Oikos

OIK-07195

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Appendix 1

Table A1. Degrees of freedom (df) and p-values for *S. fallax* traits. L = light, W = water, D = density, L × W = interaction of light and water, L × D = interaction of light and density, M × D = interaction of moisture and density while L × W × D = interaction of light, water and density.

Treatments	DF	Respiration	F_v/F_m	Vertical growth	Total biomass	Capitulum mass	Branch mass	Stem mass	%N	%C	C:N
L	1	**9.9 , 0.0018**	**90.1, < 0.0001**	**223.7, < 0.0001**	0.03, 0.8680	3.0, 0.0834	1.6, 0.2026	0.8, 0.4	2.1, 0.155	0.7, 0.4212	2.0, 0.1661
W	1	**33.7 , < 0.0001**	**256.0, < 0.0001**	**52.1, < 0.0001**	**7.8, 0.0057**	**4.3, 0.0379**	**30.14, < 0.0001**	**27.6, < 0. 0001**	1.7, 0.1924	1.1, 0.2917	0.9, 0.3495
D	2	**133.7, < 0.0001**	**4.6, 0.0103**	1.7, 0.1829	**1.9, 0.1508**	2.5, 0.0765	3.0, 0.0527	0.5, 0.5775	-	-	-
L*W	1	**13.4, 0.0003**	**79.4, < 0.0001**	**14.2, 0.0002**	3.5, 0.0643	**15.0, 0.0001**	0.06, 0.8093	0.09, 0.7639	0.01, 0.9163	1.6, 0.2074	1.6, 0.2159
L*D	2	**5.6, 0.0040**	**14.2, < 0.0001**	0.1, 0.8775	**4.5, 0.0124**	**25.7, < 0.0001**	0.6, 0.9405	0.2, 0.8244	-	-	-
W*D	2	2.9, 0.0565	**20.0, < 0.0001**	**12.5, < 0.0001**	1.5, 0.2265	**4.6, 0.0103**	1.4, 0.2368	0.9, 0.4171	-	-	-
L*W*D	2	0.4, 0.6338	**12.6, < 0.0001**	0.2, 0.5022	0.5, 0.5755	0.3, 0.6892	0.5, 0.5703	0.7, 0.4938	-	-	-

Note that density was excluded from the model used to explore the treatment effects on tissue chemistry (C, N, C:N)

Table A2. Analyses of vertical growth and biomass allocations relative to the total biomass for *S. fallax*. Ht = vertical growth, cap = capitulum mass, branch = branch mass, stem = stem mass, Tmass = total biomass.

Treatments	DF	Ht:Tmass	Cap:Tmass	Branch:Tmass	Stem:Tmass
L	1	**35.6, <.0001**	2.6, 0.1087	3.6, 0.0582	2.3, 0.1304
W	1	0.03, 0.8673	**32.4, <.0001**	**41.8, <.0001**	**13.5, 0.0003**
D	2	**4.0, 0.0192**	1.1, 0.3102	2.2, 0.1104	**14.3, < 0.0001**
L*W	1	0.3, 0.5976	**4.8, 0.0287**	3.0, 0.0849	0.4, 0.5342
L*D	2	**5.5, 0.0047**	**11.4, < 0.0001**	3.8, 0.0237	**12.8, < 0.0001**
W*D	2	6.7, 0.0015	1.7, 0.1748	**4.9, 0.0076**	1.9, 0.1449
L*W*D	2	0.3, 0.7344	0.6, 0.5600	0.6, 0.5651	1.1, 0.3210

Caution should be exercised when comparing the effect of the treatments on allocation in table 2 relative to table 1. This is because the denominators e.g. (capitulum mass) and the numerators (total biomass) change invariably across the treatment combinations, which can lead to inflated errors (Poorter and Sack 2012).

Table A3. Degrees of freedom (df) and p-values for *S. magellanicum* traits. L = light, W = water, D = density, L × W = interaction of light and water, L × D = interaction of light and density, W × D = interaction of water and density while L × W × D = interaction of light, water and density.

