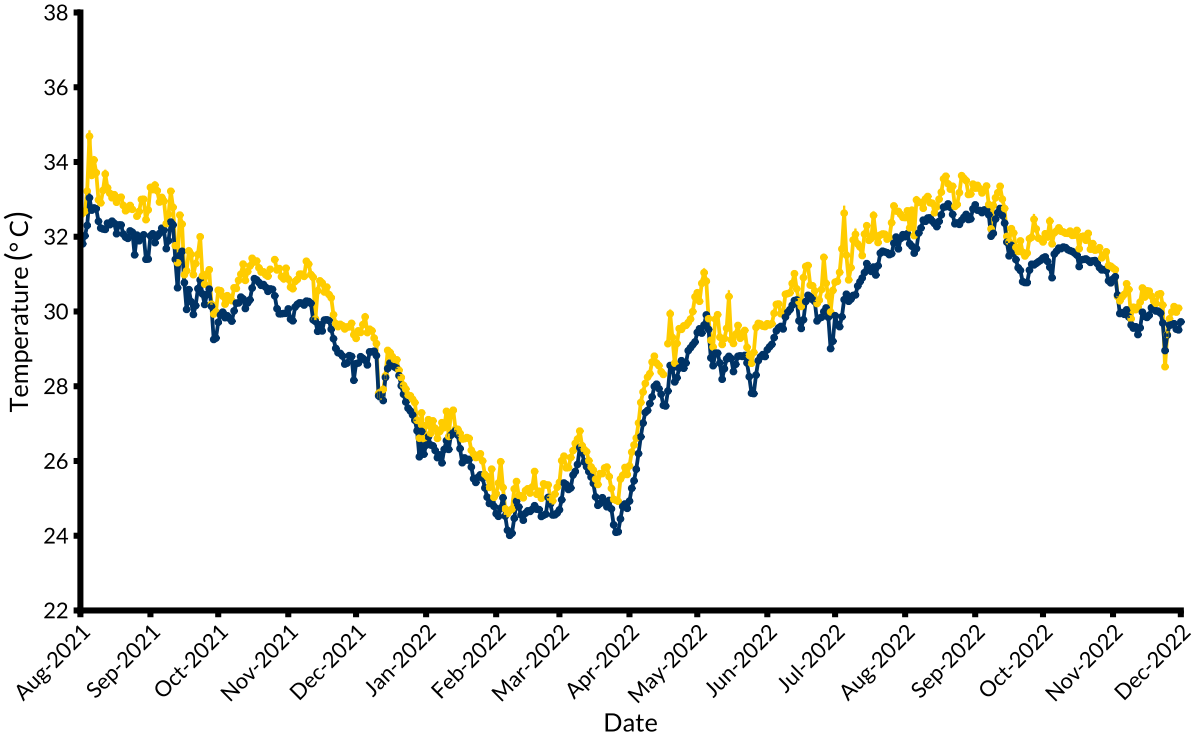


Figure S11. Average day (7am to 7pm; yellow) and night (8 pm to 6 am; blue) temperature at Al-Fahal recorded with loggers. Logging interval was set to 10 min. Dots indicate averages and error bars the standard error.

Table S10. Calcification (mg $CacCO_3$ cm^{-2} d^{-1}) over the pre-impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	0.0002 ± 0.0003	27	df = 10.56	df = 10.56	df = 10.56
		NO	0.0001 ± 0.0004	15	F = 0.31	F = 0.35	F = 0.33
	31	YES	-0.0001 ± 0.0002	24	p = 0.59	p = 0.57	p = 0.58
		NO	0.0001 ± 0.0002	15		cond. R^2 = 0.06	
Neogoniolithon sp.	34	YES	0.0881 ± 0.0151	29	df = 11.93	df = 11.92	df = 11.93
		NO	0.1573 ± 0.0288	13	F = 7.61	F = 0.45	F = 0.62
	31	YES	0.0475 ± 0.0127	20	**p = 0.02**	p = 0.51	p = 0.45
		NO	0.0827 ± 0.0136	15		cond. R^2 = 0.26	
H. opuntia	34	YES	-0.2199 ± 0.0071	8	df = 6.41	df = 6.43	df = 6.41
		NO	-0.1358 ± 0.0373	7	F = 0.59	F = 0.09	F = 0.04
	31	YES	-0.2100 ± 0.0196	10	p = 0.47	p = 0.78	p = 0.84
		NO	-0.1029 ± 0.0498	6		cond. R^2 = 0.55	
H. discoidea	34	YES	0.0941 ± 0.0296	18	df = 9.81	df = 9.98	df = 9.81
		NO	-0.0159 ± 0.0509	8	F = 4.37	F = 0.74	F = 0.93
	31	YES	0.1341 ± 0.0242	14	p = 0.06	p = 0.41	p = 0.36
		NO	0.0897 ± 0.0225	8		cond. R^2 = 0.19	

Table S11. Calcification (mg $CacCO_3$ cm^{-2} d^{-1}) over the impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	0.005 ± 0.010	29	df = 12.31	df = 12.32	df = 12.31
		NO	-0.001 ± 0.013	14	F = 5.87	F = 1.76	F = 1.61
	31	YES	0.063 ± 0.006	22	**p = 0.03**	p = 0.21	p = 0.23
		NO	0.022 ± 0.011	14		cond. R^2 = 0.47	
Neogoniolithon sp.	34	YES	-0.161 ± 0.014	25	df = 67.00	df = 67.00	df = 67.00
		NO	-0.147 ± 0.008	11	F = 1.65	F = 8.15	F = 7.65
	31	YES	-0.095 ± 0.017	22	p = 0.20	**p = 0.01**	**p = 0.01**
		NO	-0.171 ± 0.014	13		cond. R^2 = 0.19	
H. opuntia	34	YES	-0.007 ± 0.003	8	df = 25.00	df = 25.00	df = 25.00
		NO	-0.025 ± 0.015	6	F = 6.60	F = 9.61	F = 9.33
	31	YES	-0.011 ± 0.006	10	**p = 0.02**	**p < 0.01**	**p = 0.01**
		NO	0.027 ± 0.015	5		cond. R^2 = 0.33	
H. discoidea	34	YES	0.012 ± 0.036	18	df = 44.00	df = 44.00	df = 44.00
		NO	0.031 ± 0.057	8	F = 0.02	F = 0.92	F = 0.88
	31	YES	0.043 ± 0.020	14	p = 0.89	p = 0.34	p = 0.35
		NO	-0.011 ± 0.032	8		cond. R^2 = 0.02	

