molecules

MDPI

Table S1. Results of the metals content in wine samples (n = 3; k = 2, α = 0.05).

No sample	Grape Type	Region of Poland	Location [Masl]	Color	Metal Content (µg/L) or (mg/L) /Isotope Mass (amu)																											
					[µg/L]																							[mg/L]					
					Ag 107	Al 27	As 75	Zr 90	Ba 138	Bi 209	Cd 111	Co 59	Cr 52	Cu 63	Fe 56	Hg 201	V 51	Li 7	Mo 98	Na 23	Ni 60	Pb 206	Sb 121	Se 78	Sn 115	Sr 88	Ti 47	Tl 205	Mg 25	K 41	Mn 55	B 10	Zn 64	Ca 40
1W	Solaris	W P	125	w	4.92 ± 0.15	206.1 ± 7.8	290.5 ± 28	10.91 ± 0.40	65.62 ± 1.12	456.1 ± 12.3	1.05 ± 0.16	2.05 ± 0.30	16.32 ± 0.75	396.2 ± 11.8	424.1 ± 12.0	0.51 ± 0.091	15.31 ± 0.45	1.68 ± 0.20	39.11 ± 1.13	170.3 ± 7.8	87.21 ± 1.47	23.51 ± 0.43	13.21 ± 0.34	139.1 ± 2.4	200.2 ± 7.9	126.1 ± 2.4	46.91 ± 1.1	2.37 ± 0.31	84.8 ± 1.5	422 ± 12	0.506 ± 0.091	2.94 ± 0.17	4.95 ± 0.30	43.4 ± 1.1
2 W	Solaris	W P	125	w	4.41 ± 0.16	64.12 ± 1.12	92.71 ± 2.9	5.81 ± 0.30	118.1 ± 2.3	118.7 ± 2.0	0.56 ± 0.091	1.61 ± 0.26	10.31 ± 0.43	394.3 ± 11.5	390.6 ± 11.8	0.47 ± 0.090	6.18 ± 0.37	1.41 ± 0.18	18.61 ± 0.50	333.3 ± 10.2	80.72 ± 1.51	22.22 ± 0.45	6.89 ± 0.22	88.03 ± 1.51	43.7 ± 1.1	142.2 ± 2.5	36.72 ± 1.12	1.08 ± 0.13	64.1 ± 1.3	591±14	0.484±0.089	2.73±0.19	5.77±0.31	79.6±1.8
3 W	Seyval Blanc	W P	125	w	4.21 ± 0.12	1511 ± 12	38.42 ± 0.54	8.33 ± 0.39	136.5 ± 2.5	85.77 ± 1.71	0.66 ± 0.096	1.15 ± 0.20	4.94 ± 0.22	53.95 ± 0.54	357.2 ± 11.6	0.45 ± 0.087	8.26 ± 0.42	2.91 ± 0.27	12.51 ± 0.43	1632 ± 25	16.51 ± 1.12	16.22 ± 0.37	4.84 ± 0.21	49.31 ± 1.32	29.9 ± 0.56	355.1 ± 6.4	34.63 ± 1.15	1.11 ± 0.10	65 ± 1.3	600 ± 15	1.26 ± 0.20	2.34 ± 0.18	2.02 ± 0.23	80.2 ± 1.9
4 W	Seyval Blanc	W P	125	w	4.29 ± 0.17	1608 ± 13	24.24 ± 0.43	7.49 ± 0.36	137.5 ± 2.4	70.98 ± 1.53	0.65 ± 0.094	1.12 ± 0.21	4.87 ± 0.23	54.41 ± 0.54	351.3 ± 11.4	0.43 ± 0.086	7.03 ± 0.40	2.83 ± 0.29	9.87 ± 0.30	1633 ± 27	18.22 ± 1.19	15.77 ± 0.34	3.85 ± 0.20	38.91 ± 1.01	18.2 ± 0.34	354.5 ± 6.2	34.71 ± 1.14	0.98 ± 0.023	84 ± 1.5	757 ± 17	1.28 ± 0.21	2.45 ± 0.16	2.18 ± 0.21	59.7 ± 1.6
