

## Supplementary Material

### Tissue bleaching:

**Table S1.** PERMANOVA main test for tissue bleaching (% cover) of *Ecklonia radiata*, *Zonaria turneriana* and *Lobophora variegata*. All factors were treated as fixed factors. Significant ( $p < 0.05$ ) results are highlighted in **bold**

Source	df	<i>E. radiata</i>			<i>Z. turneriana</i>			<i>L. variegata</i>		
		MS	Pseudo-F	P	MS	Pseudo-F	P	MS	Pseudo-F	P
Day	9	8.9E+03	55	<b>≤0.001</b>	4.5E+03	49	<b>≤0.001</b>	5.3E+03	86	<b>≤0.001</b>
Temp	2	5.3E+04	326	<b>≤0.001</b>	3.9E+04	423	<b>≤0.001</b>	1.8E+04	297	<b>≤0.001</b>
Light	1	2.5E+03	16	<b>≤0.001</b>	3.4E+03	37	<b>≤0.001</b>	4.3E+03	70	<b>≤0.001</b>
DaxTe	18	3.4E+03	21	<b>≤0.001</b>	3.2E+03	34	<b>≤0.001</b>	4.0E+03	66	<b>≤0.001</b>
DaxLi	9	111	0.7	0.729	314	3.4	<b>≤0.001</b>	873	14	<b>≤0.001</b>
TexLi	2	1.1E+03	6.6	<b>≤0.001</b>	1.4E+03	15	<b>≤0.001</b>	2.8E+03	45	<b>≤0.001</b>
DaxTexLi	18	141	0.9	0.610	183	2.0	<b>≤0.001</b>	588	10	<b>≤0.001</b>
Res	300		162			93			61	
Total	359									

### Biomass:

**Table S2.** PERMANOVA main test for biomass (g wet weight) of *E. radiata*, *Z. turneriana* and *L. variegata*. All factors were treated as fixed factors. Significant ( $p < 0.05$ ) results are highlighted in **bold**

Source	df	<i>E. radiata</i>			<i>Z. turneriana</i>			<i>L. variegata</i>		
		MS	Pseudo-F	P	MS	Pseudo-F	P	MS	Pseudo-F	P
Day	2	7.3	1.8	0.165	81	1.0	0.388	475	49	<b>≤0.001</b>
Temp	2	99	25	<b>≤0.001</b>	115	1.4	0.262	62	6.4	<b>0.002</b>
Light	1	11	2.7	0.112	72	0.9	0.361	6.5	0.7	0.428
DaxTe	4	12	2.9	<b>0.024</b>	23	0.3	0.897	7.1	0.7	0.573
DaxLi	2	1.3	0.3	0.729	8.3	0.1	0.908	5.0	0.5	0.605
TexLi	2	0.4	0.1	0.913	34	0.4	0.667	28	2.9	0.058
DaxTexLi	4	0.4	0.1	0.979	2.8	0.0	0.998	8.8	0.9	0.470
Res	89		4.0			83			9.7	
Total	106									

**Relative growth rate:****Table S3.** PERMANOVA main test for relative growth rate (RGR) of *E. radiata*, *Z. turneriana* and *L. variegata*. All factors were treated as fixed factors. Significant ( $p < 0.05$ ) results are highlighted in **bold**

Source	df	<i>E. radiata</i>			<i>Z. turneriana</i>			<i>L. variegata</i>		
		MS	Pseudo-F	P	MS	Pseudo-F	P	MS	Pseudo-F	P
Day	1	2800.000	7.0	<b>0.006</b>	66	3.4	0.060	0.1	0.0	0.923
Temp	2	6400.000	16	<b>≤0.001</b>	143	7.3	<b>≤0.001</b>	52	7.1	<b>0.002</b>
Light	1	1600.000	4.1	<b>0.046</b>	40	2.0	0.167	2.7	0.4	0.550
DaxTe	2	1700.000	4.2	<b>0.015</b>	44	2.2	0.100	27	3.7	<b>0.033</b>
DaxLi	1	324	0.8	0.382	4.0	0.2	0.684	0.5	0.1	0.803
TexLi	2	1500.000	3.9	<b>0.018</b>	14	0.7	0.325	10	1.4	0.257
DaxTexLi	2	364	0.9	0.413	15	0.7	0.530	16	2.1	0.126
Res	59	395			20			7.3		
Total	70									

**Maximum quantum yield:****Table S4.** PERMANOVA main test for maximum quantum yield of *E. radiata*, *Z. turneriana* and *L. variegata*. All factors were treated as fixed factors. Significant ( $p < 0.05$ ) results are highlighted in **bold**