Table S12. Calcification (mg $CacCO_3$ cm^{-2} d^{-1}) over the recovery phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	0.0006 ± 0.0003	28	df = 11.55	df = 11.54	df = 11.55
		NO	-0.0001 ± 0.0002	15	F = 1.42	F = 0.08	F = 0.12
	31	YES	0.0009 ± 0.0002	25	p = 0.26	p = 0.78	p = 0.73
		NO	0.0005 ± 0.0002	15		cond. R^2 = 0.33	
Neogoniolithon sp.	34	YES	-0.0739 ± 0.0146	23	df = 63.00	df = 63.00	df = 63.00
		NO	-0.1195 ± 0.0191	10	F = 7.29	F = 5.96	F = 0.04
	31	YES	-0.0154 ± 0.0227	21	**p = 0.01**	**p = 0.02**	p = 0.85
		NO	-0.0687 ± 0.0134	13		cond. R^2 = 0.17	
H. opuntia	34	YES	-0.0050 ± 0.0036	8	df = 4.04	df = 4.15	df = 4.04
		NO	0.0153 ± 0.0179	7	F = 3.00	F = 2.70	F = 2.36
	31	YES	0.0001 ± 0.0092	10	p = 0.16	p = 0.17	p = 0.20
		NO	0.0898 ± 0.0492	5		cond. R^2 = 0.36	
H. discoidea	34	YES	-0.0728 ± 0.0855	12	df = 29.00	df = 29.00	df = 29.00
		NO	-0.0148 ± 0.0379	4	F = 0.86	F = 0.01	F = 0.02
	31	YES	-0.1503 ± 0.0647	12	p = 0.36	p = 0.92	p = 0.90
		NO	-0.1161 ± 0.1036	5		cond. R^2 = 0.03	

Table S13. Calcification (mg $CacCO_3$ cm^{-2} d^{-1}) over the pre-impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	0.0004 ± 0.0004	14	df = 6.47	df = 6.44	df = 6.47
		NIGHT	-0.0001 ± 0.0004	13	F = 0.50	F = 0.36	F = 0.40
	31	DAY	-0.0001 ± 0.0003	10	p = 0.50	p = 0.57	p = 0.55
		NIGHT	-0.0001 ± 0.0002	14		cond. R^2 = 0.21	
Neogoniolithon sp.	34	DAY	0.1002 ± 0.0276	14	df = 7.07	df = 7.13	df = 7.07
		NIGHT	0.0768 ± 0.0144	15	F = 0.87	F = 0.03	F = 0.04
	31	DAY	0.0705 ± 0.0239	7	p = 0.38	p = 0.87	p = 0.84
		NIGHT	0.0352 ± 0.0143	13		cond. R^2 = 0.21	
H. opuntia	34	DAY	-0.4310 ± 0.0128	7	df = 6.12	df = 6.10	df = 6.12
		NIGHT	-0.5009 ± -	1	F = 10.52	F = 8.42	F = 7.05
	31	DAY	-0.2107 ± 0.0608	2	**p = 0.02**	**p = 0.03**	**p = 0.04**
		NIGHT	-0.4722 ± 0.0198	8		cond. R^2 = 0.78	
H. discoidea	34	DAY	0.1732 ± 0.1063	9	df = 4.56	df = 4.58	df = 4.56
		NIGHT	0.2033 ± 0.0593	9	F = 0.58	F = 0.03	F = 0.03
	31	DAY	0.2839 ± 0.0644	7	p = 0.48	p = 0.88	p = 0.88
		NIGHT	0.2523 ± 0.0769	7		cond. R^2 = 0.21	

Table S14. Calcification (mg $CacCO_3$ cm^{-2} d^{-1}) over the impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	0.0241 ± 0.0427	15	df = 6.63	df = 6.61	df = 6.63
		NIGHT	-0.0149 ± 0.0542	14	F = 10.22	F = 1.49	F = 1.65
	31	DAY	0.0678 ± 0.0352	9	**p = 0.02**	p = 0.26	p = 0.24
		NIGHT	0.0595 ± 0.0180	13		cond. R^2 = 0.30	
Neogoniolithon sp.	34	DAY	-0.1527 ± 0.0501	10	df = 42.00	df = 42.00	df = 42.00
		NIGHT	-0.1664 ± 0.0806	15	F = 6.64	F = 0.61	F = 0.56
	31	DAY	-0.1149 ± 0.0728	8	**p = 0.01**	p = 0.44	p = 0.46
		NIGHT	-0.0830 ± 0.0829	14		cond. R^2 = 0.17	
H. opuntia	34	DAY	-0.0080 ± 0.0082	7	df = 3.31	df = 3.31	df = 3.31
		NIGHT	0.0016 ± -	1	F = 5.32	F = 2.26	F = 1.87
	31	DAY	-0.0384 ± 0.0234	2	p = 0.10	p = 0.22	p = 0.26
		NIGHT	-0.0046 ± 0.0078	8		cond. R^2 = 0.71	
H. discoidea	34	DAY	0.0333 ± 0.1762	9	df = 28.00	df = 28.00	df = 28.00
		NIGHT	-0.0100 ± 0.1319	9	F = 0.49	F = 0.37	F = 0.30
	31	DAY	0.0884 ± 0.0497	7	p = 0.49	p = 0.55	p = 0.59
		NIGHT	-0.0032 ± 0.0722	7		cond. R^2 = 0.09	

Table S15. Calcification (mg $CacCO_3$ cm^{-2} d^{-1}) over the recovery phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	0.0009 ± 0.0003	15	df = 5.84	df = 5.83	df = 5.84
		NIGHT	0.0001 ± 0.0004	13	F = 0.32	F = 0.43	F = 0.47
	31	DAY	0.0009 ± 0.0002	10	p = 0.59	p = 0.54	p = 0.52
		NIGHT	0.0009 ± 0.0003	15		cond. R^2 = 0.36	
Neogoniolithon sp.	34	DAY	-0.0791 ± 0.0250	10	df = 40.00	df = 40.00	df = 40.00
		NIGHT	-0.0699 ± 0.0180	13	F = 4.27	F = 0.07	F < 0.01
	31	DAY	-0.0190 ± 0.0446	7	**p = 0.05**	p = 0.80	p = 0.95
		NIGHT	-0.0136 ± 0.0271	14		cond. R^2 = 0.10	
H. opuntia	34	DAY	-0.0058 ± 0.0041	7	df = 14.00	df = 14.00	df = 14.00
		NIGHT	-0.0039 ± -	1	F = 0.01	F = 0.40	F = 0.35
	31	DAY	-0.0161 ± 0.0425	2	p = 0.94	p = 0.54	p = 0.56
		NIGHT	0.0042 ± 0.0077	8		cond. R^2 = 0.08	
H. discoidea	34	DAY	-0.0698 ± 0.1163	7	df = 28.00	df = 28.00	df = 28.00
		NIGHT	-0.0770 ± 0.1409	5	F = 0.49	F = 0.37	F = 0.30
	31	DAY	-0.1722 ± 0.1165	6	p = 0.49	p = 0.55	p = 0.59
		NIGHT	-0.1283 ± 0.0681	6		cond. R^2 = 0.09	

Table S16. Photosynthetic efficiency (Fv/Fm) during the pre-impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	0.49 ± 0.02	29	df = 14.28	df = 14.29	df = 14.28
		NO	0.48 ± 0.02	16	F = 0.23	F = 0.03	F = 0.02
	31	YES	0.52 ± 0.02	28	p = 0.64	p = 0.87	p = 0.89
		NO	0.49 ± 0.02	15		cond. R^2 = 0.43	
Neogoniolithon sp.	34	YES	0.44 ± 0.02	29	df = 14.02	df = 13.99	df = 14.02
		NO	0.53 ± 0.03	12	F = 0.74	F = 0.76	F = 0.93
	31	YES	0.50 ± 0.02	20	p = 0.40	p = 0.40	p = 0.35
		NO	0.52 ± 0.02	14		cond. R^2 = 0.18	
H. opuntia	34	YES	0.60 ± 0.01	28	df = 14.10	df = 14.00	df = 14.10
		NO	0.60 ± 0.02	13	F = 1.28	F = 0.03	F = 0.02
	31	YES	0.60 ± 0.02	28	p = 0.28	p = 0.87	p = 0.90
		NO	0.65 ± 0.02	12		cond. R^2 = 0.25	
H. discoidea	34	YES	0.76 ± 0.01	28	df = 14.69	df = 14.70	df = 14.69
		NO	0.75 ± 0.01	11	F = 0.50	F = 0.75	F = 0.70
	31	YES	0.74 ± 0.01	26	p = 0.49	p = 0.40	p = 0.42
		NO	0.73 ± 0.01	13		cond. R^2 = 0.30	

