

Supplementary Material

Isolation, Purification and Characterization of Proteins in “Señorita” Banana (*Musa Acuminata* (AAA) ‘Señorita’) Pulp with Bioactive Peptides Exhibiting Antihypertensive and Antioxidant Activities

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Supplementary Material A

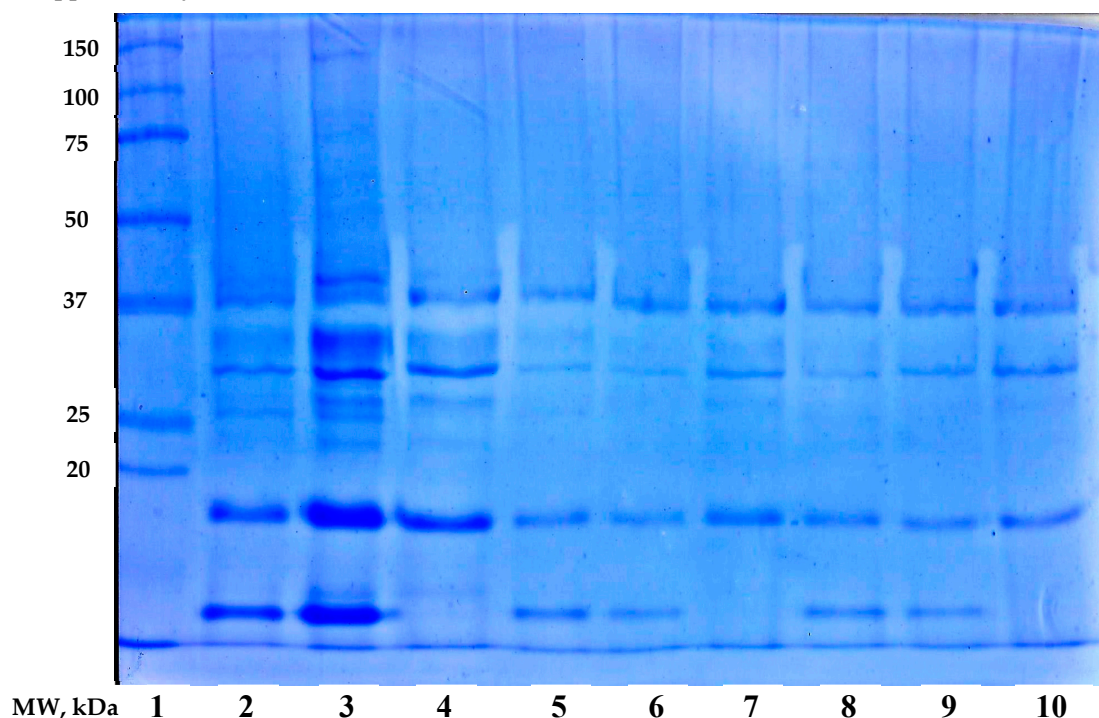


Figure S1. SDS-PAGE Profile for the comparison of the crude, partially purified and purified protein extract at different sample concentrations and sample to sample buffer ratio (figure legend given below).

Lane No.	Sample	Sample to Sample Buffer Ratio
1	Protein Ladder	-
2	167 µg/mL Crude Extract	2:1
3	964 µg/mL Partially Purified Extract	2:1
4	152 µg/mL Purified Extract	2:1
5	50 µg/mL Crude Extract	5:1
6	50 µg/mL Partially Purified Extract	5:1
7	50 µg/mL Purified Extract	5:1
8	50 µg/mL Crude Extract	10:1
9	50 µg/mL Partially Purified Extract	10:1
10	50 µg/mL Purified Extract	10:1

