

Supplementary Material

Understanding the Margin Squeeze: Differentiation in Fitness-related Traits Between Central and Trailing Edge Populations of *Corallina officinalis*

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 6 **Table S1:** Statistical differences summarised for figures 1-3. Significant statistical differences
 7 are highlighted in yellow. UK represents the central populations or conditions, respectively. SP
 8 represents the southern populations or conditions, respectively.

Parameter	Population vs. Population		Time point vs. time point		Test	P-value	df
Net Production	UK populations		pre-experimental	UK conditions	Shapiro-Wilk	0.040	6
	SP populations		pre-experimental	SP conditions	Shapiro-Wilk	0.527	6
	UK populations		after UK conditions		Shapiro-Wilk	0.293	6
	SP populations		after SP conditions		Shapiro-Wilk	0.208	6
	UK populations		after SP conditions		Shapiro-Wilk	0.013	6
	SP populations		after UK conditions		Shapiro-Wilk	0.973	6
Reproduction	UK populations		pre-experimental	UK conditions	Shapiro-Wilk	0.445	6

	SP populations		pre-experimental	SP conditions	Shapiro-Wilk	0.422	6
	UK populations		after UK conditions		Shapiro-Wilk	0.829	6
	SP populations		after SP conditions		Shapiro-Wilk	0.320	6
	UK populations		after SP conditions		Shapiro-Wilk	0.933	6
	SP populations		after UK conditions		Shapiro-Wilk	0.740	6
Calcification light	UK populations		pre-experimental	UK conditions	Shapiro-Wilk	0.838	6
	SP populations		pre-experimental	SP conditions	Shapiro-Wilk	0.146	6
	UK populations		after UK conditions		Shapiro-Wilk	0.814	6
	SP populations		after SP conditions		Shapiro-Wilk	0.692	6
	UK populations		after SP conditions		Shapiro-Wilk	0.826	6
	SP populations		after UK conditions		Shapiro-Wilk	0.539	6
Calcification dark	UK populations		pre-experimental	UK conditions	Shapiro-Wilk	0.480	6
	SP populations		pre-experimental	SP conditions	Shapiro-Wilk	0.995	6
	UK populations		after UK conditions		Shapiro-Wilk	0.856	6
	SP populations		after SP conditions		Shapiro-Wilk	0.061	6
	UK populations		after SP conditions		Shapiro-Wilk	0.892	6
	SP populations		after UK conditions		Shapiro-Wilk	0.181	6
$P_{\max}$	UK population 1		after UK conditions		Shapiro-Wilk	0.152	3
			after SP conditions		Shapiro-Wilk	0.322	3
$C_{\max}$			after UK conditions		Shapiro-Wilk	0.870	3
			after SP conditions		Shapiro-Wilk	0.651	3
$P_{\max}$	UK population 2		after UK conditions		Shapiro-Wilk	0.558	3
			after SP conditions		Shapiro-Wilk	0.352	3
$C_{\max}$			after UK conditions		Shapiro-Wilk	0.479	3

			after SP conditions		Shapiro-Wilk	0.226	3
P _{max}	SP population 1		after UK conditions		Shapiro-Wilk	0.745	3
			after SP conditions		Shapiro-Wilk	0.505	3
C _{max}			after UK conditions		Shapiro-Wilk	0.383	3
			after SP conditions		Shapiro-Wilk	0.641	3
P _{max}	SP population 2		after UK conditions		Shapiro-Wilk	0.674	3
			after SP conditions		Shapiro-Wilk	0.932	3
C _{max}			after UK conditions		Shapiro-Wilk	0.097	3
			after SP conditions		Shapiro-Wilk	0.165	3
Net Production	all populations	all populations	pre-experimental	pre-experimental	Levene's Test	<0.001	6
Respiration	all populations	all populations	pre-experimental	pre-experimental	Levene's Test	0.181	6
Calcification light	all populations	all populations	pre-experimental	pre-experimental	Levene's Test	0.479	6
Calcification dark	all populations	all populations	pre-experimental	pre-experimental	Levene's Test	0.109	6
Net Production	all populations	all populations	after all conditions	after all conditions	Levene's Test	0.034	6
Respiration	all populations	all populations	after all conditions	after all conditions	Levene's Test	0.039	6
Calcification light	all populations	all populations	after all conditions	after all conditions	Levene's Test	0.129	6
Calcification dark	all populations	all populations	after all conditions	after all conditions	Levene's Test	0.041	6
P _{max}	UK1	UK2	after UK/SP conditions	after UK/SP conditions	Levene's Test	0.338	8
C _{max}	UK1	UK2	after UK/SP conditions	after UK/SP conditions	Levene's Test	0.325	8
P _{max}	SP1	SP2	after UK/SP conditions	after UK/SP conditions	Levene's Test	0.253	8
C _{max}	SP1	SP2	after UK/SP conditions	after UK/SP conditions	Levene's Test	0.736	8
Net Production	UK1	UK2	pre-experimental	pre-experimental	Kruskal-Wallis	0.757	
	UK1	SP1	pre-experimental	pre-experimental	Kruskal-Wallis	0.022	
	UK1	SP2	pre-experimental	pre-experimental	Kruskal-Wallis	0.614	