Table S17. Photosynthetic efficiency (Fv/Fm) during the impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	0.58 ± 0.01	28	df = 13.94	df = 14.00	df = 13.94
		NO	0.58 ± 0.01	14	F = 8.04	F = 6.53	F = 6.04
	31	YES	0.58 ± 0.01	24	**p = 0.01**	**p = 0.02**	**p = 0.03**
		NO	0.64 ± 0.01	13		cond. R^2 = 0.22	
Neogoniolithon sp.	34	YES	0.50 ± 0.03	24	df = 57.00	df = 57.00	df = 57.00
		NO	0.49 ± 0.02	10	F = 12.31	F = 0.55	F = 0.52
	31	YES	0.57 ± 0.02	16	**p < 0.01**	p = 0.46	p = 0.47
		NO	0.61 ± 0.01	11		cond. R^2 = 0.18	
H. opuntia	34	YES	0.61 ± 0.02	12	df = 6.40	df = 6.36	df = 6.40
		NO	0.67 ± 0.03	6	F = 2.87	F = 0.43	F = 0.50
	31	YES	0.67 ± 0.02	10	p = 0.14	p = 0.54	p = 0.50
		NO	0.69 ± 0.01	9		cond. R^2 = 0.60	
H. discoidea	34	YES	0.71 ± 0.01	23	df = 9.08	df = 9.18	df = 9.08
		NO	0.72 ± 0.02	8	F = 0.02	F = 0.01	F = 0.01
	31	YES	0.71 ± 0.01	15	p = 0.88	p = 0.94	p = 0.93
		NO	0.72 ± 0.01	9		cond. R^2 = 0.04	

Table S18. Photosynthetic efficiency (Fv/Fm) during the recovery phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	**Model statistics (Var.*MHW)**
Lithophyllum sp.	34	YES	0.64 ± 0.01	29	df = 13.78	df = 13.81	df = 13.78
		NO	0.60 ± 0.02	14	F = 5.60	F = 0.30	F = 0.38
	31	YES	0.67 ± 0.02	25	**p = 0.03**	p = 0.59	p = 0.55
		NO	0.66 ± 0.01	13		cond. R^2 = 0.23	
Neogoniolithon sp.	34	YES	0.62 ± 0.02	28	df = 13.28	df = 13.23	df = 13.28
		NO	0.55 ± 0.03	11	F = 2.27	F = 0.36	F = 0.44
	31	YES	0.65 ± 0.02	21	p = 0.16	p = 0.56	p = 0.52
		NO	0.63 ± 0.04	14		cond. R^2 = 0.40	
H. opuntia	34	YES	0.66 ± 0.05	9	df = 4.69	df = 4.73	df = 4.69
		NO	0.66 ± 0.03	4	F = 0.18	F = 0.39	F = 0.35
	31	YES	0.67 ± 0.03	8	p = 0.69	p = 0.56	p = 0.58
		NO	0.71 ± 0.02	9		cond. R^2 = 0.37	
H. discoidea	34	YES	0.73 ± 0.02	16	df = 14.06	df = 14.09	df = 14.06
		NO	0.66 ± 0.03	6	F = 0.06	F = 1.29	F = 1.44
	31	YES	0.69 ± 0.02	13	p = 0.82	p = 0.28	p = 0.25
		NO	0.68 ± 0.03	7		cond. R^2 = 0.13	

Table S19. Photosynthetic efficiency (Fv/Fm) during the pre-impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	0.55 ± 0.02	14	df = 8.38	df = 8.39	df = 8.38
		NIGHT	0.44 ± 0.03	15	F = 0.21	F = 0.50	F = 0.63
	31	DAY	0.53 ± 0.02	13	p = 0.66	p = 0.50	p = 0.45
		NIGHT	0.50 ± 0.02	15		cond. R^2 = 0.47	
Neogoniolithon sp.	34	DAY	0.47 ± 0.03	14	df = 45.00	df = 45.00	df = 45.00
		NIGHT	0.41 ± 0.03	15	F = 2.26	F = 2.52	F = 2.58
	31	DAY	0.46 ± 0.04	8	p = 0.14	p = 0.12	p = 0.12
		NIGHT	0.52 ± 0.01	12		cond. R^2 = 0.11	
H. opuntia	34	DAY	0.61 ± 0.02	14	df = 8.28	df = 8.29	df = 8.28
		NIGHT	0.59 ± 0.02	14	F = 0.01	F = 0.01	F = 0.02
	31	DAY	0.60 ± 0.03	14	p = 0.92	p = 0.91	p = 0.90
		NIGHT	0.59 ± 0.04	14		cond. R^2 = 0.37	
H. discoidea	34	DAY	0.77 ± 0.01	13	df = 7.08	df = 7.05	df = 7.08
		NIGHT	0.74 ± 0.01	15	F = 0.46	F = 0.00	F = 0.01
	31	DAY	0.75 ± 0.01	11	p = 0.52	p = 0.97	p = 0.92
		NIGHT	0.73 ± 0.01	15		cond. R^2 = 0.35	

Table S20. Photosynthetic efficiency (Fv/Fm) during the impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	0.59 ± 0.02	14	df = 48.00	df = 48.00	df = 48.00
		NIGHT	0.57 ± 0.01	14	F = 0.26	F = 0.22	F = 0.17
	31	DAY	0.60 ± 0.01	9	p = 0.61	p = 0.64	p = 0.68
		NIGHT	0.57 ± 0.01	15		cond. R^2 = 0.04	
Neogoniolithon sp.	34	DAY	0.53 ± 0.03	12	df = 36.00	df = 36.00	df = 36.00
		NIGHT	0.47 ± 0.04	12	F = 4.55	F = 0.02	F = 0.04
	31	DAY	0.60 ± 0.04	7	**p = 0.04**	p = 0.90	p = 0.84
		NIGHT	0.55 ± 0.01	9		cond. R^2 = 0.15	
H. opuntia	34	DAY	0.64 ± 0.02	8	df = 5.46	df = 5.58	df = 5.46
		NIGHT	0.56 ± 0.03	4	F = 4.47	F = 0.37	F = 0.46
	31	DAY	0.69 ± 0.04	2	p = 0.08	p = 0.57	p = 0.53
		NIGHT	0.66 ± 0.02	8		cond. R^2 = 0.60	
H. discoidea	34	DAY	0.73 ± 0.01	11	df = 34.00	df = 34.00	df = 34.00
		NIGHT	0.69 ± 0.02	12	F = 0.03	F = 0.03	F = 0.07
	31	DAY	0.73 ± 0.02	7	p = 0.87	p = 0.85	p = 0.79
		NIGHT	0.70 ± 0.02	8		cond. R^2 = 0.08	