Supplementary Material B

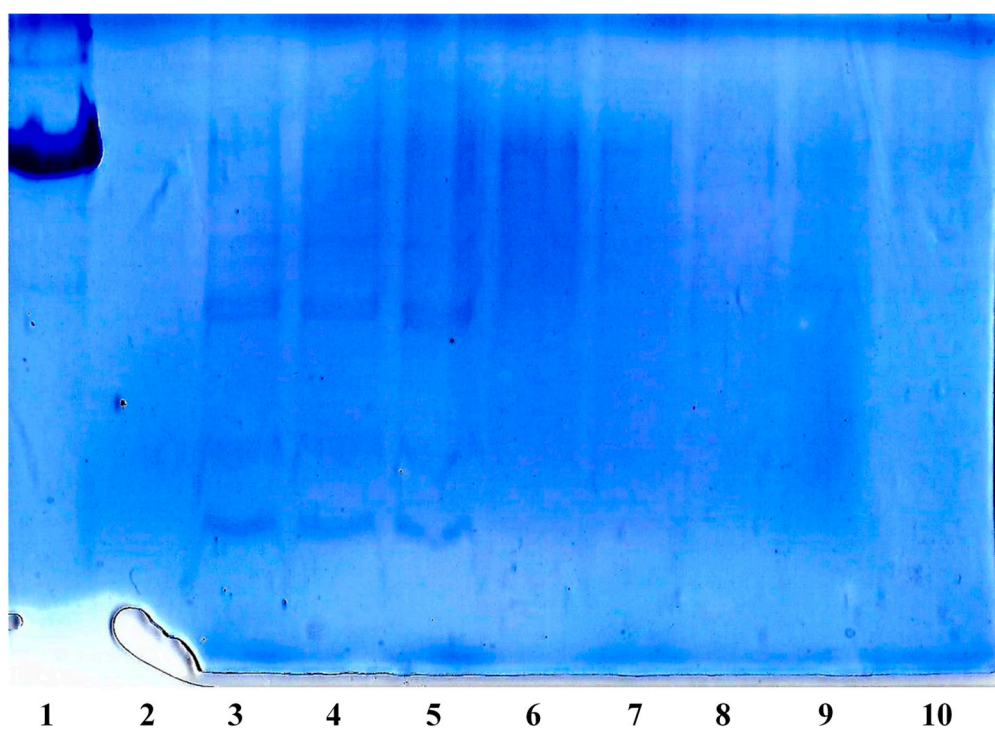


Figure S2. SDS-PAGE Profile of the obtained supernatants at different percent saturation during ammonium sulfate precipitation (figure legend given below).

Lane No.	Sample	Sample to Sample Buffer Ratio
1	Bovine Serum Albumin	1:1
2	Blank Lane	-
3	00% to 20% Supernatant	1:1
4	20% to 40% Supernatant	1:1
5	20% to 40% Supernatant	2:1
6	40% to 60% Supernatant	1:1
7	40% to 60% Supernatant	2:1
8	60% to 80% Supernatant	1:1
9	60% to 80% Supernatant	2:1
10	80% to 95% Supernatant	1:1

Supplementary Material C

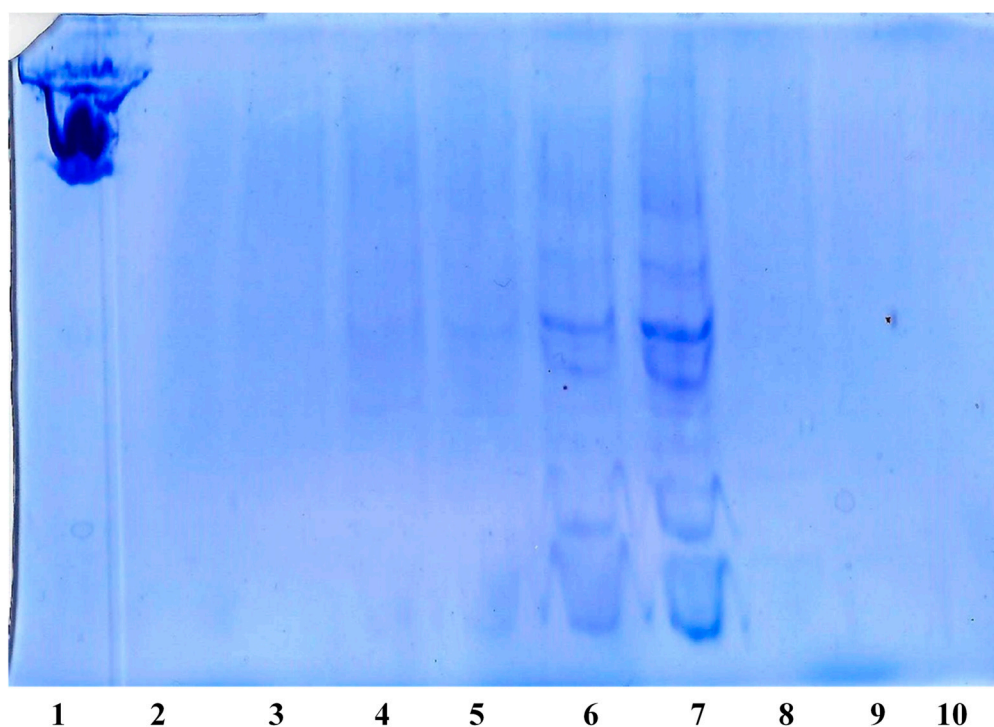


Figure S3. SDS-PAGE Profile of the obtained precipitates at different percent saturation during ammonium sulfate precipitation and their corresponding concentrations determined using colorimetric Bradford assay (figure legend given below).

