

Supplementary Data Table 1: Stomatal density values of cycad species grown under elevated [CO₂] of 1500ppm and sub-ambient [O₂] of 13% in combination and isolation relative to control of 380ppm [CO₂] and 20.9% [O₂].

Species		Atmospheric Treatment							
		Control	st dev	Low O ₂	st dev	High CO ₂	st dev	Low O ₂ / High CO ₂	st dev
<i>Cycas revoluta</i>	Stomatal Density (mm ²)	51.9	12.9	53.7	12.1	54.2	2.4	40.7	2.9
	Cv	24.9		22.6		4.4		7.1	
	Change Relative to Control (%)	-		103.6		104.5		78.6	
<i>Dioon merolae</i>	Stomatal Density (mm ²)	66.2	9.5	69.0	5.8	62.0	7.1	80.1	17.3
	Cv	14.3		8.4		11.5		21.5	
	Change Relative to Control (%)	-		104.2		93.7		121.0	
<i>Lepidozamia hopei</i>	Stomatal Density (mm ²)	31.0	2.9	32.4	5.8	31.5	0.8	36.1	7.7
	Cv	9.3		17.8		2.5		21.4	
	Change Relative to Control (%)	-		104.5		101.5		116.4	
<i>Lepidozamia peroffskyana</i>	Stomatal Density (mm ²)	33.3	4.2	39.4	5.6	35.6	3.5	36.6	7.6
	Cv	12.5		14.3		9.8		20.9	
	Change Relative to Control (%)	-		118.1		106.9		109.7	
<i>Macrozamia miquelii</i>	Stomatal Density (mm ²)	62.5	2.4	50.9	7.0	53.2	10.4	55.6	4.2
	Cv	3.8		13.7		19.6		7.5	
	Change Relative to Control (%)	-		81.5		85.2		88.9	
<i>Zamia floridiana</i>	Stomatal Density (mm ²)	72.7	8.5	74.5	18.7	61.1	1.4	70.4	14.7
	Cv	11.7		25.0		2.3		20.9	
	Change Relative to Control (%)	-		102.5		84.1		96.8	

Supplementary Data Table 2: Stomatal index values of cycad species grown under elevated [CO₂] of 1500ppm and sub-ambient [O₂] of 13% in combination and isolation relative to control of 380ppm [CO₂] and 20.9% [O₂].

Species		Atmospheric Treatment							
		Control	st dev	Low O ₂	st dev	High CO ₂	st dev	Low O ₂ / High CO ₂	st dev
<i>Cycas revoluta</i>	Stomatal Index (%)	4.7	0.5	4.8	0.4	4.4	0.3	4.2	0.1
	Cv	11.2		9.1		7.1		2.7	
	Change Relative to Control (%)	-		102.4		94.8		90.2	
<i>Dioon merolae</i>	Stomatal Index (%)	6.8	0.7	6.5	0.4	5.8	0.6	6.6	0.9
	Cv	9.6		6.3		10.5		13.4	
	Change Relative to Control (%)	-		96.2		85.1		97.6	
<i>Lepidozamia hopei</i>	Stomatal Index (%)	4.6	0.1	4.3	0.5	4.3	0.5	4.3	0.5
	Cv	1.6		11.0		10.8		10.9	
	Change Relative to Control (%)	-		92.4		92.0		92.2	
<i>Lepidozamia peroffskyana</i>	Stomatal Index (%)	4.6	0.7	4.8	0.3	4.2	0.4	4.2	0.4
	Cv	15.1		7.2		8.6		8.3	
	Change Relative to Control (%)	-		104.0		92.3		92.4	
<i>Macrozamia miquelii</i>	Stomatal Index (%)	8.1	0.1	6.8	0.5	7.3	1.3	7.4	0.7
	Cv	1.6		7.2		18.2		10.0	
	Change Relative to Control (%)	-		84.6		90.1		91.3	
<i>Zamia floridiana</i>	Stomatal Index (%)	6.7	0.4	6.4	0.7	6.3	0.2	6.9	0.3
	Cv	5.9		10.4		3.9		4.0	
	Change Relative to Control (%)	-		96.0		94.4		103.1	

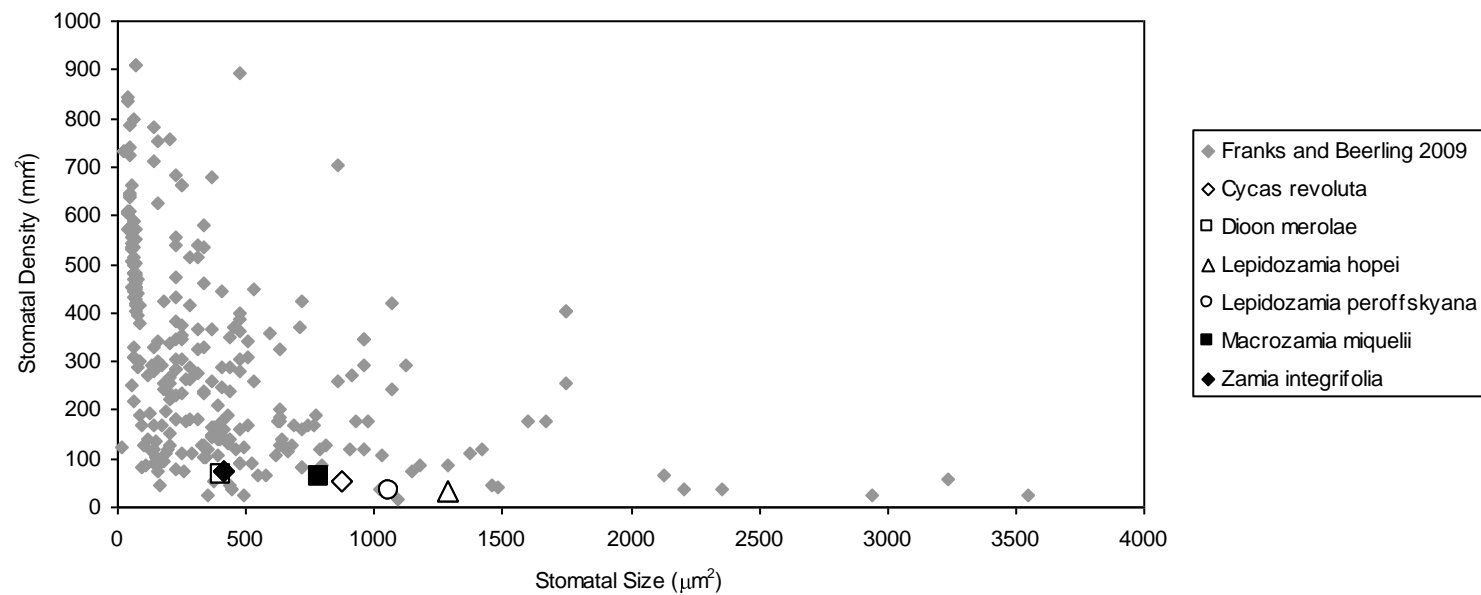
Supplementary Data Table 3: Stomatal Pore Lengths of cycad species grown under elevated [CO₂] of 1500ppm and sub-ambient [O₂] of 13% in combination and isolation relative to control of 380ppm [CO₂] and 20.9% [O₂].