5 W	Bianca	KP	74	w	2.35± 0.10	145.2 ± 5.1	14.31 ± 0.21	2.14 ± 0.23	75.64 ± 1.31	51.91 ± 1.21	0.51 ± 0.091	1.67± 0.26	12.11 ± 0.56	19.11 ± 0.34	613.2 ± 15.8	0.43 ± 0.082	2.77 ± 0.23	4.73 ± 0.31	7.41 ± 0.32	305.5 ± 10.5	29.61 ± 1.25	18.11 ± 0.38	2.61 ± 0.19	25.71 ± 1.02	7.54 ± 0.45	239.6 ± 7.9	28.61 ± 1.11	0.81 ± 0.023	135 ± 1.8	733 ± 18	0.940 ± 0.18	3.05 ± 0.21	8.73 ± 0.37	44.2 ± 1.2

Nosample	W 6	W 7	W 8	W 9	W 10	
Grape Type	Solaris	Aurora. Bianca Hibernal. Muscat	Aurora. Bianca	Hibernal. Bianca. Muller Turgau	Bianca	
Region of Poland	KP	P	P	KP	SC	
Location [Masl]	74	120	120	92	320	
Color	w	w	w	w	w	
Ag 107	1.840 ± 0.091	1.520 ± 0.089	1.390 ± 0.072	1.660 ± 0.088	1.170 ± 0.064	[µg/L] Metal Content (µg/L) or (mg/L) /Isotope Mass (amu)
Al 27	170.5 ± 5.8	906.1 ± 11.1	327.1 ± 8.8	577.1 ± 14.2	2059 ± 32	
As 75	19.83 ± 0.27	15.87 ± 0.25	13.02 ± 0.19	8.83 ± 0.17	11.71 ± 0.19	
Zr 90	1.73 ± 0.19	5.51 ± 0.30	3.97 ± 0.26	1.96 ± 0.17	25.42 ± 0.89	
Ba 138	65.51 ± 1.12	92.11 ± 1.71	64.83 ± 1.15	63.02 ± 1.17	261.2 ± 4.9	
Bi 209	40.71 ± 1.12	48.62 ± 1.14	48.33 ± 1.19	34.92 ± 1.10	33.85 ± 1.09	
Cd 111	0.66 ± 0.097	0.41 ± 0.081	0.27 ± 0.034	0.36 ± 0.039	0.94 ± 0.19	
Co 59	3.76 ± 0.34	3.79 ± 0.35	1.21 ± 0.19	1.08 ± 0.19	5.47 ± 0.40	
Cr 52	16.11 ± 0.75	24.81 ± 0.87	22.84 ± 0.89	95.17 ± 1.23	11.35 ± 0.50	
Cu 63	61.71 ± 0.59	20.62 ± 0.33	15.93 ± 0.31	769.1 ± 11.9	63.44 ± 0.58	
Fe 56	855.1 ± 23.8	637.2 ± 20.8	482.4 ± 12.1	1324 ± 28	475.5 ± 11.9	
Hg 201	0.42 ± 0.085	0.42 ± 0.083	0.41 ± 0.084	0.39 ± 0.079	0.38 ± 0.077	
V 51	2.14 ± 0.21	17.91 ± 0.45	8.52 ± 0.36	2.77 ± 0.21	4.44 ± 0.24	
Li 7	4.44 ± 0.33	6.09 ± 0.45	3.01 ± 0.32	27.21 ± 1.0	9.57 ± 0.89	
Mo 98	5.58 ± 0.31	15.31 ± 0.43	8.47 ± 0.32	7.38 ± 0.29	4.41 ± 0.26	
Na 23	338.6 ± 10.2	791.7 ± 20.1	493.1 ± 13.1	345.2 ± 10.4	3732 ± 39	
Ni 60	61.72 ± 1.23	39.91 ± 1.34	43.25 ± 1.33	174.7 ± 2.5	78.27 ± 1.51	