Lane No.	Sample	Protein Concentration*, $\mu\text{g/mL}$	Sample to Sample Buffer Ratio
1	Bovine Serum Albumin	-	1:1
2	Blank Lane	-	-
3	00% to 20% Precipitate	62.34 ± 16.71	1:1
4	20% to 40% Precipitate	187.20 ± 15.91	1:1
5	20% to 40% Precipitate		2:1
6	40% to 60% Precipitate	1383.23 ± 57.34	1:1
7	40% to 60% Precipitate		2:1
8	60% to 80% Precipitate	92.91 ± 11.11	1:1
9	60% to 80% Precipitate		2:1
10	80% to 95% Precipitate	108.20 ± 17.84	1:1

Supplementary Material D

Table S1. Lectin active fragment search determined through BIOPEP protein analyzer.

Sequence	Name	Activity
GP	peptide regulating the stomach mucosal membrane activity	regulating
GP	peptide regulating the stomach mucosal membrane activity	regulating
GP	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
GP	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
GP	-	antithrombotic
GP	-	antithrombotic
GP	prolyl endopeptidase inhibitor	antiamnestic
GP	prolyl endopeptidase inhibitor	antiamnestic
GP	ACE inhibitor from Alaskan pollack skin	ACE inhibitor
GP	ACE inhibitor from Alaskan pollack skin	ACE inhibitor
AW	ACE inhibitor	ACE inhibitor
VK	ACE inhibitor from buckwheat	ACE inhibitor
VG	ACE inhibitor	ACE inhibitor
IG	ACE inhibitor	ACE inhibitor
GR	ACE inhibitor	ACE inhibitor
AH	ACE inhibitor	ACE inhibitor
EK	ACE inhibitor	ACE inhibitor
AH	peptide derived from egg white albumin	antioxidative
AW	Antioxidant peptide from marine bivalve (<i>Macra veneriformis</i>)	antioxidative
EP	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
EK	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
AW	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
AH	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
TN	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
TS	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
VD	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
VG	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor

VK	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
VT	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor
DM	ACE inhibitor	ACE inhibitor

Supplementary Material E

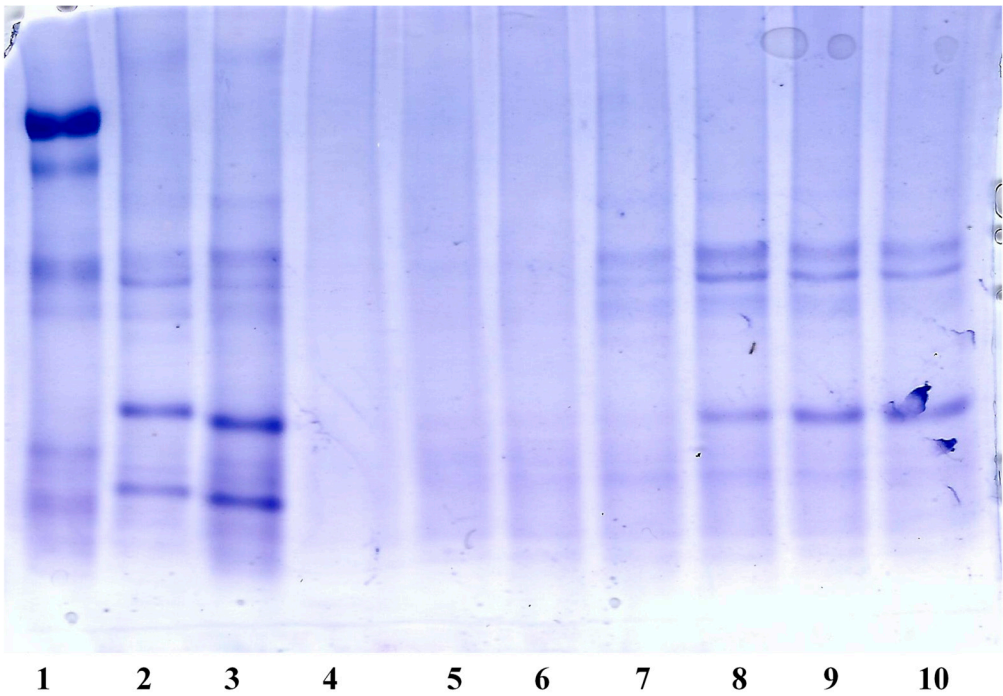


Figure S4. SDS-PAGE Profile of the obtained GFC Fractions [set 2] (figure legend given below).

