TABLE S1. Profile of non-acylated anthocyanins of Malbec wines obtained applying pre-fermentative (PFS) and fermentative strategies (FS) of winemaking.

Treatments	Dp-3-gl	Cy-3-gl	Pt-3-gl	Pn-3-gl	Mv-3-gl
1H-CS	5.95 ± 0.47 a	3.51 ± 0.82	15.85 ± 1.79 a	7.64 ± 1.18 a	189.12 ± 14.25 ab
1H-NS	6.52 ± 0.09 a	3.32 ± 0.36	16.43 ± 1.17 ab	8.49 ± 0.53 ab	185.99 ± 15.67 ab
1H-CI	6.47 ± 0.36 a	3.32 ± 0.11	17.12 ± 0.20 abc	8.18 ± 0.33 a	181.38 ± 5.92 ab
2H-CS	6.59 ± 0.66 a	3.66 ± 0.25	19.94 ± 0.61 bcde	13.15 ± 0.84 d	198.06 ± 12.77 b
2H-NS	7.40 ± 0.07 ab	3.41 ± 0.36	20.49 ± 1.56 cde	12.09 ± 0.94 cd	185.70 ± 5.21 ab
2H-CI	6.32 ± 1.07 a	3.15 ± 0.27	17.83 ± 2.06 abcd	11.27 ± 0.78 cd	178.24 ± 12.91 ab
2RW-CS	8.43 ± 0.52 bc	4.10 ± 0.54	20.59 ± 0.73 cde	11.88 ± 0.94 cd	186.54 ± 12.33 ab
2RW-NS	10.52 ± 0.29 d	3.76 ± 0.31	21.51 ± 0.39 e	11.07 ± 0.74 cd	164.43 ± 3.29 a
2RW-CI	9.82 ± 0.76 cd	3.90 ± 0.13	21.33 ± 1.49 de	10.53 ± 0.76 bc	172.27 ± 13.19 ab
1H	6.31 ± 0.41 A	3.38 ± 0.46 A	16.47 ± 1.21 A	8.10 ± 0.76 A	185.50 ± 11.50
2H	6.77 ± 0.79 A	3.41 ± 0.34 A	19.42 ± 1.80 B	12.17 ± 1.10 B	187.33 ± 12.82
2RW	9.59 ± 1.04 B	3.92 ± 0.35 B	21.14 ± 0.95 C	11.16 ± 0.92 B	174.41 ± 13.36
CS	6.99 ± 1.22 α	3.76 ± 0.57	18.79 ± 2.45	10.89 ± 2.65	191.24 ± 12.53 β
NS	8.15 ± 1.83 β	3.50 ± 0.36	19.48 ± 2.53	10.55 ± 1.73	178.71 ± 13.62 αβ
CI	7.54 ± 1.84 αβ	3.46 ± 0.38	18.76 ± 2.33	9.99 ± 1.51	177.30 ± 10.49 α
Two-way ANOVA					
PFS	<0.0001	0.0186	<0.0001	<0.0001	0.0575
FS	0.0016	0.2553	0.4224	0.0890	0.0352
Interaction (PFS x FS)	0.0746	0.9093	0.1442	0.1254	0.5787

* Mean ± SD (mg/L, n=3). Different lowercase letters in the same column indicate significant differences among treatments (Tukey HSD test, $p<0.05$). Different uppercase letters indicate statistical differences ($p<0.05$) between wines from pre-fermentative strategies. Pre-fermentative strategies (PFS): 1H, 1st harvest wines (22°Brix); 2H, 2nd harvest wines (24°Brix); 2RW, reduced alcohol wines. Fermentative strategies (FS): CS, *S. cerevisiae* commercial strain (EC1118); NS, *S. cerevisiae* native strain (BSc114); CI, co-inoculation *S. cerevisiae*/*Hanseniaspora (BHu9/BSc114)*. Abbreviations: Dp, delphinidin; Cy, cyanidin; Pt, petunidin; Pn, peonidin; Mv, malvidin; 3-gl, 3-glucoside.

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TABLE S2. Profile of acetylated anthocyanins of Malbec wines obtained applying pre-fermentative (PFS) and fermentative strategies (FS) of winemaking.FS) of winemaking.

