

Article

Supplementary Materials: Supplementary Light with Increased Blue Fraction Accelerates Emergence and Improves Development of the Inflorescence in *Aechmea*, *Guzmania* and *Vriesea*

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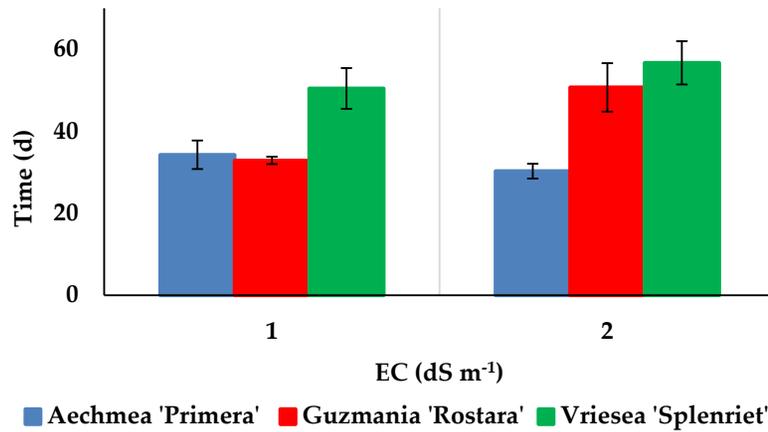


Figure S1. Time to inflorescence emergence following acetylene treatment as a function of nutrient solution electrical conductivity (EC) in the three species under study. Data of the four light treatments were pooled. Sixteen replicate plants were assessed per treatment. Error bars represent SEM.

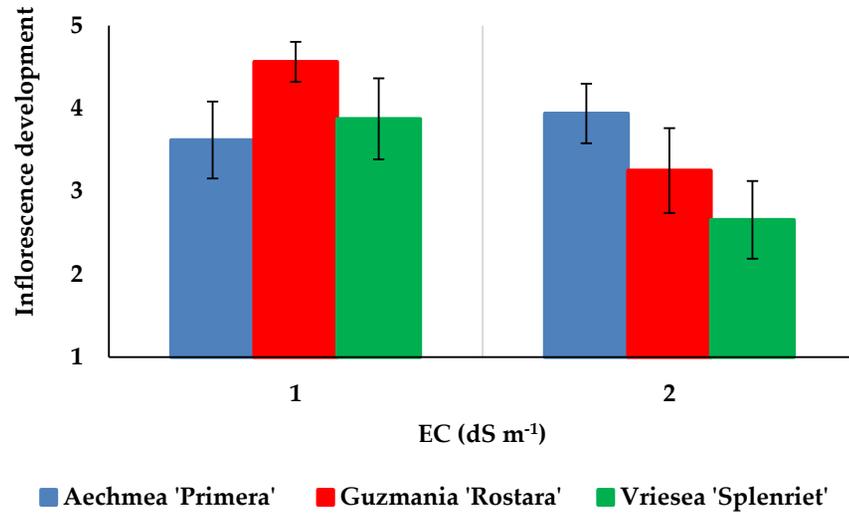


Figure S2. Inflorescence development as a function of nutrient solution electrical conductivity (EC) in the three species under study. Data of the four light treatments were pooled. The scale (1 to 5) characterizing inflorescence development is provided in Figure 1. Sixteen replicate plants were assessed per treatment. Error bars represent SEM.

Table S1. Effect of supplementary light and nutrient solution electrical conductivity (EC) on dry mass partitioning of the three species under study. The former treatment included control (no supplementary light), R90B10 [90 % red (R) and 10 % blue (B)], R80B20 (80 % R and 20 % B), and R70B30 (70 % R and 30 % B), while the latter 1 and 2 dS m⁻¹. In traits, where the interaction of the two factors (light regime, EC) was significant, different letters indicate significant differences. FMR, flower mass ratio; LMR, leaf mass ratio; RMR, root mass ratio.

