

Supplementary Material

Raw coffee beans (*Coffea arabica* and *Coffea canephora*) valorization through solvent development and bioactive compounds extraction

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Physicochemical Analyses

Moisture. The moisture content was determined by gravimetry according to the methodology presented by the Adolfo Lutz Institute (2008). The method consists of drying the sample directly in an oven at 105 °C until constant weight, monitored with the aid of an analytical balance. All results were expressed on a dry basis. **Total lipids, ashes and proteins.** The contents of lipids, ashes and proteins were determined according to methodologies established by AOAC (1920.39, 923.03 and 960.52, respectively) (AOAC, 2005). **Total dietary fiber.** The total dietary fiber content was determined according to methodology No. 985.29 according to AOAC, which consists of an enzymatic-gravimetric method (AOAC, 2005). The results of the physical-chemical characterization are available in Table S1.

Table S1. Raw coffee bean (*C. arabica* and *C. canephora*) physiochemical composition.

Parameters analyzed (g.100g ⁻¹)	Results (dry basis)	
	<i>Coffea arabica</i>	<i>Coffea canephora</i>
Moisture	10.2±0.2	11.4±0.2
Protein	17.1±3.3	18.1±1.2
Lipids	21.1±1.2	13.9±1.9
Ashes	4.32±0.04	5.9±1.8
Dietary fiber	47.4±4.5	50.7±2.2

* Average of three repetitions ± standard deviation

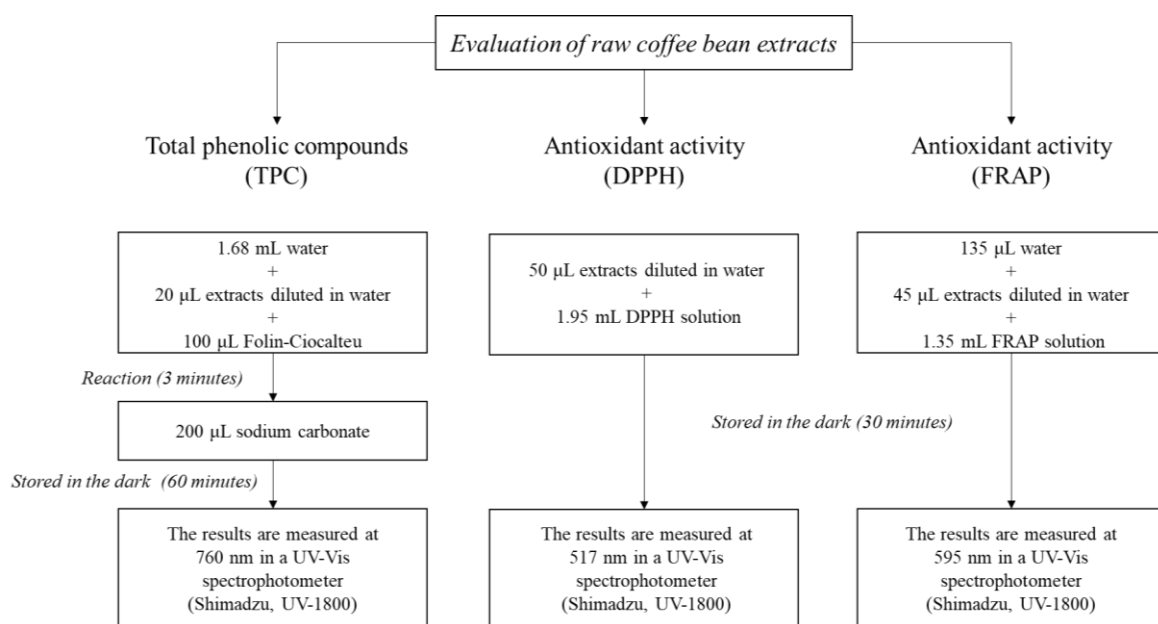


Figure S1. Evaluation of raw *C. arabica* and *C. canephora* bean extracts potential according to total phenolic compounds (TPC) and antioxidant activity (DPPH and FRAP).

Table S2. Analysis of variance (ANOVA) regarding the content of total phenolic compounds (TPC) of extracts from *Coffea arabica*.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	5	3661.23	732.24	27.37	1.30E-14
Temperature	2	823.28	411.64	15.39	3.60E-06
Technique	1	436.26	436.26	16.31	0.00
Solvent-temperature	10	264.15	26.41	1.17	0.32
Solvent-technique	5	330.13	66.02	2.94	0.02
Temperature-technique	2	59.80	29.90	1.33	0.27
Waste	46	1030.81	22.40		

Table S3. Analysis of variance (ANOVA) regarding the content of total phenolic compounds (TPC) of extracts from *Coffea canephora*.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	3	5085.8	1695.26	130.08	7.64E-13
Temperature	1	475.35	475.35	36.47	8.25E-06
Technique	1	440.91	440.91	33.83	1.32E-05
Solvent-temperature	3	132.34	44.11	3.85	0.03
Solvent-technique	3	93.48	31.16	2.39	0.10
Temperature-technique	1	10.01	10.01	0.76	0.39
Waste	19	247.60	13.03	-	-

