Supplementary Material

for

The Effect of Ultrasound on the Extraction and Functionality of Proteins from Duckweed (*Lemna minor*)

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Content

Table S1. Analysis of Variance for the response surface regression of the extract yield.

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	9	19575.2	2175.0	50.32	0.000
Linear	3	13662.4	4554.1	105.36	0.000
pH	1	13207.2	13207.2	305.54	0.000
Amplitude	1	17.2	17.2	0.40	0.535
Time	1	438.1	438.1	10.13	0.005
Square	3	5064.3	1688.1	39.05	0.000
pH*pH	1	4862.9	4862.9	112.50	0.000
Amplitude*Amplitude	1	21.3	21.3	0.49	0.491
Time*Time	1	77.1	77.1	1.78	0.197
2-Way Interaction	3	848.5	282.8	6.54	0.003
pH*Amplitude	1	26.3	26.3	0.61	0.445
pH*Time	1	821.5	821.5	19.01	0.000
Amplitude*Time	1	0.6	0.6	0.01	0.904
Error	20	864.5	43.2		
Lack-of-Fit	3	419.2	139.7	5.33	0.009
Pure Error	17	445.3	26.2		
Total	29	20439.8			

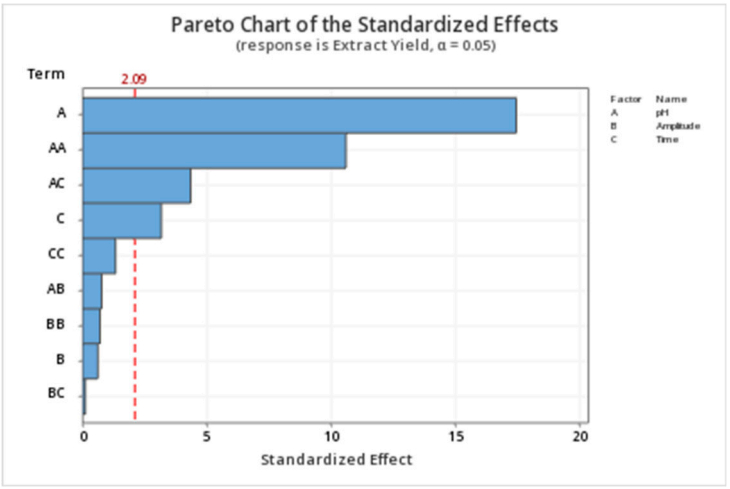

Figure S1. Pareto chart o the standardized effects on the extract yield.

Table S2. Analysis of Variance for the response surface regression of the protein content.

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	9	2425.32	269.48	14.43	0.000
Linear	3	1614.21	538.07	28.82	0.000
pH	1	1548.62	1548.62	82.93	0.000
Amplitude	1	8.51	8.51	0.46	0.507
Time	1	57.08	57.08	3.06	0.096
Square	3	773.21	257.74	13.80	0.000
pH*pH	1	746.33	746.33	39.97	0.000
Amplitude*Amplitude	1	5.02	5.02	0.27	0.610
Time*Time	1	1.01	1.01	0.05	0.818
2-Way Interaction	3	37.90	12.63	0.68	0.577
pH*Amplitude	1	16.56	16.56	0.89	0.358
pH*Time	1	18.24	18.24	0.98	0.335
Amplitude*Time	1	3.10	3.10	0.17	0.688
Error	20	373.46	18.67		
Lack-of-Fit	3	63.63	21.21	1.16	0.353
Pure Error	17	309.83	18.23		
Total	29	2798.77			

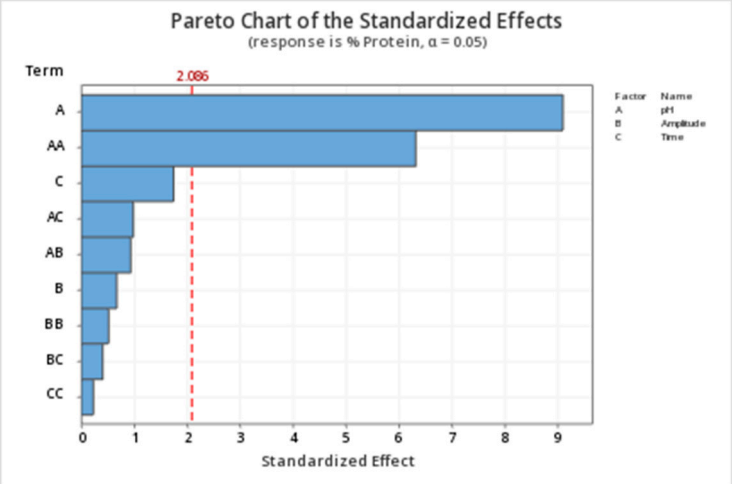

Figure S2. Pareto chart o the standardized effects on the protein content.