Table S21. Photosynthetic efficiency (Fv/Fm) during the recovery phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	**Model statistics (MHW)**	**Model statistics (Var.)**	**Model statistics (Var.*MHW)**
Lithophyllum sp.	34	DAY	0.63 ± 0.01	14	df = 7.09	df = 7.08	df = 7.09
		NIGHT	0.65 ± 0.02	15	F = 2.03	F = 1.26	F = 1.21
	31	DAY	0.70 ± 0.02	10	p = 0.20	p = 0.30	p = 0.31
		NIGHT	0.66 ± 0.02	15		cond. R^2 = 0.26	
Neogoniolithon sp.	34	DAY	0.62 ± 0.01	14	df = 7.06	df = 7.10	df = 7.06
		NIGHT	0.63 ± 0.03	14	F = 0.89	F = 0.02	F = 0.03
	31	DAY	0.65 ± 0.03	8	p = 0.38	p = 0.88	p = 0.87
		NIGHT	0.65 ± 0.02	13		cond. R^2 = 0.18	
H. opuntia	34	DAY	0.73 ± 0.03	6	df = 13.00	df = 13.00	df = 13.00
		NIGHT	0.53 ± 0.11	3	F = 0.34	F = 3.32	F = 3.64
	31	DAY	0.65 ± 0.09	2	p = 0.57	p = 0.09	p = 0.08
		NIGHT	0.67 ± 0.03	6		cond. R^2 = 0.31	
H. discoidea	34	DAY	0.76 ± 0.03	9	df = 25.00	df = 25.00	df = 25.00
		NIGHT	0.68 ± 0.02	7	F = 1.39	F = 2.28	F = 2.53
	31	DAY	0.69 ± 0.03	7	p = 0.25	p = 0.14	p = 0.12
		NIGHT	0.69 ± 0.02	6		cond. R^2 = 0.21	

Table S22. Maximum relative electron transport rate (rETRmax) during the pre-impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	22.26 ± 4.41	9	df = 9.36	df = 9.28	df = 9.36
		NO	15.09 ± 3.45	5	F = 1.53	F = 3.39	F = 3.33
	31	YES	16.92 ± 3.49	10	p = 0.25	p = 0.10	p = 0.10
		NO	31.56 ± 1.22	4		cond. R^2 = 0.60	
Neogoniolithon sp.	34	YES	28.31 ± 4.67	10	df = 13.21	df = 13.19	df = 13.21
		NO	23.44 ± 6.08	5	F = 0.02	F = 2.59	F = 2.43
	31	YES	16.47 ± 2.94	10	p = 0.89	p = 0.13	p = 0.14
		NO	36.31 ± 7.61	5		cond. R^2 = 0.73	
H. opuntia	34	YES	10.66 ± 0.95	9	df = 13.18	df = 13.16	df = 13.18
		NO	10.86 ± 2.23	5	F = 0.04	F = 1.48	F = 1.35
	31	YES	8.96 ± 1.96	9	p = 0.84	p = 0.24	p = 0.27
		NO	13.51 ± 2.72	5		cond. R^2 = 0.22	
H. discoidea	34	YES	13.12 ± 1.94	8	df = 7.65	df = 7.44	df = 7.65
		NO	12.61 ± 3.06	5	F = 1.98	F = 0.03	F = 0.03
	31	YES	16.03 ± 1.87	10	p = 0.20	p = 0.87	p = 0.88
		NO	16.55 ± 1.55	7		cond. R^2 = 0.20	

Table S23. Maximum relative electron transport rate (rETRmax) during the impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	21.92 ± 2.66	11	df = 13.28	df = 13.32	df = 13.28
		NO	14.80 ± 3.51	7	F = 2.12	F = 0.22	F = 0.26
	31	YES	25.87 ± 4.43	11	p = 0.17	p = 0.65	p = 0.62
		NO	24.17 ± 5.49	6		cond. R^2 = 0.29	
Neogoniolithon sp.	34	YES	9.68 ± 3.94	8	df = 13.48	df = 15.62	df = 15.53
		NO	15.66 ± 4.73	6	F = 5.29	F = 3.07	F = 2.99
	31	YES	28.29 ± 4.66	9	**p = 0.04**	p = 0.10	p = 0.10
		NO	18.37 ± 3.72	7		cond. R^2 = 0.37	
H. opuntia	34	YES	7.56 ± 1.24	10	df = 13.94	df = 14.00	df = 13.94
		NO	5.63 ± 1.30	5	F = 7.45	F = 2.90	F = 2.78
	31	YES	10.16 ± 1.85	11	**p = 0.02**	p = 0.11	p = 0.12
		NO	17.22 ± 6.08	4		cond. R^2 = 0.30	
H. discoidea	34	YES	15.75 ± 1.95	11	df = 28.00	df = 28.00	df = 28.00
		NO	12.89 ± 1.40	6	F = 0.05	F = 2.88	F = 2.89
	31	YES	12.98 ± 1.18	11	p = 0.82	p = 0.10	p = 0.10
		NO	16.52 ± 1.72	4		cond. R^2 = 0.09	

Table S24. Maximum relative electron transport rate (rETRmax) during the recovery phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	19.19 ± 1.75	9	df = 27.00	df = 27.00	df = 27.00
		NO	15.00 ± 1.94	6	F = 0.02	F = 0.01	F < 0.01
	31	YES	18.87 ± 2.43	10	p = 0.89	p = 0.93	p = 1.00
		NO	14.68 ± 2.35	6		cond. R^2 = 0.10	
Neogoniolithon sp.	34	YES	17.63 ± 6.92	3	df = 9.85	df = 9.82	df = 9.85
		NO	24.55 ± 6.42	7	F = 0.29	F = 0.34	F = 0.33
	31	YES	28.60 ± 4.91	9	p = 0.60	p = 0.57	p = 0.58
		NO	21.84 ± 4.74	6		cond. R^2 = 0.48	
H. opuntia	34	YES	9.97 ± 2.88	4	df = 4.78	df = 4.81	df = 4.78
		NO	7.56 ± 0.81	3	F = 1.01	F = 1.57	F = 1.51
	31	YES	10.03 ± 1.27	5	p = 0.36	p = 0.27	p = 0.28
		NO	13.88 ± 2.79	5		cond. R^2 = 0.55	
H. discoidea	34	YES	15.47 ± 2.37	11	df = 25.00	df = 25.00	df = 25.00
		NO	10.79 ± 1.00	3	F = 1.17	F = 0.83	F = 0.91
	31	YES	10.45 ± 1.20	11	p = 0.29	p = 0.37	p = 0.35
		NO	10.47 ± 0.93	4		cond. R^2 = 0.16	