Treatments	Dp-3-acgl	Cy-3-acgl	Pt-3-acgl	Pn-3-acgl	Mv-3-acgl
1H-CS	2.98 ± 0.32 a	2.99 ± 0.11 abc	6.76 ± 0.50 ab	2.95 ± 0.40	37.53 ± 3.30 b
1H-NS	3.13 ± 0.12 ab	2.27 ± 0.56 a	6.51 ± 0.55 a	3.07 ± 0.23	37.06 ± 3.52 ab
1H-CI	2.99 ± 0.03 a	2.66 ± 0.14 ab	6.52 ± 0.05 a	3.08 ± 0.02	35.16 ± 1.31 ab
2H-CS	4.06 ± 0.14 c	3.85 ± 0.16 d	7.54 ± 0.81 ab	3.07 ± 0.17	35.73 ± 3.34 b
2H-NS	4.33 ± 0.22 c	3.77 ± 0.10 cd	7.05 ± 0.40 ab	3.09 ± 0.08	32.39 ± 1.07 ab
2H-CI	3.73 ± 0.39 bc	3.85 ± 0.22 d	6.66 ± 0.38 ab	2.93 ± 0.23	31.01 ± 3.58 ab
2RW-CS	4.15 ± 0.11 c	3.71 ± 0.54 cd	7.74 ± 0.24 ab	3.07 ± 0.16	34.55 ± 2.37 ab
2RW-NS	4.15 ± 0.10 c	3.53 ± 0.04 cd	7.44 ± 0.44 ab	2.89 ± 0.14	29.78 ± 0.96 a
2RW-CI	4.28 ± 0.30 c	3.36 ± 0.06 bcd	7.85 ± 0.36 b	3.17 ± 0.19	33.18 ± 2.49 ab
1H	3.04 ± 0.19 A	2.64 ± 0.43 A	6.60 ± 0.39 A	3.03 ± 0.24	36.58 ± 2.73 B
2H	4.04 ± 0.35 B	3.82 ± 0.15 B	7.08 ± 0.62 A	3.03 ± 0.17	33.04 ± 3.27 A
2RW	4.19 ± 0.18 B	3.53 ± 0.31 B	7.68 ± 0.36 B	3.04 ± 0.19	32.50 ± 2.78 A
CS	3.73 ± 0.59	3.52 ± 0.49	7.34 ± 0.66	3.03 ± 0.24	35.94 ± 2.93
NS	3.87 ± 0.58	3.19 ± 0.75	7.00 ± 0.57	3.02 ± 0.17	33.07 ± 3.72
CI	3.67 ± 0.61	3.29 ± 0.53	7.01 ± 0.69	3.06 ± 0.18	33.12 ± 2.90
Two-way ANOVA					
PFS	<0.0001	<0.0001	0.0004	0.9903	0.0083
FS	0.1641	0.0662	0.2196	0.9011	0.0534
Interaction (PFS x FS)	0.1140	0.2584	0.4249	0.3791	0.3579

* Mean ± SD (mg/L, n=3). Different lowercase letters in the same column indicate significant differences among treatments (Tukey HSD test, $p<0.05$). Different uppercase letters indicate statistical differences ($p<0.05$) between wines from pre-fermentative strategies. Pre-fermentative strategies (PFS): 1H, 1st harvest wines (22°Brix); 2H, 2nd harvest wines (24°Brix); 2RW, reduced alcohol wines. Fermentative strategies (FS): CS, *S. cerevisiae* commercial strain (EC1118); NS, *S. cerevisiae* native strain (BSc114); CI, co-inoculation *S. cerevisiae*/*Hanseniaspora (BHu9/BSc114)*. Abbreviations: Dp, delphinidin; Cy, cyanidin; Pt, petunidin; Pn, peonidin; Mv, malvidin; 3-acgl, 3-(6"-acetyl)-glucoside.

TABLE S3. .Profile of cinnamoylated anthocyanins of Malbec wines obtained applying pre-fermentative (PFS) and fermentative strategies (FS) of winemaking..

