

The following supplement accompanies the article

Dissolved inorganic nutrient enrichment does not affect sponge growth or condition

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Table S1. Sampling location and counts of five sponge species at Orpheus Island (18° 35' 27" S, 146° 28' 47" E) and Rib Reef (18° 28' 54" S, 146° 52' 15" E) on the Great Barrier Reef. Each sponge was cut into explants for use in the experiment.

Species	Photosymbiont	Location	Depth (m)	Sponges (n)	Explants (n)
<i>Carteriospongia foliascens</i>	<i>Cyanobacteria</i>	Orpheus Island	1	12	68
<i>Cliona orientalis</i>	<i>Symbiodinium</i>	Orpheus Island	1	12	81
<i>Cymbastella coralliophila</i>	<i>Cyanobacteria</i>	Orpheus Island	9	12	72
<i>Ircinia ramosa</i>	<i>Cyanobacteria</i>	Rib Reef	9	12	70
<i>Stylissa flabelliformis</i>	NA	Orpheus Island	9	10	61

Table S2. Sponges per tank and treatment for *Carteriospongia foliascens* (*C. fol.*), *Cliona orientalis* (*C. ori.*), *Cymbastella coralliophila* (*C. cor.*), *Ircinia ramosa* (*I. ram.*), *Stylissa flabelliformis* (*S. fla.*). Total indicates the sum of sponges per species for each treatment.

Nutrients	Light	Tank num.	<i>C. fol.</i>	<i>C. ori.</i>	<i>C. cor.</i>	<i>I. ram.</i>	<i>S. fla.</i>
Control	80	Total	12	16	13	12	10
		5	2	3	3	2	1
		6	2	3	2	2	1
		17	2	4	2	2	2
		23	2	2	2	2	2
		27	2	2	2	2	2
		36	2	2	2	2	2
	160	Total	12	14	12	12	10
		2	3	2	2	2	2
		8	1	3	2	2	2
		14	2	2	2	2	2
		25	2	2	2	2	1
		30	2	2	2	2	2
		32	2	3	2	2	1
Medium	80	Total	12	14	12	12	10
		4	2	3	2	2	2
		9	2	3	2	2	1
		11	2	2	2	2	2
		28	2	2	2	2	2
		29	2	2	2	2	1
		31	2	2	2	2	2
	160	Total	12	12	11	12	9
		10	2	2	1	2	1
		18	2	2	2	2	1
		19	2	2	2	2	2
		21	2	2	2	2	2
		33	2	2	2	2	2
		34	2	2	2	2	1
High	80	Total	12	13	13	12	9
		3	2	2	3	2	1
		7	2	2	2	2	2
		13	2	2	2	2	2
		15	2	3	2	2	1
		16	2	2	2	2	1
		20	2	2	2	2	2
	160	Total	12	14	11	11	10
		1	2	2	1	2	2
		12	2	2	2	2	2
		22	2	4	2	2	1
		24	2	2	2	1	1
		26	2	2	2	2	2
		35	2	2	2	2	2

Table S3. Sample sizes for all sponge species and treatments. For most species and treatments, each sponge was represented by one explant and the number indicates both the number of sponges and explants. In some cases, multiple explants per sponge were used, and the total number of explants is listed in parentheses.

	80 $\mu\text{mol quanta m}^{-2} \text{s}^{-1}$			160 $\mu\text{mol quanta m}^{-2} \text{s}^{-1}$		
	Control	Medium	High	Control	Medium	High
Growth rate						
<i>C. coralliophila</i>	11	11	12 (13)	12	10	10
<i>C. foliascens</i>	11	11	12	10	11	11
<i>C. orientalis</i>	12 (15)	12 (13)	12 (13)	12	9	12
<i>I. ramosa</i>	11	12	12	12	12	11
<i>S. flabelliformis</i>	10	10	9	10	9	10
Organic matter						
<i>C. coralliophila</i>	12	12 (13)	12	12	11	12
<i>C. foliascens</i>	11	12	11	10	11	10
<i>C. orientalis</i>	12 (14)	12 (14)	12 (13)	12 (13)	12 (13)	12 (13)
<i>I. ramosa</i>	12	11	12	12	12	11
<i>S. flabelliformis</i>	10	10	9	10	9	10
Chlorophyll <i>a</i>						
<i>C. coralliophila</i>	12	12 (13)	12	12	12	12
<i>C. foliascens</i>	10	12	11	11	11	12
<i>C. orientalis</i>	12 (13)	12 (14)	12 (13)	12 (15)	12	12 (13)
<i>I. ramosa</i>	12	11	12	12	12	11

Table S4. Dosing reservoir concentrations (mean and SD) of particulate and dissolved nutrients.

