

## SUPPLEMENTARY MATERIAL

**Figure S1.** Image of Brazil nut (*Bertholletia excels* HBK)

**Figure S2.** HPLC chromatogram of betalains and phenolic compounds from (a) OPD, (b) BN ED 1%, and (c) BN ED 0.5% at 280 nm. Numbers correspond to the identified compounds shown in Tables 1 and 4.

**Figure S3.** HPLC chromatogram of betalains and phenolic compounds from (a) OPD, (b) BN ED 1%, and (c) BN ED 0.5% at 370 nm. Numbers correspond to the identified compounds shown in Tables 1 and 4.

**Figure S4.** HPLC chromatogram of betalains and phenolic compounds from (a) OPD, (b) BN ED 1%, and (c) BN ED 0.5% at 480 nm. Numbers correspond to the identified compounds shown in Tables 1 and 4.

**Figure S5.** HPLC chromatogram of betalains and phenolic compounds from (a) OPD, (b) BN ED 1%, and (c) BN ED 0.5% at 535 nm. Numbers correspond to the identified compounds shown in Tables 1 and 4.

**Table S1.** Physicochemical characteristics of Brazil nuts (BN), fresh *Opuntia stricta* var. *dillenii* fruits, and standardized Brazil nut beverage (BNB).

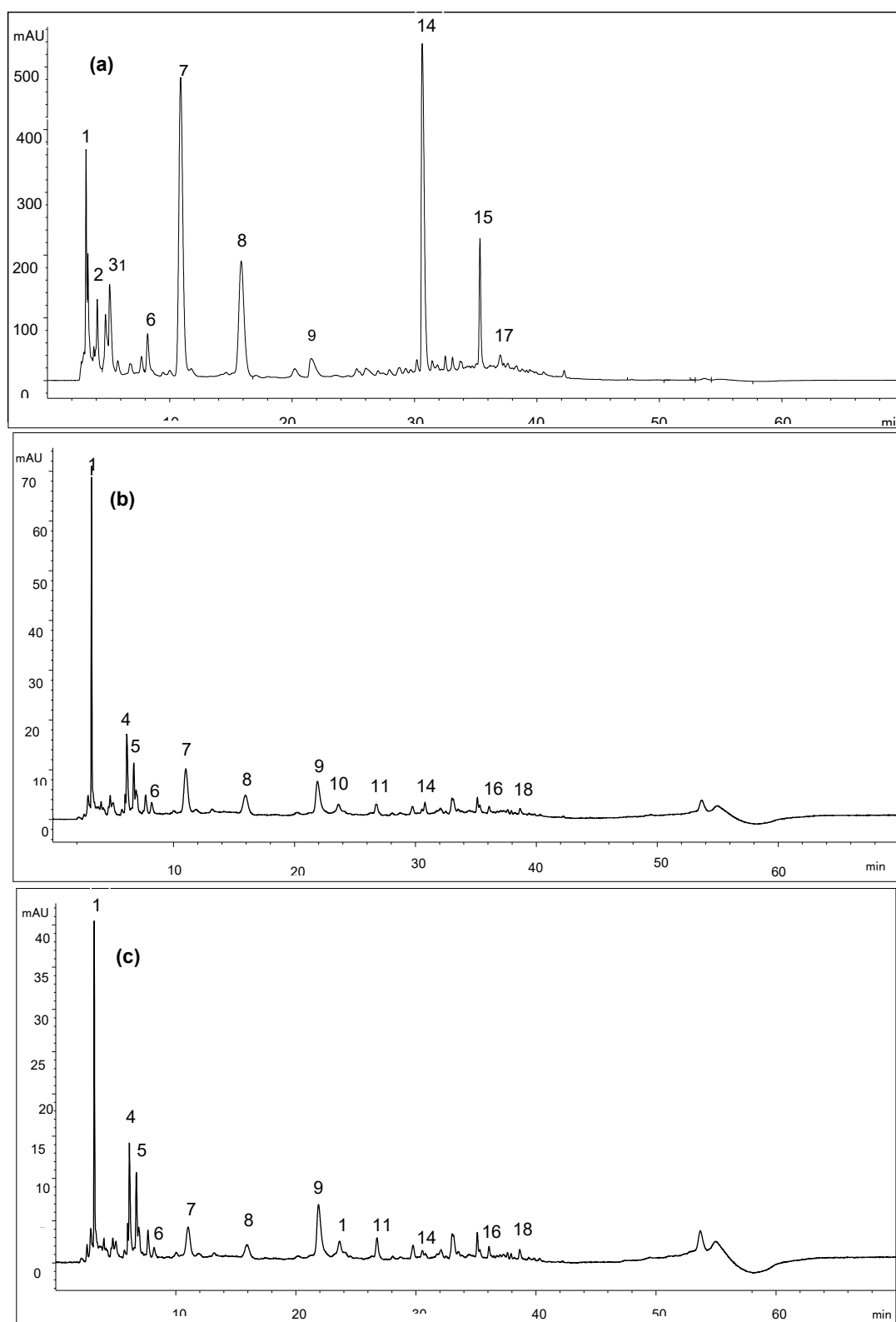
**Table S2.** Encapsulation efficiency of main betalains and phenolic compounds of Brazil nut beverages with 0.5% (BN ED 0.5%) and 1% (BN ED 1%) *Opuntia stricta* dillenii pulp extract added during cold storage at 5 °C for 24 days.