	UK2	SP1	pre-experimental	pre-experimental	Kruskal-Wallis	0.048	
	UK2	SP2	pre-experimental	pre-experimental	Kruskal-Wallis	0.846	
	SP1	SP2	pre-experimental	pre-experimental	Kruskal-Wallis	0.075	
	UK1	UK1	pre-experimental	after UK conditions	Kruskal-Wallis	0.416	
	UK1	UK1	pre-experimental	after SP conditions	Kruskal-Wallis	0.670	
	UK2	UK2	pre-experimental	after UK conditions	Kruskal-Wallis	0.352	
	UK2	UK2	pre-experimental	after SP conditions	Kruskal-Wallis	0.230	
	SP1	SP1	pre-experimental	after UK conditions	Kruskal-Wallis	0.698	
	SP1	SP1	pre-experimental	after SP conditions	Kruskal-Wallis	0.063	
	SP2	SP2	pre-experimental	after UK conditions	Kruskal-Wallis	0.044	
	SP2	SP2	pre-experimental	after SP conditions	Kruskal-Wallis	0.561	
	UK1	UK2	after UK conditions	after UK conditions	Kruskal-Wallis	0.846	
	UK1	SP1	after UK conditions	after UK conditions	Kruskal-Wallis	0.007	
	UK1	SP2	after UK conditions	after UK conditions	Kruskal-Wallis	0.001	
	UK2	SP1	after UK conditions	after UK conditions	Kruskal-Wallis	0.012	
	UK2	SP2	after UK conditions	after UK conditions	Kruskal-Wallis	0.020	
	SP1	SP2	after UK conditions	after UK conditions	Kruskal-Wallis	0.535	
	UK1	UK2	after SP conditions	after SP conditions	Kruskal-Wallis	0.278	
	UK1	SP1	after SP conditions	after SP conditions	Kruskal-Wallis	1.000	
	UK1	SP2	after SP conditions	after SP conditions	Kruskal-Wallis	0.510	
	UK2	SP1	after SP conditions	after SP conditions	Kruskal-Wallis	0.278	
	UK2	SP2	after SP conditions	after SP conditions	Kruskal-Wallis	0.670	
	SP1	SP2	after SP conditions	after SP conditions	Kruskal-Wallis	0.510	
	UK1	UK1	after UK conditions	after SP conditions	Kruskal-Wallis	0.125	

