

Supplement 1:

Technical details and statistical analyses described in this study.

Supplementary Table S1: Technical details of all experiments included in this study.

	February experiment	May experiment
Number of individuals in sample	50	<i>S. orbiculus</i> - 40 <i>A. lobifera</i> - 30
Size fraction of individuals	600-1000 μm	750-1000 μm
Number of replicates	5	4
Excluded samples after acclimation	One from 35°C treatment	<i>S. orbiculus</i> - One from 30°C treatment <i>A. lobifera</i> - One from 25°C treatment
Seawater properties	Natural, unfiltered	Natural, filtered 45 μm
Acclimation conditions	25°C	<i>S. orbiculus</i> -27°C <i>A. lobifera</i> - 25°C

Supplementary Table S2.1: One-way ANOVA comparing calcification rates of the three examined groups after the acclimation phase.

	SS	n	MS	F	p
Intercept	159.65	1	159.65	12020.26	0.00
Group	7.2	2	3.6	271.04	0.00
Error	0.62	47	0.01		

Supplementary Table S2.2: Tukey HSD post-hoc test demonstrating the differences between calcification rate of the three groups after the acclimation phase. Stars indicate homogenous groups and thus significant differences between them.

Group	log (Calcification rates)	1	2	3
<i>S. orbiculus</i> - Feb	1.29	****		
<i>S. orbiculus</i> - May	1.99		****	
<i>A. lobifera</i> - May	2.16			****

Supplementary Table S3.1: One-way ANOVA comparing photosynthesis activity of the three examined groups after the acclimation phase.

	SS	n	MS	F	p
Intercept	16993.20	1	16993.2	199.0	0.000000
Group	2502.53	1	2502.5	29.3	0.000009
Error	2390.85	28	85.4		

Supplementary Table S3.2: Tukey HSD post-hoc test demonstrating the differences between photosynthesis activity of the three groups after the acclimation phase. Stars indicate homogenous groups and thus significant differences between them.

Group	Photosynthesis activity	1	2
<i>S. orbiculus</i> - May	14.67	****	
<i>A. lobifera</i> - May	32.93		****

Supplementary Table S4: Multiple Comparisons p-values for Kruskal-Wallis non parametric test comparing calcification rates of *S. orbiculus* winter population under different temperature treatments and weeks.

Kruskal-Wallis comparing temperatures: $H(3, N=76) = 40.20611$ $p = .0000$				
Kruskal-Wallis comparing weeks: $H(3, N=76) = 3.502386$ $p = .3205$				
	25	30	32	35
25		0.025102	1.000000	0.002917
30	0.025102		0.469084	0.000000
32	1.000000	0.469084		0.000036
35	0.002917	0.000000	0.000036	

Supplementary Table S5.1: Two-way ANOVA comparing calcification rates of *S. orbiculus* spring population under different temperature treatments and weeks.

	SS	n	MS	F	p
Intercept	435511.7	1	435511.7	955.0896	0.000000
Temperature	8459.2	3	2819.7	6.1838	0.001875
Week	4651.9	2	2326.0	5.1009	0.011741
Temperature*Week	10814.5	6	1802.4	3.9527	0.004362
Error	15047.7	33	456.0		

Supplementary Table S5.2: Tukey HSD post-hoc test demonstrating the differences between calcification rates of *S. orbiculus* spring population under different temperature treatments and between weeks. Stars indicate homogenous groups and thus significant differences between them.

Temperature	Week	Calcification rates	1	2	3
25	1	102.41	****	****	****
30	1	86.20	****	****	
32	1	102.96	****	****	****
35	1	109.87	****	****	****
25	2	92.51	****	****	****
30	2	90.10	****	****	****
32	2	98.62	****	****	****
35	2	62.89	****		
25	3	106.24	****	****	****
30	3	131.43		****	****
32	3	144.30			****
35	3	62.18	****		

Supplementary Table S6: Welch's ANOVA and Tukey HSD post-hoc test comparing photosynthetic activity of *S. orbiculus* spring population under different temperature treatments and between weeks.