**Table S3.** Total phenolic content (TPC) and oxygen radical absorbance capacity (ORAC) of Brazil nut beverages (BNs) and BN beverages with 0.5% (BN ED 0.5%) and 1% (BN ED 1%) of *Opuntia stricta* dillenii pulp extract added during storage at 5°C for 24 days analyzed after TCA extraction method.

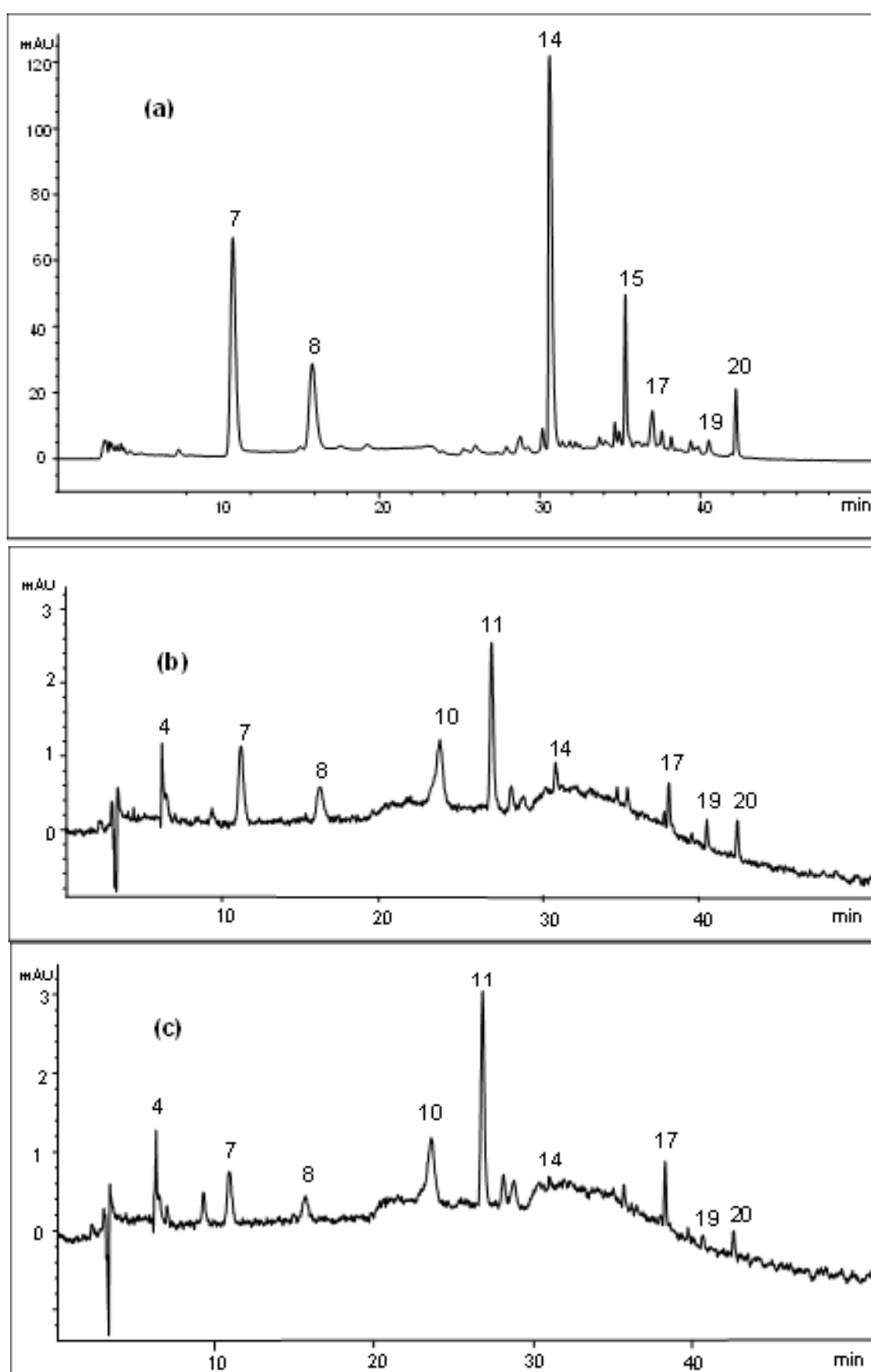
**Table S4.** Total phenolic content (TPC) and oxygen radical absorbance capacity (ORAC) of Brazil nut beverages (BNs) and BN beverages with 0.5% (BN ED 0.5%) and 1% (BN ED 1%) of *Opuntia Stricta* var. *Dillenii* pulp extract added during storage at 5°C for 24 days directly analyzed from the beverages.