Source	df	<i>E. radiata</i>			<i>Z. turneriana</i>			<i>L. variegata</i>		
		MS	Pseudo-F	P	MS	Pseudo-F	P	MS	Pseudo-F	P
Day	4	0.1	26	<b>≤0.001</b>	0.3	15	<b>≤0.001</b>	0.1	23	<b>≤0.001</b>
Temp	2	0.4	103	<b>≤0.001</b>	1.5	80	<b>≤0.001</b>	0.5	74	<b>≤0.001</b>
Light	1	0.3	89	<b>≤0.001</b>	0.0	0.2	0.685	0.0	4.3	<b>0.037</b>
DaxTe	8	0.0	13	<b>≤0.001</b>	0.2	12	<b>≤0.001</b>	0.1	19	<b>≤0.001</b>
DaxLi	4	0.0	5.7	<b>≤0.001</b>	0.0	0.2	0.918	0.0	1.5	0.200
TexLi	2	0.1	19	<b>≤0.001</b>	0.0	0.3	0.724	0.1	9.3	<b>≤0.001</b>
DaxTexLi	7	0.0	1.7	0.114	0.0	0.1	0.999	0.0	2.6	<b>0.009</b>
Res	134		0.0			0.0			0.0	
Total	162									

## Pigment concentrations:

**Table S5.** PERMANOVA main test for pigment concentrations of *E. radiata*, *Z. turneriana* and *L. variegata* after 15 days. All factors were treated as fixed factors. Significant ( $p < 0.05$ ) results are highlighted in **bold** with grey background.

Pigment	Source	df	<i>E. radiata</i>			<i>Z. turneriana</i>			<i>L. variegata</i>		
			MS	Pseudo-F	P	MS	Pseudo-F	P	MS	Pseudo-F	P
Fuco-xanthin	Temp	2	420000	2.0	0.188	22000000	11	<b>0.003</b>	680000	1.0	0.388
	Light	1	9500	0.0	0.835	11000000	5.8	<b>0.038</b>	59000	0.1	0.766
	TexLi	2	110000	0.5	0.617	310000	0.2	0.858	440000	0.7	0.534
	Res	12	220000			2000000			670000		
	Total	17									
Viola-xanthin	Temp	2	7300	4.7	<b>0.034</b>	210000	65	<b>≤ 0.001</b>	24634	9.0	<b>0.005</b>
	Light	1	11000	6.8	<b>0.027</b>	7800	2.4	0.153	23	0.0	0.930
	TexLi	2	270	0.2	0.847	42000	1.3	0.310	687	0.3	0.779
	Res	12	1600			3200			2741		
	Total	17									
Anthera-xanthin	Temp	2	180	4	0.052	200	1.6	0.230	47	1.3	0.315
	Light	1	1900	42	<b>0</b>	560	4.5	0.062	21	0.6	0.449
	TexLi	2	180	4	<b>0.047</b>	200	1.6	0.230	84	2.3	0.141
	Res	12	46			120			37		
	Total	17									
Xea-xanthin	Temp	2	3200	1.9	0.179	1100	3.6	0.060	1700	8.5	<b>0.005</b>
	Light	1	24000	14	<b>0.003</b>	1600	5.2	<b>0.046</b>	229	1.2	0.309
	TexLi	2	1700	1.0	0.444	1000	3.3	0.076	226	1.1	0.363
	Res	12	1700			310			197		
	Total	17									
Lutein	Temp	2	52	2	0.126	65	0.7	0.510	880	4.2	<b>0.034</b>
	Light	1	227	11	<b>0.006</b>	490	5.2	<b>0.043</b>	14	0.1	0.809
	TexLi	2	13	0.6	0.603	90	1.0	0.401	21	0.1	0.916
	Res	12	21			94			212		
	Total	17									
Chl a	Temp	2	790000	1.1	0.349	16000000	29	<b>≤ 0.001</b>	8900000	4.7	<b>0.031</b>
	Light	1	1300000	1.9	0.195	28000000	4.9	<b>0.048</b>	100000	0.1	0.815
	TexLi	2	740000	1.0	0.379	420000	0.1	<b>0.927</b>	1400000	0.7	0.500
	Res	12	710000			5700000			1900000		
	Total	17									
Beta-carotene	Temp	2	1324	2.3	0.137	120000	19	<b>0.001</b>	10146	7.6	<b>0.010</b>
	Light	1	573	1.0	0.337	7000	1.1	0.301	217	0.2	0.700
	TexLi	2	431	0.8	0.492	1200	0.2	0.813	1111	0.8	0.454
	Res	12	571			6100			1335		
	Total	17									