Species		Atmospheric Treatment							
		Control	st dev	Low O ₂	st dev	High CO ₂	st dev	Low O ₂ / High CO ₂	st dev
<i>Cycas revoluta</i>	Stomatal Pore Length (μm)	31.8	9.4	23.9	5.2	25.9	5.9	26.3	4.5
	Cv	29.7		21.8		22.6		17.3	
	Change Relative to Control (%)	-		75.1		81.5		82.7	
<i>Dioon merolae</i>	Stomatal Pore Length (μm)	17.5	4.7	22.3	4.6	22.9	4.5	24.4	5.1
	Cv	26.7		20.5		19.8		20.7	
	Change Relative to Control (%)	-		127.9		131.4		139.8	
<i>Lepidozamia hopei</i>	Stomatal Pore Length (μm)	41.2	8.4	38.0	8.3	46.7	5.2	43.6	5.5
	Cv	20.5		21.8		11.2		12.7	
	Change Relative to Control (%)	-		92.1		113.4		105.8	
<i>Lepidozamia peroffskyana</i>	Stomatal Pore Length (μm)	35.6	5.5	39.8	4.0	42.9	5.7	39.3	5.9
	Cv	15.5		10.1		13.3		15.1	
	Change Relative to Control (%)	-		111.7		120.4		110.3	
<i>Macrozamia miquelii</i>	Stomatal Pore Length (μm)	28.6	3.3	26.4	3.8	31.5	6.7	29.8	5.0
	Cv	11.7		14.5		21.2		16.8	
	Change Relative to Control (%)	-		92.1		110.2		104.3	
<i>Zamia floridiana</i>	Stomatal Pore Length (μm)	21.5	5.4	19.4	3.7	17.2	3.1	18.0	2.7
	Cv	25.2		18.8		17.8		15.1	
	Change Relative to Control (%)	-		90.3		79.8		83.7	

Supplementary Data Table 4: Calculated maximum stomatal conductance ($G_{s_{max}}$) of cycad species (see Supplementary Data Formulae 1) grown under elevated $[CO_2]$ of 1500ppm and sub-ambient $[O_2]$ of 13% in combination and isolation relative to control of 380ppm $[CO_2]$ and 20.9% $[O_2]$.

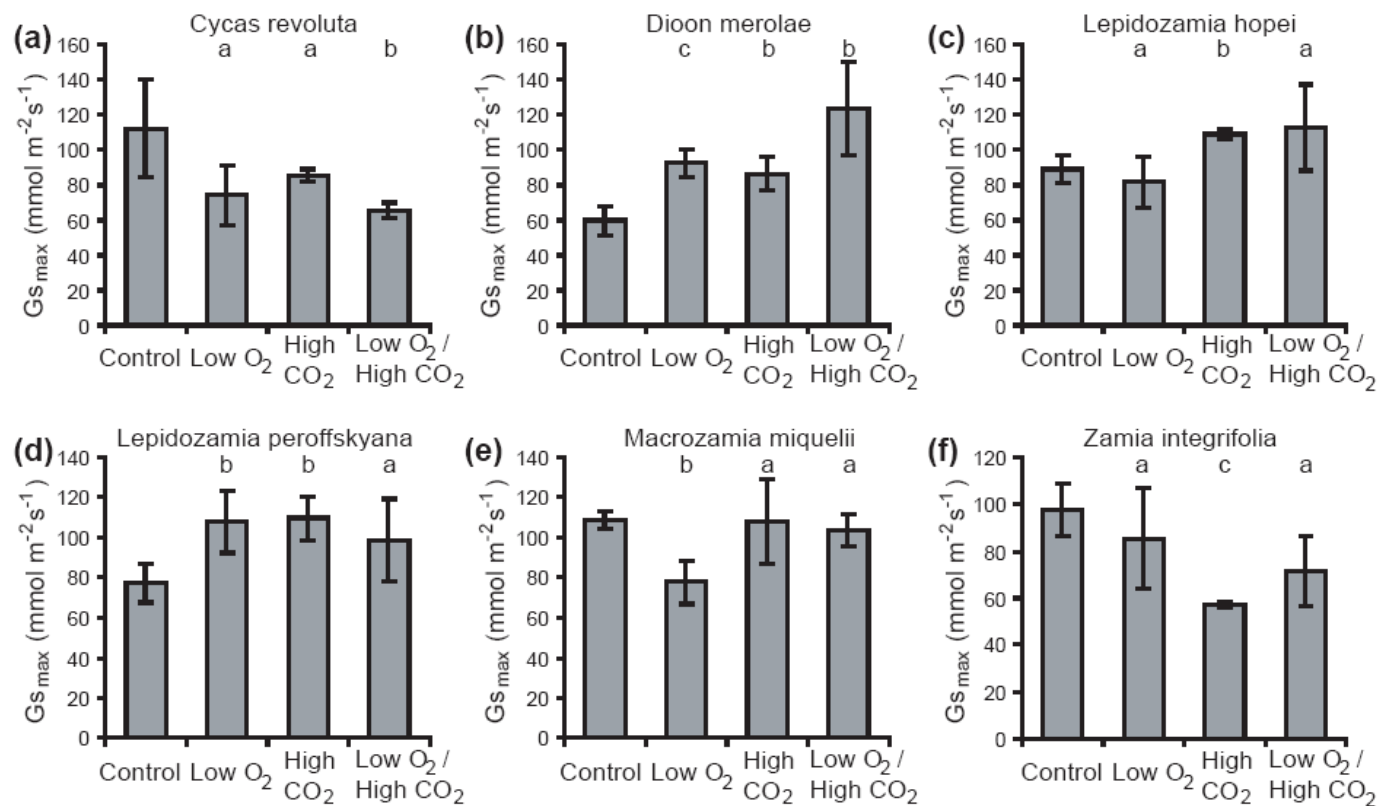
Species		Atmospheric Treatment							
		Control	st dev	Low O_2	st dev	High CO_2	st dev	Low O_2 / High CO_2	st dev
Cycas revoluta	$G_{s_{max}}$ (mmol $m^{-2} s^{-1}$)	112.1	27.9	74.2	16.8	85.2	3.8	65.6	4.7
	Cv	24.9		22.6		4.4		7.1	
	Change Relative to Control (%)	-		66.2		76.0		58.5	
Dioon merolae	$G_{s_{max}}$ (mmol $m^{-2} s^{-1}$)	59.6	8.5	92.4	7.7	86.8	10.0	123.5	26.6
	Cv	14.3		8.4		11.5		21.5	
	Change Relative to Control (%)	-		154.9		145.5		207.1	
Lepidozamia hopei	$G_{s_{max}}$ (mmol $m^{-2} s^{-1}$)	89.0	8.3	82.1	14.6	109.1	2.8	112.8	24.2
	Cv	9.3		17.8		2.5		21.4	
	Change Relative to Control (%)	-		92.2		122.6		126.7	
Lepidozamia peroffskyana	$G_{s_{max}}$ (mmol $m^{-2} s^{-1}$)	77.2	9.7	108.0	15.4	109.6	10.7	98.5	20.6
	Cv	12.5		14.3		9.8		20.9	
	Change Relative to Control (%)	-		139.9		142.0		127.6	
Macrozamia miquelii	$G_{s_{max}}$ (mmol $m^{-2} s^{-1}$)	108.8	4.2	77.7	10.7	107.8	21.1	103.2	7.7
	Cv	3.8		13.7		19.6		7.5	
	Change Relative to Control (%)	-		71.4		99.1		94.9	
Zamia floridiana	$G_{s_{max}}$ (mmol $m^{-2} s^{-1}$)	97.8	11.4	85.4	21.4	57.4	1.3	71.4	14.9
	Cv	11.7		25.0		2.3		20.9	
	Change Relative to Control (%)	-		87.3		58.7		73.0	

