

Figure S1. Histogram of residuals and approximation of normal probability density function of pectinase activity produced by *P. rolf sii* CCMB-714.

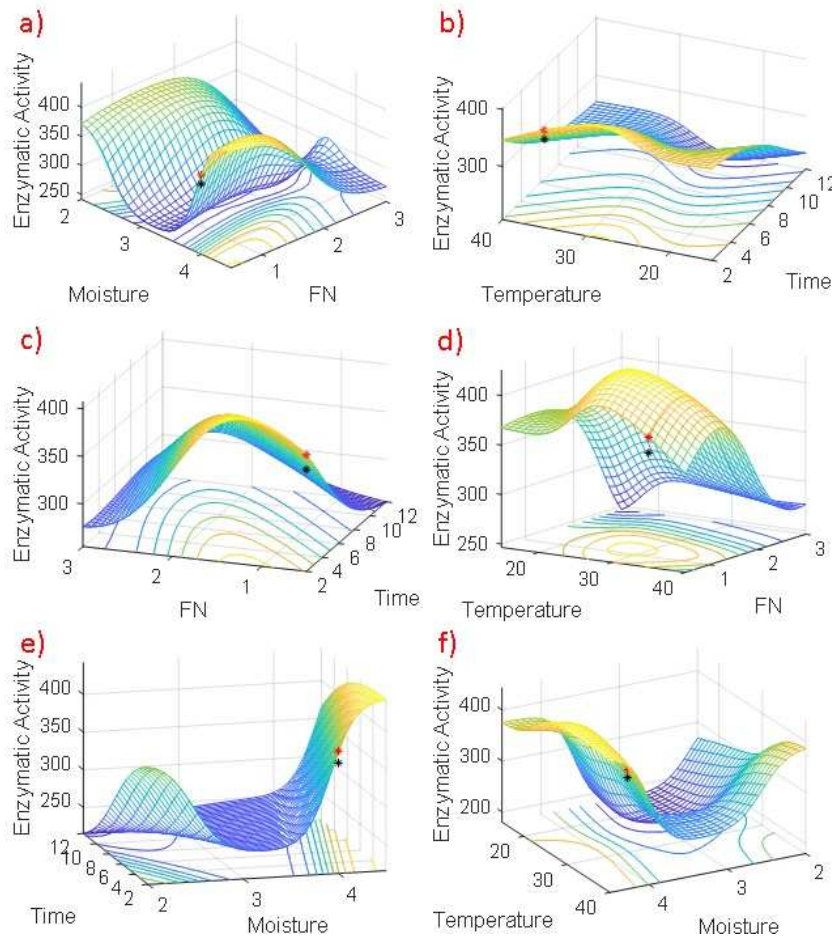
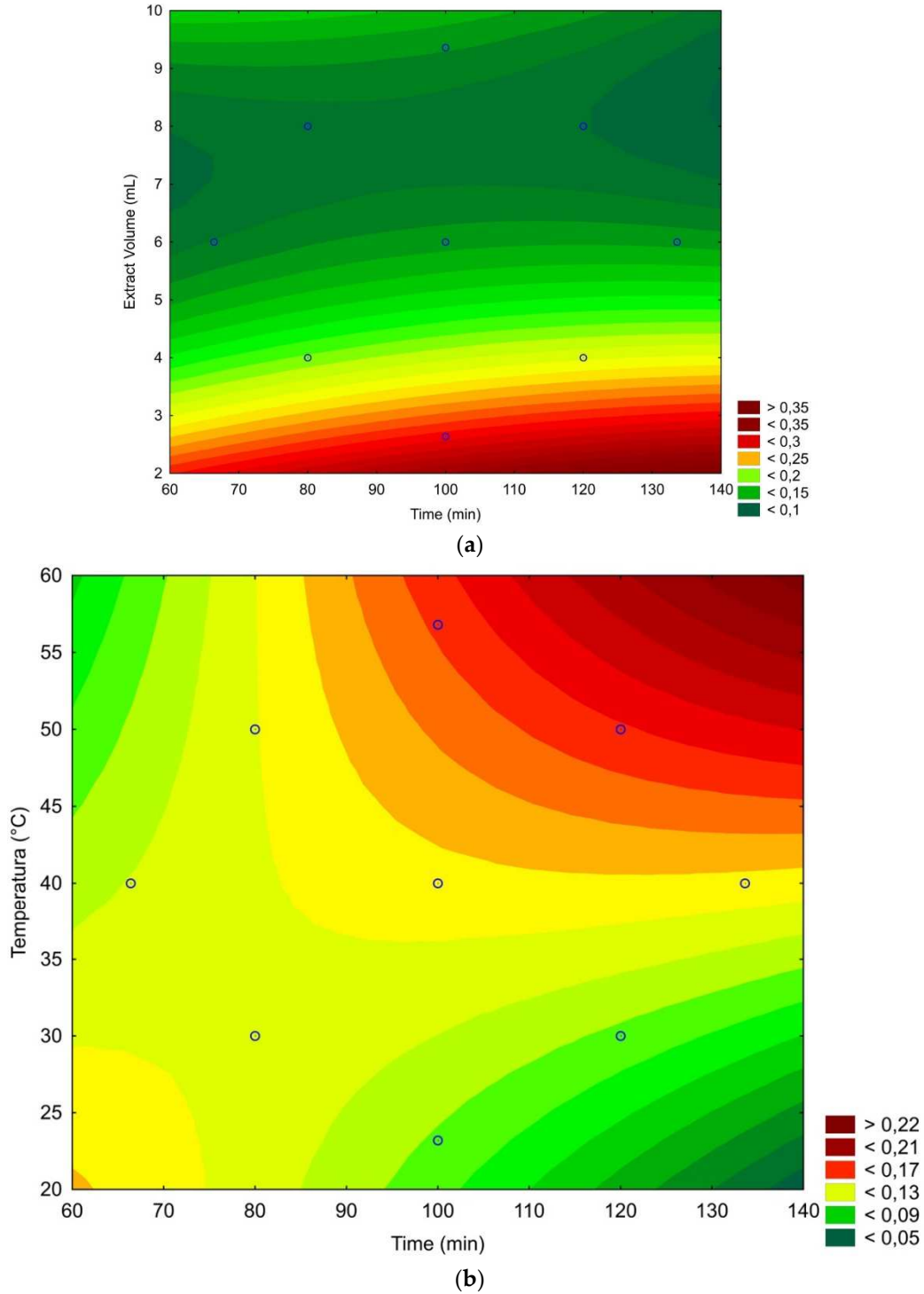