	Control			Medium		High	
	n	Mean	SD	Mean	SD	Mean	SD
<i>Particulate ($\mu\text{mol l}^{-1}$)</i>							
Organic C	5	21.6	10.6	49.2	66.4	31.7	19.7
N	5	4.4	1.6	12.4	11.4	10.0	4.6
<i>Dissolved ($\mu\text{mol l}^{-1}$)</i>							
Organic C	5	93.7	9.2	2535.4	112.0	4842.6	223.1
N	5	6.9	0.7	4700.8	192.4	9148.9	311.4
Organic N	5	5.4	0.8	3664.4	183.4	7024.7	251.2
<i>Dissolved inorg. ($\mu\text{mol l}^{-1}$)</i>							
Total DIN	5	1.1	1.0	905.6	276.2	2098.4	95.1
NH ₄ ⁺	5	0.4	0.2	388.8	113.4	950.0	48.5
NO ₂ ⁻	5	0.2	0.3	22.8	15.2	15.0	9.7
NO ₃ ⁻	5	0.6	0.8	494.0	152.6	1133.4	48.8
PO ₄ ³⁻	5	0.1	0.1	317.7	91.7	681.6	41.4
Total DIN : PO ₄ ³⁻	5	16.0	8.9	2.8	0.8	3.1	0.1

Table S5. Results of linear models analysing nutrient levels within dosing reservoirs. The model included nutrient treatments and time. Degrees of freedom (num., denom.), F statistic, and P-values are reported for each measured nutrient. The table also contains post-hoc results from linear contrasts of nutrient doses within experimental aquaria. The tests compared the control (C), medium (M), and high (H) nutrient doses. P-values for post-hoc tests were corrected using single-step correction. P-values less than 0.05 are indicated in bold.

	Linear model			Time			Post-hoc tests		
	Nutrients df	F	P	df	F	P	C vs M P	M vs H P	C vs H P
<i>Particulate</i>									
Organic C	2,6	1.3	0.33	4,6	9.5	0.01	-	-	-
N	2,8	1.6	0.24	4,8	1.4	0.31	-	-	-
<i>Dissolved</i>									
Organic C	2,5	1090.0	<0.01	1,5	3.0	0.14	<0.01	<0.01	<0.01
N	2,5	1271.5	<0.01	1,5	0.4	0.54	<0.01	<0.01	<0.01
Organic N	2,5	4136.2	<0.01	1,5	0.1	<0.72	<0.01	<0.01	<0.01
<i>Dissolved inorg.</i>									
Total DIN	2,14	464.7	<0.01	8,14	1.4	0.26	<0.01	<0.01	<0.01
NH ₄ ⁺	2,14	335.0	<0.01	8,14	1.4	0.29	<0.01	<0.01	<0.01
NO ₂ ⁻	2,14	5.8	0.01	8,14	2.2	0.10	<0.01	<0.01	<0.01
NO ₃ ⁻	2,14	471.1	<0.01	8,14	1.5	0.24	<0.01	<0.01	<0.01
PO ₄ ³⁻	2,14	118.9	<0.01	8, 14	1.0	0.50	<0.01	<0.01	<0.01
Total DIN : PO ₄ ³⁻	2,14	432.7	<0.01	8, 14	1.6	0.21	0.02	0.91	0.08

Table S6. Concentrations of mean tank concentration and SD of particulate and dissolved nutrients within the experimental aquaria.

	Irradiance	Nutrient treatment							
		Control			Medium		High		
		n	Mean	SD	Mean	SD	Mean	SD	
<i>Particulate ($\mu\text{mol l}^{-1}$)</i>									
Organic C	80	3	4.8	0.7	4.9	0.2	4.3	0.2	
	160	3	4.4	0.6	4.9	0.4	4.2	0.3	
N	80	3	0.9	0.1	1.0	0.1	0.8	0.1	
	160	3	0.8	0.1	1.0	0.1	0.6	<0.1	
<i>Dissolved ($\mu\text{mol l}^{-1}$)</i>									
Organic C	80	6	1.1	0.1	1.1	0.1	1.3	0.1	
	160	6	1.1	0.1	1.1	0.1	1.2	0.1	
N	80	6	0.1	<0.1	0.2	<0.1	0.3	<0.1	
	160	6	0.1	<0.1	0.2	<0.1	0.2	<0.1	
Organic N	80	6	6.2	0.4	8.7	0.4	11.7	0.2	
	160	6	6.5	0.1	9.1	0.4	11.7	0.7	
<i>Dissolved inorg. ($\mu\text{mol l}^{-1}$)</i>									
Total DIN	80	6	1.6	0.1	3.6	0.2	6.1	0.2	
	160	6	1.3	0.1	3.1	0.1	5.6	0.6	
NH ₄ ⁺	80	6	0.3	<0.1	0.6	0.1	1.2	0.1	
	160	6	0.2	<0.1	0.6	0.1	0.9	0.1	
NO ₂ ⁻	80	6	0.1	<0.1	0.7	0.2	1.3	0.1	
	160	6	0.1	<0.1	0.6	0.1	1.3	0.1	
NO ₃ ⁻	80	6	1.2	<0.1	2.4	0.1	3.5	0.2	
	160	6	0.9	0.1	2.0	0.1	3.3	0.3	
PO ₄ ³⁻	80	6	0.2	<0.1	0.6	<0.1	1.0	<0.1	
	160	6	0.2	<0.1	0.5	<0.1	0.9	0.1	
Total DIN : PO ₄ ³⁻	80	6	9.0	0.2	6.5	0.4	6.5	0.2	
	160	6	7.8	0.6	5.9	0.2	6.3	0.5	