Treatments	Dp-3-cmgl	Mv-3-cfgl	Pt-3-cmgl	Mv-3-cis-cmgl	Pn-3-cmgl	Mv-3-trans-cmgl
1H-CS	4.22 ± 0.31 a	0.99 ± 0.18 a	2.37 ± 0.27	1.51 ± 0.07	2.33 ± 0.32	12.60 ± 1.82
1H-NS	4.21 ± 0.19 a	1.19 ± 0.08 a	2.44 ± 0.28	1.52 ± 0.11	2.45 ± 0.20	12.60 ± 1.53
1H-CI	4.01 ± 0.06 a	0.98 ± 0.10 a	2.54 ± 0.03	1.46 ± 0.11	2.47 ± 0.01	12.35 ± 0.23
2H-CS	5.40 ± 0.28 bc	2.03 ± 0.12 c	2.25 ± 0.15	1.40 ± 0.10	2.46 ± 0.15	11.79 ± 1.01
2H-NS	5.12 ± 0.16 bc	1.78 ± 0.07 bc	2.17 ± 0.02	1.35 ± 0.06	2.51 ± 0.05	10.36 ± 0.10
2H-CI	4.74 ± 0.34 abc	1.96 ± 0.19 bc	2.10 ± 0.16	1.34 ± 0.08	2.29 ± 0.12	9.89 ± 0.94
2RW-CS	5.43 ± 0.51 c	2.11 ± 0.10 c	2.39 ± 0.14	1.45 ± 0.09	2.72 ± 0.17	11.41 ± 0.76
2RW-NS	4.64 ± 0.05 ab	1.80 ± 0.14 bc	2.46 ± 0.11	1.53 ± 0.12	2.53 ± 0.17	10.01 ± 0.48
2RW-CI	4.75 ± 0.25 abc	1.65 ± 0.04 b	2.43 ± 0.10	1.52 ± 0.08	2.70 ± 0.29	10.24 ± 0.91
1H	4.15 ± 0.21 A	1.05 ± 0.15 A	2.45 ± 0.21 B	1.50 ± 0.09 B	2.42 ± 0.20 A	12.52 ± 1.20 B
2H	5.09 ± 0.37 B	1.92 ± 0.16 B	2.17 ± 0.13 A	1.36 ± 0.07 A	2.42 ± 0.14 A	10.68 ± 1.10 A
2RW	4.94 ± 0.47 B	1.85 ± 0.22 B	2.43 ± 0.11 B	1.50 ± 0.09 B	2.65 ± 0.21 B	10.55 ± 0.91 A
CS	5.02 ± 0.68 β	1.71 ± 0.55 β	2.34 ± 0.18	1.45 ± 0.09	2.51 ± 0.26	11.93 ± 1.23
NS	4.66 ± 0.41 α	1.59 ± 0.31 αβ	2.36 ± 0.21	1.47 ± 0.13	2.50 ± 0.14	10.99 ± 1.46
CI	4.50 ± 0.42 α	1.53 ± 0.45 α	2.35 ± 0.22	1.44 ± 0.11	2.49 ± 0.24	10.83 ± 1.33
Two-way ANOVA						
PFS	<0.0001	<0.0001	0.0037	0.0070	0.0271	0.0009
FS	0.0025	0.0170	0.9672	0.8301	0.9806	0.0688
Interaction (PFS x FS)	0.1474	0.0026	0.5707	0.6412	0.3255	0.5881

* Mean ± SD (mg/L, n=3). Different lowercase letters in the same column indicate significant differences among treatments (Tukey HSD test, $p<0.05$). Different uppercase letters indicate statistical differences ($p<0.05$) between wines from pre-fermentative strategies. Pre-fermentative strategies (PFS): 1H, 1st harvest wines (22°Brix); 2H, 2nd harvest wines (24°Brix); 2RW, reduced alcohol wines. Fermentative strategies (FS): CS, *S. cerevisiae* commercial strain (EC1118); NS, *S. cerevisiae* native strain (BSc114); CI, co-inoculation *S. cerevisiae*/*Hanseniaspora (BHu9/BSc114)*. Abbreviations: Dp, delphinidin; Cy, cyanidin; Pt, petunidin; Pn, peonidin; Mv, malvidin; 3-cfgl, 3-(6"-caffeoyl)-glucoside; 3-cmgl, 3-(6"-*p*-coumaroyl)-glucoside.

