

Table S1. Total phenolic contents (TPC), condensed tannins, and DPPH assay (IC₅₀) after 50 % ethanol extraction.

Treatment	TPC (mg GAE/gDW)	Condensed Tannins (mg GAE/gDW)	DPPH (IC ₅₀) (µg DW/ml)
Control (non-extruded shell)	36.14±0.09 ^e	309.60±0.22 ^a	617.28±0.33 ^{cd}
T1 (33.25°C, 150 rpm)	21.29±0.01 ^h	262.11±0.84 ^h	749.76±1.44 ^a
T2 (40°C, 100 rpm)	32.82±0.02 ^g	264.61±0.14 ^g	668.11±2.46 ^b
T3 (40°C, 200 rpm)	34.98±0.02 ^f	284.30±0.05 ^e	614.16±6.27 ^{cd}
T4 (70°C, 150 rpm)	69.83±0.05 ^a	291.56±0.49 ^c	377.54±1.41 ^f
T5 (70°C, 88.75 rpm)	36.40±0.03 ^{de}	310.56±0.35 ^a	681.46±2.34 ^b
T6 (70°C, 150 rpm)	65.21±0.50 ^c	287.40±0.07 ^d	368.94±2.29 ^f
T7 (70°C, 211.25 rpm)	37.33±0.03 ^d	277.53±0.49 ^f	568.34±1.77 ^e
T8 (70°C, 150 rpm)	67.08±0.21 ^b	293.15±0.23 ^c	381.76±7.85 ^f
T9 (100°C, 100 rpm)	34.48±0.03 ^f	299.92±0.19 ^b	623.03±1.75 ^c
T10 (100°C, 200 rpm)	37.34±0.03 ^d	287.20±0.23 ^d	603.70±2.76 ^d
T11 (106.75°C, 150 rpm)	37.04±0.04 ^{de}	265.23±0.75 ^g	577.47±2.15 ^e

Data from control and extrusion treatments; all contents are expressed *versus* dry plant material. Average ± SD; different letters by column represents significant differences by Tukey's test ($p < 0.05$).

Table T2. Coefficients of extrusion conditions variables (B temperature and A screw speed) of the predictive quadratic model for Total Phenolic Content (TPC), Radical Scavenging Activity (DPPH) and Condensed Tannin Contents (CTC).

Factor	TPC				DPPH				CTC			
	Coef	Std Error	T-Value	p-Value	Coef	Std Error	T-Value	p-Value	Coef	Std Error	T-Value	p-Value
Linear coefficient	65.03	2.43	26.81	0.000	392.2	21.1	18.63	0.000	289.32	3.58	80.88	0.000
A (rpm)	1.08	2.00	0.54	0.596	-37.2	17.3	-2.15	0.048	-585	2.94	-1.99	0.064
B (°C)	4.08	2.00	2.04	0.058	-46.6	17.3	-2.69	0.016	7.35	2.94	2.50	0.024
A(rpm)*A (rpm)	-22.13	3.24	-6.84	0.000	184.3	28.1	6.56	0.000	8.85	4.77	1.85	0.082
B (°C)*B (°C)	-29.84	3.24	-9.22	0.000	223.1	28.1	7.94	0.000	-21.49	4.77	-4.50	0.000
A (rpm)*B (°C)	0.26	3.23	0.08	0.937	12.9	28.1	0.46	0.653	-12.16	4.77	-2.55	0.021
R ²	88.54				87.06				72.70			
R ² adj.	84.96				83.01				64.17			