

Seagrass *Halophila ovalis* is affected by light quality across different life history stages

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Table S1: The mean (\pm SE) values of all *H.ovalis* adult response variables to each light quality treatment.

	<u>Control</u>	<u>Blue</u>	<u>Green</u>	<u>Yellow</u>	<u>Red</u>
Effective quantum yield (PSII)	0.73 (0.01)	0.75 (0.01)	0.76 (0.008)	0.70 (0.01)	0.67 (0.02)
Photosynthetic efficiency (α)	0.27 (0.007)	0.38 (0.01)	0.27 (0.005)	0.24 (0.004)	0.26 (0.01)
E_k	168 (19)	151 (7.2)	106 (11)	187 (29)	199 (16)
ETR_{max}	56 (6.7)	45 (5.7)	29 (2.8)	44 (7.1)	53 (2.6)
Chl <i>a</i> ($\mu\text{g g}^{-1}$ fresh wt)	375 (60)	299 (68)	409 (13)	297 (52)	374 (133)
Chl <i>b</i> ($\mu\text{g g}^{-1}$ fresh wt)	269 (39)	222 (48)	313 (10)	232 (36)	290 (110)
Xanthophylls ($\mu\text{g g}^{-1}$ fresh wt)	58 (5)	49 (4)	60 (2)	53 (6)	55 (17)
Leaf sugars (% DW)	6.4 (0.6)	5.0 (0.9)	4.0 (0.3)	6.6 (1.6)	5.6 (1.0)
Leaf starch (% DW)	1.0 (0.2)	0.9 (0.1)	0.7 (0.1)	0.9 (0.1)	1.0 (0.1)
Rhizome sugars (% DW)	0.7 (0.1)	0.42 (0.02)	0.54 (0.02)	0.67 (0.04)	0.61 (0.09)
Rhizome starch (% DW)	13.3 (1.9)	13.8 (0.6)	11.3 (1.5)	16.8 (3.0)	13.7 (0.6)
Total biomass (mg DW)	364 (19)	182 (42)	272 (30)	204 (40)	283 (54)
Above-below ground biomass (ratio)	0.39 (0.08)	0.42 (0.14)	0.53 (0.16)	0.58 (0.16)	0.50 (0.10)
Relative growth rate (mg DW apex ⁻¹ d ⁻¹)	0.04 (0.001)	0.01 (0.008)	0.03 (0.003)	0.02 (0.006)	0.03 (0.005)
Ramet productivity (mg DW apex ⁻¹ d ⁻¹)	0.57 (0.07)	0.43 (0.08)	0.39 (0.03)	0.29 (0.03)	0.35 (0.02)
Root productivity (mg DW apex ⁻¹ d ⁻¹)	0.16 (0.02)	0.07 (0.003)	0.10 (0.01)	0.07 (0.003)	0.11 (0.009)
Rhizome productivity (mg DW apex ⁻¹ d ⁻¹)	0.26 (0.02)	0.15 (0.008)	0.14 (0.009)	0.11 (0.02)	0.13 (0.005)
Leaf productivity (mg DW apex ⁻¹ d ⁻¹)	0.14 (0.02)	0.07 (0.008)	0.12 (0.01)	0.09 (0.01)	0.15 (0.03)
Shoot production (shoots apex ⁻¹ d ⁻¹)	0.25 (0.03)	0.21 (0.004)	0.15 (0.03)	0.23 (0.06)	0.26 (0.05)
Shoot mortality (shoots apex ⁻¹ d ⁻¹)	0.07 (0.01)	0.08 (0.020)	0.03 (0.01)	0.08 (0.03)	0.06 (0.02)
Leaf density (No. leaves m ²)	815 (66)	457 (166)	480 (940)	535 (84)	749 (74)
Leaf area (cm ²)	8.15 (2.2)	9.50 (2.2)	9.82 (1.2)	6.96 (1.1)	8.09 (1.4)
Petiole length (cm)	1.9 (0.14)	2.0 (0.12)	2.3 (0.16)	2.1 (0.04)	1.9 (0.20)
Root length (cm)	8.73 (0.5)	7.60 (0.1)	9.03 (1.0)	8.96 (0.5)	7.28 (0.3)
Internode length (cm)	3.81 (0.3)	3.84 (0.05)	3.95 (0.49)	3.57 (0.17)	3.51 (0.22)
Rhizome extension rate (cm apex ⁻¹ d ⁻¹)	1.11 (0.09)	0.78 (0.10)	0.69 (0.11)	0.59 (0.04)	0.70 (0.07)
Branching (No. secondary branches)	7.0 (1.2)	2.7 (0.8)	2.7 (0.63)	4.0 (1.2)	8.0 (1.3)
Flowering	0.01 (0.007)	0.02 (0.008)	0.03 (0.01)	0.02 (0.01)	0.02 (0.006)

Table S2: Significant ($p < 0.05$) results from PERMANOVA analysis examining the effect of light quality (one fixed factor) on response variables in the seed and seedling experiments.

MAIN-TEST PERMANOVA	df	MS	<i>F</i>	Unique perms	p
Seed germination	19	3.54	11.01	999	< 0.01
Seedling survival	11		5.90	144	< 0.05
PAIR-WISE PERMANOVA TESTS					
Seed germination					
Control, Blue				25	< 0.05
Control, Green				35	< 0.05
Yellow, Blue				18	< 0.05
Yellow, Green				25	< 0.05
Red, Blue				25	< 0.05
Red, Green				25	< 0.05
Seedling survival					
Control, Red				8	< 0.05

Table S3: GPS co-ordinates for the spectral profiles at each field site displayed in Fig. 2 in the main text.

