

Supplementary Material

Relationships between climate of origin and photosynthetic responses to an episodic heatwave depend on growth CO₂ concentration for *Eucalyptus camaldulensis* var. *camaldulensis*

Michael E. Loik^A, Víctor Resco de Dios^{B,C}, Renee Smith^C and David T. Tissue^C

^ADepartment of Environmental Studies, University of California, Santa Cruz, CA 95064, USA.

^BDepartment of Crop and Forest Sciences, Universitat de Lleida, 25198 Lleida, Spain.

^CHawkesbury Institute for the Environment, Western Sydney University, Richmond, NSW 2753, Australia.

^DCorresponding author. Email: mloik@ucsc.edu

Table S1. Correlations between meteorological variables† at collection sites (climate-of-origin) and physiological parameters for *Eucalyptus camaldulensis* var. *camaldulensis* genotypes, before, during, and after the heat wave

Values are correlation coefficients between variables; bold indicates significance at the following levels: * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$; values in parentheses are marginally significant at $P < 0.10$. Photosynthetic data used to infer sensitivity to a spring heat wave (electron transport within Photosystem II (ETR, $\mu\text{mol electrons m}^{-2} \text{s}^{-1}$), stomatal conductance to water vapor (g_s , $\text{mol m}^{-2} \text{s}^{-1}$); net leaf-level CO_2 assimilation (A , $\mu\text{mol CO}_2 \text{ m}^{-2} \text{s}^{-1}$)) are compared for plants grown in a CO_2 (below the diagonal) and e CO_2 (above the diagonal). Photosynthetic values were averaged by site, and meteorological data for the period 1 January 1971 to 1 January 2010 were averaged for each site, before correlation analysis

	<u>Lat</u>	<u>Long</u>	<u>Elev</u>	<u>MAP</u>	<u>MRH</u>	<u>MAT</u>
Lat	1	-0.654	-0.146	0.290	0.335	-0.824*
Long	-0.654	1	-0.588	0.122	0.330	0.254
Elev	-0.146	-0.588	1	-0.629	-0.800	0.460
MAP	0.290	0.122	-0.629	1	0.827	-0.612
MRH	0.335	0.330	-0.800*	0.827*	1	-0.775*
MAT	-0.824*	0.254	0.460	-0.612	-0.775*	1
MXT	-0.604	0.048	0.570	-0.813*	-0.922**	0.928**
TWM	-0.882**	0.575	0.168	-0.545	-0.566	0.923**
TSM	-0.886**	0.423	0.336	-0.587	(-0.678)	0.982***
MMT	-0.261	-0.539	0.839*	-0.468	-0.825*	0.644
ATR	-0.589	0.513	0.063	(-0.695)	-0.545	(0.703)
A Before	(-0.689)	(0.728)	-0.079	-0.465	-0.270	0.556
g_s Before	0.255	-0.260	0.457	-0.494	-0.200	-0.191
ETR Before	-0.532	0.405	-0.262	-0.048	-0.073	0.472
A During	0.364	-0.192	0.013	-0.116	0.315	-0.515
g_s During	0.790*	-0.600	0.082	-0.210	-0.157	-0.419
ETR During	-0.657	0.877**	-0.298	-0.092	0.246	0.216
A After	0.520	-0.237	-0.056	-0.045	0.378	-0.658
g_s After	0.820*	-0.509	-0.046	0.101	0.095	-0.610
ETR After	(-0.734)	0.921**	-0.348	-0.052	0.233	0.297

Table S1 (continued)

					<u>Before Heat Wave</u>	
<u>MXT</u>	<u>TWM</u>	<u>TSM</u>	<u>MMT</u>	<u>ATR</u>	<u>A</u>	<u>g_s</u>
-0.604	-0.882**	-0.886**	-0.261	-0.589	0.481	0.017
0.048	0.575	0.423	-0.539	0.513	0.050	0.066
0.570	0.168	0.336	0.839*	0.063	(-0.669)	0.241
-0.813*	-0.545	-0.587	-0.468	-0.695	0.940**	-0.585
-0.922**	-0.566	-0.678	-0.825*	-0.545	0.931**	-0.223
0.928**	0.923**	0.982***	0.644	(0.703)	-0.820*	0.068
1	0.831*	0.890**	0.663	0.783*	-0.955**	0.216
0.831*	1	0.977***	0.305	0.856*	(-0.729)	0.198
0.890**	0.977***	1	0.492	0.779*	-0.785*	0.131
0.663	0.305	0.492	1	0.054	-0.620	-0.119
0.783*	0.856*	0.779*	0.054	1	-0.759*	0.387
0.553	0.779*	0.676*	-0.186	0.893**	1	-0.449
0.033	-0.163	-0.175	-0.074	0.105	0.119	1
0.308	0.469	0.483	0.139	0.296	0.267	(-0.754)
-0.427	-0.504	-0.500	-0.300	-0.320	-0.217	0.469
-0.065	-0.467	-0.480	-0.073	-0.026	-0.232	0.414
0.053	0.499	0.380	-0.477	0.468	(0.749)	0.124
-0.517	-0.621	-0.638	-0.416	-0.344	-0.225	0.538
-0.318	-0.612	-0.647	-0.259	-0.209	-0.263	0.412
0.100	0.566	0.455	-0.426	0.488	0.756*	-0.060

Table S1 (continued)

<u>During heat wave</u>			<u>After heat wave</u>			
<u>ETR</u>	<u>A</u>	<u>g_s</u>	<u>ETR</u>	<u>A</u>	<u>g_s</u>	<u>ETR</u>
0.468	0.575	0.275	0.490	-0.206	-0.155	-0.476
-0.092	-0.119	0.179	-0.806*	-0.132	-0.167	0.040
-0.513	-0.318	-0.327	0.425	0.492	0.430	0.351
0.034	0.062	-0.126	0.271	-0.351	-0.408	0.237
0.143	0.098	0.036	-0.028	-0.553	-0.701	0.017
-0.252	-0.408	-0.212	-0.361	0.348	0.495	0.249
-0.104	-0.147	0.025	-0.302	0.487	0.660	-0.038
-0.198	-0.279	0.000	-0.670	0.264	0.413	0.109
-0.260	-0.385	-0.139	-0.511	0.310	0.443	0.218
-0.257	-0.428	-0.510	0.400	0.322	0.436	0.393
0.074	0.159	0.457	-0.736	0.382	0.518	-0.377
0.147	0.122	-0.059	0.290	-0.462	-0.591	0.089
-0.173	0.081	0.207	-0.497	-0.090	0.017	-0.190
1	0.474	0.354	-0.146	-0.367	-0.112	-0.772*
-0.108	1	0.917**	-0.035	0.338	0.463	-0.837*
-0.479	0.148	1	-0.294	0.446	0.482	-0.832*
0.218	0.155	-0.600	1	0.235	0.030	0.260
-0.258	0.968***	0.330	0.088	1	0.840*	-0.098
-0.660	0.074	0.912**	-0.517	0.306	1	-0.261
0.392	0.072	-0.677	0.981***	-0.015	-0.613	1

†MAP: mean annual precipitation (mm); MRH: mean annual relative humidity (%); MAT: mean annual air temperature (°C); MXT: mean annual maximum air temperature (°C); TWM: the mean temperature of the warmest month (January, °C); TSM: the mean air temperature of spring months (October, November and December, °C); MMT: the mean annual minimum air temperature (°C); ATR: the mean annual temperature range (°C)