Lane No.	Sample	Sample to Sample Buffer Ratio
1	Bovine Serum Albumin	1:1
2	Crude Extract	1:1
3	Partially Purified Extract	1:1
4	Fraction 7	1:1
5	Fraction 9	1:1
6	Fraction 11	1:1
7	Fraction 13	1:1
8	Fraction 15	1:1
9	Fraction 17	1:1
10	Fraction 19	1:1

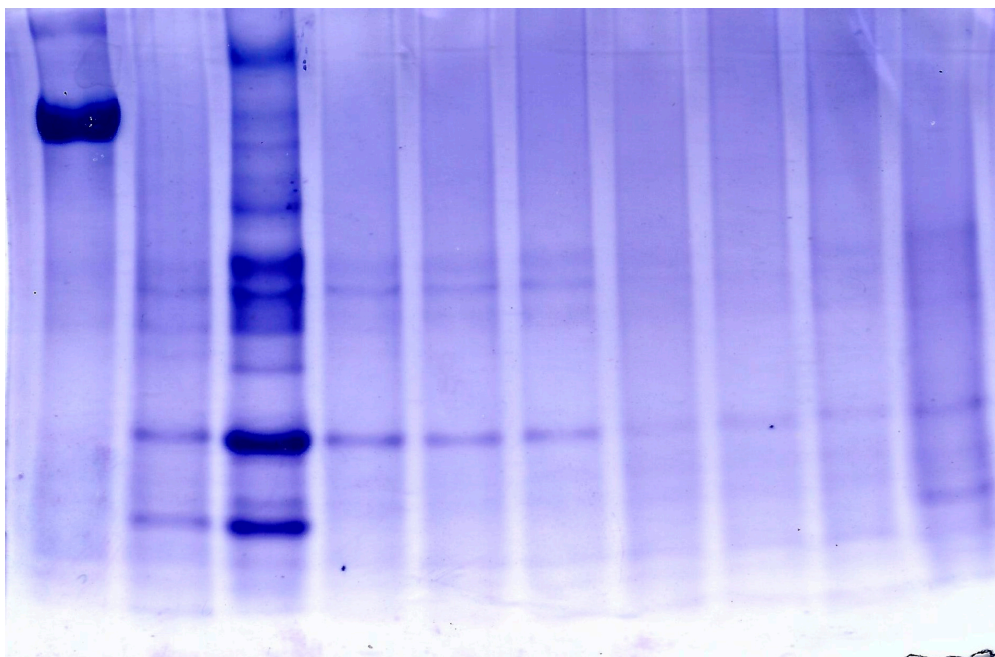


Figure S5. SDS-PAGE Profile of the obtained GFC Fractions [set 2] (figure legend given below).

Lane No.	Sample	Sample to Sample Buffer Ratio
1	Bovine Serum Albumin	1:1
2	Crude Extract	1:1
3	Partially Purified Extract	1:1
4	Fraction 21	1:1
5	Fraction 23	1:1
6	Fraction 25	1:1
7	Fraction 27	1:1
8	Fraction 29	1:1
9	Fraction 31	1:1
10	Partially Purified Extract	1:1