Species		<i>Aechmea</i> 'Primera'			<i>Guzmania</i> 'Rostara'			<i>Vriesea</i> 'Splendret'		
EC (dS m ⁻¹)	Light regime	LMR (g g ⁻¹)	FMR (g g ⁻¹)	RMR (g g ⁻¹)	LMR (g g ⁻¹)	FMR (g g ⁻¹)	RMR (g g ⁻¹)	LMR (g g ⁻¹)	FMR (g g ⁻¹)	RMR (g g ⁻¹)
1	Control	0.85a	0.04	0.11b	0.62b	0.20	0.18	0.76	0.08	0.17
	R90B10	0.73cd	0.13	0.14a	0.57b	0.25	0.18	0.72	0.13	0.15
	R80B20	0.63e	0.21	0.16a	0.56b	0.24	0.20	0.66	0.18	0.16
	R70B30	0.68de	0.20	0.12b	0.57b	0.28	0.16	0.66	0.19	0.15
2	Control	0.81ab	0.08	0.11b	0.79a	0.05	0.16	0.88	0.00	0.12
	R90B10	0.78bc	0.12	0.10b	0.74a	0.10	0.16	0.83	0.05	0.12
	R80B20	0.69de	0.22	0.09b	0.60b	0.23	0.17	0.71	0.12	0.17
	R70B30	0.70de	0.20	0.10b	0.60b	0.24	0.16	0.77	0.11	0.12
P value	Light regime	0.0001**	0.0001**	0.13ns	0.003**	0.001**	0.41ns	0.005**	0.013*	0.34ns
	EC	0.07ns	0.32ns	0.0001**	0.0003**	0.003**	0.03*	0.0003**	0.002**	0.043*
	Light regime × EC	0.04*	0.39ns	0.001**	0.045*	0.09ns	0.39ns	0.536ns	0.98ns	0.32ns

ns= non-significant. Significance at the 0.05 probability level is indicated by *, and significance at the 0.01 probability level by **. #

Table S2. Effect of supplementary light and nutrient solution electrical conductivity (EC) on leaf osmotic potential, photosynthetic pigment content and SPAD value of *Aechmea* 'Primera' plants. The former treatment included control (no supplementary light), R90B10 [90 % red (R) and 10 % blue (B)], R80B20 (80 % R and 20 % B), and R70B30 (70 % R and 30 % B), while the latter 1 and 2 dS m⁻¹. In traits, where the interaction of the two factors (light regime, EC) was significant, different letters indicate significant differences.

EC (dS m ⁻¹)	Light regime	Osmotic potential (MPa)	Chlorophyll content (mg g ⁻¹)	Carotenoid content (mg g ⁻¹)	SPAD value
1	Control	-0.85bc	65.9	3.63	60.1
	R90B10	-0.89bc	59.8	5.74	58.2
	R80B20	-0.72ab	61.6	4.99	54.2
	R70B30	-0.63a	71.2	2.17	86.5
2	Control	-0.86bc	62.5	4.79	64.3
	R90B10	-1.06c	54.5	7.17	58.2
	R80B20	-1.06c	54.5	6.90	54.9
	R70B30	-1.06c	66.4	3.86	71.9
P value	Light regime	0.18ns	0.0001**	0.0001**	0.0002**

EC	0.0004**	0.008**	0.003**	0.51ns
Light regime × EC	0.04*	0.57ns	0.92ns	0.29ns

ns= non-significant. Significance at the 0.05 probability level is indicated by *, and significance at the 0.01 probability level by **.

Table S3. Effect of supplementary light and nutrient solution electrical conductivity (EC) on leaf osmotic potential, photosynthetic pigment content and SPAD value of *Guzmania* 'Rostara' plants. The former treatment included control (no supplementary light), R90B10 [90 % red (R) and 10 % blue (B)], R80B20 (80 % R and 20 % B), and R70B30 (70 % R and 30 % B), while the latter 1 and 2 dS m⁻¹. In traits, where the interaction of the two factors (light regime, EC) was significant, different letters indicate significant differences.

EC (dS m ⁻¹)	Light regime	Osmotic potential (MPa)	Chlorophyll content (mg g ⁻¹)	Carotenoid content (mg g ⁻¹)	SPAD value
1	Control	-0.33	40.6	6.55	48.3
	R90B10	-0.36	46.5	6.12	49.9
	R80B20	-0.34	31.9	7.15	45.4
	R70B30	-0.32	47.6	8.73	52.8
2	Control	-0.38	43.5	7.62	50.7
	R90B10	-0.49	40.5	7.07	53.5
	R80B20	-0.44	39.9	7.80	53.4
	R70B30	-0.40	33.8	6.39	57.1
<i>P</i> value	Light regime	0.07ns	0.59ns	0.69ns	0.013*
	EC	0.0005**	0.34ns	0.93ns	0.001**
	Light regime × EC	0.45ns	0.25ns	0.38ns	0.32ns

ns= non-significant. Significance at the 0.05 probability level is indicated by *, and significance at the 0.01 probability level by **.