Table S3. Analysis of Variance for the response surface regression of the protein yield.

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	9	3787.97	420.89	14.43	0.000
Linear	3	3025.84	1008.61	34.57	0.000
pH	1	2871.43	2871.43	98.42	0.000
Amplitude	1	115.55	115.55	3.96	0.060
Time	1	38.86	38.86	1.33	0.262
Square	3	496.47	165.49	5.67	0.006
pH*pH	1	406.26	406.26	13.93	0.001
Amplitude*Amplitude	1	54.67	54.67	1.87	0.186
Time*Time	1	16.11	16.11	0.55	0.466
2-Way Interaction	3	265.66	88.55	3.04	0.053
pH*Amplitude	1	130.74	130.74	4.48	0.047
pH*Time	1	123.23	123.23	4.22	0.053
Amplitude*Time	1	11.70	11.70	0.40	0.534
Error	20	583.49	29.17		
Lack-of-Fit	3	35.68	11.89	0.37	0.776
Pure Error	17	547.81	32.22		
Total	29	4371.45			

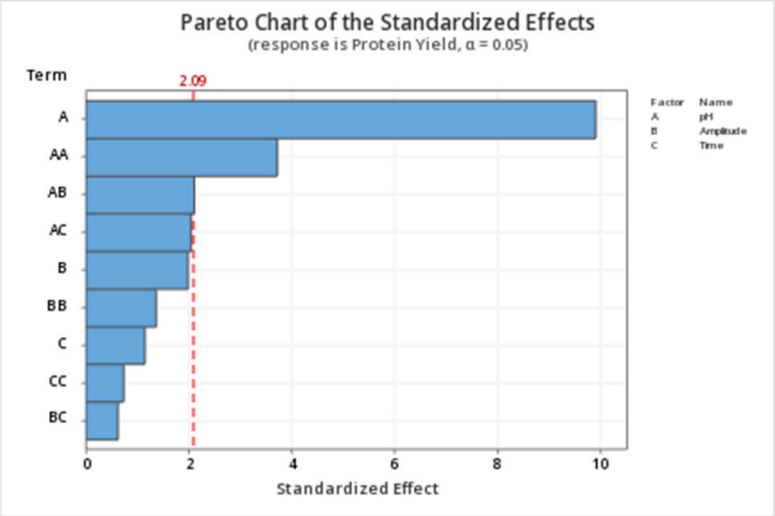

Figure S3 . Pareto chart o the standardized effects on the protein yield.

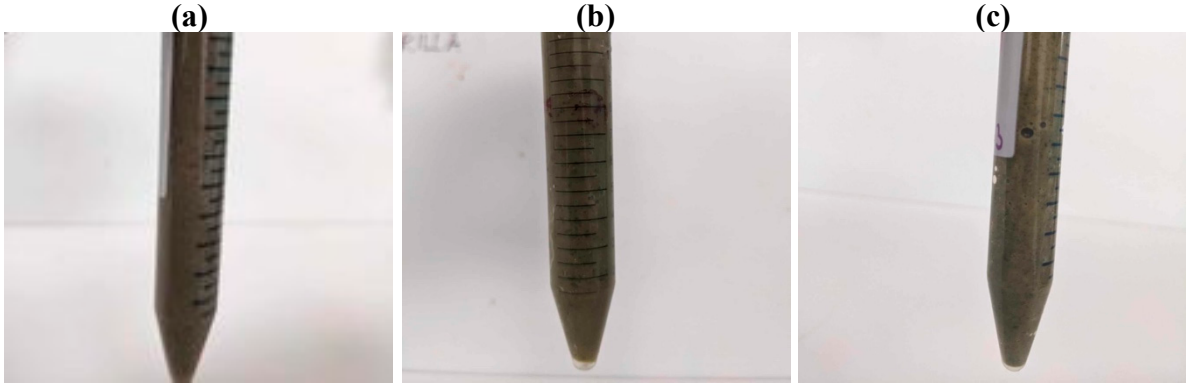

Figure S4. Emulsions produced with **(a)** duckweed flour, **(b)** control protein extract, and **(c)** ultrasound protein extract.