Supplementary Data Graph 1: Stomatal density and size of cycad species relative to other plant groups grown under ambient atmospheric [CO₂] and [O₂]. Stomatal size calculated as stomatal length x width of closed guard cells. Data taken from Franks and Beerling (2009).

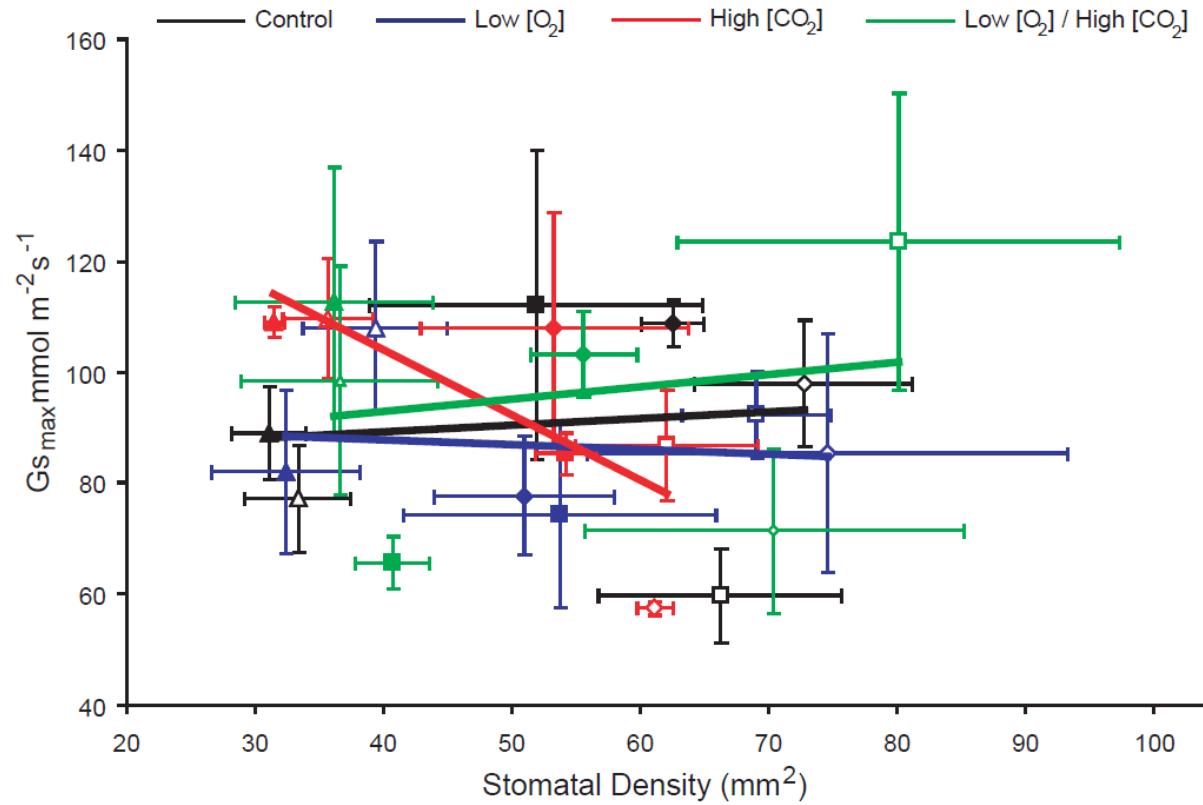


Franks PJ, Beerling DJ. 2009. Maximum leaf conductance driven by CO₂ effects on stomatal size and density over geologic time. *Proceedings of the National Academy of Sciences of the United States of America* 106: 10343-10347

Supplementary Data Graph 2: Calculated maximum stomatal conductance ($G_{s_{max}}$) (see supplementary data for additional information) of cycad species grown sub-ambient $[O_2]$ of 13.0 % and elevated $[CO_2]$ of 1500 ppm (see Table 2 for growth conditions): a) *Cycas revoluta*; b) *Dioon merolae*; c) *Lepidozamia hopei*; d) *Lepidozamia peroffskyana*; e) *Macrozamia miquelii*, and; f) *Zamia integrifolia*. Letters indicates significant difference in treatment SPL to control SPL value (a = $P > 0.05$; b = $P < 0.05$; c = $P < 0.01$). Error bars indicate one standard deviation either side of the mean.



Supplementary Data Graph 3: Maximum stomatal conductance ($G_{s_{max}}$) of cycad species grown under elevated $[CO_2]$ and sub-ambient $[O_2]$. *Cycas revoluta* (closed squares); *Dioon merolae* (open squares); *Lepidozamia hopei* (closed triangles); *Lepidozamia peroffskyana* (open triangles); *Macrozamia miquelii* (closed diamonds); *Zamia integrifolia* (open diamonds). Error bars indicate stomatal deviation either side of mean.



Supplementary Data Formulae 1: Maximum stomatal conductance formulae of Cowan (1977) use in Figure 3.

$$G_{s_{\max}} = \frac{S D A}{V \left(L + \frac{\pi}{4} \sqrt{\frac{a}{\pi}} \right)}$$

- $G_{s_{\max}}$ = maximum stomatal conductance of water vapour ($\text{mol m}^{-2} \text{s}^{-1}$)
 S = stomatal density (number of stomata per m^2)
 D = diffusivity of water in air ($\text{m}^2 \text{s}^{-1}$)
 A = area of the stomatal pore (m^2)
 V = molar volume of air ($\text{m}^3 \text{mol}^{-1}$)
 L = depth of stomatal pore (m)

Area of the stomatal pore was calculated as an ellipse as cycad species analysed possess large kidney shaped stomata. Following the methods of Beerling and Chaloner (1993) stomatal width at full opening was assumed to be half stomatal pore length.

