

-- Supplementary Data --

## Valorization of *Delonix regia* Pods for Bioethanol Production

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**Table S1:** Response surface regression analysis for glucose production and the interactive effects of substrate concentration versus substrate concentration (g), time (min), Acid concentration (%), and temperature (°C)

Analysis of Variance						
Source	df	Sum of Squares	Mean Square	F-value	p-value	
<b>Model</b>	14	0.0690	0.0049	29.72	< 0.0001	significant
A-Substrate concentration	1	0.0061	0.0061	36.59	< 0.0001	
B-Time	1	0.0014	0.0014	8.28	0.0115	
C-Acid concentration	1	0.0225	0.0225	135.59	< 0.0001	
D-Temperature	1	0.0001	0.0001	0.6129	0.4459	
AB	1	0.0012	0.0012	7.46	0.0155	
AC	1	0.0311	0.0311	187.52	< 0.0001	
AD	1	0.0029	0.0029	17.24	0.0009	
BC	1	0.0020	0.0020	12.16	0.0033	
BD	1	0.0000	0.0000	0.2591	0.6181	
CD	1	0.0181	0.0181	109.07	< 0.0001	
A <sup>2</sup>	1	0.0014	0.0014	8.17	0.0120	
B <sup>2</sup>	1	0.0020	0.0020	11.91	0.0036	
C <sup>2</sup>	1	0.0007	0.0007	4.38	0.0537	
D <sup>2</sup>	1	0.0013	0.0013	8.10	0.0122	
<b>Residual</b>	15	0.0025	0.0002			
Lack of Fit	11	0.0019	0.0002	1.15	0.4874	not significant
Pure Error	4	0.0006	0.0001			
<b>Cor Total</b>	29	0.0715				

**Table S2:** Model fit summary for Glucose production

Std. Dev.	0.0129	R <sup>2</sup>	0.9652
Mean	0.1382	Adjusted R <sup>2</sup>	0.9327
C.V. %	9.32	Predicted R <sup>2</sup>	0.8511
		Adeq Precision	24.0197

**Table S3:** Final equation of glucose production in terms of actual factors

Glucose yield	=
+0.287255	
-2.31915	Substrate concentration
+0.002681	Time
-0.204528	Acid concentration
+0.001721	Temperature
-0.005919	Substrate concentration * Time
+0.577122	Substrate concentration * Acid concentration
+0.015446	Substrate concentration * Temperature
-0.000358	Time * Acid concentration
+4.48050E-06	Time * Temperature
+0.001829	Acid concentration * Temperature
+2.80443	Substrate concentration <sup>2</sup>
-0.000020	Time <sup>2</sup>
+0.004760	Acid concentration <sup>2</sup>
-0.000039	Temperature <sup>2</sup>

**Table S4:** Response surface regression analysis for xylose production and the interactive effects of substrate concentration versus substrate concentration (g), time (min), Acid concentration (%), temperature (°C)

Analysis of Variance						
Source	df	Sum of Squares	Mean Square	F-value	p-value	
Model	14	0.0690	0.0049	29.72	< 0.0001	significant
A-Substrate concentration	1	0.0061	0.0061	36.59	< 0.0001	
B-Time	1	0.0014	0.0014	8.28	0.0115	
C-Acid concentration	1	0.0225	0.0225	135.59	< 0.0001	
D-Temperature	1	0.0001	0.0001	0.6129	0.4459	
AB	1	0.0012	0.0012	7.46	0.0155	

AC	1	0.0311	0.0311	187.52	< 0.0001	
AD	1	0.0029	0.0029	17.24	0.0009	
BC	1	0.0020	0.0020	12.16	0.0033	
BD	1	0.0000	0.0000	0.2591	0.6181	
CD	1	0.0181	0.0181	109.07	< 0.0001	
A <sup>2</sup>	1	0.0014	0.0014	8.17	0.0120	
B <sup>2</sup>	1	0.0020	0.0020	11.91	0.0036	
C <sup>2</sup>	1	0.0007	0.0007	4.38	0.0537	
D <sup>2</sup>	1	0.0013	0.0013	8.10	0.0122	
<b>Residual</b>	15	0.0025	0.0002			
Lack of Fit	11	0.0019	0.0002	1.15	0.4874	not significant
Pure Error	4	0.0006	0.0001			
<b>Cor Total</b>	29	0.0715				