Pb 206	10.61 ± 0.32	13.5 ± 0.35	12.29 ± 0.27	48.69 ± 1.12	21.71 ± 0.54	
Sb 121	2.38 ± 0.19	2.56 ± 0.20	2.15 ± 0.19	1.86 ± 0.16	1.73 ± 0.15	
Se 78	47.12 ± 1.51	26.55 ± 0.87	24.66 ± 0.89	25.11 ± 0.83	15.62 ± 0.65	
Sn 115	6.69 ± 0.43	6.97 ± 0.43	4.17 ± 0.45	2.33 ± 0.23	3.11 ± 0.25	
Sr 88	172.7±7.5	321.1 ± 8.2	165.1 ± 7.1	222.1 ± 7.9	951.1 ± 11.2	
Ti 47	31.82 ± 1.10	33.11 ± 1.15	31.84 ± 1.12	30.18 ± 1.11	38.99 ± 1.16	
Tl 205	0.86 ± 0.024	0.65 ± 0.021	0.58 ± 0.018	0.58 ± 0.018	1.26 ± 0.23	
Mg 25	69.5 ± 1.4	93.1 ± 1.8	100 ± 1.9	115 ± 2.0	104 ± 1.9	[mg/L]
K 41	828 ± 18	890 ± 19	965 ± 20	1410 ± 23	880 ± 20	
Mn 55	1.14 ± 0.20	3.48 ± 0.34	0.329 ± 0.078	1.40 ± 0.22	1.42 ± 0.22	
B 10	4.42 ± 0.24	3.32 ± 0.18	2.96 ± 0.16	4.65 ± 0.23	5.52 ± 0.27	
Zn 64	1.29 ± 0.19	2.21 ± 0.23	1.55 ± 0.20	1.42 ± 0.17	3.50 ± 0.25	
Ca 40	88.3 ± 2.1	85.5 ± 1.9	72.5 ± 1.8	95.2 ± 2.2	76.7 ± 1.9	

No sample	W 11	W 12	W 13	W 14	W 15	W 16
Grape Type	Hibernal	Hibernal	Hibernal	Hibernal	Jutrzenka	Jutrzenka
Region of Poland	SC	SC	SC	LP	M	M
Location [Masl]	320	320	296	335	151	151
Color	w	w	w	w	w	w
Metal Content (µg/L) or (mg/L) /Isotope Mass (amu) [µg/L] Ag 107	0.73 ± 0.056	0.48 ± 0.055	1.840 ± 0.091	0.590 ± 0.046	0.610 ± 0.041	0.390 ± 0.039
Al 27	1174 ± 20	2729 ± 22	56.66 ± 1.91	1127 ± 19	387.1 ± 9.2	427.1 ± 9.6
As 75	12.97 ± 0.23	22.75 ± 0.22	3.11 ± 0.10	9.41 ± 0.24	5.75 ± 0.28	3.47 ± 0.19
Zr 90	7.88 ± 0.39	33.21 ± 0.78	1.21 ± 0.12	2.22 ± 0.19	3.81 ± 0.28	1.55 ± 0.18
Ba 138	190.4 ± 4.2	182.1 ± 4.0	43.31 ± 1.09	187.1 ± 4.3	202.4 ± 4.2	174.4 ± 3.7
Bi 209	24.25 ± 1.08	20.36 ± 1.11	1.71 ± 0.091	24.51 ± 1.10	25.31 ± 1.09	20.92 ± 1.11
Cd 111	1.56 ± 0.23	0.89 ± 0.16	0.51 ± 0.091	0.44 ± 0.078	0.65 ± 0.095	0.51 ± 0.091
Co 59	3.64 ± 0.34	4.97 ± 0.39	<0.002	2.86 ± 0.32	1.26 ± 0.26	1.36 ± 0.27
Cr 52	13.41 ± 0.59	24.83	7.12 ± 0.27	13.61 ± 0.56	6.11 ± 0.22	4.86 ± 0.22
Cu 63	155.5 ± 2.3	126.1 ± 1.8	25000 ± 29	98.21 ± 0.98	436.1 ± 11.5	29.47 ± 0.34