The depth of the stomatal pore was assumed to be equivalent to guard cell width following Franks and Farquhar (2007) and Franks and Beerling (2009) where the stomatal pore depth was assumed to be equal to guard cell width on the basis that guard cells increase in turgor to a “cross circular cross-section”

For further information see:

- Beerling DJ, Chaloner WG (1993) Evolutionary Responses of Stomatal Density to Global CO_2 Change. *Biological Journal of the Linnean Society* 48, 343-353.
- Brown HT, Escombe F. 1900. Static diffusion of gases and liquids in relation to the assimilation of carbon and translocation in plants. *Philosophical Transactions of the Royal Society B - Biological Sciences* 193: 233-291.
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- Franks PJ, Drake PL, Beerling DJ. 2009. Plasticity in maximum stomatal conductance constrained by negative correlation between stomatal size and density: an analysis using *Eucalyptus globulus*. *Plant Cell and Environment* 32(12): 1737-1748.
- Franks PJ, Farquhar GD. 2001. The Effect of Exogenous Abscisic Acid on Stomatal Development, Stomatal Mechanics, and Leaf Gas Exchange in *Tradescantia virginiana*. *Plant Physiology* 125(2): 935-942.
- Franks P.J. & Farquhar G.D. (2007) The mechanical diversity of stomata and its significance in gas exchange control. *Plant Physiology* 143, 78–87
- Kaiser H (2009) The relation between stomatal aperture and gas exchange under consideration of pore geometry and diffusional resistance in the mesophyll. *Plant Cell and Environment* 32, 1091-1098.
- Kürschner WM, Wagner F, Visscher EH, Visscher H. 1997. Predicting the response of leaf stomatal frequency to a future CO_2 -enriched atmosphere: constraints from historical observations. *Geologische Rundschau* 86(2): 512-517.
- Lee R, Gates DM. 1964. Diffusion resistance in leaves as related to their stomatal anatomy and micro-structure. *American Journal of Botany* 51: 963-975.
- Schuepp PH. 1993. Leaf Boundary Layers. *New Phytologist* 125: 477-507.
- Ting IP, Loomis WE. 1962. Diffusion through stomates. *American Journal of Botany* 50: 866-872.
- Willmer C, Fricker M. 1996. *Stomata*. London: Chapman and Hall.

Cycas revoluta SI

Oneway

ANOVA

Stomatal Index

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.583	3	.194	1.355	.324
Within Groups	1.148	8	.144		
Total	1.732	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Index

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-.11180	.30935	1.000	-1.1880	.9644
	high CO2	.24156	.30935	1.000	-.8346	1.3178
	low O2 / high CO2	.45833	.30935	1.000	-.6179	1.5345
Low O2	Control	.11180	.30935	1.000	-.9644	1.1880
	high CO2	.35336	.30935	1.000	-.7228	1.4295
high CO2	low O2 / high CO2	.57012	.30935	.615	-.5061	1.6463
	Control	-.24156	.30935	1.000	-1.3178	.8346
	Low O2	-.35336	.30935	1.000	-1.4295	.7228
low O2 / high CO2	low O2 / high CO2	.21676	.30935	1.000	-.8594	1.2930
	Control	-.45833	.30935	1.000	-1.5345	.6179
	Low O2	-.57012	.30935	.615	-1.6463	.5061
	high CO2	-.21676	.30935	1.000	-1.2930	.8594

Dioon merolae SI

Oneway

ANOVA

Stomatal Index

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.822	3	.607	1.388	.315
Within Groups	3.499	8	.437		
Total	5.321	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Index
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	.26176	.54001	1.000	-1.6169	2.1404
	high CO2	1.01621	.54001	.580	-.8624	2.8948
	low O2 / high CO2	.16651	.54001	1.000	-1.7121	2.0451
Low O2	Control	-.26176	.54001	1.000	-2.1404	1.6169
	high CO2	.75445	.54001	1.000	-1.1242	2.6331
	low O2 / high CO2	-.09525	.54001	1.000	-1.9739	1.7834
high CO2	Control	-1.01621	.54001	.580	-2.8948	.8624
	Low O2	-.75445	.54001	1.000	-2.6331	1.1242
	low O2 / high CO2	-.84970	.54001	.926	-2.7283	1.0289
low O2 / high CO2	Control	-.16651	.54001	1.000	-2.0451	1.7121
	Low O2	.09525	.54001	1.000	-1.7834	1.9739
	high CO2	.84970	.54001	.926	-1.0289	2.7283

Lepidozamia hopei SI

Oneway

ANOVA

Stomatal Index

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.293	3	.098	.598	.634
Within Groups	1.309	8	.164		
Total	1.603	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Index
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	.35226	.33030	1.000	-.7968	1.5013
	high CO2	.36873	.33030	1.000	-.7804	1.5178
	low O2 / high CO2	.36155	.33030	1.000	-.7875	1.5106
Low O2	Control	-.35226	.33030	1.000	-1.5013	.7968
	high CO2	.01647	.33030	1.000	-1.1326	1.1656
	low O2 / high CO2	.00930	.33030	1.000	-1.1398	1.1584
high CO2	Control	-.36873	.33030	1.000	-1.5178	.7804
	Low O2	-.01647	.33030	1.000	-1.1656	1.1326
	low O2 / high CO2	-.00717	.33030	1.000	-1.1563	1.1419
low O2 / high CO2	Control	-.36155	.33030	1.000	-1.5106	.7875
	Low O2	-.00930	.33030	1.000	-1.1584	1.1398
	high CO2	.00717	.33030	1.000	-1.1419	1.1563

Lepidozamia peroffskyana SI

Oneway

ANOVA

Stomatal Index

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.647	3	.216	1.001	.441
Within Groups	1.722	8	.215		
Total	2.369	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Index
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-.18540	.37880	1.000	-1.5032	1.1324
	high CO2	.35463	.37880	1.000	-.9632	1.6724
	low O2 / high CO2	.35073	.37880	1.000	-.9671	1.6685
Low O2	Control	.18540	.37880	1.000	-1.1324	1.5032
	high CO2	.54003	.37880	1.000	-.7778	1.8578
	low O2 / high CO2	.53612	.37880	1.000	-.7817	1.8539
high CO2	Control	-.35463	.37880	1.000	-1.6724	.9632
	Low O2	-.54003	.37880	1.000	-1.8578	.7778
	low O2 / high CO2	-.00390	.37880	1.000	-1.3217	1.3139
low O2 / high CO2	Control	-.35073	.37880	1.000	-1.6685	.9671
	Low O2	-.53612	.37880	1.000	-1.8539	.7817
	high CO2	.00390	.37880	1.000	-1.3139	1.3217

Macrozamia miquelii SI

Oneway

ANOVA

Stomatal Index

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.389	3	.796	1.251	.354
Within Groups	5.093	8	.637		
Total	7.481	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Index

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	1.24458	.65147	.555	-1.0218	3.5110
	high CO2	.80107	.65147	1.000	-1.4653	3.0675
	low O2 / high CO2	.70426	.65147	1.000	-1.5621	2.9706
Low O2	Control	-1.24458	.65147	.555	-3.5110	1.0218
	high CO2	-.44351	.65147	1.000	-2.7099	1.8229
	low O2 / high CO2	-.54032	.65147	1.000	-2.8067	1.7261
high CO2	Control	-.80107	.65147	1.000	-3.0675	1.4653
	Low O2	.44351	.65147	1.000	-1.8229	2.7099
	low O2 / high CO2	-.09681	.65147	1.000	-2.3632	2.1696
low O2 / high CO2	Control	-.70426	.65147	1.000	-2.9706	1.5621
	Low O2	.54032	.65147	1.000	-1.7261	2.8067
	high CO2	.09681	.65147	1.000	-2.1696	2.3632