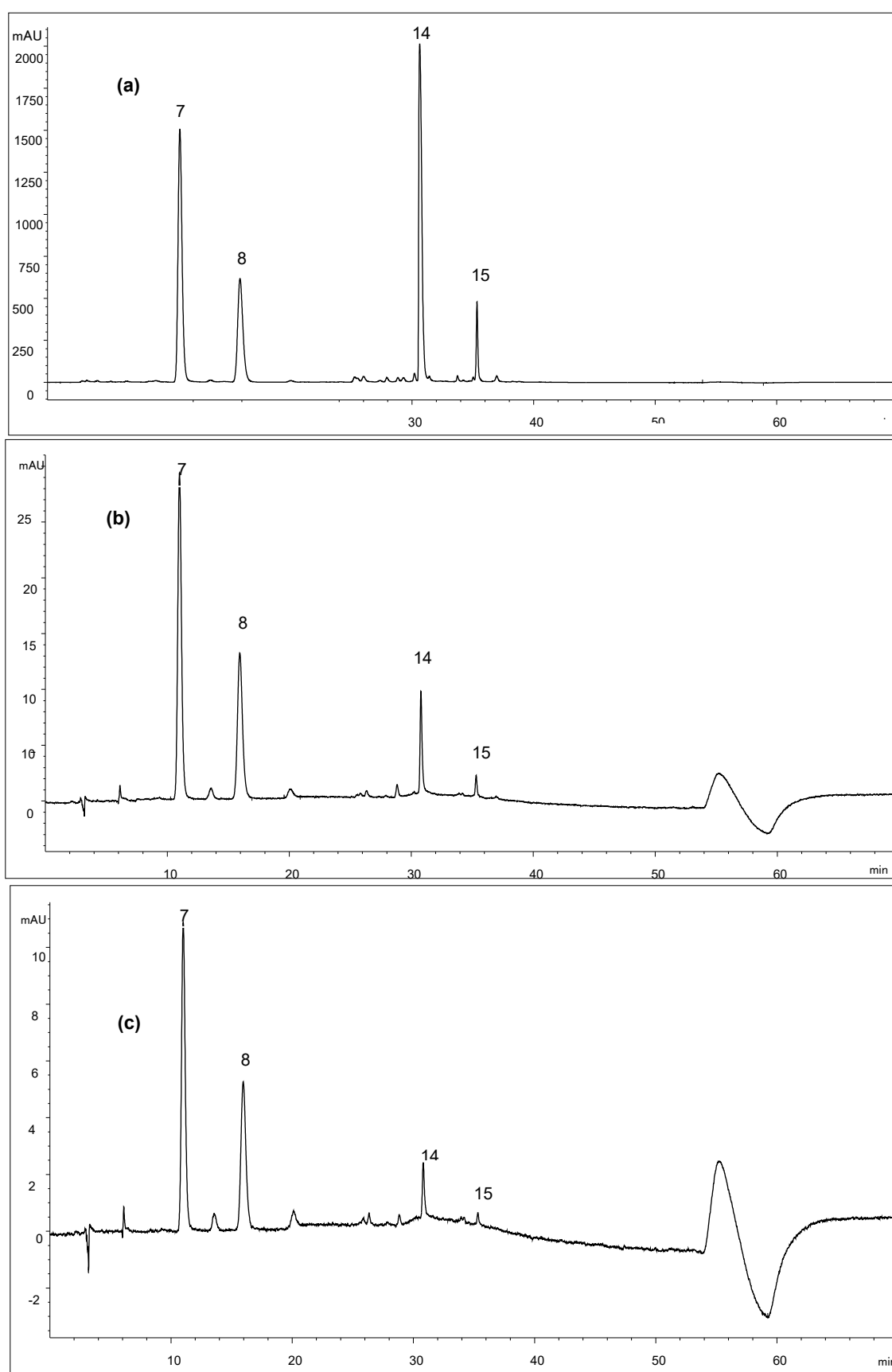
**Figure S1.** Image of Brazil nut (*Bertholletia excels* HBK).