Figure S2. Tridimensional perspectives of the ANN experiment model. Each perspective was obtained by varying two inputs and fixing the other two to the value of experiment 21. (a) $T = 35/\text{FN} = 0.5$; (b) $t = 32/\text{FN} = 0.5$; (c) $t = 2/T = 35$; (d) $V = 4/\text{FN} = 0.5$; (e) $V = 4/T = 35$; and (f) $V = 4/t = 2$. Asterisks provide a comparison between experiment 21 enzyme activity (*) and ANN model estimation. Moisture (M), time (t), temperature (T), nitrogen (FN) and enzymatic activity (EA, U/g).



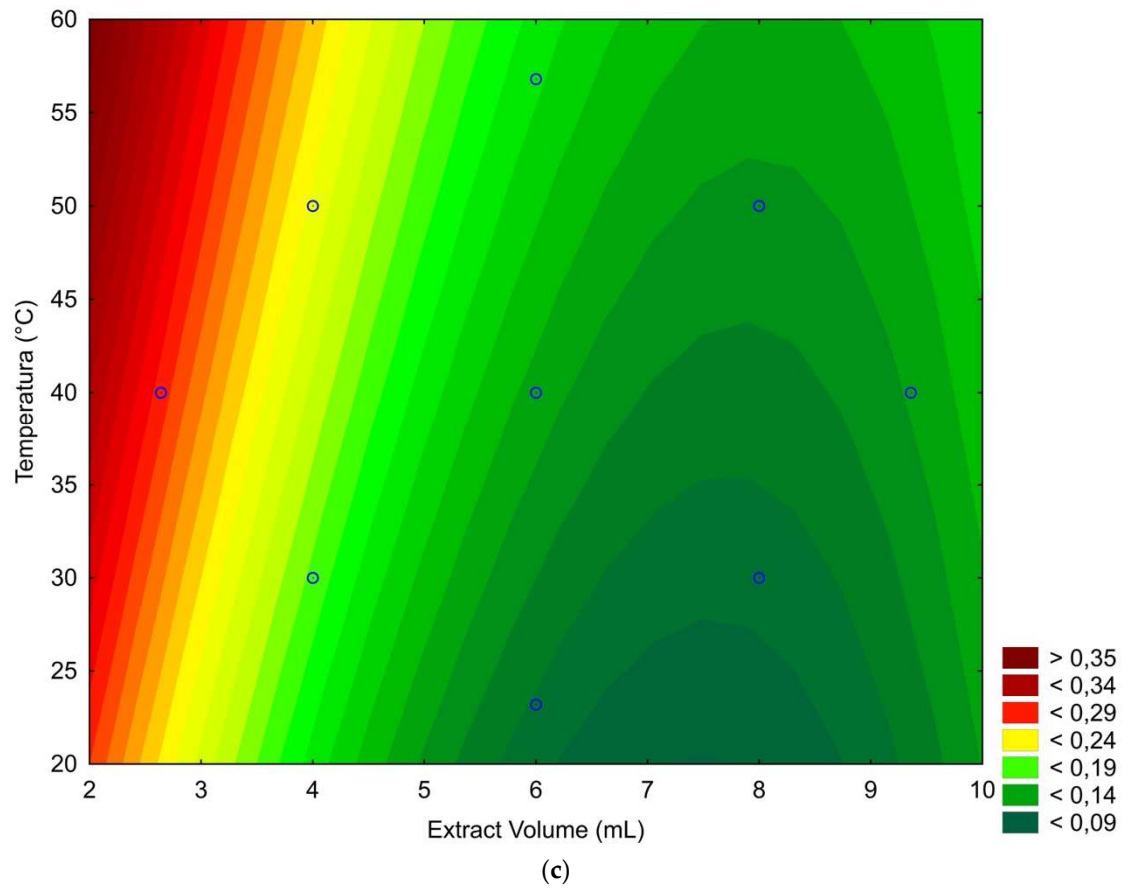


Figure S3. Contour curves for the relationships between the coded factors: (a) volume of enzymatic extract (V, mL) versus time (t, min), (b) temperature (T, °C) versus t (time, min) and (c) T (°C) versus V (mL) for the absorbance response (abs) from orange juice clarification by *P. rolfsii* CCMB-714 pectinases.

Table S1: Mixing matrix using nitrogen sources: cocoa seed peel (CSP), yeast extract (YE), ammonium phosphate (AP) as a supplement to the substrate (5 g) of jackfruit seed bran at a final concentration of 1% (w/w) for production of pectinases (PEC, U/g) by *P. rolf sii* CCMB – 714.

Experiment	Variables			Responses
	<i>CSP</i>	<i>YE</i>	<i>AP</i>	<i>PEC</i>
	(% w/w)	(% w/w)	(% w/w)	(U/g)
1	1.00	0.00	0.00	243.81
2	0.00	1.00	0.00	252.88
3	0.00	0.00	1.00	266.67
4	0.50	0.50	0.00	306.58
5	0.50	0.00	0.50	293.51
6	0.00	0.50	0.50	299.32