Zamia integrifolia SI

Oneway

ANOVA

Stomatal Index

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.615	3	.205	1.114	.399
Within Groups	1.473	8	.184		
Total	2.088	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Index
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	.26431	.35034	1.000	-.9545	1.4831
	high CO2	.37585	.35034	1.000	-.8429	1.5946
	low O2 / high CO2	-.20387	.35034	1.000	-1.4226	1.0149
Low O2	Control	-.26431	.35034	1.000	-1.4831	.9545
	high CO2	.11154	.35034	1.000	-1.1072	1.3303
	low O2 / high CO2	-.46818	.35034	1.000	-1.6870	.7506
high CO2	Control	-.37585	.35034	1.000	-1.5946	.8429
	Low O2	-.11154	.35034	1.000	-1.3303	1.1072
	low O2 / high CO2	-.57972	.35034	.819	-1.7985	.6391
low O2 / high CO2	Control	.20387	.35034	1.000	-1.0149	1.4226
	Low O2	.46818	.35034	1.000	-.7506	1.6870
	high CO2	.57972	.35034	.819	-.6391	1.7985

Cycas revoluta SD

Oneway

ANOVA

Stomatal Density

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	360.507	3	120.169	1.466	.295
Within Groups	655.877	8	81.985		
Total	1016.384	11			

Oneway

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Density
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-1.85000	7.39300	1.000	-27.5693	23.8693
	high CO2	-2.31667	7.39300	1.000	-28.0360	23.4027
	low O2 / high CO2	11.11000	7.39300	1.000	-14.6093	36.8293
Low O2	Control	1.85000	7.39300	1.000	-23.8693	27.5693
	high CO2	-.46667	7.39300	1.000	-26.1860	25.2527
	low O2 / high CO2	12.96000	7.39300	.706	-12.7593	38.6793
high CO2	Control	2.31667	7.39300	1.000	-23.4027	28.0360
	Low O2	.46667	7.39300	1.000	-25.2527	26.1860
	low O2 / high CO2	13.42667	7.39300	.641	-12.2927	39.1460
low O2 / high CO2	Control	-11.11000	7.39300	1.000	-36.8293	14.6093
	Low O2	-12.96000	7.39300	.706	-38.6793	12.7593
	high CO2	-13.42667	7.39300	.641	-39.1460	12.2927

Dioon merolae SD

Oneway

ANOVA

Stomatal Density

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	536.461	3	178.820	1.518	.283
Within Groups	942.643	8	117.830		
Total	1479.104	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Density

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-2.77667	8.86305	1.000	-33.6101	28.0568
	high CO2	4.16333	8.86305	1.000	-26.6701	34.9968
	low O2 / high CO2	-13.88667	8.86305	.935	-44.7201	16.9468
Low O2	Control	2.77667	8.86305	1.000	-28.0568	33.6101
	high CO2	6.94000	8.86305	1.000	-23.8935	37.7735
	low O2 / high CO2	-11.11000	8.86305	1.000	-41.9435	19.7235
high CO2	Control	-4.16333	8.86305	1.000	-34.9968	26.6701
	Low O2	-6.94000	8.86305	1.000	-37.7735	23.8935
	low O2 / high CO2	-18.05000	8.86305	.456	-48.8835	12.7835
low O2 / high CO2	Control	13.88667	8.86305	.935	-16.9468	44.7201
	Low O2	11.11000	8.86305	1.000	-19.7235	41.9435
	high CO2	18.05000	8.86305	.456	-12.7835	48.8835

Lepidozamia hopei SD

Oneway

ANOVA

Stomatal Density

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	48.066	3	16.022	.627	.617
Within Groups	204.332	8	25.542		
Total	252.399	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Density

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-1.39000	4.12646	1.000	-15.7455	12.9655
	high CO2	-.46148	4.12646	1.000	-14.8169	13.8940
	low O2 / high CO2	-5.09222	4.12646	1.000	-19.4477	9.2632
Low O2	Control	1.39000	4.12646	1.000	-12.9655	15.7455
	high CO2	.92852	4.12646	1.000	-13.4269	15.2840
	low O2 / high CO2	-3.70222	4.12646	1.000	-18.0577	10.6532
high CO2	Control	.46148	4.12646	1.000	-13.8940	14.8169
	Low O2	-.92852	4.12646	1.000	-15.2840	13.4269
	low O2 / high CO2	-4.63074	4.12646	1.000	-18.9862	9.7247
low O2 / high CO2	Control	5.09222	4.12646	1.000	-9.2632	19.4477
	Low O2	3.70222	4.12646	1.000	-10.6532	18.0577
	high CO2	4.63074	4.12646	1.000	-9.7247	18.9862

Lepidozamia peroffskyana SD

Oneway

]

ANOVA

Stomatal Density

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	55.749	3	18.583	.622	.620
Within Groups	239.062	8	29.883		
Total	294.811	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Density

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-6.01667	4.46339	1.000	-21.5442	9.5109
	high CO2	-2.31333	4.46339	1.000	-17.8409	13.2142
	low O2 / high CO2	-3.24000	4.46339	1.000	-18.7676	12.2876
Low O2	Control	6.01667	4.46339	1.000	-9.5109	21.5442
	high CO2	3.70333	4.46339	1.000	-11.8242	19.2309
	low O2 / high CO2	2.77667	4.46339	1.000	-12.7509	18.3042
high CO2	Control	2.31333	4.46339	1.000	-13.2142	17.8409
	Low O2	-3.70333	4.46339	1.000	-19.2309	11.8242
	low O2 / high CO2	-.92667	4.46339	1.000	-16.4542	14.6009
low O2 / high CO2	Control	3.24000	4.46339	1.000	-12.2876	18.7676
	Low O2	-2.77667	4.46339	1.000	-18.3042	12.7509
	high CO2	.92667	4.46339	1.000	-14.6009	16.4542

Macrozamia miquelii SD

Oneway

ANOVA

Stomatal Density

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	225.134	3	75.045	1.661	.252
Within Groups	361.474	8	45.184		
Total	586.608	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Density
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	11.57667	5.48843	.408	-7.5169	30.6703
	high CO2	9.26000	5.48843	.780	-9.8336	28.3536
	low O2 / high CO2	6.94333	5.48843	1.000	-12.1503	26.0369
Low O2	Control	-11.57667	5.48843	.408	-30.6703	7.5169
	high CO2	-2.31667	5.48843	1.000	-21.4103	16.7769
	low O2 / high CO2	-4.63333	5.48843	1.000	-23.7269	14.4603
high CO2	Control	-9.26000	5.48843	.780	-28.3536	9.8336
	Low O2	2.31667	5.48843	1.000	-16.7769	21.4103
	low O2 / high CO2	-2.31667	5.48843	1.000	-21.4103	16.7769
low O2 / high CO2	Control	-6.94333	5.48843	1.000	-26.0369	12.1503
	Low O2	4.63333	5.48843	1.000	-14.4603	23.7269
	high CO2	2.31667	5.48843	1.000	-16.7769	21.4103