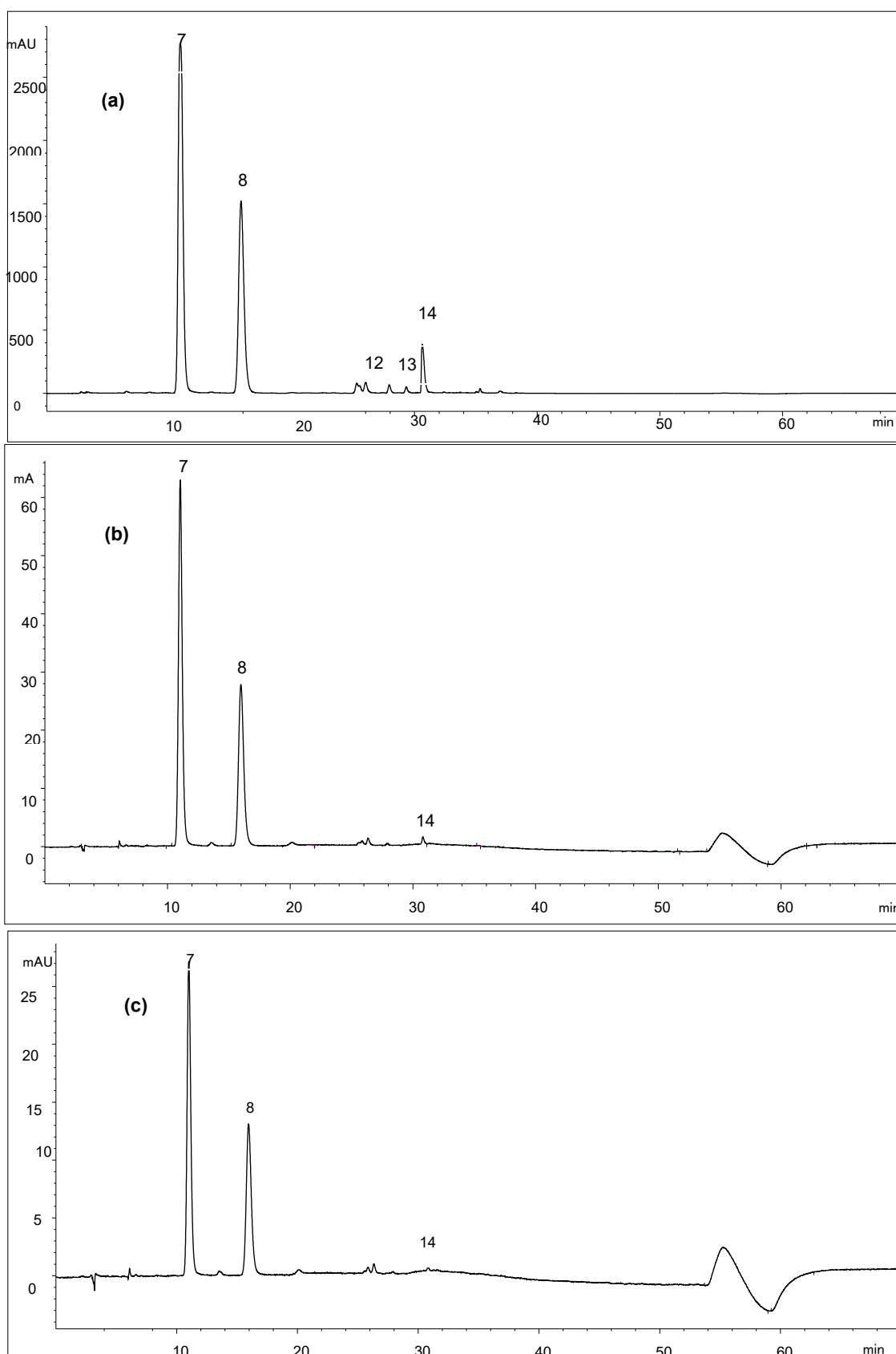
**Figure S2.** HPLC chromatogram of betalains and phenolic compounds from (a) OPD, (b) BN ED 1%, and (c) BN ED 0.5% at 280 nm. Numbers correspond to the identified compounds shown in Tables 1 and 4.