7	0.333	0.333	0.333	309.84
8	0.333	0.333	0.333	326.53
9	0.333	0.333	0.333	347.21

Table S2: Results obtained for ANOVA showing the mathematical models evaluated and the quadratic used to generate the surface using nitrogen sources: cocoa seed peel (CSP), yeast extract (YE), ammonium phosphate (AP) as a supplement to the substrate (5 g) of jackfruit seed bran at a final concentration of 1% (w/ w) for production of pectinases (PEC, U/g) by *P. rolfsii* CCMB – 714.

Factor	ANOVA									
	<i>SS</i> (<i>effect</i>)	<i>df</i> (<i>effect</i>)	<i>MS</i> (<i>effect</i>)	<i>SS</i> (<i>error</i>)	<i>df</i> (<i>error</i>)	<i>MS</i> (<i>error</i>)	<i>F</i>	<i>p</i>	<i>R</i> ²	<i>R</i> ² _{adj}
Linear	150.97	2	75.485	9133.045	6	1522.174	0.049	0.952	0.016	0
Quadratic	8258.29	3	2752.766	874.746	3	291.582	9.441	0.049	0.905	0.749
Special cubic	173.81	1	173.814	700.932	2	350.466	0.496	0.554	0.924	0.698
Total Adjusted	150.96	2	75.485	9133.045	6	1522.174	0.0496	0.952	0.016	0
Model	8583.08	6	1430.514				4.081	0.210		
Total Error	700.93	2	350.466							
Lack of Fit	0.021	0	0.000							
Pure Error	700.912	2	350.456							
Total Adjusted	9284.01	8	1160.502							

Table S3: Pearson correlation coefficients between each input and output. Second line (*) computed without 21th essay. The correlation was between moisture (M), time (t), temperature (T) and nitrogen source (NS) and the enzymatic activity (EA, U/g).