Zamia integrifolia SD

Oneway

ANOVA

Stomatal Density

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	319.584	3	106.528	.667	.595
Within Groups	1276.809	8	159.601		
Total	1596.393	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Stomatal Density
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-1.85333	10.31507	1.000	-37.7382	34.0316
	high CO2	11.57333	10.31507	1.000	-24.3116	47.4582
	low O2 / high CO2	2.31333	10.31507	1.000	-33.5716	38.1982
Low O2	Control	1.85333	10.31507	1.000	-34.0316	37.7382
	high CO2	13.42667	10.31507	1.000	-22.4582	49.3116
	low O2 / high CO2	4.16667	10.31507	1.000	-31.7182	40.0516
high CO2	Control	-11.57333	10.31507	1.000	-47.4582	24.3116
	Low O2	-13.42667	10.31507	1.000	-49.3116	22.4582
	low O2 / high CO2	-9.26000	10.31507	1.000	-45.1449	26.6249
low O2 / high CO2	Control	-2.31333	10.31507	1.000	-38.1982	33.5716
	Low O2	-4.16667	10.31507	1.000	-40.0516	31.7182
	high CO2	9.26000	10.31507	1.000	-26.6249	45.1449

Cycas revoluta SPL

Oneway

ANOVA

SPL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	102.836	3	34.279	1.426	.305
Within Groups	192.245	8	24.031		
Total	295.081	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: SPL
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	7.90121	4.00255	.503	-6.0232	21.8256
	high CO2	5.87400	4.00255	1.000	-8.0504	19.7984
	low O2 / high CO2	5.48459	4.00255	1.000	-8.4398	19.4090
Low O2	Control	-7.90121	4.00255	.503	-21.8256	6.0232
	high CO2	-2.02720	4.00255	1.000	-15.9516	11.8972
	low O2 / high CO2	-2.41662	4.00255	1.000	-16.3410	11.5078
high CO2	Control	-5.87400	4.00255	1.000	-19.7984	8.0504
	Low O2	2.02720	4.00255	1.000	-11.8972	15.9516
	low O2 / high CO2	-.38942	4.00255	1.000	-14.3138	13.5350
low O2 / high CO2	Control	-5.48459	4.00255	1.000	-19.4090	8.4398
	Low O2	2.41662	4.00255	1.000	-11.5078	16.3410
	high CO2	.38942	4.00255	1.000	-13.5350	14.3138

Dioon merolae SPL

Oneway

ANOVA

SPL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	81.803	3	27.268	3.034	.093
Within Groups	71.906	8	8.988		
Total	153.709	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: SPL

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-4.86578	2.44788	.492	-13.3817	3.6501
	high CO2	-5.48863	2.44788	.331	-14.0045	3.0273
	low O2 / high CO2	-6.95475	2.44788	.131	-15.4706	1.5611
Low O2	Control	4.86578	2.44788	.492	-3.6501	13.3817
	high CO2	-.62284	2.44788	1.000	-9.1387	7.8930
	low O2 / high CO2	-2.08897	2.44788	1.000	-10.6049	6.4269
high CO2	Control	5.48863	2.44788	.331	-3.0273	14.0045
	Low O2	.62284	2.44788	1.000	-7.8930	9.1387
	low O2 / high CO2	-1.46612	2.44788	1.000	-9.9820	7.0498
low O2 / high CO2	Control	6.95475	2.44788	.131	-1.5611	15.4706
	Low O2	2.08897	2.44788	1.000	-6.4269	10.6049
	high CO2	1.46612	2.44788	1.000	-7.0498	9.9820

Lepidozamia hopei SPL

Oneway

ANOVA

SPL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	132.205	3	44.068	1.684	.247
Within Groups	209.329	8	26.166		
Total	341.534	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: SPL
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	3.51404	4.17661	1.000	-11.0159	18.0440
	high CO2	-5.57865	4.17661	1.000	-20.1086	8.9513
	low O2 / high CO2	-2.32909	4.17661	1.000	-16.8590	12.2008
Low O2	Control	-3.51404	4.17661	1.000	-18.0440	11.0159
	high CO2	-9.09270	4.17661	.367	-23.6226	5.4372
	low O2 / high CO2	-5.84313	4.17661	1.000	-20.3731	8.6868
high CO2	Control	5.57865	4.17661	1.000	-8.9513	20.1086
	Low O2	9.09270	4.17661	.367	-5.4372	23.6226
	low O2 / high CO2	3.24956	4.17661	1.000	-11.2804	17.7795
low O2 / high CO2	Control	2.32909	4.17661	1.000	-12.2008	16.8590
	Low O2	5.84313	4.17661	1.000	-8.6868	20.3731
	high CO2	-3.24956	4.17661	1.000	-17.7795	11.2804

Lepidozamia peroffskyana SPL

Oneway

ANOVA

SPL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	71.589	3	23.863	2.891	.102
Within Groups	66.037	8	8.255		
Total	137.626	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: SPL
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-3.79615	2.34586	.866	-11.9571	4.3648
	high CO2	-6.87929	2.34586	.114	-15.0403	1.2817
	low O2 / high CO2	-3.16499	2.34586	1.000	-11.3260	4.9960
Low O2	Control	3.79615	2.34586	.866	-4.3648	11.9571
	high CO2	-3.08314	2.34586	1.000	-11.2441	5.0778
high CO2	low O2 / high CO2	.63116	2.34586	1.000	-7.5298	8.7921
	Control	6.87929	2.34586	.114	-1.2817	15.0403
	Low O2	3.08314	2.34586	1.000	-5.0778	11.2441
low O2 / high CO2	low O2 / high CO2	3.71430	2.34586	.912	-4.4467	11.8753
	Control	3.16499	2.34586	1.000	-4.9960	11.3260
	Low O2	-.63116	2.34586	1.000	-8.7921	7.5298
	high CO2	-3.71430	2.34586	.912	-11.8753	4.4467

Macrozamia miquelli SPL

Oneway

ANOVA

SPL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	42.809	3	14.270	1.308	.337
Within Groups	87.251	8	10.906		
Total	130.060	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: SPL
Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	2.27567	2.69647	1.000	-7.1050	11.6564
	high CO2	-1.21766	2.69647	1.000	-10.5983	8.1630
	low O2 / high CO2	-2.90951	2.69647	1.000	-12.2902	6.4712
Low O2	Control	-2.27567	2.69647	1.000	-11.6564	7.1050
	high CO2	-3.49333	2.69647	1.000	-12.8740	5.8874
	low O2 / high CO2	-5.18519	2.69647	.544	-14.5659	4.1955
high CO2	Control	1.21766	2.69647	1.000	-8.1630	10.5983
	Low O2	3.49333	2.69647	1.000	-5.8874	12.8740
	low O2 / high CO2	-1.69186	2.69647	1.000	-11.0725	7.6888
low O2 / high CO2	Control	2.90951	2.69647	1.000	-6.4712	12.2902
	Low O2	5.18519	2.69647	.544	-4.1955	14.5659
	high CO2	1.69186	2.69647	1.000	-7.6888	11.0725