TABLE S4.. Profile of vitisin-like pyranoanthocyanins (A, B) of Malbec wines obtained applying pre-fermentative (PFS) and fermentative strategies (FS) of winemaking.

Treatments	10-H-pyrmv-3-acgl	10-C-pyrpn-3-gl	10-C-pyrmv-3-gl	10-C-pyrmv-3-acgl
1H-CS	3.08 ± 0.40 ab	2.13 ± 0.06 ab	4.16 ± 0.23 a	3.27 ± 0.06 a
1H-NS	2.87 ± 0.79 a	2.21 ± 0.29 abc	3.61 ± 0.35 a	3.29 ± 0.12 a
1H-CI	2.88 ± 0.08 a	2.09 ± 0.01 a	3.97 ± 0.09 a	3.10 ± 0.02 a
2H-CS	4.17 ± 0.40 bc	3.81 ± 0.52 d	7.60 ± 0.37 d	4.62 ± 0.39 b
2H-NS	4.19 ± 0.29 bc	3.68 ± 0.83 d	6.97 ± 0.12 cd	4.40 ± 0.19 b
2H-CI	3.71 ± 0.48 abc	3.06 ± 0.06 abcd	7.41 ± 0.27 cd	4.05 ± 0.26 b
2RW-CS	4.32 ± 0.33 c	3.53 ± 0.35 d	6.33 ± 1.13 bc	4.30 ± 0.34 b
2RW-NS	3.92 ± 0.08 abc	3.23 ± 0.08 cd	6.34 ± 0.19 bcd	3.97 ± 0.12 b
2RW-CI	4.06 ± 0.12 bc	3.18 ± 0.26 bcd	5.68 ± 0.09 b	3.98 ± 0.31 b
1H	2.94 ± 0.45 A	2.14 ± 0.16 A	3.91 ± 0.33 A	3.22 ± 0.11 A
2H	4.03 ± 0.41 B	3.52 ± 0.60 B	7.33 ± 0.36 C	4.35 ± 0.35 B
2RW	4.10 ± 0.25 B	3.31 ± 0.28 B	6.12 ± 0.66 B	4.08 ± 0.29 B
CS	3.86 ± 0.67	3.16 ± 0.84	6.03 ± 1.62	4.06 ± 0.66 β
NS	3.66 ± 0.74	3.04 ± 0.79	5.64 ± 1.56	3.89 ± 0.50 αβ
CI	3.55 ± 0.58	2.77 ± 0.53	5.69 ± 1.50	3.71 ± 0.50 α
Two-way ANOVA				
PFS	<0.0001	<0.0001	<0.0001	<0.0001
FS	0.2643	0.1080	0.1522	0.0173
Interaction (PFS x FS)	0.7011	0.4582	0.2489	0.4342

* Mean ± SD (mg/L, n=3). Different lowercase letters in the same column indicate significant differences among treatments (Tukey HSD test, $p<0.05$). Different uppercase letters indicate statistical differences ($p<0.05$) between wines from pre-fermentative strategies. Pre-fermentative strategies (PFS): 1H, 1st harvest wines (22°Brix); 2H, 2nd harvest wines (24°Brix); 2RW, reduced alcohol wines. Fermentative strategies (FS): CS, *S. cerevisiae* commercial strain (EC1118); NS, *S. cerevisiae* native strain (BSc114); CI, co-inoculation *S. cerevisiae*/*Hanseniaspora (BHu9/BSc114)*. Abbreviations: 10-H, vitisin B structures; 10-C, vitisin A structures; pyrpn, pyranopeonidin; pyrmv, pyranomalvidin; 3-gl, 3-glucoside; 3-acgl, 3-(6''-acetyl)-glucoside.

TABLE S5..Profile of hydroxyphenyl-pyranoanthocyanins and flavanol-anthocyanin adducts of Malbec wines obtained applying pre-fermentative (PFS) and fermentative strategies (FS) of winemaking.