Table S4. Analysis of variance (ANOVA) of the total chlorogenic acids content of *Coffea arabica* extracts.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	5	1203434.54	240686.90	55.55	2.32E-18
Temperature	2	199265.99	99632.99	22.99	1.19E-07
Technique	1	92237.50	92237.50	21.28	3.16E-05
Solvent-temperature	10	115035.65	11503.56	2.65	0.01
Solvent-technique	5	86028.23	17205.64	3.97	0.00
Temperature-technique	2	54216.38	27108.19	6.25	0.00
Waste	46	199294.19	4332.48		

Table S5. Analysis of variance (ANOVA) of the total chlorogenic acids content of *Coffea canephora* extracts.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	3	1221661.50	407220.50	58.37	0.00
Temperature	1	3296.47	3296.47	0.47	0.50
Technique	1	54278.14	54278.14	7.78	0.01
Solvent-temperature	3	45862.00	15287.33	2.19	0.12
Solvent-technique	3	20714.99	6905.00	0.99	0.42
Temperature-technique	1	531.70	531.70	0.08	0.79
Waste	19	132554.24	6976.54		

Table S6. Analysis of variance (ANOVA) of the caffeine content of *Coffea arabica* extracts.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	5	78939.69	15787.94	180.17	5.14E-29
Temperature	2	7034.22	3517.11	40.14	8.18E-11
Technique	1	2753.74	2753.74	31.43	1.12E-06
Solvent-temperature	10	3286.31	328.63	3.75	0.00
Solvent-technique	5	8876.23	1775.25	20.26	1.24E-10
Temperature-technique	2	2562.29	1281.15	14.62	1.21E-05
Waste	46	4030.84	87.63		

Table S7. Analysis of variance (ANOVA) of the caffeine content of *Coffea canephora* extracts.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	3	81359.98	27119.99	122.40	0.00
Temperature	1	79.42	79.42	0.36	0.56
Technique	1	768.06	768.06	3.47	0.08
Solvent-temperature	3	9585.13	3195.04	14.42	0.00
Solvent-technique	3	732.94	244.31	1.10	0.37
Temperature-technique	1	223.79	223.79	1.01	0.33
Waste	19	4209.94	221.58		

Table S8. Analysis of variance (ANOVA) of the trigonelline content of *Coffea arabica* extracts.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	5	111977.44	22395.49	172.72	1.29E-28
Temperature	2	3106.94	1553.47	11.98	6.48E-05
Technique	1	53.82	53.82	0.42	0.52
Solvent-temperature	10	5422.91	542.29	4.18	0.00
Solvent-technique	5	6258.50	1251.70	9.65	2.37E-06
Temperature-technique	2	430.37	215.18	1.66	0.20
Waste	46	5964.52	129.66		

Table S9. Analysis of variance (ANOVA) of the trigonelline content of *Coffea canephora* extracts.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	3	4716.11	1572.04	56.02	0.00
Temperature	1	76.26	76.26	2.72	0.12
Technique	1	167.88	167.88	5.98	0.02
Solvent-temperature	3	820.47	273.49	9.75	0.00
Solvent-technique	3	126.63	42.21	1.50	0.25
Temperature-technique	1	1.44	1.44	0.05	0.82
Waste	19	533.20	28.06		

Table S10. Analysis of variance (ANOVA) regarding antioxidant activity by DPPH assay of *Coffea arabica* extracts.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	5	6604.67	1320.93	23.60	2.75E-13
Temperature	2	786.98	393.49	7.03	0.00
Technique	1	287.38	287.38	5.13	0.01
Solvent-temperature	10	536.89	53.68	1.15	0.34
Solvent-technique	5	532.91	106.58	2.28	0.06
Temperature-technique	2	312.08	156.04	3.34	0.04
Waste	46	2143.11	46.58		

Table S11. Analysis of variance (ANOVA) regarding antioxidant activity by FRAP assay of *Coffea arabica* extracts.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	5	12990.08	2598.01	16.32	2.65E-10
Temperature	2	4348.30	2174.15	13.66	1.18E-05
Technique	1	1078.22	1078.22	6.77	0.01
Solvent-temperature	10	678.35	67.83	0.51	0.86
Solvent-technique	5	555.34	111.06	0.85	0.52
Temperature-technique	2	2792.47	1396.23	10.70	0.00
Waste	46	6000.98	130.45		

Table S12. Analysis of variance (ANOVA) regarding antioxidant activity by DPPH assay of *Coffea canephora* extracts.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	3	4002.51	1334.17	98.97	8.86E-12
Temperature	1	306.65	306.65	22.74	1.33E-4
Technique	1	203.70	203.70	15.11	9.91E-4
Solvent-temperature	3	125.14	41.71	3.09	0.05
Solvent-technique	3	464.75	154.91	11.49	0.00
Temperature-technique	1	71.84	71.84	5.32	0.03
Waste	19	4002.51	1334.17	98.97	8.86E-12

Table S13. Analysis of variance (ANOVA) regarding antioxidant activity by FRAP assay of *Coffea canephora* extracts.