	M x EA	t x EA	T x EA	NSx EA
Correlation coefficient	0.152	-0.219	0.428	0.313
Correlation coefficient*	0.008	-0.060	0.334	0.583

Table S4: Analysis of the effect of ions and reagents (1 and 5 mM) on the pectinase activity produced by *P. rolfii* CCMB – 714, values expressed as relative activity (%).

Additives	Relative Activity	
	(U/U _o %)	
	1 mM	5 mM
Control (no additives)	100.0 ± 0.008	
Na₂CO₃	104.5 ± 0.04	102.7 ± 0.04
NiSO ₄	99.9 ± 0.03	95.6 ± 0.03
ZnSO ₄	107.0 ± 0.0	90.0 ± 0.03
MgCl₂	96.4 ± 0.01	97.6 ± 0.05
CaCl₂	91.2 ± 0.02	91.6 ± 0.01
LiSO₄	108.3 ± 0.01	101.0 ± 0.02
MnSO ₄	99.4 ± 0.03	101.1 ± 0.03
CuSO₄	117.1 ± 0.02	56.8 ± 0.01
SDS	100.8 ± 0.06	3.5 ± 0.02
EDTA	112.7 ± 0.01	205.4 ± 0.04
β-Mercaptoetanol	83.5 ± 0.01	79.4 ± 0.01

Table S5: Matrix of the Central Composite Rotational Design (CCDR 2²) for the coded and uncoded independent variables: Temperature (°C) and time (h) and the reducing sugar response (μmol /mL) from the saccharification of passion fruit peel by *P. rolfii* CCMB – 714 pectinases.

Variables			Responses
Experiment	Temperature (°C)	Time (h)	Reducing sugar (μmol /mL)
1	-1 (35)	-1 (5)	79.24
2	1 (55)	-1 (5)	92.18
3	-1 (35)	1 (19)	94.41
4	1 (55)	1 (19)	90.62
5	-1.41 (30.9)	0 (12)	72.32
6	1.41 (59.1)	0 (12)	85.04
7	0 (45)	-1.41 (2)	86.42
8	0 (45)	1.41 (22)	126.55
9	0 (45)	0 (12)	77.90
10	0 (45)	0 (12)	93.74
11	0 (45)	0 (12)	85.93

Table S6: Table of coefficients model chosen according to their statistical significance by the t test and p value. The test evaluated the influence of temperature and incubation time on the saccharification of passion fruit peel by pectinase from *P. rolfsii* CCMB – 714.

	Regr.Coeff.	Std.Err.	t(5)	p
Mean	85,871	5,122	16,764	< 0,0001*
(T)²	3,396	3,142	1,081	0,3291
(T)	-4,500	3,749	-1,200	0,2838
(t)²	8,800	3,142	2,801	0,0379*

* statistically significant with 90 % of confidence ($p < 0.10$)

Table S7: Table of coefficients model chosen according to their statistical significance by the t test and p value. The test evaluated the time, volume of enzymatic extract and temperature and the absorbance response (read at 600 nm) from the clarification of orange juice by *P. rolfsii* CCMB-714 pectinases.

	Regr.Coeff.	Std.Err.	t(7)	p
Mean	0,136	0,013	10,557	< 0.0001*
(t)²	0,005	0,006	0,808	0,4456
(t)	-0,003	0,007	-0,391	0,7073
(V)²	-0,046	0,006	-7,579	0,0001*
(V)	0,025	0,007	3,827	0,0065*
(T)²	0,016	0,006	2,629	0,0340*
(T)	-0,0003	0,007	-0,046	0,9644
(t)·(V)	-0,008	0,008	-0,980	0,3599
(t)·(T)	0,015	0,008	1,865	0,1045*
(V)·(T)	-0,004	0,008	-0,537	0,6077

* statistically significant with 85 % of confidence ($p < 0.15$)