Zamia integrifolia SPL

Oneway

ANOVA

SPL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32.393	3	10.798	1.205	.368
Within Groups	71.693	8	8.962		
Total	104.086	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: SPL

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	1.42162	2.44426	1.000	-7.0817	9.9249
	high CO2	2.25964	2.44426	1.000	-6.2436	10.7629
	low O2 / high CO2	-2.07705	2.44426	1.000	-10.5803	6.4262
Low O2	Control	-1.42162	2.44426	1.000	-9.9249	7.0817
	high CO2	.83801	2.44426	1.000	-7.6653	9.3413
	low O2 / high CO2	-3.49867	2.44426	1.000	-12.0019	5.0046
high CO2	Control	-2.25964	2.44426	1.000	-10.7629	6.2436
	Low O2	-.83801	2.44426	1.000	-9.3413	7.6653
	low O2 / high CO2	-4.33669	2.44426	.684	-12.8400	4.1666
low O2 / high CO2	Control	2.07705	2.44426	1.000	-6.4262	10.5803
	Low O2	3.49867	2.44426	1.000	-5.0046	12.0019
	high CO2	4.33669	2.44426	.684	-4.1666	12.8400

Cycas revoluta $G_{s_{max}}$

Oneway

ANOVA

Gsmax

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4459.506	3	1486.502	4.243	.045
Within Groups	2802.469	8	350.309		
Total	7261.975	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Gsmax

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	41.20265	15.28199	.163	-11.9615	94.3668
	high CO2	29.07922	15.28199	.561	-24.0850	82.2434
	low O2 / high CO2	51.46907	15.28199	.059	-1.6951	104.6333
Low O2	Control	-41.20265	15.28199	.163	-94.3668	11.9615
	high CO2	-12.12343	15.28199	1.000	-65.2876	41.0408
high CO2	low O2 / high CO2	10.26642	15.28199	1.000	-42.8978	63.4306
	Control	-29.07922	15.28199	.561	-82.2434	24.0850
	Low O2	12.12343	15.28199	1.000	-41.0408	65.2876
low O2 / high CO2	low O2 / high CO2	22.38985	15.28199	1.000	-30.7743	75.5540
	Control	-51.46907	15.28199	.059	-104.6333	1.6951
	Low O2	-10.26642	15.28199	1.000	-63.4306	42.8978
	high CO2	-22.38985	15.28199	1.000	-75.5540	30.7743

Dioon merolae G_{smax}

Oneway

ANOVA

Gsmax

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6862.886	3	2287.629	8.601	.007
Within Groups	2127.664	8	265.958		
Total	8990.550	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Gsmax

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-34.48892	13.31561	.193	-80.8123	11.8345
	high CO2	-28.44533	13.31561	.391	-74.7687	17.8781
	low O2 / high CO2	-67.29937(*)	13.31561	.006	-113.6228	-20.9760
Low O2	Control	34.48892	13.31561	.193	-11.8345	80.8123
	high CO2	6.04359	13.31561	1.000	-40.2798	52.3670
	low O2 / high CO2	-32.81045	13.31561	.234	-79.1338	13.5129
high CO2	Control	28.44533	13.31561	.391	-17.8781	74.7687
	Low O2	-6.04359	13.31561	1.000	-52.3670	40.2798
	low O2 / high CO2	-38.85404	13.31561	.116	-85.1774	7.4693
low O2 / high CO2	Control	67.29937(*)	13.31561	.006	20.9760	113.6228
	Low O2	32.81045	13.31561	.234	-13.5129	79.1338
	high CO2	38.85404	13.31561	.116	-7.4693	85.1774

* The mean difference is significant at the .05 level.

Lepidozamia hopei G_{smax}

Oneway

ANOVA

G_{smax}

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2029.714	3	676.571	3.095	.089
Within Groups	1748.531	8	218.566		
Total	3778.245	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: G_{smax}

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	6.97832	12.07108	1.000	-35.0155	48.9721
	high CO2	-20.08236	12.07108	.808	-62.0762	21.9115
	low O2 / high CO2	-23.75226	12.07108	.508	-65.7461	18.2416
Low O2	Control	-6.97832	12.07108	1.000	-48.9721	35.0155
	high CO2	-27.06068	12.07108	.332	-69.0545	14.9331
	low O2 / high CO2	-30.73058	12.07108	.206	-72.7244	11.2632
high CO2	Control	20.08236	12.07108	.808	-21.9115	62.0762
	Low O2	27.06068	12.07108	.332	-14.9331	69.0545
	low O2 / high CO2	-3.66990	12.07108	1.000	-45.6637	38.3239
low O2 / high CO2	Control	23.75226	12.07108	.508	-18.2416	65.7461
	Low O2	30.73058	12.07108	.206	-11.2632	72.7244
	high CO2	3.66990	12.07108	1.000	-38.3239	45.6637

Lepidozamia peroffskyana G_{smax}

Oneway

ANOVA

G_{smax}

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2000.895	3	666.965	3.065	.091
Within Groups	1740.915	8	217.614		
Total	3741.810	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: G_{smax}

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	-30.80496	12.04476	.203	-72.7072	11.0973
	high CO2	-32.39295	12.04476	.165	-74.2952	9.5093
	low O2 / high CO2	-21.30102	12.04476	.690	-63.2033	20.6012
Low O2	Control	30.80496	12.04476	.203	-11.0973	72.7072
	high CO2	-1.58799	12.04476	1.000	-43.4903	40.3143
	low O2 / high CO2	9.50394	12.04476	1.000	-32.3983	51.4062
high CO2	Control	32.39295	12.04476	.165	-9.5093	74.2952
	Low O2	1.58799	12.04476	1.000	-40.3143	43.4903
	low O2 / high CO2	11.09193	12.04476	1.000	-30.8103	52.9942
low O2 / high CO2	Control	21.30102	12.04476	.690	-20.6012	63.2033
	Low O2	-9.50394	12.04476	1.000	-51.4062	32.3983
	high CO2	-11.09193	12.04476	1.000	-52.9942	30.8103

Macrozamia miquelli $G_{s_{max}}$

Oneway

ANOVA

Gsmax

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2607.249	3	869.083	3.833	.057
Within Groups	1813.932	8	226.741		
Total	4421.181	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Gsmax