Table S25. Maximum relative electron transport rate (rETRmax) during the pre-impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	18.00 ± 4.65	5	df = 6.07	df = 6.02	df = 6.07
		NIGHT	27.58 ± 7.98	6	F = 0.22	F < 0.01	F = 0.01
	31	DAY	14.55 ± 4.05	4	p = 0.65	p = 0.98	p = 0.94
		NIGHT	19.30 ± 5.97	5		cond. R^2 = 0.66	
Neogoniolithon sp.	34	DAY	31.14 ± 7.90	4	df = 6.37	df = 6.34	df = 6.37
		NIGHT	25.47 ± 5.63	4	F = 1.81	F = 1.17	F = 1.15
	31	DAY	10.06 ± 2.64	4	p = 0.22	p = 0.32	p = 0.32
		NIGHT	22.88 ± 3.39	6		cond. R^2 = 0.75	
H. opuntia	34	DAY	10.57 ± 1.44	4	df = 14.00	df = 14.00	df = 14.00
		NIGHT	10.74 ± 1.41	4	F = 0.86	F = 1.65	F = 1.52
	31	DAY	11.22 ± 3.10	4	p = 0.37	p = 0.22	p = 0.24
		NIGHT	6.13 ± 1.48	6		cond. R^2 = 0.17	
H. discoidea	34	DAY	17.76 ± 4.08	5	df = 12.00	df = 12.00	df = 12.00
		NIGHT	10.33 ± 0.62	5	F = 0.53	F = 3.16	F = 3.30
	31	DAY	14.49 ± 1.33	5	p = 0.48	p = 0.10	p = 0.09
		NIGHT	17.58 ± 3.58	5		cond. R^2 = 0.27	

Table S26. Maximum relative electron transport rate (rETRmax) during the impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	18.55 ± 1.93	5	df = 7.38	df = 7.34	df = 7.38
		NIGHT	24.72 ± 4.48	6	F = 0.75	F = 0.98	F = 0.98
	31	DAY	30.72 ± 10.52	4	p = 0.41	p = 0.35	p = 0.35
		NIGHT	23.09 ± 4.05	5		cond. R^2 = 0.39	
Neogoniolithon sp.	34	DAY	3.99 ± 0.53	4	df = 14.00	df = 14.00	df = 14.00
		NIGHT	15.38 ± 7.10	4	F = 11.68	F = 4.51	F = 4.47
	31	DAY	35.56 ± 7.78	4	**p < 0.01**	p = 0.05	p = 0.05
		NIGHT	22.47 ± 4.78	6		cond. R^2 = 0.49	
H. opuntia	34	DAY	8.54 ± 1.85	4	df = 7.15	df = 7.04	df = 7.15
		NIGHT	6.08 ± 1.31	4	F = 1.11	F = 0.83	F = 0.84
	31	DAY	8.67 ± 1.40	4	p = 0.33	p = 0.39	p = 0.39
		NIGHT	11.39 ± 3.25	6		cond. R^2 = 0.42	
H. discoidea	34	DAY	16.18 ± 3.39	5	df = 18.00	df = 18.00	df = 18.00
		NIGHT	15.24 ± 1.87	5	F = 1.23	F = 0.04	F = 0.03
	31	DAY	13.95 ± 2.40	5	p = 0.28	p = 0.84	p = 0.86
		NIGHT	12.17 ± 0.98	5		cond. R^2 = 0.08	

Table S27. Maximum relative electron transport rate (rETRmax) during the recovery phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	23.39 ± 1.91	4	df = 15.00	df = 15.00	df = 15.00
		NIGHT	15.82 ± 1.56	5	F = 0.06	F = 1.35	F = 1.49
	31	DAY	19.02 ± 2.73	4	p = 0.82	p = 0.26	p = 0.24
		NIGHT	18.78 ± 3.84	6		cond. R^2 = 0.15	
Neogoniolithon sp.	34	DAY	17.63 ± 6.92	3	df = 9.00	df = 9.00	df = -
		NIGHT	- ± -		F = 0.16	F = 1.79	F = -
	31	DAY	21.77 ± 5.37	4	p = 0.70	p = 0.21	p = -
		NIGHT	34.07 ± 7.27	5		cond. R^2 = 0.23	
H. opuntia	34	DAY	13.06 ± 4.79	2	df = 5.00	df = 5.00	df = 5.00
		NIGHT	6.87 ± 2.79	2	F = 0.00	F = 0.99	F = 1.08
	31	DAY	10.08 ± 0.23	2	p = 0.98	p = 0.37	p = 0.35
		NIGHT	10.00 ± 2.32	3		cond. R^2 = 0.20	
H. discoidea	34	DAY	14.42 ± 2.78	6	df = 18.00	df = 18.00	df = 18.00
		NIGHT	16.73 ± 4.32	5	F = 3.49	F = 0.01	F = 0.02
	31	DAY	9.63 ± 1.41	5	p = 0.08	p = 0.91	p = 0.89
		NIGHT	11.14 ± 1.94	6		cond. R^2 = 0.15	

Table S28. Light use efficiency (α) during the pre-impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	0.23 ± 0.02	7	df = 8.07	df = 8.14	df = 8.07
		NO	0.25 ± 0.02	4	F = 0.08	F = 0.17	F = 0.14
	31	YES	0.21 ± 0.03	7	p = 0.79	p = 0.69	p = 0.72
		NO	0.25 ± 0.02	5		cond. R^2 = 0.54	
Neogoniolithon sp.	34	YES	0.25 ± 0.03	9	df = 14.93	df = 14.79	df = 14.93
		NO	0.31 ± 0.05	4	F = 0.76	F = 3.50	F = 3.33
	31	YES	0.44 ± 0.08	10	p = 0.40	p = 0.08	p = 0.09
		NO	0.25 ± 0.03	5		cond. R^2 = 0.35	
H. opuntia	34	YES	0.12 ± 0.01	9	df = 15.66	df = 15.67	df = 15.66
		NO	0.15 ± 0.03	4	F = 1.17	F = 0.68	F = 0.64
	31	YES	0.44 ± 0.20	8	p = 0.30	p = 0.42	p = 0.44
		NO	0.20 ± 0.04	4		cond. R^2 = 0.30	
H. discoidea	34	YES	0.17 ± 0.01	7	df = 22.00	df = 22.00	df = 22.00
		NO	0.20 ± 0.04	4	F = 1.07	F = 0.92	F = 0.92
	31	YES	0.22 ± 0.02	8	p = 0.31	p = 0.35	p = 0.35
		NO	0.20 ± 0.03	7		cond. R^2 = 0.09	

Table S29. Light use efficiency (α) during the impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	0.22 ± 0.02	11	df = 28.00	df = 28.00	df = 28.00
		NO	0.36 ± 0.08	7	F = 1.18	F = 3.05	F = 3.13
	31	YES	0.31 ± 0.04	10	p = 0.29	p = 0.06	p = 0.06
		NO	0.28 ± 0.03	6		cond. R^2 = 0.21	
Neogoniolithon sp.	34	YES	0.21 ± 0.05	10	df = 24.00	df = 24.00	df = 24.00
		NO	0.32 ± 0.08	3	F = 0.04	F = 0.87	F = 0.97
	31	YES	0.26 ± 0.02	10	p = 0.84	p = 0.36	p = 0.34
		NO	0.28 ± 0.02	5		cond. R^2 = 0.10	
H. opuntia	34	YES	0.14 ± 0.02	11	df = 28.00	df = 28.00	df = 28.00
		NO	0.18 ± 0.05	5	F = 1.78	F = 0.67	F = 0.73
	31	YES	0.13 ± 0.02	10	p = 0.19	p = 0.42	p = 0.40
		NO	0.13 ± 0.02	6		cond. R^2 = 0.08	
H. discoidea	34	YES	0.20 ± 0.01	11	df = 7.59	df = 7.49	df = 7.59
		NO	0.25 ± 0.02	6	F = 1.98	F = 1.54	F = 1.32
	31	YES	0.23 ± 0.02	9	p = 0.20	p = 0.25	p = 0.28
		NO	0.20 ± 0.02	5		cond. R^2 = 0.34	