Fe 56	456.2 ± 11.7	816.9 ± 25.8	155.8 ± 2.8	331.8 ± 4.5	407.1 ± 11.8	680.3 ± 23.8
Hg 201	0.41 ± 0.089	0.39 ± 0.077	0.43 ± 0.091	0.37 ± 0.081	0.38 ± 0.080	0.35 ± 0.067
V 51	4.75 ± 0.26	25.89 ± 0.49	0.37 ± 0.14	20.19 ± 0.47	7.5 ± 0.34	1.67 ± 0.11
Li 7	16.64 ± 1.20	13.02 ± 0.78	1.13 ± 0.20	8.69 ± 0.67	2.47 ± 0.28	3.65 ± 0.32
Mo 98	5.35 ± 0.31	4.87 ± 0.30	1.01 ± 0.19	5.99 ± 0.27	2.73 ± 0.23	4.57 ± 0.32
Na 23	3823 ± 41	3421 ± 42	99.94 ± 1.81	2491 ± 29	169.3 ± 7.8	110.4 ± 3.2
Ni 60	69.56 ± 1.43	142.9 ± 2.4	0.21 ± 0.012	23.11 ± 1.12	50.91 ± 1.32	10.19 ± 1.01
Pb 206	27.85 ± 0.32	26.47 ± 0.24	23.24 ± 0.30	18.16 ± 0.21	43.85 ± 0.43	6.14 ± 0.29
Sb 121	1.84 ± 0.17	1.57 ± 0.14	0.56 ± 0.012	1.06 ± 0.021	1.79 ± 0.11	0.87 ± 0.021
Se 78	12.82 ± 0.43	11.47 ± 0.39	6.79 ± 0.37	6.93 ± 0.40	10.81 ± 0.32	5.56 ± 0.25
Sn 115	3.03 ± 0.25	1.56 ± 0.13	<0.021	2.22 ± 0.22	2.71 ± 0.23	1.58 ± 0.18
Sr 88	401.4 ± 8.2	867.7 ± 12.2	49.7 ± 1.2	503.4 ± 4.2	150.6 ± 5.1	143.1 ± 2.4
Ti 47	38.67 ± 1.15	43.41 ± 1.19	24.61 ± 1.10	31.02 ± 1.14	29.12 ± 1.11	26.82 ± 1.10
Tl 205	0.97 ± 0.021	1.03 ± 0.029	0.54 ± 0.017	1.15 ± 0.23	0.67 ± 0.020	0.65 ± 0.021
[mg/L] Mg 25	94.1 ± 1.7	92.1 ± 1.8	123 ± 2.2	42.7 ± 1.3	84.2 ± 1.5	88.9 ± 1.6
K 41	1160 ± 21	188 ± 2.3	1540 ± 23	1130 ± 21	1090 ± 20	817 ± 19
Mn 55	1.49 ± 0.24	1.41 ± 0.21	0.018 ± 0.007	0.99 ± 0.17	1.57 ± 0.25	2.26 ± 0.27
B 10	7.67 ± 0.32	9.93 ± 0.36	0.333 ± 0.019	5.89 ± 0.34	1.44 ± 0.17	2.57 ± 0.19
Zn 64	3.89 ± 0.25	5.71 ± 0.30	2.34 ± 0.21	9.89 ± 0.67	5.66 ± 0.30	3.05 ± 0.25
Ca 40	90.8 ± 2.1	75.5 ± 1.8	137	42.9 ± 1.3	72.4 ± 1.8	78.5 ± 1.6

No sample	W 17	W 18	W 19	W 20	W 21	W 22
Grape Type	Aurora. Bianca	Aurora. Bianca	La Crescent	La Crescent. St. Pepin	Andalamina. Kristally Prarie Star	Andalamina. Kristally
Region of Poland	M	M	M	M	M	M
Location [Masl]	151	151	151	151	151	151
Color	w	w	w	w	w	w
Metal Content (µg/L) or (mg/L) /Isotope Mass (amu)						
[µg/L]						
Ag 107	0.39 ± 0.038	0.31 ± 0.037	0.56 ± 0.041	0.29 ± 0.028	0.13 ± 0.006	0.19 ± 0.009