	UK2	UK2	after UK conditions	after SP conditions	Kruskal-Wallis	0.033	
	SP1	SP1	after UK conditions	after SP conditions	Kruskal-Wallis	0.141	
	SP2	SP2	after UK conditions	after SP conditions	Kruskal-Wallis	0.152	
Respiration	UK1	UK2	pre-experimental	pre-experimental	2-way ANOVA	0.484	3
	UK1	SP1	pre-experimental	pre-experimental	2-way ANOVA	1.000	3
	UK1	SP2	pre-experimental	pre-experimental	2-way ANOVA	0.552	3
	UK2	SP1	pre-experimental	pre-experimental	2-way ANOVA	1.000	3
	UK2	SP2	pre-experimental	pre-experimental	2-way ANOVA	0.027	3
	SP1	SP2	pre-experimental	pre-experimental	2-way ANOVA	0.075	3
	UK1	UK1	pre-experimental	after UK conditions	2-way ANOVA	0.270	2
	UK1	UK1	pre-experimental	after SP conditions	2-way ANOVA	0.713	2
	UK2	UK2	pre-experimental	after UK conditions	2-way ANOVA	0.356	2
	UK2	UK2	pre-experimental	after SP conditions	2-way ANOVA	0.814	2
	SP1	SP1	pre-experimental	after UK conditions	2-way ANOVA	0.311	2
	SP1	SP1	pre-experimental	after SP conditions	2-way ANOVA	0.160	2
	SP2	SP2	pre-experimental	after UK conditions	2-way ANOVA	0.076	2
	SP2	SP2	pre-experimental	after SP conditions	2-way ANOVA	0.628	2
	UK1	UK2	after UK conditions	after UK conditions	1-way ANOVA	0.495	1
	UK1	SP1	after UK conditions	after UK conditions	1-way ANOVA	0.012	1
	UK1	SP2	after UK conditions	after UK conditions	1-way ANOVA	0.012	1
	UK2	SP1	after UK conditions	after UK conditions	1-way ANOVA	0.015	1
	UK2	SP2	after UK conditions	after UK conditions	1-way ANOVA	0.015	1
	SP1	SP2	after UK conditions	after UK conditions	1-way ANOVA	0.975	1
	UK1	UK2	after SP conditions	after SP conditions	1-way ANOVA	0.433	1

	UK1	SP1	after SP conditions	after SP conditions	1-way ANOVA	0.000	1
	UK1	SP2	after SP conditions	after SP conditions	1-way ANOVA	0.000	1
	UK2	SP1	after SP conditions	after SP conditions	1-way ANOVA	0.001	1
	UK2	SP2	after SP conditions	after SP conditions	1-way ANOVA	0.001	1
	SP1	SP2	after SP conditions	after SP conditions	1-way ANOVA	0.982	1
	UK1	UK1	after UK conditions	after SP conditions	1-way ANOVA	0.004	1
	UK2	UK2	after UK conditions	after SP conditions	1-way ANOVA	0.007	1
	SP1	SP1	after UK conditions	after SP conditions	1-way ANOVA	0.007	1
	SP2	SP2	after UK conditions	after SP conditions	1-way ANOVA	0.009	1
Calcification light	UK1	UK2	pre-experimental	pre-experimental	2-way ANOVA	0.100	3
	UK1	SP1	pre-experimental	pre-experimental	2-way ANOVA	1.000	3
	UK1	SP2	pre-experimental	pre-experimental	2-way ANOVA	0.054	3
	UK2	SP1	pre-experimental	pre-experimental	2-way ANOVA	0.719	3
	UK2	SP2	pre-experimental	pre-experimental	2-way ANOVA	1.000	3
	SP1	SP2	pre-experimental	pre-experimental	2-way ANOVA	0.383	3
	UK1	UK1	pre-experimental	after UK conditions	2-way ANOVA	0.004	2
	UK1	UK1	pre-experimental	after SP conditions	2-way ANOVA	0.008	2
	UK2	UK2	pre-experimental	after UK conditions	2-way ANOVA	0.743	2
	UK2	UK2	pre-experimental	after SP conditions	2-way ANOVA	0.000	2
	SP1	SP1	pre-experimental	after UK conditions	2-way ANOVA	0.529	2
	SP1	SP1	pre-experimental	after SP conditions	2-way ANOVA	0.037	2
	SP2	SP2	pre-experimental	after UK conditions	2-way ANOVA	0.150	2
	SP2	SP2	pre-experimental	after SP conditions	2-way ANOVA	0.651	2
	UK1	UK2	after UK conditions	after UK conditions	2-way ANOVA	0.827	3