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	36.60489	12.29475	.106	-6.1671	79.3769
	high CO2	2.17524	12.29475	1.000	-40.5967	44.9472
	low O2 / high CO2	7.06921	12.29475	1.000	-35.7028	49.8412
Low O2	Control	-36.60489	12.29475	.106	-79.3769	6.1671
	high CO2	-34.42966	12.29475	.139	-77.2016	8.3423
	low O2 / high CO2	-29.53568	12.29475	.258	-72.3076	13.2363
high CO2	Control	-2.17524	12.29475	1.000	-44.9472	40.5967
	Low O2	34.42966	12.29475	.139	-8.3423	77.2016
	low O2 / high CO2	4.89397	12.29475	1.000	-37.8780	47.6659
low O2 / high CO2	Control	-7.06921	12.29475	1.000	-49.8412	35.7028
	Low O2	29.53568	12.29475	.258	-13.2363	72.3076
	high CO2	-4.89397	12.29475	1.000	-47.6659	37.8780

Zamia integrifolia $G_{s_{max}}$

Oneway

ANOVA

Gsmax

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2742.028	3	914.009	4.502	.039
Within Groups	1624.141	8	203.018		
Total	4366.169	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Gsmax

Bonferroni

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Low O2	12.37265	11.63379	1.000	-28.0999	52.8452
	high CO2	40.37751	11.63379	.051	-.0950	80.8501
	low O2 / high CO2	26.38567	11.63379	.318	-14.0869	66.8582
Low O2	Control	-12.37265	11.63379	1.000	-52.8452	28.0999
	high CO2	28.00486	11.63379	.256	-12.4677	68.4774
	low O2 / high CO2	14.01302	11.63379	1.000	-26.4595	54.4856
high CO2	Control	-40.37751	11.63379	.051	-80.8501	.0950
	Low O2	-28.00486	11.63379	.256	-68.4774	12.4677
	low O2 / high CO2	-13.99183	11.63379	1.000	-54.4644	26.4807
low O2 / high CO2	Control	-26.38567	11.63379	.318	-66.8582	14.0869
	Low O2	-14.01302	11.63379	1.000	-54.4856	26.4595
	high CO2	13.99183	11.63379	1.000	-26.4807	54.4644

Supplementary Data Table 4: One-way ANOVA P-values of stomatal density, stomatal index, stomatal pore length and $G_{s_{max}}$ for six cycad species grown under elevated $[CO_2]$ of 1500ppm and sub-ambient $[O_2]$ of 13% in combination and isolation relative to control of 380ppm $[CO_2]$ and 20.9% $[O_2]$.

Stomatal Density					Stomatal Index					Stomatal Pore Length					Calculated Maximum Stomatal Conductance				
Cycas revoluta					Cycas revoluta					Cycas revoluta					Cycas revoluta				
	Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂
Control	-	0.865	0.775	0.219	Control	-	0.790	0.531	0.212	Control	-	0.207	0.305	0.337	Control	-	0.125	0.187	0.049
Low O ₂	-	-	0.951	0.146	Low O ₂	-	-	0.318	0.093	Low O ₂	-	-	0.478	0.415	Low O ₂	-	-	0.346	0.422
High CO ₂	-	-	-	0.003	High CO ₂	-	-	-	0.324	High CO ₂	-	-	-	0.861	High CO ₂	-	-	-	0.005
Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-
Dioon merolae					Dioon merolae					Dioon merolae					Dioon merolae				
	Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂
Control	-	0.687	0.575	0.289	Control	-	0.589	0.120	0.808	Control	-	0.115	0.136	0.051	Control	-	0.008	0.024	0.017
Low O ₂	-	-	0.260	0.350	Low O ₂	-	-	0.149	0.874	Low O ₂	-	-	0.806	0.315	Low O ₂	-	-	0.480	0.126
High CO ₂	-	-	-	0.169	High CO ₂	-	-	-	0.244	High CO ₂	-	-	-	0.585	High CO ₂	-	-	-	0.090
Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-
Lepidozamia hopei					Lepidozamia hopei					Lepidozamia hopei					Lepidozamia hopei				
	Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂
Control	-	0.729	0.802	0.346	Control	-	0.269	0.243	0.254	Control	-	0.570	0.159	0.159	Control	-	0.512	0.016	0.182
Low O ₂	-	-	0.543	0.797	Low O ₂	-	-	0.967	0.967	Low O ₂	-	-	0.152	0.303	Low O ₂	-	-	0.035	0.133
High CO ₂	-	-	-	0.361	High CO ₂	-	-	-	0.986	High CO ₂	-	-	-	0.108	High CO ₂	-	-	-	0.807
Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-
Lepidozamia peroffskyana					Lepidozamia peroffskyana					Lepidozamia peroffskyana					Lepidozamia peroffskyana				
	Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂
Control	-	0.210	0.502	0.554	Control	-	0.700	0.478	0.480	Control	-	0.106	0.026	0.318	Control	-	0.043	0.018	0.180
Low O ₂	-	-	0.387	0.639	Low O ₂	-	-	0.136	0.133	Low O ₂	-	-	0.165	0.824	Low O ₂	-	-	0.891	0.557
High CO ₂	-	-	-	0.858	High CO ₂	-	-	-	0.990	High CO ₂	-	-	-	0.251	High CO ₂	-	-	-	0.455
Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-
Macrozamia miquelii					Macrozamia miquelii					Macrozamia miquelii					Macrozamia miquelii				
	Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂
Control	-	0.053	0.208	0.067	Control	-	0.013	0.355	0.176	Control	-	0.157	0.442	0.436	Control	-	0.010	0.890	0.309
Low O ₂	-	-	0.765	0.380	Low O ₂	-	-	0.615	0.349	Low O ₂	-	-	0.124	0.216	Low O ₂	-	-	0.102	0.032
High CO ₂	-	-	-	0.739	High CO ₂	-	-	-	0.917	High CO ₂	-	-	-	0.661	High CO ₂	-	-	-	0.767
Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-
Zamia integrifolia					Zamia integrifolia					Zamia integrifolia					Zamia integrifolia				
	Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂
Control	-	0.883	0.080	0.825	Control	-	0.586	0.233	0.503	Control	-	0.446	0.227	0.549	Control	-	0.426	0.004	0.072
Low O ₂	-	-	0.282	0.776	Low O ₂	-	-	0.799	0.324	Low O ₂	-	-	0.570	0.318	Low O ₂	-	-	0.086	0.405
High CO ₂	-	-	-	0.339	High CO ₂	-	-	-	0.053	High CO ₂	-	-	-	0.224	High CO ₂	-	-	-	0.181
Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-
Cycads Group (See Figure 2)					Cycads Group (See Figure 2)					Cycads Group (See Figure 2)					Cycads Group (See Figure 2)				
	Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂		Control	Low O ₂	High CO ₂	Low O ₂ / High CO ₂
Control	-	0.969	0.717	0.977	Control	-	0.695	0.635	0.730	Control	-	0.834	0.765	0.873	Control	-	0.675	0.874	0.690
Low O ₂	-	-	0.673	0.994	Low O ₂	-	-	0.895	0.998	Low O ₂	-	-	0.631	0.717	Low O ₂	-	-	0.551	0.405
High CO ₂	-	-	-	0.705	High CO ₂	-	-	-	0.911	High CO ₂	-	-	-	0.879	High CO ₂	-	-	-	0.805
Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-	Low O ₂ / High CO ₂	-	-	-	-