Supplementary Material F

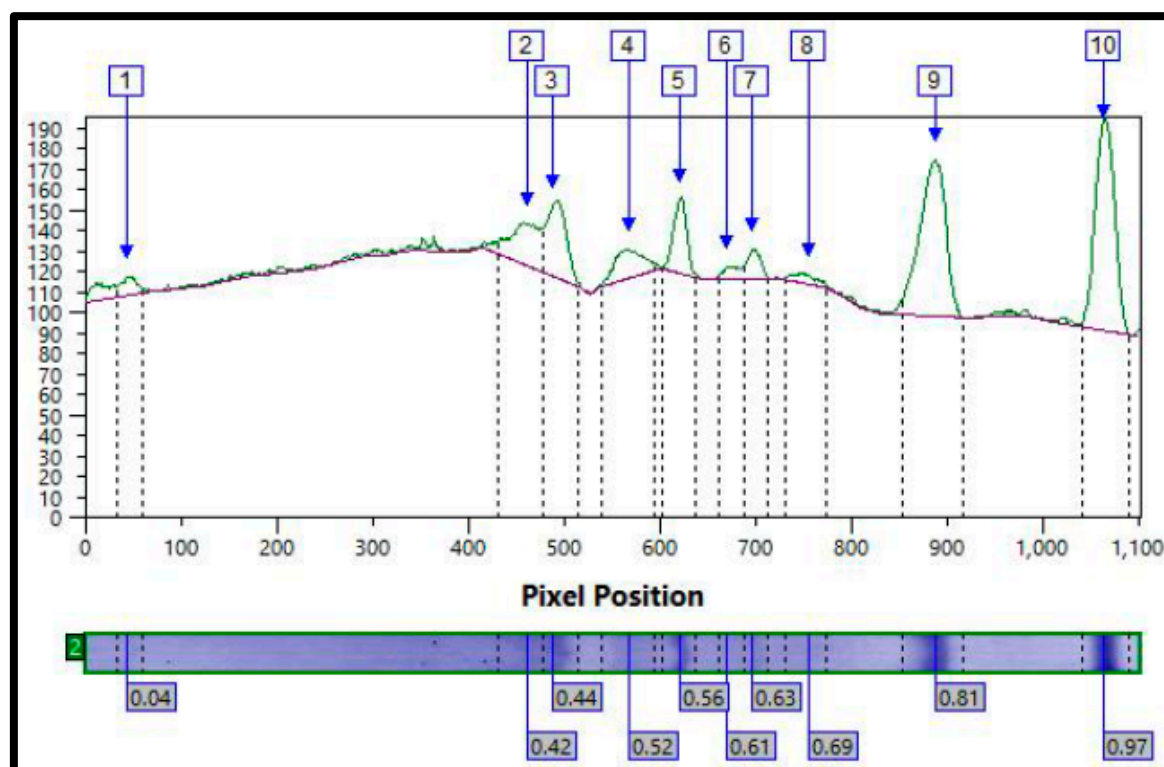


Figure S6. Densitometric analysis of the SDS-PAGE profile of the crude 'Señorita' banana protein extract.

Table S2. Estimated molecular weights and percent volume of each band present in SDS-PAGE profile of the crude 'Señorita' banana protein extract*.

Band No.	Volume	Percent Volume (%)	Molecular Weight (kDa)
1	14409.65	2.20	117.64
2	57853.62	8.82	43.05
3	73184.89	11.15	40.52
4	39475.75	6.02	33.44
5	46281.30	7.05	29.55
6	10136.45	1.54	26.25
7	19549.66	2.98	24.64
8	11299.22	1.72	21.32
9	191466.37	29.18	15.59
10	192434.28	29.33	10.26

*with the major protein band(s) being focused on the study presented in bold characters.