Table S4. Effect of supplementary light and nutrient solution electrical conductivity (EC) on leaf osmotic potential, photosynthetic pigment content and SPAD value of *Vriesea* 'Splendret' plants. The former treatment included control (no supplementary light), R90B10 [90 % red (R) and 10 % blue (B)], R80B20 (80 % R and 20 % B), and R70B30 (70 % R and 30 % B), while the latter 1 and 2 dS m⁻¹. In traits, where the interaction of the two factors (light regime, EC) was significant, different letters indicate significant differences.

EC (dS m ⁻¹)	Light regime	Osmotic potential (MPa)	Chlorophyll content (mg g ⁻¹)	Carotenoid content (mg g ⁻¹)	SPAD value
1	Control	-0.16	33.3	5.88	53.6ab
	R90B10	-0.14	30.6	6.27	52.3abc
	R80B20	-0.09	41.0	7.53	48.4bc
	R70B30	-0.16	36.2	6.77	55.8ab
2	Control	-0.37	29.7	6.49	43.1c
	R90B10	-0.16	39.1	7.22	44.1c
	R80B20	-0.19	35.0	6.77	50.1bc
	R70B30	-0.20	34.9	7.26	61.4a
<i>P</i> value	Light regime	0.11ns	0.19ns	0.25ns	0.009**
	EC	0.003**	0.82ns	0.37ns	0.19ns
	Light regime × EC	0.09ns	0.25ns	0.36ns	0.05*

ns= non-significant. Significance at the 0.05 probability level is indicated by *, and significance at the 0.01 probability level by **.

Table S5. Effect of supplementary light and nutrient solution electrical conductivity (EC) on leaf photosynthetic functioning of *Aechmea* 'Primera' plants. The former treatment included control (no supplementary light), R90B10 [90 % red (R) and 10 % blue (B)], R80B20 (80 % R and 20 % B), and R70B30 (70 % R and 30 % B), while the latter 1 and 2 dS m⁻¹. Four replicates were assessed per treatment. In traits, where the interaction of the two factors (light regime, EC) was significant, different letters indicate significant differences.

EC (dS m ⁻¹)	Light regime	F _v /F _m	NPQ	PI _{ABS}	F _v '/F _m '-L1	F _v '/F _m '-L2	F _v '/F _m '-L3	F _v '/F _m '-L4	F _v '/F _m '-L5
1	Control	0.822	2.267	2.18	0.360	0.270	0.233	0.185	0.110
	R90B10	0.8	2.26	1.911	0.228	0.198	0.178	0.138	0.088
	R80B20	0.81	1.82	2.191	0.323	0.243	0.210	0.170	0.93
	R70B30	0.817	1.94	2.239	0.363	0.258	0.225	0.183	0.113
2	Control	0.822	2.217	2.029	0.360	0.273	0.240	0.195	0.115
	R90B10	0.795	2.112	1.305	0.405	0.278	0.230	0.168	0.090
	R80B20	0.81	1.802	1.827	0.390	0.278	0.245	0.195	0.100
	R70B30	0.81	1.627	2.118	0.368	0.243	0.208	0.163	0.093

P value	Light regime	0.005**	0.068ns	0.212ns	0.899ns	0.569ns	0.689ns	0.526ns	0.637ns
	EC	0.324ns	0.593ns	0.261ns	0.063ns	0.382ns	0.490ns	0.735ns	0.919ns
	Light regime × EC	0.769ns	0.971ns	0.907ns	0.287ns	0.646ns	0.819ns	0.925ns	0.949ns

ns= non-significant. Significance at the 0.05 probability level is indicated by *, and significance at the 0.01 probability level by **.

F_v/F_m, ratio of variable to maximum fluorescence; NPQ, non-photochemical quenching; PI_{ABS}, performance index for the photochemical activity;

F_v'/F_m'-L1 to L5 are related to measuring photosystem II efficiency under 100, 200, 300, 500, and 1000 μmol m⁻² s⁻¹ light intensity, respectively.

Table S6. Effect of supplementary light and nutrient solution electrical conductivity (EC) on leaf photosynthetic functioning of *Guzmania* 'Rostara' plants. The former treatment included control (no supplementary light), R90B10 [90 % red (R) and 10 % blue (B)], R80B20 (80 % R and 20 % B), and R70B30 (70 % R and 30 % B), while the latter 1 and 2 dS m⁻¹. Four replicates were assessed per treatment. In traits, where the interaction of the two factors (light regime, EC) was significant, different letters indicate significant differences.