Treatments	10-HP-pyrmv-3-gl	10-MHP-pyrmv-3-gl	10-HP-pyrmv-3-acgl	10-HP-pyrmv-3-cmgl	Mv-3-gl-Cat	Mv-3-gl-ethyl-Cat
1H-CS	1.36 ± 0.05 ab	0.70 ± 0.02 a	0.82 ± 0.01 ab	0.73 ± 0.01 a	2.47 ± 0.06 abc	2.39 ± 0.18 a
1H-NS	1.34 ± 0.05 ab	0.71 ± 0.01 a	0.78 ± 0.02 a	0.74 ± 0.02 a	2.41 ± 0.17 abc	2.22 ± 0.06 a
1H-CI	1.52 ± 0.04 b	0.73 ± 0.00 a	0.84 ± 0.02 ab	0.75 ± 0.00 a	2.54 ± 0.08 abc	2.18 ± 0.14 a
2H-CS	1.52 ± 0.03 b	0.90 ± 0.01 b	0.94 ± 0.01 d	0.87 ± 0.02 b	2.18 ± 0.15 a	3.38 ± 0.09 b
2H-NS	1.53 ± 0.05 b	0.91 ± 0.01 b	0.92 ± 0.03 cd	0.90 ± 0.02 b	2.64 ± 0.22 bcd	3.54 ± 0.18 b
2H-CI	1.32 ± 0.16 ab	0.88 ± 0.02 b	0.88 ± 0.03 bcd	0.85 ± 0.03 b	2.27 ± 0.19 ab	3.41 ± 0.22 b
2RW-CS	1.27 ± 0.18 ab	0.89 ± 0.02 b	0.89 ± 0.05 bcd	0.87 ± 0.03 b	3.01 ± 0.12 de	3.73 ± 0.22 b
2RW-NS	1.28 ± 0.05 ab	0.88 ± 0.00 b	0.86 ± 0.01 bc	0.86 ± 0.02 b	3.15 ± 0.15 e	3.42 ± 0.03 b
2RW-CI	1.17 ± 0.12 a	0.87 ± 0.01 b	0.85 ± 0.02 ab	0.85 ± 0.02 b	2.81 ± 0.22 cde	3.53 ± 0.13 b
1H	1.41 ± 0.09 B	0.71 ± 0.02 A	0.82 ± 0.03 A	0.74 ± 0.01 A	2.48 ± 0.11 A	2.26 ± 0.15 A
2H	1.46 ± 0.13 B	0.90 ± 0.02 C	0.92 ± 0.03 C	0.87 ± 0.03 B	2.36 ± 0.27 A	3.44 ± 0.17 B
2RW	1.24 ± 0.12 A	0.88 ± 0.01 B	0.87 ± 0.03 B	0.86 ± 0.02 B	2.99 ± 0.21 B	3.56 ± 0.19 B
CS	1.38 ± 0.14	0.83 ± 0.10	0.89 ± 0.06 b	0.82 ± 0.07	2.55 ± 0.38 ab	3.17 ± 0.62
NS	1.38 ± 0.12	0.83 ± 0.09	0.86 ± 0.06 a	0.83 ± 0.08	2.74 ± 0.36 b	3.06 ± 0.64
CI	1.34 ± 0.19	0.83 ± 0.07	0.86 ± 0.03 a	0.82 ± 0.05	2.54 ± 0.28 a	3.04 ± 0.67
Two-way ANOVA						
PFS	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
FS	0.5247	0.6555	0.0230	0.2334	0.0318	0.1950
Interaction (PFS x FS)	0.0164	0.0071	0.0161	0.1022	0.0318	0.1418

* Mean ± SD (mg/L, n=3). Different lowercase letters in the same column indicate significant differences among treatments (Tukey HSD test, $p<0.05$). Different uppercase letters indicate statistical differences ($p<0.05$) between wines from pre-fermentative strategies. Pre-fermentative strategies (PFS): 1H, 1st harvest wines (22°Brix); 2H, 2nd harvest wines (24°Brix); 2RW, reduced alcohol wines. Fermentative strategies (FS): CS, *S. cerevisiae* commercial strain (EC1118); NS, *S. cerevisiae* native strain (BSc114); CI, co-inoculation *S. cerevisiae*/*Hanseniaspora (BHu9/BSc114)*. Abbreviations: 10-HP, *p-hydroxyphenyl*; 10-MHP, methoxy-hydroxyphenyl or guaiacyl; pyrmv, pyranomalvidin; 3-gl, 3-glucoside; 3-acgl, 3-(6"-acetyl)-glucoside; 3-cmgl, 3-(6"-coumaroyl)-glucoside; Cat, catechin.