Al 27	342.1 ± 9.1	232.1 ± 7.8	402.2 ± 9.8	226.2 ± 7.6	559.9 ± 11.8	133.1 ± 4.8
As 75	5.84 ± 0.33	4.11 ± 0.22	3.91 ± 0.19	4.04 ± 0.20	6.12 ± 0.26	3.38 ± 0.21
Zr 90	3.11 ± 0.23	1.48 ± 0.11	1.41 ± 0.10	1.18 ± 0.10	3.97 ± 0.27	3.15 ± 0.23
Ba 138	181.4 ± 4.1	117.3 ± 2.3	230.7 ± 4.7	186.4 ± 4.2	156.1 ± 3.2	70.42 ± 1.16
Bi 209	17.11 ± 1.08	14.41 ± 1.07	14.27 ± 1.01	10.68 ± 1.02	7.19 ± 0.67	7.35 ± 0.62
Cd 111	1.21 ± 0.21 ± 0.034	1.09 ± 0.16	2.11 ± 0.30	3.73 ± 0.36	0.91 ± 0.15	0.62 ± 0.097
Co 59	2.12 ± 0.31	1.46 ± 0.27	2.82 ± 0.35	2.12 ± 0.32	1.04 ± 0.15	1.19 ± 0.17
Cr 52	11.77 ± 0.50	8.63 ± 0.26	6.77 ± 0.31	5.46 ± 0.27	4.75 ± 0.22	5.33 ± 0.25
Cu 63	127.5 ± 1.7	<0.268	226.1 ± 3.2	164.4 ± 2.8	47.31 ± 0.50	496.1 ± 12.3
Fe 56	761.2 ± 23.9	290.2 ± 3.2	476.1 ± 11.5	361.2 ± 2.9	469.3 ± 11.9	267.9 ± 2.8
Hg 201	0.36 ± 0.078	0.36 ± 0.075	0.36 ± 0.075	0.35 ± 0.072	0.35 ± 0.073	0.34 ± 0.070
V 51	8.76 ± 0.31	7.46 ± 0.27	1.92 ± 0.11	0.88 ± 0.023	19.77 ± 0.46	0.56 ± 0.027
Li 7	4.16 ± 0.34	2.74 ± 0.29	1.03 ± 0.20	0.58 ± 0.14	3.07 ± 0.29	5.65 ± 0.34
Mo 98	2.27 ± 0.23	2.04 ± 0.22	5.03 ± 0.29	2.99 ± 0.24	4.61 ± 0.36	1.78 ± 0.19
Na 23	480.1 ± 10.1	33.63 ± 0.69	77.74 ± 1.13	39.29 ± 0.39	188.9 ± 7.8	67.68 ± 1.11
Ni 60	62.38 ± 1.51	35.71 ± 1.41	21.41 ± 1.14	32.61 ± 1.31	33.84 ± 1.36	244.9 ± 2.9
Pb 206	19.61 ± 0.33	13.91 ± 0.22	6.21 ± 0.23	6.87 ± 0.19	13.81 ± 0.34	40.21 ± 0.43
Sb 121	0.98 ± 0.019	0.78 ± 0.016	0.61 ± 0.014	0.51 ± 0.013	0.62 ± 0.016	0.57 ± 0.017
Se 78	11.72 ± 0.43	5.78 ± 0.21	3.94 ± 0.19	4.99 ± 0.32	10.11 ± 0.87	3.34 ± 0.23
Sn 115	1.37 ± 0.12	0.84 ± 0.023	0.87 ± 0.045	0.72 ± 0.046	0.57 ± 0.032	0.22 ± 0.021
Sr 88	282.1 ± 7.9	279.2 ± 7.7	280.2 ± 7.4	289.1 ± 7.4	170.5 ± 6.2	89.81
Ti 47	27.42 ± 1.00	30.12 ± 1.13	33.71 ± 1.15	31.51 ± 1.12	27.95 ± 1.11	30.26 ± 1.16
Tl 205	0.55 ± 0.018	0.6 ± 0.019	1.06 ± 0.13	0.87 ± 0.016	0.61 ± 0.014	0.61 ± 0.016
[mg/L]						
Mg 25	106 ± 1.9	161 ± 2.5	156 ± 2.5	69.3 ± 1.5	62.5±1.4	66.5 ± 1.6