Table S30. Light use efficiency (α) during the recovery phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	0.28 ± 0.01	8	df = 20.00	df = 20.00	df = 20.00
		NO	0.26 ± 0.01	4	F = 0.28	F = 0.68	F = 0.56
	31	YES	0.31 ± 0.03	8	p = 0.60	p = 0.42	p = 0.46
		NO	0.25 ± 0.03	4		cond. R^2 = 0.16	
Neogoniolithon sp.	34	YES	0.17 ± 0.06	3	df = 19.00	df = 19.00	df = 19.00
		NO	0.25 ± 0.04	5	F = 2.34	F = 0.17	F = 0.20
	31	YES	0.29 ± 0.05	9	p = 0.14	p = 0.68	p = 0.66
		NO	0.31 ± 0.06	6		cond. R^2 = 0.11	
H. opuntia	34	YES	0.15 ± 0.07	5	df = 4.78	df = 4.79	df = 4.78
		NO	0.16 ± 0.05	3	F = 0.33	F = 0.03	F = 0.03
	31	YES	0.21 ± 0.07	7	p = 0.59	p = 0.86	p = 0.87
		NO	0.20 ± 0.04	6		cond. R^2 = 0.64	
H. discoidea	34	YES	0.22 ± 0.03	9	df = 7.38	df = 7.41	df = 7.38
		NO	0.12 ± 0.02	4	F = 0.04	F = 0.68	F = 0.82
	31	YES	0.18 ± 0.02	8	p = 0.85	p = 0.44	p = 0.39
		NO	0.16 ± 0.05	5		cond. R^2 = 0.38	

Table S31. Light use efficiency (α) during the pre-impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	0.25 ± 0.02	4	df = 4.98	df = 4.97	df = 4.98
		NIGHT	0.21 ± 0.01	3	F = 1.30	F = 0.58	F = 0.61
	31	DAY	0.24 ± 0.01	3	p = 0.31	p = 0.48	p = 0.47
		NIGHT	0.19 ± 0.05	4		cond. R^2 = 0.16	
Neogoniolithon sp.	34	DAY	0.26 ± 0.05	5	df = 5.82	df = 5.83	df = 5.82
		NIGHT	0.24 ± 0.02	4	F = 2.28	F = 0.33	F = 0.31
	31	DAY	0.59 ± 0.12	5	p = 0.18	p = 0.59	p = 0.60
		NIGHT	0.29 ± 0.03	5		cond. R^2 = 0.88	
H. opuntia	34	DAY	0.12 ± 0.01	4	df = 5.98	df = 5.98	df = 5.98
		NIGHT	0.12 ± 0.01	5	F = 0.10	F = 0.40	F = 0.36
	31	DAY	0.57 ± 0.30	5	p = 0.77	p = 0.55	p = 0.57
		NIGHT	0.21 ± 0.16	3		cond. R^2 = 0.99	
H. discoidea	34	DAY	0.20 ± 0.02	3	df = 12.00	df = 12.00	df = 12.00
		NIGHT	0.15 ± 0.02	4	F = 4.22	F = 0.81	F = 0.87
	31	DAY	0.20 ± 0.01	4	p = 0.06	p = 0.39	p = 0.37
		NIGHT	0.23 ± 0.03	4		cond. R^2 = 0.29	

Table S32. Light use efficiency (α) during the impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	0.20 ± < 0.01	5	df = 17.00	df = 17.00	df = 17.00
		NIGHT	0.23 ± 0.03	6	F = 7.88	F = 4.51	F = 4.32
	31	DAY	0.39 ± 0.09	4	**p = 0.01**	**p = 0.05**	p = 0.05
		NIGHT	0.26 ± 0.02	6		cond. R^2 = 0.37	
Neogoniolithon sp.	34	DAY	0.18 ± 0.07	6	df = 16.00	df = 16.00	df = 16.00
		NIGHT	0.24 ± 0.09	4	F = 1.26	F = 1.96	F = 1.92
	31	DAY	0.32 ± 0.01	4	p = 0.28	p = 0.18	p = 0.18
		NIGHT	0.23 ± 0.02	6		cond. R^2 = 0.14	
H. opuntia	34	DAY	0.14 ± 0.03	6	df = 6.85	df = 6.82	df = 6.85
		NIGHT	0.13 ± 0.02	5	F = 0.04	F = 0.05	F = 0.04
	31	DAY	0.13 ± 0.02	4	p = 0.85	p = 0.83	p = 0.84
		NIGHT	0.12 ± 0.02	6		cond. R^2 = 0.36	
H. discoidea	34	DAY	0.22 ± 0.02	5	df = 7.59	df = 7.49	df = 7.59
		NIGHT	0.18 ± 0.01	6	F = 1.98	F = 1.54	F = 1.32
	31	DAY	0.26 ± 0.03	4	p = 0.20	p = 0.25	p = 0.28
		NIGHT	0.21 ± 0.04	5		cond. R^2 = 0.34	

Table S33. Light use efficiency (α) during the recovery phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	**Model statistics (MHW)**	**Model statistics (Var.)**	**Model statistics (Var.*MHW)**
Lithophyllum sp.	34	DAY	0.30 ± 0.01	5	df = 4.98	df = 4.97	df = 4.98
		NIGHT	0.25 ± 0.02	3	F = 1.30	F = 0.58	F = 0.61
	31	DAY	0.31 ± 0.03	4	p = 0.31	p = 0.48	p = 0.47
		NIGHT	0.31 ± 0.05	4		cond. R^2 = 0.16	
Neogoniolithon sp.	34	DAY	0.17 ± 0.06	3	df = 9.00	df = 9.00	df = -
		NIGHT	- ± -		F = 2.47	F = 0.93	F = -
	31	DAY	0.34 ± 0.10	4	p = 0.15	p = 0.36	p = -
		NIGHT	0.25 ± 0.04	5		cond. R^2 = 0.19	
H. opuntia	34	DAY	0.07 ± 0.04	3	df = 2.21	df = 2.24	df = 2.21
		NIGHT	0.27 ± 0.15	2	F = 0.10	F = 0.07	F = 0.10
	31	DAY	0.16 ± 0.08	3	p = 0.78	p = 0.81	p = 0.78
		NIGHT	0.25 ± 0.12	4		cond. R^2 = 0.46	
H. discoidea	34	DAY	0.20 ± 0.05	5	df = 3.83	df = 3.78	df = 3.83
		NIGHT	0.25 ± 0.03	4	F = 1.14	F = 0.02	F = 0.01
	31	DAY	0.14 ± 0.01	3	p = 0.35	p = 0.90	p = 0.93
		NIGHT	0.20 ± 0.03	5		cond. R^2 = 0.51	