	G.L.	Sum of squares	Average Square	Stat. F	P-value
Solvent	3	20398.56	6799.52	32.48	1.11E-07
Temperature	1	427.58	427.58	2.04	0.17
Technique	1	2326.36	2326.36	11.11	0.00
Solvent-temperature	3	1033.93	344.64	1.64	0.21
Solvent-technique	3	653.91	217.97	1.04	0.39
Temperature-technique	1	10.03	10.03	0.04	0.82
Waste	19	3977.96	209.36		

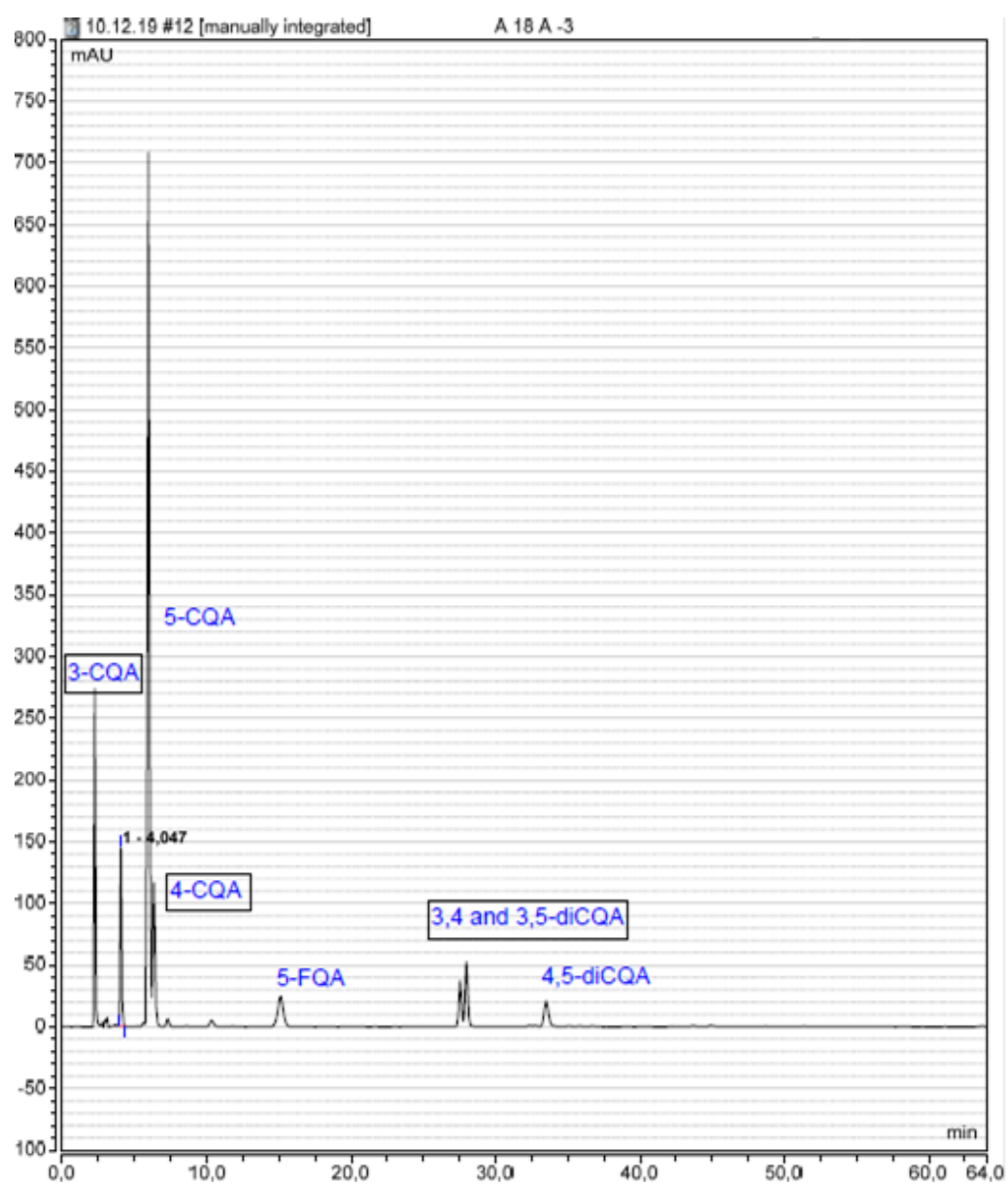


Figure S2. Chlorogenic acid chromatogram from *Coffea arabica* extract at 360nm.