**Figure S3.** HPLC chromatogram of betalains and phenolic compounds from (a) OPD, (b) BN ED 1%, and (c) BN ED 0.5% at 370 nm. Numbers correspond to the identified compounds indicated in Tables 4 and 5.



**Figure S4.** HPLC chromatogram of betalains and phenolic compounds from (a) OPD, (b) BN ED 1%, and (c) BN ED 0.5% at 480 nm. Numbers correspond to the identified compounds shown in Tables 1 and 4.



**Figure S5.** HPLC chromatogram of betalains and phenolic compounds from (a) OPD, (b) BN ED 1%, and (c) BN ED 0.5% at 535 nm. Numbers correspond to the identified compounds shown in Tables 1 and 4.

**Table S1.** Physicochemical characteristics of Brazil nuts (BNs), fresh *Opuntia stricta* var. *dillenii* fruits, and standardized Brazil nut beverage (BNB).

Characteristic	Brazil Nut (BN)	<i>Opuntia stricta</i> var. <i>dillenii</i> Fruit Pulp	Brazil Nut Standardized Beverage (BNB)
Protein (% $\omega/\omega$ )	17.3 $\pm$ 0.4	-	1.27 $\pm$ 0.0
Lipid (% $\omega/\omega$ )	66.1 $\pm$ 1.1	-	2.9 $\pm$ 0.0
Carbohydrates <sup>1</sup> (% $\omega/\omega$ )	10.9 $\pm$ 1.5	36.7 $\pm$ 5.7	1.06 $\pm$ 1.0
Ashes (% $\omega/\omega$ )	3.4 $\pm$ 0.02	-	0.14 $\pm$ 0.0
Energy (kcal)	707.9 $\pm$ 1.5	-	41.3 $\pm$ 1.1
Total solids (% $\omega/\omega$ )	97.8 $\pm$ 0.03	17.55 $\pm$ 2.82	5.7 $\pm$ 0.3
Wet (% $\omega/\omega$ )	2.2 $\pm$ 0.03	82.45 $\pm$ 3.21	94.3 $\pm$ 0.3
Ph	6.14 $\pm$ 0.1	3.28 $\pm$ 0.05	6.65 $\pm$ 0.1
Acidity <sup>2</sup>	0.18 $\pm$ 0.0	1.58 $\pm$ 0.1	0.03 $\pm$ 0.0
Soluble solids ( $^{\circ}$ Brix)	14.5 $\pm$ 0.1	11.6 $\pm$ 0.2	2.23 $\pm$ 0.1