Table S34. Saturation intensity (E_k) during the pre-impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	90.95 ± 22.30	9	df = 11.86	df = 11.86	df = 11.86
		NO	52.58 ± 13.67	5	F = 0.64	F = 2.00	F = 2.01
	31	YES	62.84 ± 15.17	8	p = 0.44	p = 0.18	p = 0.18
		NO	111.87 ± 20.80	5		cond. R^2 = 0.62	
Neogoniolithon sp.	34	YES	101.11 ± 13.01	10	df = 13.19	df = 13.22	df = 13.19
		NO	75.90 ± 25.85	5	F = 0.07	F = 3.06	F = 2.91
	31	YES	51.28 ± 15.47	9	p = 0.80	p = 0.10	p = 0.11
		NO	108.17 ± 8.56	4		cond. R^2 = 0.80	
H. opuntia	34	YES	92.60 ± 7.11	9	df = 24.00	df = 24.00	df = 24.00
		NO	74.22 ± 31.58	5	F = 0.15	F = 0.03	F = 0.02
	31	YES	86.30 ± 33.57	9	p = 0.71	p = 0.85	p = 0.88
		NO	60.00 ± 17.09	5		cond. R^2 = 0.03	
H. discoidea	34	YES	76.77 ± 8.00	7	df = 11.32	df = 11.01	df = 11.32
		NO	73.93 ± 6.20	4	F = 0.40	F = 0.02	F = 0.01
	31	YES	81.15 ± 3.25	8	p = 0.54	p = 0.90	p = 0.92
		NO	77.03 ± 3.64	6		cond. R^2 = 0.06	

Table S35. Saturation intensity (E_k) during the impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	92.41 ± 9.15	11	df = 29.00	df = 29.00	df = 29.00
		NO	61.35 ± 20.98	7	F = 0.52	F = 0.93	F = 1.03
	31	YES	87.83 ± 13.71	9	p = 0.47	p = 0.34	p = 0.32
		NO	88.72 ± 22.27	6		cond. R^2 = 0.07	
Neogoniolithon sp.	34	YES	60.20 ± 17.77	8	df = 12.60	df = 12.52	df = 12.60
		NO	27.08 ± 15.22	5	F = 5.26	F = 0.01	F = 0.03
	31	YES	95.70 ± 12.45	10	**p = 0.04**	p = 0.92	p = 0.87
		NO	73.78 ± 8.50	5		cond. R^2 = 0.55	
H. opuntia	34	YES	40.12 ± 5.53	8	df = 22.00	df = 22.00	df = 22.00
		NO	28.23 ± 9.86	4	F = 27.39	F = 7.05	F = 6.64
	31	YES	75.17 ± 10.75	10	**p < 0.01**	**p = 0.01**	**p = 0.02**
		NO	131.25 ± 25.55	4		cond. R^2 = 0.55	
H. discoidea	34	YES	82.63 ± 4.48	10	df = 26.00	df = 26.00	df = 26.00
		NO	52.05 ± 4.29	6	F = 0.11	F = 16.47	F = 16.96
	31	YES	54.15 ± 6.02	10	p = 0.74	**p < 0.01**	**p < 0.01**
		NO	76.28 ± 10.33	4		cond. R^2 = 0.43	

Table S36. Saturation intensity (E_k) during the recovery phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	68.18 ± 12.51	10	df = 27.00	df = 27.00	df = 27.00
		NO	45.98 ± 12.79	6	F = 0.39	F = 0.26	F = 0.32
	31	YES	53.40 ± 8.73	9	p = 0.54	p = 0.62	p = 0.58
		NO	45.26 ± 14.50	6		cond. R^2 = 0.08	
Neogoniolithon sp.	34	YES	114.31 ± 33.04	3	df = 13.19	df = 13.22	df = 13.19
		NO	85.95 ± 24.64	7	F = 0.07	F = 3.06	F = 2.91
	31	YES	109.67 ± 16.22	9	p = 0.80	p = 0.10	p = 0.11
		NO	83.05 ± 23.37	6		cond. R^2 = 0.80	
H. opuntia	34	YES	81.20 ± 33.27	4	df = 3.05	df = 3.06	df = 3.05
		NO	56.16 ± 15.47	3	F = 0.00	F = 0.25	F = 0.27
	31	YES	70.59 ± 4.54	3	p = 0.98	p = 0.65	p = 0.64
		NO	73.82 ± 7.00	5		cond. R^2 = 0.70	
H. discoidea	34	YES	70.02 ± 15.59	11	df = 27.00	df = 27.00	df = 27.00
		NO	84.99 ± 26.39	5	F = 0.66	F = 0.05	F = 0.03
	31	YES	51.09 ± 10.73	12	p = 0.42	p = 0.83	p = 0.86
		NO	72.82 ± 6.38	3		cond. R^2 = 0.07	

Table S37. Saturation intensity (E_k) during the pre-impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	64.89 ± 18.52	5	df = 6.36	df = 6.34	df = 6.36
		NIGHT	123.51 ± 42.15	4	F = 0.31	F = 0.00	F = 0.00
	31	DAY	46.07 ± 20.38	5	p = 0.59	p = 1.00	p = 0.95
		NIGHT	90.80 ± 11.75	3		cond. R^2 = 0.65	
Neogoniolithon sp.	34	DAY	109.06 ± 9.16	5	df = 5.53	df = 5.52	df = 5.53
		NIGHT	93.16 ± 25.43	5	F = 4.75	F = 3.70	F = 3.58
	31	DAY	11.75 ± 3.04	4	p = 0.08	p = 0.11	p = 0.11
		NIGHT	82.91 ± 17.13	5		cond. R^2 = 0.75	
H. opuntia	34	DAY	92.08 ± 11.24	4	df = 14.00	df = 14.00	df = 14.00
		NIGHT	93.01 ± 10.31	5	F = 0.03	F = 0.01	F = 0.01
	31	DAY	89.23 ± 43.87	5	p = 0.86	p = 0.92	p = 0.92
		NIGHT	82.64 ± 59.56	4		cond. R^2 < 0.01	
H. discoidea	34	DAY	87.51 ± 17.55	3	df = 11.00	df = 11.00	df = 11.00
		NIGHT	68.71 ± 4.45	4	F = 0.15	F = 2.93	F = 3.01
	31	DAY	76.85 ± 3.57	4	p = 0.71	p = 0.12	p = 0.11
		NIGHT	85.45 ± 4.94	4		cond. R^2 = 0.20	

Table S38. Saturation intensity (E_k) during the impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	80.68 ± 8.78	5	df = 7.98	df = 7.97	df = 7.98
		NIGHT	102.18 ± 14.62	6	F = 0.11	F = 0.67	F = 0.74
	31	DAY	94.06 ± 30.69	4	p = 0.75	p = 0.44	p = 0.42
		NIGHT	82.84 ± 9.87	5		cond. R^2 = 0.22	
Neogoniolithon sp.	34	DAY	33.45 ± 9.11	4	df = 5.70	df = 5.55	df = 5.70
		NIGHT	86.95 ± 30.21	4	F = 3.27	F = 2.64	F = 2.73
	31	DAY	108.22 ± 23.84	4	p = 0.12	p = 0.16	p = 0.15
		NIGHT	87.35 ± 14.24	6		cond. R^2 = 0.38	
H. opuntia	34	DAY	37.49 ± 8.90	4	df = 5.68	df = 5.59	df = 5.68
		NIGHT	42.75 ± 7.67	4	F = 5.39	F = 0.75	F = 0.66
	31	DAY	59.02 ± 12.24	4	p = 0.06	p = 0.42	p = 0.45
		NIGHT	85.93 ± 15.13	6		cond. R^2 = 0.44	
H. discoidea	34	DAY	82.26 ± 8.28	5	df = 6.75	df = 6.65	df = 6.75
		NIGHT	83.00 ± 4.66	5	F = 12.28	F = 0.34	F = 0.30
	31	DAY	49.30 ± 10.59	5	**p = 0.01**	p = 0.58	p = 0.60
		NIGHT	59.00 ± 6.27	5		cond. R^2 = 0.47	