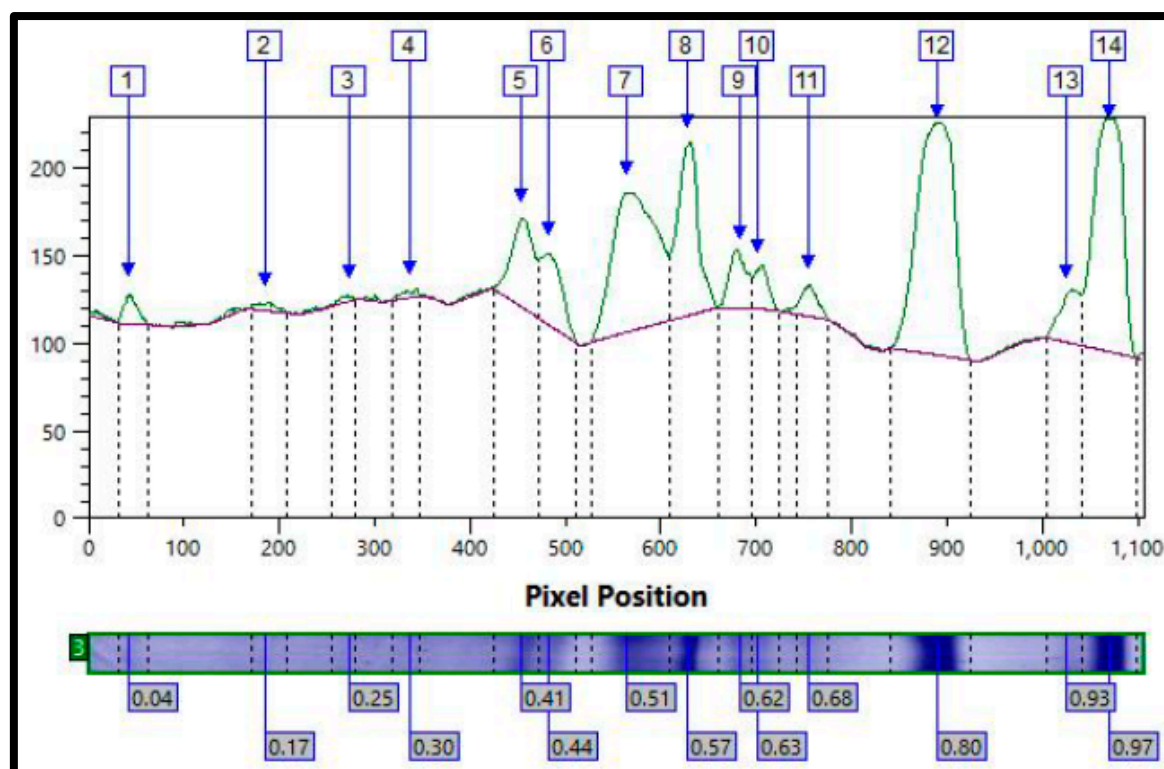


Figure S7. Densitometric analysis of the SDS-PAGE profile of the partially purified 'Señorita' banana protein extract.

Table S3. Estimated molecular weights and percent volume of each band present in SDS-PAGE profile of the partially purified 'Señorita' banana protein extract*.

Band No.	Volume	Percent Volume (%)	Molecular Weight (kDa)
1	21262.00	1.17	117.64
2	8792.73	0.48	84.00
3	4509.00	0.25	67.87
4	6588.13	0.36	58.42
5	109463.82	6.01	44.32
6	85790.18	4.71	41.28
7	338942.45	18.61	33.97
8	205085.55	11.26	29.24
9	57332.00	3.15	25.57
10	33694.00	1.85	24.58
11	27535.98	1.51	21.66
12	480725.00	26.39	15.67
13	59436.38	3.26	11.34
14	382382.62	20.99	10.18

*with the major protein band(s) being focused on the study presented in bold characters.