	UK1	SP1	after UK conditions	after UK conditions	2-way ANOVA	0.018	3
	UK1	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.249	3
	UK2	SP1	after UK conditions	after UK conditions	2-way ANOVA	0.011	3
	UK2	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.174	3
	SP1	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.187	3
	UK1	UK2	after SP conditions	after SP conditions	2-way ANOVA	0.881	3
	UK1	SP1	after SP conditions	after SP conditions	2-way ANOVA	0.000	3
	UK1	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.000	3
	UK2	SP1	after SP conditions	after SP conditions	2-way ANOVA	0.000	3
	UK2	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.000	3
	SP1	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.859	3
	UK1	UK1	after UK conditions	after SP conditions	1-way ANOVA	0.014	1
	UK2	UK2	after UK conditions	after SP conditions	1-way ANOVA	0.001	1
	SP1	SP1	after UK conditions	after SP conditions	1-way ANOVA	0.078	1
	SP2	SP2	after UK conditions	after SP conditions	1-way ANOVA	0.165	1
Calcification dark	UK1	UK2	pre-experimental	pre-experimental	2-way ANOVA	1.000	3
	UK1	SP1	pre-experimental	pre-experimental	2-way ANOVA	1.000	3
	UK1	SP2	pre-experimental	pre-experimental	2-way ANOVA	1.000	3
	UK2	SP1	pre-experimental	pre-experimental	2-way ANOVA	0.402	3
	UK2	SP2	pre-experimental	pre-experimental	2-way ANOVA	1.000	3
	SP1	SP2	pre-experimental	pre-experimental	2-way ANOVA	0.551	3
	UK1	UK1	pre-experimental	after UK conditions	2-way ANOVA	0.188	2
	UK1	UK1	pre-experimental	after SP conditions	2-way ANOVA	0.913	2
	UK2	UK2	pre-experimental	after UK conditions	2-way ANOVA	0.997	2

	UK2	UK2	pre-experimental	after SP conditions	2-way ANOVA	0.884	2
	SP1	SP1	pre-experimental	after UK conditions	2-way ANOVA	0.432	2
	SP1	SP1	pre-experimental	after SP conditions	2-way ANOVA	0.045	2
	SP2	SP2	pre-experimental	after UK conditions	2-way ANOVA	0.368	2
	SP2	SP2	pre-experimental	after SP conditions	2-way ANOVA	0.689	2
	UK1	UK2	after UK conditions	after UK conditions	1-way ANOVA	0.916	1
	UK1	SP1	after UK conditions	after UK conditions	1-way ANOVA	0.085	1
	UK1	SP2	after UK conditions	after UK conditions	1-way ANOVA	0.178	1
	UK2	SP1	after UK conditions	after UK conditions	1-way ANOVA	0.368	1
	UK2	SP2	after UK conditions	after UK conditions	1-way ANOVA	0.492	1
	SP1	SP2	after UK conditions	after UK conditions	1-way ANOVA	0.671	1
	UK1	UK2	after SP conditions	after SP conditions	1-way ANOVA	0.564	1
	UK1	SP1	after SP conditions	after SP conditions	1-way ANOVA	0.438	1
	UK1	SP2	after SP conditions	after SP conditions	1-way ANOVA	0.758	1
	UK2	SP1	after SP conditions	after SP conditions	1-way ANOVA	0.565	1
	UK2	SP2	after SP conditions	after SP conditions	1-way ANOVA	0.983	1
	SP1	SP2	after SP conditions	after SP conditions	1-way ANOVA	0.662	1
	UK1	UK1	after UK conditions	after SP conditions	1-way ANOVA	0.252	1
	UK2	UK2	after UK conditions	after SP conditions	1-way ANOVA	0.661	1
	SP1	SP1	after UK conditions	after SP conditions	1-way ANOVA	0.113	1
	SP2	SP2	after UK conditions	after SP conditions	1-way ANOVA	0.592	1
Growth rates	UK1	UK2	after UK conditions	after UK conditions	2-way ANOVA	0.054	3
	UK1	SP1	after UK conditions	after UK conditions	2-way ANOVA	0.497	3
	UK1	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.496	3