Table S39. Saturation intensity (E_k) during the recovery phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	90.84 ± 13.79	5	df = 15.00	df = 15.00	df = 15.00
		NIGHT	45.51 ± 16.05	5	F = 0.68	F = 0.76	F = 0.95
	31	DAY	64.87 ± 1.33	3	p = 0.42	p = 0.40	p = 0.34
		NIGHT	47.66 ± 12.76	6		cond. R^2 = 0.29	
Neogoniolithon sp.	34	DAY	114.31 ± 33.04	3	df = 9.00	df = 9.00	df = -
		NIGHT	– ± –	–	F = 0.56	F = 1.63	F = -
	31	DAY	86.36 ± 33.17	4	p = 0.47	p = 0.23	p = -
		NIGHT	128.31 ± 9.55	5		cond. R^2 = 0.13	
H. opuntia	34	DAY	116.49 ± 53.11	2	df = 0.97	df = 1.19	df = -
		NIGHT	45.92 ± 36.54	2	F = 0.22	F = 1.56	F = -
	31	DAY	– ± –	–	p = 0.72	p = 0.40	p = -
		NIGHT	70.59 ± 4.54	3		cond. R^2 = 0.57	
H. discoidea	34	DAY	81.90 ± 27.05	6	df = 19.00	df = 19.00	df = 19.00
		NIGHT	55.76 ± 12.11	5	F = 0.89	F = 0.65	F = 0.69
	31	DAY	47.67 ± 18.53	5	p = 0.36	p = 0.43	p = 0.42
		NIGHT	53.54 ± 14.01	7		cond. R^2 = 0.08	

Table S40. Magnesium content (%mol Mg) during the impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	14.23 ± 0.30	9	df = 8.67	df = 8.69	df = 8.67
		NO	13.45 ± 0.48	5	F = 1.18	F = 0.01	F = 0.02
	31	YES	14.59 ± 0.24	9	p = 0.31	p = 0.94	p = 0.89
		NO	14.22 ± 0.69	5		cond. R^2 = 0.38	
Neogoniolithon sp.	34	YES	12.04 ± 0.37	9	df = 24.00	df = 24.00	df = 24.00
		NO	12.55 ± 0.32	5	F = 0.01	F = 1.34	F = 1.12
	31	YES	11.50 ± 0.39	8	p = 0.92	p = 0.26	p = 0.30
		NO	12.99 ± 0.73	5		cond. R^2 = 0.18	
H. opuntia	34	YES	-	-	df = -	df = -	df = -
		NO	-	-	F = -	F = -	F = -
	31	YES	-	-	p = -	p = -	p = -
		NO	-	-		cond. R^2 = -	
H. discoidea	34	YES	-	-	df = -	df = -	df = -
		NO	-	-	F = -	F = -	F = -
	31	YES	-	-	p = -	p = -	p = -
		NO	-	-		cond. R^2 = -	

Table S41. Magnesium content (%mol Mg) during the impact phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	14.18 ± 0.50	5	df = 13.00	df = 13.00	df = 13.00
		NIGHT	14.29 ± 0.38	4	F = 0.54	F = 0.08	F = 0.07
	31	DAY	14.38 ± 0.31	3	p = 0.47	p = 0.78	p = 0.80
		NIGHT	14.72 ± 0.35	5		cond. R^2 = 0.06	
Neogoniolithon sp.	34	DAY	12.44 ± 0.59	5	df = 6.14	df = 6.10	df = 6.14
		NIGHT	11.55 ± 0.33	4	F = 0.19	F = 0.00	F = 0.01
	31	DAY	12.01 ± 0.92	3	p = 0.68	p = 0.98	p = 0.93
		NIGHT	11.24 ± 0.39	6		cond. R^2 = 0.47	
H. opuntia	34	DAY	-	-	df = -	df = -	df = -
		NIGHT	-	-	F = -	F = -	F = -
	31	DAY	-	-	p = -	p = -	p = -
		NIGHT	-	-		cond. R^2 = -	
H. discoidea	34	DAY	-	-	df = -	df = -	df = -
		NIGHT	-	-	F = -	F = -	F = -
	31	DAY	-	-	p = -	p = -	p = -
		NIGHT	-	-		cond. R^2 = -	

Table S42. Residual Full-Width-Half-Maximum (FWHM) during the impact phase.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	YES	1.02 ± 0.05	7	df = 7.31	df = 7.31	df = 7.31
		NO	1.23 ± 0.06	5	F = 22.87	F = 3.47	F = 3.61
	31	YES	0.82 ± 0.06	9	**p < 0.01**	p = 0.10	p = 0.10
		NO	0.72 ± 0.06	4		cond. R^2 = 0.75	
Neogoniolithon sp.	34	YES	0.66 ± 0.06	9	df = 13.30	df = 13.29	df = 13.30
		NO	0.52 ± 0.17	4	F = 0.02	F = 0.95	F = 1.00
	31	YES	0.58 ± 0.07	7	p = 0.90	p = 0.35	p = 0.33
		NO	0.64 ± 0.08	4		cond. R^2 = 0.36	
H. opuntia	34	YES			df = -	df = -	df = -
		NO			F = -	F = -	F = -
	31	YES			p = -	p = -	p = -
		NO				cond. R^2 = -	
H. discoidea	34	YES			df = -	df = -	df = -
		NO			F = -	F = -	F = -
	31	YES			p = -	p = -	p = -
		NO				cond. R^2 = -	

Table S43. Residual Full-Width-Half-Maximum (FWHM) during the recovery phase in the treatments with peaks in temperature occurring during the day or at night.

Species	Maximum temperature	Variability	Mean ± SE	n	Model statistics (MHW)	Model statistics (Var.)	Model statistics (Var.*MHW)
Lithophyllum sp.	34	DAY	1.01 ± 0.07	5	df = 4.00	df = 4.02	df = 4.00
		NIGHT	1.03 ± 0.09	4	F = 7.01	F = 1.27	F = 1.16
	31	DAY	0.71 ± 0.07	3	p = 0.06	p = 0.32	p = 0.34
		NIGHT	0.90 ± 0.06	5		cond. R^2 = 0.52	
Neogoniolithon sp.	34	DAY	0.64 ± 0.08	5	df = 12.00	df = 12.00	df = 12.00
		NIGHT	0.69 ± 0.08	4	F = 0.55	F = 0.22	F = 0.22
	31	DAY	0.61 ± 0.10	3	p = 0.47	p = 0.65	p = 0.65
		NIGHT	0.57 ± 0.09	6		cond. R^2 = 0.06	
H. opuntia	34	DAY	-	-	df = -	df = -	df = -
		NIGHT	-	-	F = -	F = -	F = -
	31	DAY	-	-	p = -	p = -	p = -
		NIGHT	-	-		cond. R^2 = -	
H. discoidea	34	DAY	-	-	df = -	df = -	df = -
		NIGHT	-	-	F = -	F = -	F = -
	31	DAY	-	-	p = -	p = -	p = -
		NIGHT	-	-		cond. R^2 = -	