Welch's ANOVA comparing temperatures: $F: 28.69839$, $P: 0.000000$				
Welch's ANOVA comparing weeks: $F: 0.345750$, $P: 0.710967$				
	25	30	32	35
25		0.093500	0.975656	0.000163
30	0.093500		0.199400	0.000284
32	0.975656	0.199400		0.000163
35	0.000163	0.000284	0.000163	

Supplementary Table S7.1: Two-way ANOVA comparing calcification rates of *A. lobifera* spring population under different temperature treatments and between weeks.

	SS	n	MS	F	p
Intercept	53.86997	1	53.90	666.57	0.000000
Temperature	3.06627	3	1.02	12.65	0.000051
Week	0.07153	1	0.072	0.89	0.357025
Temperature*Week	0.23488	3	0.078	0.97	0.425157
Error	1.77797	22	0.08		

Supplementary Table S7.2: Tukey HSD post-hoc test demonstrating the differences between calcification rates of *A. lobifera* spring population under different temperature treatments and between weeks. Stars indicate homogenous groups and thus significant differences between them.

Temperature	Week	Log	1	2
25	1	1.637020	****	
30	1	1.585204	****	
32	1	1.573123	****	
35	1	0.803304		****
25	2	1.267510	****	****
30	2	1.683252	****	
32	2	1.406749	****	****
35	2	0.847461		****

Supplementary Table S8.1: Two-way ANOVA comparing photosynthetic activity of *A. lobifera* spring population under different temperature treatments and between weeks.

	SS	n	MS	F	p
Intercept	4870.09	1	4870.09	21.92	0.000114
Temperature	12698.82	3	4232.94	19.05	0.000003
Week	420.01	1	420.01	1.89	0.183001
Temperature*Week	574.36	3	191.45	0.86	0.475630
Error	4888.04	22	222.18		

Supplementary Table S8.2: Tukey HSD post-hoc test demonstrating the differences between photosynthetic activity of *A. lobifera* spring population under different temperature treatments and between weeks. Stars indicate homogenous groups and thus significant differences between them.

	Temperature	Week	Photosynthetic activity	1	2	3
1	25	1	33.78	****		
3	30	1	22.92	****		
5	32	1	24.92	****		
7	35	1	-15.17		****	****
2	25	2	21.78	****	****	
4	30	2	9.75	****	****	
6	32	2	32.17	****		
8	35	2	-27.42			****

Supplement 2:

Raw data: calcification rates and photosynthetic activity measured in the experiments.

Table S1: Calcification rates ($\mu\text{mol CaCO}_3 \text{ week}^{-1} \text{ individual}^{-1}$) and photosynthetic activity ($\mu\text{g/L O}_2 \text{ individual}^{-1}$) baseline measurements after the acclimation period of *Sorites orbiculus* and *Amphistegina lobifera*.

	<i>S. orbiculus</i> February	<i>S. orbiculus</i> May		<i>A. lobifera</i> May	
	Calcification rate	Calcification rate	Photosynthetic activity	Calcification rate	Photosynthetic activity
1	20 ± 8	91 ± 7	13	212 ± 5	43
2	22 ± 10	66 ± 10	12	-	-
3	22 ± 7	97 ± 3	15	110 ± 8	19
4	25 ± 9	95 ± 0	14	131 ± 14	35
5	24 ± 7	106 ± 7	21	0 ± 0	40
6	13 ± 4	107 ± 5	27	119 ± 15	25
7	-	101 ± 0	22	128 ± 3	43
8	15 ± 5	106 ± 3	28	134 ± 0	35
9	17 ± 5	85 ± 12	9	184 ± 11	53
10	19 ± 9	-	-	219 ± 0	21
11	31 ± 8	74 ± 3	12	84 ± 5	25
12	34 ± 12	83 ± 6	15	119 ± 3	10
13	19 ± 8	67 ± 3	11	117 ± 14	42
14	33 ± 14	138 ± 1	5	229 ± 9	35
15	16 ± 5	71 ± 6	9	151 ± 15	30
16	24 ± 2	76 ± 10	9	134 ± 22	38
17	27 ± 9				
18	25 ± 10				
19	17 ± 8				
20	22 ± 7				

Table S2: Calcification rates ($\mu\text{mol CaCO}_3 \text{ week}^{-1} \text{ individual}^{-1}$) of *S. orbiculus* winter population under different temperature treatments and weeks.