<sup>1</sup> Total carbohydrates of fruit pulp in g of carbohydrates/100 g of *O. dillenii* pulp. <sup>2</sup> Expressed as g of citric acid/100 ml of beverage or g of citric acid/100 g of *O. dillenii* fruit pulp or Brazil nut.

**Table S2.** Encapsulation efficiency of main betalains and phenolic compounds of Brazil nut beverages with 0.5% (BN ED 0.5%) and 1 % (BN ED 1%) *Opuntia stricta* dillenii pulp extract added during cold storage at 5 °C for 24 days.

		Recovery Efficiency (%)						
		Days of Storage at 5 °C						
COMPOUND	Samples	0	1	3	8	12	24	
Piscidic acid	BN ED 1%	93.67 $\pm$ 0.41 <sup>Ba</sup>	91.61 $\pm$ 0.41 <sup>Ba</sup>	88.74 $\pm$ 0.39 <sup>Bb</sup>	88.12 $\pm$ 0.39 <sup>Bb</sup>	80.11 $\pm$ 0.35 <sup>Bc</sup>	78.47 $\pm$ 0.35 <sup>Bc</sup>	
	BN ED 0.5%	81.20 $\pm$ 0.40 <sup>Aa</sup>	79.11 $\pm$ 0.73 <sup>Aa</sup>	73.73 $\pm$ 0.83 <sup>Ab</sup>	69.87 $\pm$ 0.59 <sup>Ab</sup>	68.45 $\pm$ 0.77 <sup>Ac</sup>	64.60 $\pm$ 0.88 <sup>Ac</sup>	
Betanin	BN ED 1%	98.84 $\pm$ 1.07 <sup>Ba</sup>	91.47 $\pm$ 0.68 <sup>Bab</sup>	83.77 $\pm$ 0.62 <sup>Bbc</sup>	82.38 $\pm$ 0.61 <sup>Bbc</sup>	78.23 $\pm$ 0.58 <sup>Bc</sup>	75.06 $\pm$ 0.56 <sup>Bc</sup>	
	BN ED 0.5%	75.53 $\pm$ 0.56 <sup>Aa</sup>	75.15 $\pm$ 0.56 <sup>Aab</sup>	73.61 $\pm$ 0.54 <sup>Abc</sup>	71.59 $\pm$ 0.53 <sup>Abc</sup>	69.73 $\pm$ 0.52 <sup>Ac</sup>	69.15 $\pm$ 0.52 <sup>Ac</sup>	
Isobetanin	BN ED 1%	92.35 $\pm$ 1.13 <sup>Ba</sup>	83.82 $\pm$ 1.02 <sup>Bb</sup>	76.13 $\pm$ 0.54 <sup>Bc</sup>	75.32 $\pm$ 0.92 <sup>Bc</sup>	70.51 $\pm$ 0.86 <sup>Bcd</sup>	69.87 $\pm$ 0.49 <sup>Bd</sup>	
	BN ED 0.5%	73.24 $\pm$ 0.52 <sup>Aa</sup>	71.22 $\pm$ 0.50 <sup>Ab</sup>	68.37 $\pm$ 0.49 <sup>Ac</sup>	67.32 $\pm$ 0.47 <sup>Ac</sup>	66.71 $\pm$ 0.47 <sup>Ac</sup>	62.57 $\pm$ 0.44 <sup>Ad</sup>	
Neobetanin	BN ED 1%	14.26 $\pm$ 0.27 <sup>Ba</sup>	13.39 $\pm$ 0.26 <sup>Bab</sup>	12.51 $\pm$ 0.24 <sup>Bbc</sup>	12.22 $\pm$ 0.24 <sup>Bc</sup>	10.52 $\pm$ 0.20 <sup>Bd</sup>	10.22 $\pm$ 0.20 <sup>Be</sup>	
	BN ED 0.5%	7.98 $\pm$ 0.16 <sup>Aa</sup>	7.64 $\pm$ 0.15 <sup>Aab</sup>	7.20 $\pm$ 0.14 <sup>Abc</sup>	6.79 $\pm$ 0.13 <sup>Ac</sup>	6.16 $\pm$ 0.12 <sup>Ad</sup>	4.57 $\pm$ 0.08 <sup>Ae</sup>	
Isorhamnetin glucosyl-rhamnoside (IG1)	BN ED 1%	91.56 $\pm$ 2.24 <sup>Ba</sup>	87.66 $\pm$ 0.69 <sup>Bb</sup>	85.71 $\pm$ 0.77 <sup>Bbc</sup>	78.84 $\pm$ 1.93 <sup>Bc</sup>	73.76 $\pm$ 1.80 <sup>Bd</sup>	63.58 $\pm$ 1.55 <sup>Bd</sup>	
	BN ED 0.5%	82.94 $\pm$ 2.03 <sup>Aa</sup>	71.21 $\pm$ 1.74 <sup>Ab</sup>	66.23 $\pm$ 0.59 <sup>Abc</sup>	66.13 $\pm$ 1.62 <sup>Ac</sup>	55.96 $\pm$ 1.36 <sup>Ad</sup>	55.96 $\pm$ 1.36 <sup>Ad</sup>	
Isorhamnetin glucosyl-rhamnosyl-pentoside (IG2)	BN ED 1%	95.40 $\pm$ 2.87 <sup>a</sup>	95.07 $\pm$ 2.41 <sup>a</sup>	90.22 $\pm$ 4.46 <sup>a</sup>	89.00 $\pm$ 4.40 <sup>a</sup>	63.81 $\pm$ 1.08 <sup>b</sup>	46.45 $\pm$ 1.08 <sup>b</sup>	
	BN ED 0.5%	93.70 $\pm$ 2.38 <sup>a</sup>	90.74 $\pm$ 0.64 <sup>a</sup>	89.25 $\pm$ 4.76 <sup>a</sup>	87.37 $\pm$ 0.44 <sup>a</sup>	74.75 $\pm$ 1.85 <sup>b</sup>	74.75 $\pm$ 1.85 <sup>b</sup>	