	Latitude ($^{\circ}$ S)	Longitude ($^{\circ}$ E)
Estuary mouth	32.14567	115.45436
Upper estuary	32.03557	115.85633
Oceanic	32.12174	115.66561

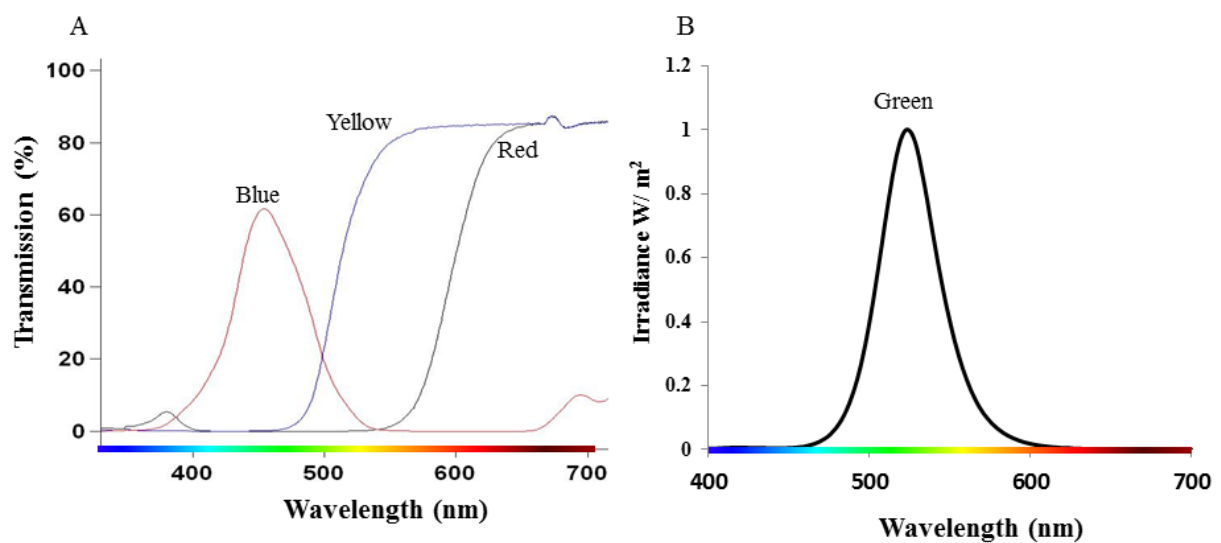


Figure S1. Transmission spectra (%) of the Rosco heat resistant gel filter sheets used to create blue ('Night Blue' peak transmission $\lambda=451$ nm), red ('Fire' peak transmission $\lambda=673$ nm) and yellow

(‘Canary Yellow’ peak transmission $\lambda=595$ nm) light quality treatments (A). The peak spectral output of the LED used to create the green ($\lambda=522$ nm) light quality treatment (B).

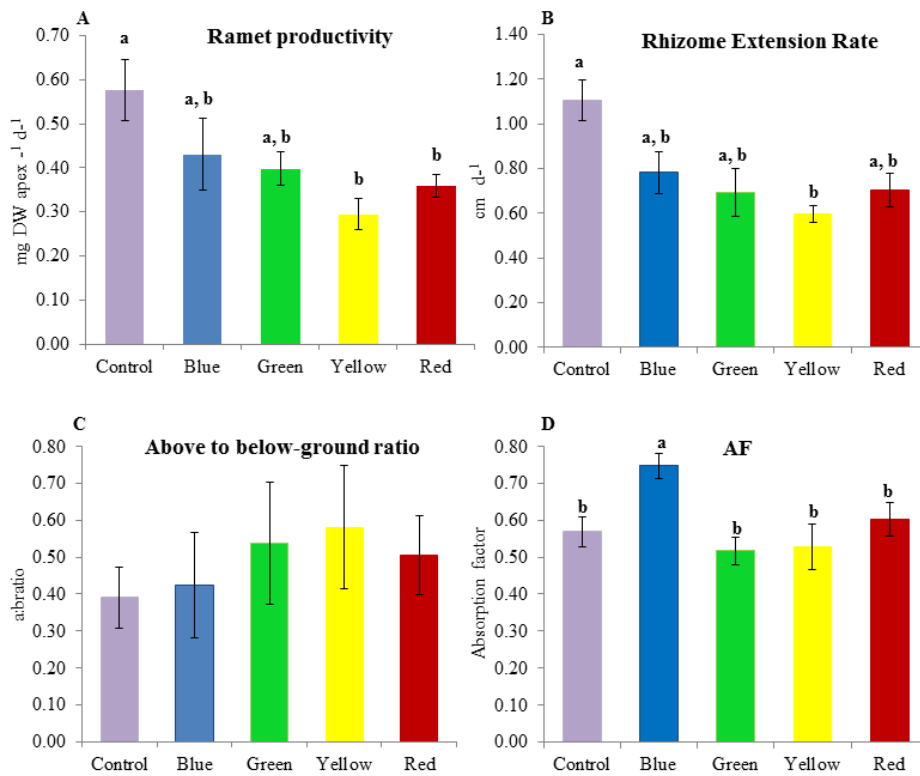


Figure S2. *H. ovalis* ramet productivity (A), rhizome extension rate (B), above-below ground ratio (C), and absorption factor (AF) in response to monochromatic and full-spectrum light. Different lower case letters denote significant differences ($p < 0.05$) among mean (\pm SE) values.