Temperature (C°)	Week 1	Week 2	Week 3	Week 4
25	32 ± 8	84 ± 19	94 ± 10	90 ± 8
	13 ± 5	44 ± 3	42 ± 30	59 ± 11
	29 ± 0	48 ± 7	34 ± 5	47 ± 4
	48 ± 1	69 ± 1	37 ± 5	26 ± 13
	58 ± 8	39 ± 2	39 ± 2	10 ± 4
30	8 ± 6	19 ± 0	9 ± 5	8 ± 10
	-	-	-	-
	33 ± 1	16 ± 4	4 ± 1	0 ± 6
	35 ± 4	30 ± 2	11 ± 0	-2 ± 1
	25 ± 5	28 ± 4	8 ± 7	12 ± 3
32	40 ± 17	61 ± 10	71 ± 10	74 ± 3
	52 ± 2	77 ± 11	90 ± 5	104 ± 11
	26 ± 7	68 ± 1	99 ± 2	96 ± 1
	36 ± 0	64 ± 3	70 ± 6	72 ± 9
	96 ± 5	80 ± 1	63 ± 8	58 ± 3
35	56 ± 2	52 ± 2	39 ± 3	62 ± 12
	43 ± 0	39 ± 16	53 ± 1	94 ± 10
	46 ± 7	62 ± 16	81 ± 10	103 ± 12
	54 ± 5	51 ± 2	33 ± 11	43 ± 1
	41 ± 12	59 ± 10	59 ± 2	59 ± 0

Table S3: Calcification rates ($\mu\text{mol CaCO}_3 \text{ week}^{-1} \text{ individual}^{-1}$) and photosynthetic activity ($\mu\text{g/L O}_2 \text{ individual}^{-1}$) of *S. orbiculus* spring population under different temperature treatments and weeks.

Temperature (C°)	Week 1		Week 2		Week 3	
	Calcification rate	Photosynthetic activity	Calcification rate	Photosynthetic activity	Calcification rate	Photosynthetic activity
25	81 ± 15	18	65 ± 6	27	74 ± 6	40
	97 ± 12	22	103 ± 6	25	119 ± 10	26
	107 ± 7	33	92 ± 2	20	101 ± 1	20
	125 ± 2	33	110 ± 2	25	131 ± 14	13
30	101 ± 12	10	56 ± 2	38	40 ± 2	19
	-	-	-	-	-	-
	116 ± 7	13	69 ± 1	3	66 ± 8	4
	102 ± 3	15	72 ± 7	6	101 ± 4	12
32	83 ± 7	14	109 ± 3	13	156 ± 0	44
	0 ± 0	23	0 ± 0	9	0 ± 0	55
	99 ± 9	16	82 ± 9	14	113 ± 2	26
	77 ± 9	18	79 ± 9	-30	126 ± 8	34
35	106 ± 7	-2	88 ± 10	-17	93 ± 11	-25
	97 ± 10	-4	83 ± 3	-18	183 ± 0	-28
	117 ± 16	2	130 ± 4	-3	138 ± 7	-7
	92 ± 3	-10	94 ± 4	1	129 ± 7	50

Table S4: Calcification rate ($\mu\text{mol CaCO}_3 \text{ week}^{-1} \text{ individual}^{-1}$) and photosynthetic activity ($\mu\text{g/L O}_2 \text{ individual}^{-1}$) of *A. lobifera* spring population under different temperature treatments and weeks.

Temperature (C°)	Week 1		Week 2	
	Calcification rate	Photosynthetic activity	Calcification rate	Photosynthetic activity
25	41 ± 11	25	18 ± 0	0
	-	-	-	-
	98 ± 17	49	68 ± 15	43
	20 ± 6	27	5 ± 8	23
30	10 ± 14	28	6 ± 18	4
	2 ± 6	18	10 ± 8	-6
	8 ± 4	46	11 ± 12	41
	9 ± 14	0	4 ± 28	4
32	36 ± 6	26	28 ± 14	45
	39 ± 0	26	66 ± 17	22
	67 ± 2	25	70 ± 8	28
	24 ± 18	23	41 ± 0	35
35	59 ± 8	-11	22 ± 0	-33
	18 ± 10	-27	15 ± 3	-16
	30 ± 7	-14	37 ± 9	-46
	60 ± 3	-8	36 ± 9	-16