<sup>1</sup> Data are provided as means and standard deviations (n=3). Different uppercase letters indicate statistically significant differences ( $p < 0.05$ ) among samples at the same storage time. Different lowercase letters indicate significant differences ( $p < 0.5$ ) in storage times for the same sample. <sup>2</sup> BN ED 0.5%: Brazil nut beverage with 0.5% OPD extract; NB ED 1%: Brazil nut beverage with 1% OPD extract.

**Table S3.** Total phenolic content (TPC) and oxygen radical absorbance capacity (ORAC) of Brazil nut beverages (BNs) and BN beverages with 0.5% (BN ED 0.5%) and 1% (BN ED 1%) of *Opuntia stricta* dillenii pulp extract added during storage at 5 °C for 24 days analyzed after TCA extraction method.<sup>3</sup>

TPC (mg of GAE/100 mL of BN Beverage) <sup>1</sup>						
Days of Storage at 5 °C						
Sample <sup>2</sup>	0	1	3	8	12	24
BNB	13.57 ± 0.02 Aa	12.5 ± 0.21 Aa	11.91 ± 0.06 Ab	11.50 ± 0.09 Abc	10.41 ± 0.1 Acd	10.18 ± 0.08 Ad
BN ED 0.5%	42.23 ± 0.02 Ba	41.41 ± 0.74 Ba	39.18 ± 0.03 Bb	38.45 ± 0.08 Bbc	38.16 ± 0.02 Bcd	37.61 ± 0.05 Bd
BN ED 1%	63.61 ± 0.14 Ca	62.85 ± 0.01 Ca	60.60 ± 0.67 Cb	60.94 ± 0.06 Cbc	59.23 ± 0.30 Ccd	57.03 ± 0.04 Cd
ORAC (μmol of TE/g BN of Beverage) <sup>1</sup>						
BNB	0.72 ± 0.04 Aa	0.70 ± 0.04 Aab	0.66 ± 0.06 Abc	0.64 ± 0.05 Acd	0.53 ± 0.04 Ade	0.49 ± 0.04 Ae
BN ED 0.5%	1.80 ± 0.05 Ba	1.76 ± 0.04 Bab	1.71 ± 0.03 Bbc	1.66 ± 0.04 Bcd	1.63 ± 0.01 Bde	1.61 ± 0.04 Be
BN ED 1%	3.67 ± 0.05 Ca	3.62 ± 0.03 Cab	3.56 ± 0.05 Cbc	3.52 ± 0.08 Ccd	3.45 ± 0.08 Cde	3.37 ± 0.09 Ce