EC (dS m ⁻¹)	Light regime	F _v /F _m	NPQ	PI _{ABS}	F _v '/F _m '-L1	F _v '/F _m '-L2	F _v '/F _m '-L3	F _v '/F _m '-L4	F _v '/F _m '-L5
1	Control	0.845	2.595	1.52bc	0.335	0.310	0.280	0.168	0.068
	R90B10	0.835	1.762	1.97ab	0.360	0.320	0.313	0.235	0.103
	R80B20	0.85	1.355	2.31a	0.270	0.233	0.233	0.203	0.117
	R70B30	0.855	2.272	1.15a	0.368	0.330	0.318	0.220	0.098
2	Control	0.847	1.852	1.93ab	0.335	0.288	0.243	0.188	0.043
	R90B10	0.837	1.522	1.17c	0.303	0.263	0.255	0.170	0.078
	R80B20	0.837	1.345	2.03ab	0.248	0.193	0.183	0.158	0.100
	R70B30	0.84	1.447	2.02ab	0.245	0.190	0.183	0.168	0.110
P value	Light regime	0.447ns	0.002**	0.0625*	0.007**	0.011*	0.073ns	0.145ns	0.001**
	EC	0.101ns	0.039*	0.11ns	0.009**	0.002**	0.001**	0.0005**	0.079ns
	Light regime × EC	0.138ns	0.426ns	0.02*	0.092ns	0.128ns	0.206ns	0.937ns	0.245ns

ns= non-significant. Significance at the 0.05 probability level is indicated by *, and significance at the 0.01 probability level by **.

F_v/F_m, ratio of variable to maximum fluorescence; NPQ, non-photochemical quenching; PI_{ABS}, performance index for the photochemical activity;

F_v'/F_m'-L1 to L5 are related to measuring photosystem II efficiency under 100, 200, 300, 500, and 1000 μmol m⁻² s⁻¹ light intensity, respectively. #

Table S7. Effect of supplementary light and nutrient solution electrical conductivity (EC) on leaf photosynthetic functioning of *Vriesea* 'Splendret' plants. The former treatment included control (no supplementary light), R90B10 [90 % red (R) and 10 % blue (B)], R80B20 (80 % R and 20 % B), and R70B30 (70 % R and 30 % B), while the latter 1 and 2 dS m⁻¹. Four replicates were assessed per treatment. In traits, where the interaction of the two factors (light regime, EC) was significant, different letters indicate significant differences.

EC (dS m ⁻¹)	Light regime	F _v /F _m	NPQ	PI _{ABS}	F _v '/F _m '-L1	F _v '/F _m '-L2	F _v '/F _m '-L3	F _v '/F _m '-L4	F _v '/F _m '-L5
1	Control	0.807	2.2	0.91	0.218	0.208a	0.222	0.178	0.063
	R90B10	0.73	2.01	0.888	0.178	0.155a-c	0.183	0.168	0.070

	R80B20	0.807	1.97	0.87	0.123	0.085c	0.095	0.095	0.063
	R70B30	0.842	1.64	1.38	0.158	0.120bc	0.135	0.140	0.110
2	Control	0.812	1.79	1.418	0.150	0.103c	0.107	0.100	0.060
	R90B10	0.74	1.81	0.489	0.203	0.180ab	0.200	0.183	0.107
	R80B20	0.84	2.14	0.789	0.160	0.108c	0.083	0.085	0.063
	R70B30	0.792	1.98	0.747	0.128	0.093c	0.103	0.105	0.075
	Light regime	0.012*	0.69ns	0.205ns	0.029*	0.012*	0.007**	0.044*	0.213ns
<i>P</i> value	EC	0.973ns	0.83ns	0.384ns	0.474ns	0.094ns	0.033*	0.076ns	0.694ns
	Light regime × EC	0.462ns	0.15ns	0.149ns	0.061ns	0.032*	0.095ns	0.232ns	0.201ns

ns= non-significant. Significance at the 0.05 probability level is indicated by *, and significance at the 0.01 probability level by **.

F_v/F_m , ratio of variable to maximum fluorescence; NPQ, non-photochemical quenching; PI_{ABS} , performance index for the photochemical activity;

F_v'/F_m' -L1 to L5 are related to measuring photosystem II efficiency under 100, 200, 300, 500, and 1000 $\mu\text{mol m}^{-2} \text{s}^{-1}$ light intensity, respectively.