TABLE S6. Sensory profile of Malbec wines obtained applying pre-fermentative (PFS) and fermentative strategies (FS) of winemaking.

Treatments	Color saturation	Violet hue	Fruity	Floral	Herbaceous	Spicy	Balsamic	Acidity	Astringency	Bitterness	Fullness
1H-CS	5.04* a	2.97 a	3.60 ab	1.96	1.92	1.84 ab	1.68	3.85	3.14 a	2.90 a	3.19 a
1H-NS	4.83 a	3.03 a	3.93 abc	2.35	1.56	1.24 a	1.99	4.01	3.97 abc	2.99 a	3.22 a
1H-CI	4.77 a	2.93 a	3.24 a	2.07	1.90	1.80 ab	1.93	3.84	3.64 ab	3.37 ab	3.44 a
2H-CS	6.79 b	5.28 b	4.44 abc	2.60	1.26	1.80 ab	2.56	3.45	4.12 bc	4.04 b	4.45 b
2H-NS	6.97 b	5.69 b	4.14 abc	2.53	1.94	2.68 b	2.44	4.00	4.62 c	3.72 ab	4.53 b
2H-CI	6.51 b	4.98 b	4.00 abc	2.64	1.72	2.14 ab	2.91	3.86	4.69 c	3.77 ab	4.66 b
2RW-CS	6.77 b	5.18 b	4.75 bc	2.30	1.42	2.05 ab	2.31	4.27	4.17 bc	3.04 a	3.87 ab
2RW-NS	6.91 b	5.78 b	4.29 abc	2.89	1.35	2.41 b	2.79	4.23	4.51 bc	3.42 ab	4.56 b
2RW-CI	7.07 b	5.74 b	4.96 c	2.65	1.51	2.24 ab	2.46	4.28	4.7 c	2.87 b	4.38 b
1H	4.88 A	2.98 A	3.59 A	2.13	1.79	1.63 A	1.87 A	3.90	3.58 A	3.08 A	3.28 A
2H	6.76 B	5.32 B	4.20 AB	2.59	1.64	2.21 B	2.64 B	3.77	4.48 B	3.84 B	4.55 B
2RW	6.92 B	5.57 B	4.67 B	2.61	1.42	2.23 B	2.52 AB	4.26	4.46 B	3.11 A	4.27 B
CS	6.20	4.48	4.27	2.29	1.53	1.89	2.18	3.86	3.81 a	3.32	3.84
NS	6.24	4.83	4.12	2.59	1.61	2.11	2.40	4.08	4.36 β	3.38	4.11
CI	6.12	4.55	4.07	2.45	1.71	2.06	2.43	3.99	4.34 β	3.33	4.16
Two-factor ANOVA											
PFS	<0.0001	<0.0001	0.0020	0.2220	0.2410	0.0160	0.0200	0.2690	<0.0001	0.0060	<0.0001
FS	0.8530	0.3650	0.8010	0.6310	0.7020	0.6260	0.6470	0.7720	0.0470	0.9790	0.2900
Interaction (PFS x FS)	0.6830	0.6200	0.4630	0.9340	0.3990	0.1220	0.8450	0.9470	0.9180	0.5270	0.7500

* Mean. Different Roman lowercase letters in the same column indicate significant differences among treatments (Tukey HSD test, $p<0.05$). Different Greek letters indicate statistical differences ($p<0.05$) between wines from fermentative strategies. Different uppercase letters indicate statistical differences ($p<0.05$) between wines from pre-fermentative strategies. Pre-fermentative strategies (PFS): 1H, 1st harvest wines (22°Brix); 2H, 2nd harvest wines (24°Brix); 2RW, reduced alcohol wines. Fermentative strategies (FS): CS, *S. cerevisiae* commercial strain (EC1118); NS, *S. cerevisiae* native strain (BSc114); CI, co-inoculation *S. cerevisiae*/*Hanseniaspora (BHu9/BSc114)*.