	UK2	SP1	after UK conditions	after UK conditions	2-way ANOVA	0.014	3
	UK2	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.014	3
	SP1	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.998	3
	UK1	UK2	after SP conditions	after SP conditions	2-way ANOVA	0.004	3
	UK1	SP1	after SP conditions	after SP conditions	2-way ANOVA	0.002	3
	UK1	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.008	3
	UK2	SP1	after SP conditions	after SP conditions	2-way ANOVA	0.665	3
	UK2	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.746	3
	SP1	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.452	3
	UK1	UK1	after UK conditions	after SP conditions	2-way ANOVA	0.000	1
	UK2	UK2	after UK conditions	after SP conditions	2-way ANOVA	0.548	1
	SP1	SP1	after UK conditions	after SP conditions	2-way ANOVA	0.106	1
	SP2	SP2	after UK conditions	after SP conditions	2-way ANOVA	0.024	1
	UK1	UK2	after UK conditions	after UK conditions	2-way ANOVA	0.481	3
Unstained branches	UK1	SP1	after UK conditions	after UK conditions	2-way ANOVA	0.169	3
	UK1	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.026	3
	UK2	SP1	after UK conditions	after UK conditions	2-way ANOVA	0.481	3
	UK2	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.102	3
	SP1	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.327	3
	UK1	UK2	after SP conditions	after SP conditions	2-way ANOVA	0.887	3
	UK1	SP1	after SP conditions	after SP conditions	2-way ANOVA	0.168	3
	UK1	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.265	3
	UK2	SP1	after SP conditions	after SP conditions	2-way ANOVA	0.212	3
	UK2	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.327	3

	SP1	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.777	3
	UK1	UK1	after UK conditions	after SP conditions	2-way ANOVA	0.399	1
	UK2	UK2	after UK conditions	after SP conditions	2-way ANOVA	0.777	1
	SP1	SP1	after UK conditions	after SP conditions	2-way ANOVA	0.399	1
	SP2	SP2	after UK conditions	after SP conditions	2-way ANOVA	0.671	1
$P_{\max}$	UK1	UK2	after UK conditions	after UK conditions	2-way ANOVA	0.068	3
	UK1	SP1	after UK conditions	after UK conditions	2-way ANOVA	0.047	3
	UK1	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.001	3
	UK2	SP1	after UK conditions	after UK conditions	2-way ANOVA	0.844	3
	UK2	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.059	3
	SP1	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.085	3
	UK1	UK2	after SP conditions	after SP conditions	2-way ANOVA	0.653	3
	UK1	SP1	after SP conditions	after SP conditions	2-way ANOVA	0.020	3
	UK1	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.150	3
	UK2	SP1	after SP conditions	after SP conditions	2-way ANOVA	0.049	3
	UK2	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.307	3
	SP1	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.300	3
	UK1	UK1	after UK conditions	after SP conditions	2-way ANOVA	0.328	1
	UK2	UK2	after UK conditions	after SP conditions	2-way ANOVA	0.631	1
	SP1	SP1	after UK conditions	after SP conditions	2-way ANOVA	0.170	1
	SP2	SP2	after UK conditions	after SP conditions	2-way ANOVA	0.162	1
$C_{\max}$	UK1	UK2	after UK conditions	after UK conditions	2-way ANOVA	0.796	3
	UK1	SP1	after UK conditions	after UK conditions	2-way ANOVA	0.858	3
	UK1	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.251	3

	UK2	SP1	after UK conditions	after UK conditions	2-way ANOVA	0.936	3
	UK2	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.367	3
	SP1	SP2	after UK conditions	after UK conditions	2-way ANOVA	0.327	3
	UK1	UK2	after SP conditions	after SP conditions	2-way ANOVA	0.019	3
	UK1	SP1	after SP conditions	after SP conditions	2-way ANOVA	0.543	3
	UK1	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.358	3
	UK2	SP1	after SP conditions	after SP conditions	2-way ANOVA	0.065	3
	UK2	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.118	3
	SP1	SP2	after SP conditions	after SP conditions	2-way ANOVA	0.749	3
	UK1	UK1	after UK conditions	after SP conditions	2-way ANOVA	0.000	1
	UK2	UK2	after UK conditions	after SP conditions	2-way ANOVA	0.003	1
	SP1	SP1	after UK conditions	after SP conditions	2-way ANOVA	0.000	1
	SP2	SP2	after UK conditions	after SP conditions	2-way ANOVA	0.001	1