Treatments	DF	Respiration	F_v/F_m	Vertical growth	Total biomass	Capitulum mass	Branch mass	Stem mass	%N	%C	C:N
L	1	**5.8, 0.0166**	2.8, 0.09	**226.6, <0.0001**	**6.2, 0.0133**	0.5, 0.4658	**10.3, 0.0015**	**43.1, <0.0001**	**20.5, 0.0001**	0.2, 0.6251	**5.1, 0.0294**
W	1	**61.3, <0.0001**	**110.9, <0.0001**	**106.7, <0.0001**	**47.4, <0.0001**	**23.1, <0.0001**	**144.8, <0.0001**	**53.0, <0.0001**	**13.2, 0.0009**	0.03, 0.8561	3.0, 0.0932
D	2	**110.8, <0.0001**	**19.7, <0.0001**	**9.2, 0.0001**	**16.3, <0.0001**	1.9, 0.1459	**30.0, <0.0001**	**11.8, <0.0001**	-	-	-
L*W	1	0.9, 0.3491	0.4, 0.5151	2.7, 0.0955	0.2, 0.6496	**13.2, 0.0003**	**9.5, 0.0022**	0.1, 0.6562	3.1, 0.05	2.0, 0.1694	2.4, 0.1262
L*D	2	1.7, 0.1781	**4.2, 0.0162**	**9.9, 0.0001**	1.6, 0.1966	**18.5, <0.0001**	**9.5, 0.0001**	**13.2, <0.0001**	-	-	-
W*D	2	**14.8, <0.0001**	**4.2, 0.0158**	**3.4, 0.0328**	**8.0, 0.0004**	0.7, 0.4938	**14.3, <0.0001**	**7.0, 0.0011**	-	-	-
L*W*D	2	2.7, 0.0773	**4.2, 0.0145**	**5.3, 0.0146**	1.4, 0.2493	**4.7, 0.0097**	0.9, 0.4144	0.7, 0.4944	-	-	-

Note that density was excluded from the model used to explore the treatment effects on tissue chemistry (C, N, C:N)

Table A4. Analyses of vertical growth and biomass allocations relative to the total biomass for *S. magellanicum*. Ht = vertical growth, cap = capitulum mass, branch = branch mass, stem = stem mass, Tmass = total biomass.

Treatments	DF	Ht:Tmass	Cap:Tmass	Branch:Tmass	Stem:Tmass
L	1	**17.1, <.0001**	**9.7, 0.0021**	**5.1, 0.0251**	**54.8, <.0001**
W	1	**8.8, 0.0032**	**154.2, <.0001**	**186.5, <.0001**	3.6, 0.0592
D	2	**31.2, <.0001**	**26.1, <.0001**	**24.7, <.0001**	**31.7, <.0001**
L*W	1	0.05, 0.8186	**26.0, <.0001**	**27.6, <.0001**	0.0, 0.9935
L*D	2	**3.4, 0.0350**	**33.8, <.0001**	**26.3, <.0001**	**35.02, <.0001**
W*D	2	**6.2, 0.0021**	**14.6, <.0001**	**11.3, <.0001**	0.1, 0.9234
L*W*D	2	0.4, 0.6826	**4.8, 0.0082**	0.2, 0.8255	0.6, 0.5308

Caution should be exercised when comparing the effect of the treatments on allocation in table 4 relative to table 3. This is because the denominators e.g. (capitulum mass) and the numerators (total biomass) change invariably across the treatment combinations, which can lead to inflated errors (Poorter and Sack 2012).

Table A5. Principal component loadings

	PC1	PC2	PC3
Respiration	-0.352		0.213
F_v/F_m	-0.264	0.214	0.824
Total biomass	-0.539	-0.149	-0.181
Vertical growth	-0.142	0.688	
Capitulum mass	-0.247	-0.658	0.27
Branch mass	-0.483	0.161	-0.339
Stem mass	-0.449		-0.231