<sup>1</sup> Data are provided as means and standard deviations (n = 3). Different uppercase letters indicate statistically significant differences ( $p < 0.05$ ) among samples at the same storage time. Different lowercase letters indicate significant differences ( $p < 0.5$ ) in storage times for the same sample. <sup>2</sup> BN ED 0.5%: Brazil nut beverage with 0.5% OPD extract; NB ED 1%: Brazil nut beverage with 1% OPD extract. <sup>3</sup> TCA extraction method reported by Naderi et al. (2010).

**Table S4.** Total phenolic content (TPC) and oxygen radical absorbance capacity (ORAC) of Brazil nut beverages (BNs) and BN beverages with 0.5% (BN ED 0.5%) and 1% (BN ED 1%) of *Opuntia Stricta* var. *Dillenii* pulp extract added during storage at 5 °C for 24 days directly analyzed from the beverages.<sup>1</sup>

TPC (mg of GAE/100 mL of Beverage) <sup>2</sup>						
Days of Storage at 5 °C						
Sample <sup>3</sup>	0	1	3	8	12	24
BNB	11.38 ± 1.66 Aa	11 ± 1.44 Aa	9.69 ± 0.27 Aab	8.27 ± 0.07 Abc	10.41 ± 0.55 Acd	6.25 ± 0.35 Ad
BN ED 0.5%	35.67 ± 0.64 Ba	33.38 ± 1.24 Ba	32.15 ± 1.21 Bab	31.3 ± 1.51 Bbc	29.19 ± 1.34 Bcd	25.29 ± 1.18 Bd
BN ED 1%	53.18 ± 1.51 Ca	51.18 ± 1.94 Ca	49.95 ± 1.8 Cab	45.45 ± 2.98 Cbc	45.45 ± 3.15 Ccd	40.18 ± 2.76 Cd
ORAC (μmol of TE/gr of Beverage) <sup>1</sup>						
BNB	0.50 ± 0.03 Aa	0.48 ± 0.03 Aab	0.46 ± 0.01 Aab	0.41 ± 0.01 Abc	0.38 ± 0.03 Acd	0.33 ± 0.04 Ad
BN ED 0.5%	1.58 ± 0.06 Ba	1.56 ± 0.07 Bab	1.50 ± 0.04 Bab	1.66 ± 0.04 Bbc	1.46 ± 0.06 Bcd	1.39 ± 0.06 Bd
BN ED 1%	2.98 ± 0.06 Ca	2.94 ± 0.06 Cab	2.91 ± 0.04 Cab	2.87 ± 0.04 Cbc	2.81 ± 0.02 Ccd	2.75 ± 0.04 Cd

<sup>1</sup> Total phenolic content (TPC) and oxygen radical absorbance capacity (ORAC) analysis was conducted directly from samples without previous extraction. <sup>2</sup> Data are provided as means and standard deviations (n = 3). Different uppercase letters indicate statistically significant differences ( $p < 0.05$ ) among samples at the same storage time. Different lowercase letters indicate significant differences ( $p < 0.5$ ) in storage times for the same sample. <sup>3</sup> BN ED 0.5%: Brazil nut beverage with 0.5% OPD extract; NB ED 1%: Brazil nut beverage with 1% OPD extract.