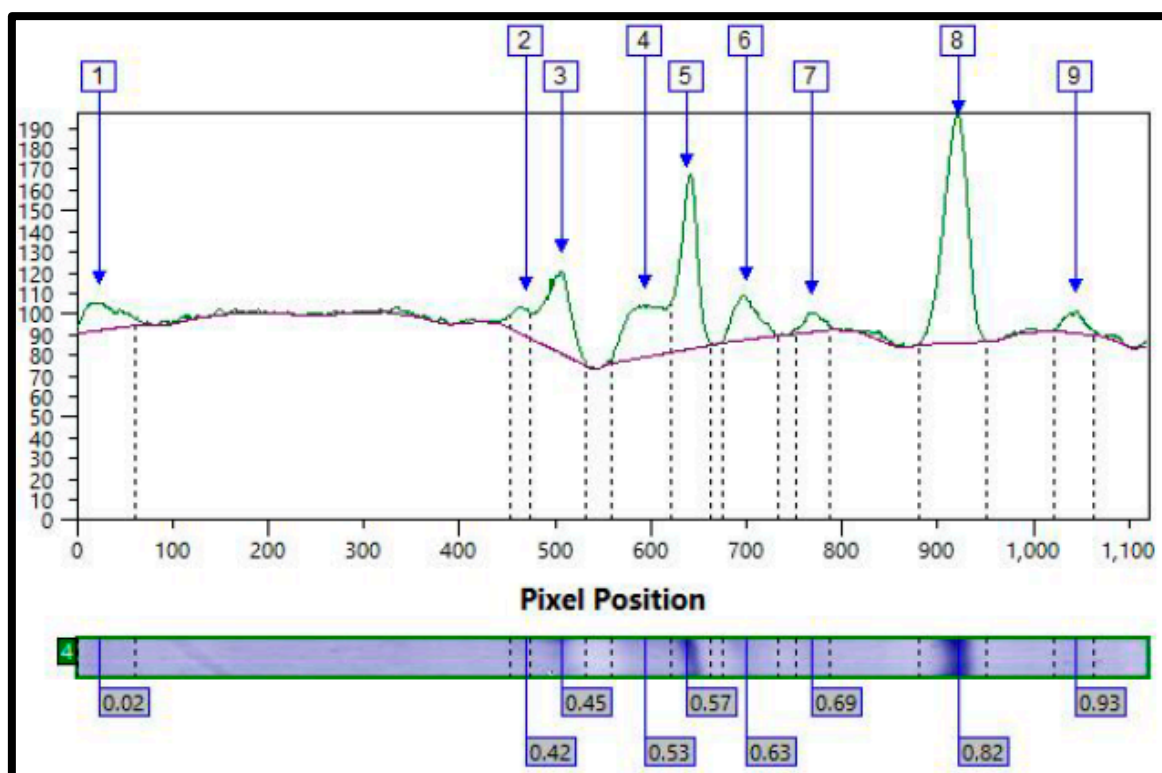


Figure S8. Densitometric analysis of the SDS-PAGE profile of the purified 'Señorita' banana protein extract.

Table S4. Estimated molecular weights and percent volume of each band present in SDS-PAGE profile of the purified 'Señorita' banana protein extract*.

Band No.	Volume	Percent Volume (%)	Molecular Weight (kDa)
1	54130.30	5.98	123.35
2	21391.96	2.36	43.28
3	123676.98	13.65	39.47
4	119624.00	13.20	32.15
5	172102.00	19.00	29.09
6	61229.72	6.76	25.10
7	20209.87	2.23	21.43
8	309701.08	34.19	14.95
9	23872.35	2.64	11.19

*with the major protein band(s) being focused on the study presented in bold characters.

Supplementary Material G

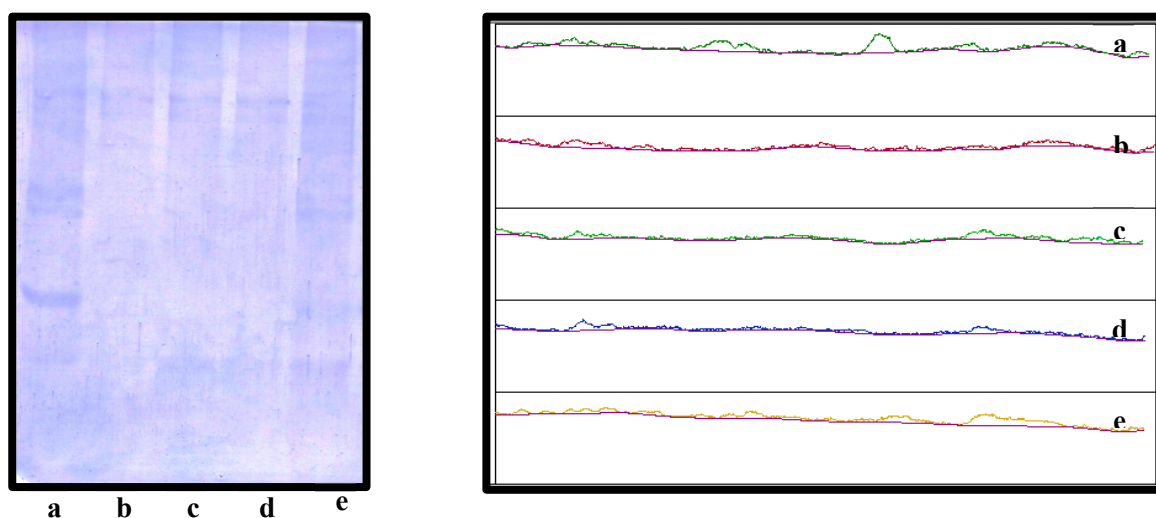


Figure S9. SDS-PAGE profile of the crude 'Señorita' banana protein extract at different digestion hours and their corresponding densitometric analysis, wherein: a) undigested crude extract; b) 3-hour crude extract digest; c) 4-hour crude extract digest; d) 12-hour crude extract digest; e) 24-hour crude extract digest.