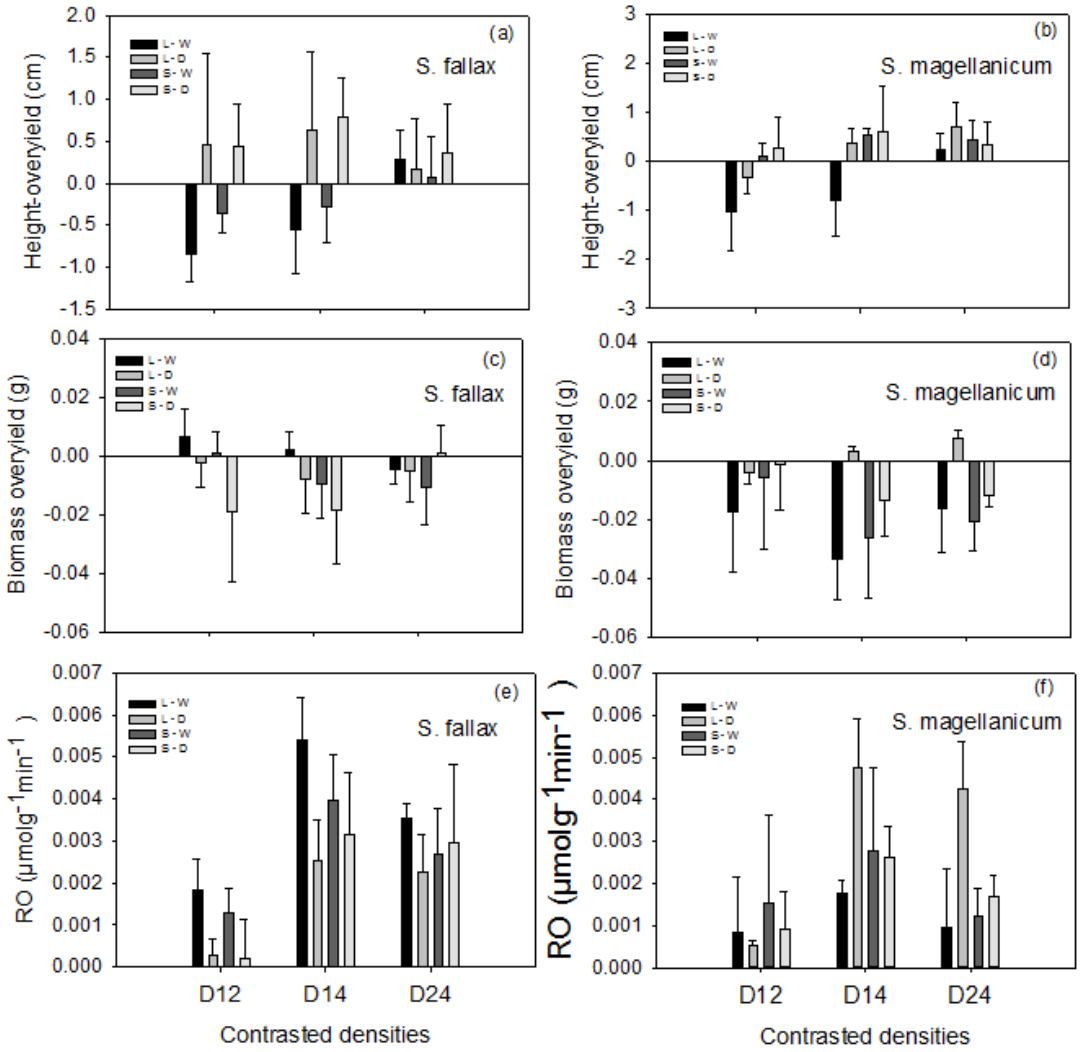

Figure A1a–f. Difference between mean vertical growth rate, total biomass, and respiration of *S. fallax* and *S. magellanicum* grown in isolation under different densities and different treatments. D12 = over-yielding between individuals in density 1 and density 2, D14 = difference between individuals in density 1 and density 4. D24 = over-yielding between density 2 and density 4. L – W = light and well-watered treatment, L – D = light and drought treatment, S – W = shade and well-watered and L – D = shade and drought treatment.

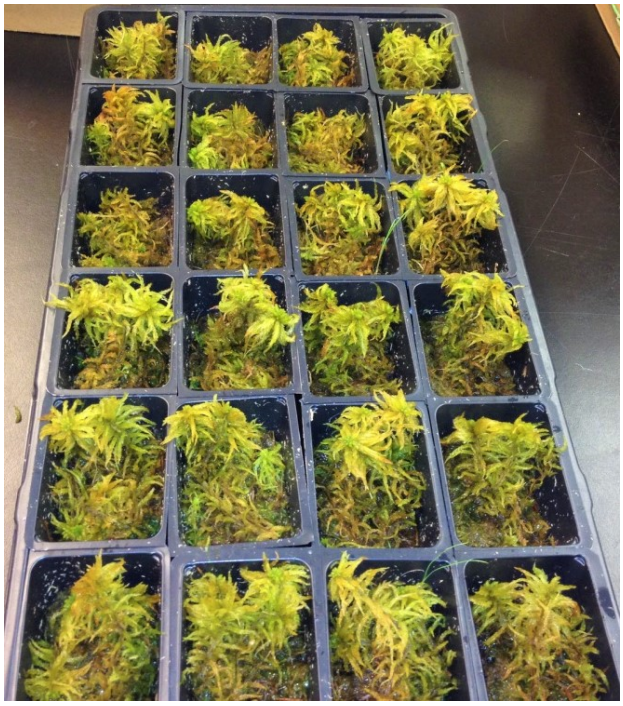

Figure A2. An example of the pots' layout.

Reference

Poorter, H. and Sack, L. 2012. Pitfalls and possibilities in the analysis of biomass allocation patterns in plants. – Front. Plant Sci. 3: 259.