**Table S5:** Model fit summary for Xylose production

<b>Std. Dev.</b>	0.0129	<b>R<sup>2</sup></b>	0.9652
<b>Mean</b>	0.1382	<b>Adjusted R<sup>2</sup></b>	0.9327
<b>C.V. %</b>	9.32	<b>Predicted R<sup>2</sup></b>	0.8511
		<b>Adeq Precision</b>	24.0197

**Table S6:** Final equation of xylose production in terms of actual factors

Glucose yield	=
+0.287255	
-2.31915	Substrate concentration
+0.002681	Time
-0.204528	Acid concentration
+0.001721	Temperature
-0.005919	Substrate concentration * Time
+0.577122	Substrate concentration * Acid concentration
+0.015446	Substrate concentration * Temperature
-0.000358	Time * Acid concentration
+4.48050E-06	Time * Temperature
+0.001829	Acid concentration * Temperature
+2.80443	Substrate concentration <sup>2</sup>
-0.000020	Time <sup>2</sup>

+0.004760	Acid concentration <sup>2</sup>
-0.000039	Temperature <sup>2</sup>

**Table S7:** Response surface regression analysis for lignin degradation and the interactive effects of substrate concentration versus substrate concentration (g), time (min), Acid concentration (%), temperature (°C)

Analysis of Variance						
Source	df	Sum of Squares	Mean Square	F-value	p-value	
<b>Model</b>	14	5575.74	398.27	35.66	< 0.0001	significant
A-Substrate concentration	1	173.37	173.37	15.52	0.0013	
B-Time	1	746.57	746.57	66.84	< 0.0001	
C-Acid concentration	1	99.77	99.77	8.93	0.0092	
D-Temperature	1	233.09	233.09	20.87	0.0004	
AB	1	2596.71	2596.71	232.48	< 0.0001	
AC	1	190.48	190.48	17.05	0.0009	
AD	1	7.33	7.33	0.6565	0.4305	
BC	1	246.37	246.37	22.06	0.0003	
BD	1	178.44	178.44	15.98	0.0012	
CD	1	308.73	308.73	27.64	< 0.0001	
A <sup>2</sup>	1	342.54	342.54	30.67	< 0.0001	
B <sup>2</sup>	1	26.99	26.99	2.42	0.1409	
C <sup>2</sup>	1	255.15	255.15	22.84	0.0002	
D <sup>2</sup>	1	414.06	414.06	37.07	< 0.0001	
<b>Residual</b>	15	167.54	11.17			
Lack of Fit	6	62.60	10.43	0.8948	0.5371	not significant
Pure Error	9	104.94	11.66			
<b>Cor Total</b>	29	5743.28				

**Table S8:** Model fit summary for lignin degradation

<b>Std. Dev.</b>	3.34	<b>R<sup>2</sup></b>	0.9708
<b>Mean</b>	22.64	<b>Adjusted R<sup>2</sup></b>	0.9436
<b>C.V. %</b>	14.76	<b>Predicted R<sup>2</sup></b>	0.8293
		<b>Adeq Precision</b>	21.0692

**Table S9:** Final equation of Lignin degradation in terms of actual factors

Glucose yield	=
+194.10273	
-631.45383	Substrate concentration
-2.55198	Time
+15.76064	Acid concentration
-2.92388	Temperature
+10.17595	Substrate concentration * Time
-54.34180	Substrate concentration * Acid concentration
-1.17454	Substrate concentration * Temperature
+0.146950	Time * Acid concentration
+0.011635	Time * Temperature
-0.301858	Acid concentration * Temperature
+1467.98082	Substrate concentration <sup>2</sup>
+0.002197	Time <sup>2</sup>
+2.87781	Acid concentration <sup>2</sup>
+0.021096	Temperature <sup>2</sup>

**Table S10:** Glucose recovery after enzymatic hydrolysis at different time-periods

Units (U mL <sup>-1</sup> )	Sample time (hrs)				
	1.5	3	24	48	72
0.5	7.28	9.0	10.57	12.28	13.96
1.0	18.71	20.42	21.97	23.85	25.57
1.5	27.0	28.28	29.85	31.49	33.71
3.0	35.38	37.71	39.85	41.28	55.28
5.0	35.57	37.85	39.99	41.28	55.57