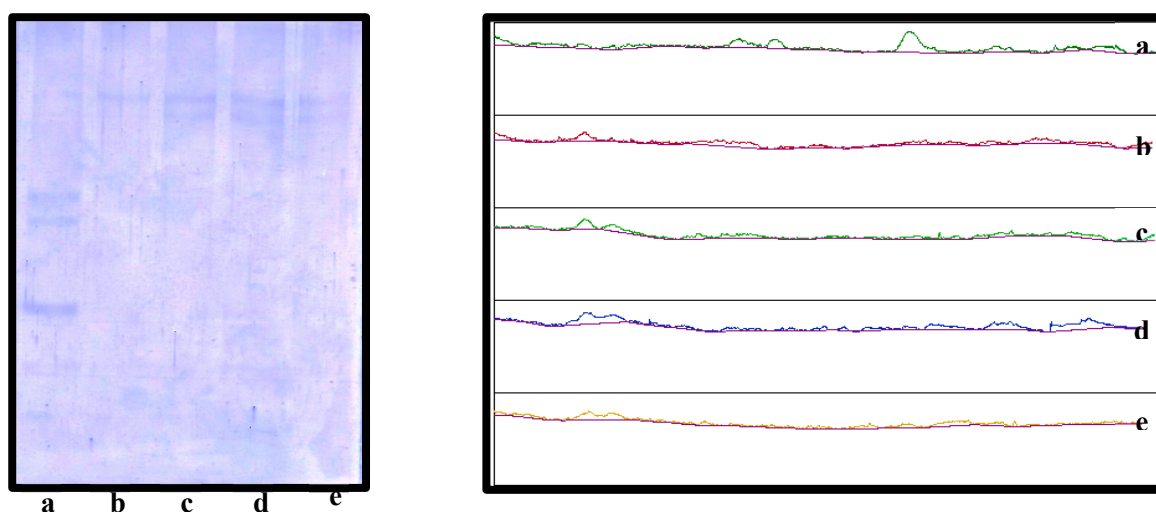


Figure S10. SDS-PAGE profile of the partially purified 'Señorita' banana protein extract at different digestion hours and their corresponding densitometric analysis, wherein: a) undigested partially purified extract; b) 3-hour partially purified extract digest; c) 4-hour partially purified extract digest; d) 12-hour partially purified extract digest; e) 24-hour partially purified extract digest.

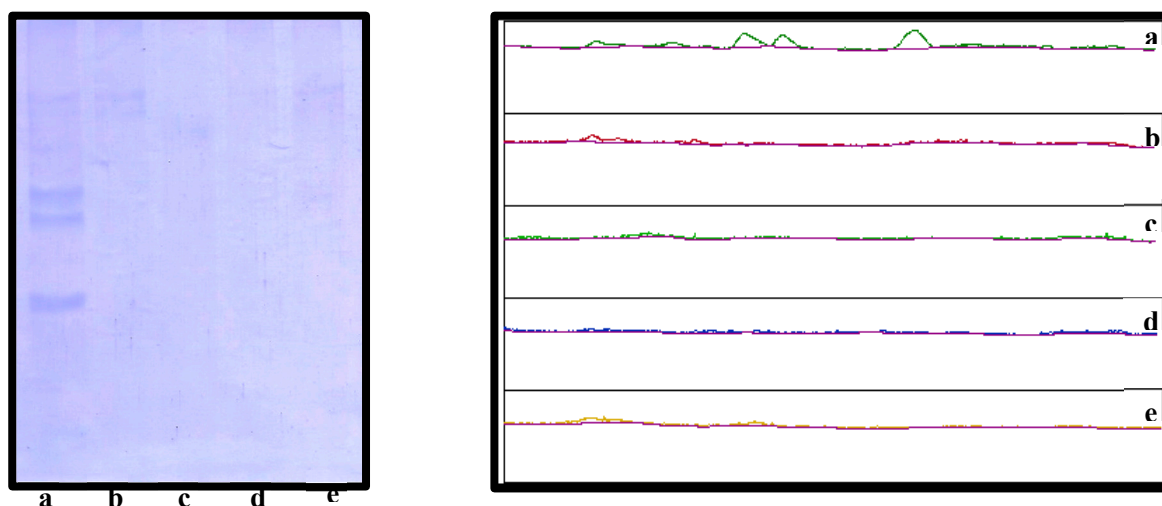


Figure S11. SDS-PAGE profile of the purified 'Señorita' banana protein extract at different digestion hours and their corresponding densitometric analysis, wherein: a) undigested purified extract; b) 3-hour purified extract digest; c) 4-hour purified extract digest; d) 12-hour purified extract digest; e) 24-hour purified extract digest.



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