K 41	862 ± 14	1390 ± 24	985 ± 19	901 ± 17	166 ± 2	1330 ± 23
Mn 55	2.07 ± 0.24	2.45 ± 0.27	7.70 ± 0.48	6.84 ± 0.46	2.46 ± 0.29	2.36 ± 0.27
B 10	1.88 ± 0.16	3.24 ± 0.22	4.00 ± 0.20	3.97 ± 0.21	2.30 ± 0.17	3.73 ± 0.24
Zn 64	3.28 ± 0.21	3.81 ± 0.26	4.77 ± 0.29	6.65 ± 0.33	2.54 ± 0.21	3.17 ± 0.25
Ca 40	87.2 ± 1.9	122	95.4 ± 2.2	55 ± 1.5	43.9 ± 1.3	32 ± 11

No sample	23 W	24 W	1R W P	2R W P	3R	4R
Grape Type	Seywal Blanc	St.Pepin. La Crescent	Allegro	Regent. Rondo	Rondo	Regent
Region of Poland	M	M	W P	W P	KP	KP
Location [Masl]	151	151	125	125	74	74
Color	w	w	r	r	r	r
Metal Content (µg/L) or (mg/L) /Isotope Mass (amu)						
[µg/L]						
Ag 107	0.16 ± 0.005	0.23 ± 0.011	0.06 ± 0.003	0.04 ± 0.001	3.85 ± 0.14	0.03 ± 0.003
Al 27	1589 ± 19.8	91.61 ± 3.5	415.1 ± 9.8	276.1 ± 6.8	146.2 ± 7.8	131.3 ± 4.8
As 75	3.63 ± 0.23	3.21 ± 0.19	4.79 ± 0.23	4.72 ± 0.23	3.62 ± 0.19	3.47 ± 0.24
Zr 90	3.34 ± 0.24	1.08 ± 0.10	1.22 ± 0.11	1.09 ± 0.099	1.01± 0.11	0.98 ± 0.034
Ba 138	113.4 ± 2.4	152.5 ± 2.7	266.3 ± 4.9	303.5 ± 5.2	95.41 ± 1.21	79.31 ± 1.18
Bi 209	9.01 ± 0.71	7.17 ± 0.79	2.51 ± 0.22	2.39 ± 0.24	3.03 ± 0.23	2.72 ± 0.20
Cd 111	1.14 ± 0.16	2.54 ± 0.32	0.55 ± 0.091	0.83 ± 0.14	0.42 ± 0.087	0.39 ± 0.076
Co 59	1.99 ± 0.26	1.17 ± 0.21	1.81 ± 0.26	1.91± 0.27	2.39 ± 0.32	1.62 ± 0.25
Cr 52	8.72 ± 0.34	5.75 ± 0.29	6.98 ± 0.32	5.89 ± 0.31	7.15 ± 0.34	6.54 ± 0.29
Cu 63	83.71 ± 1.91	400.2 ± 11.5	47.03 ± 0.51	10.51 ± 0.24	<0.268	27.61 ± 0.34
Fe 56	826.1 ± 23.8	261.2 ± 3.1	711.2 ± 21.8	311.1 ± 2.9	290.4 ± 2.8	268.1 ± 2.7
Hg 201	0.34 ± 0.072	0.35 ± 0.073	0.34 ± 0.080	0.34 ± 0.075	0.35 ± 0.069	0.33 ± 0.068
V 51	5.09 ± 0.31	0.47 ± 0.23	4.28 ± 0.26	0.61 ± 0.023	0.03 ± 0.0021	<0.003
Li 7	8.09 ± 0.45	0.53 ± 0.30	15.37 ± 1.20	6.48 ± 0.67	9.33 ± 0.61	5.18 ± 0.59
Mo 98	2.29 ± 0.21	2.27 ± 0.20	2.04 ± 0.22	0.59 ± 0.034	0.31 ± 0.021	0.58 ± 0.026
Na 23	463.1 ± 14.9	5.33 ± 0.49	3805 ± 45	3287 ± 42	311.1 ± 10.1	308.1 ± 10.8
Ni 60	149.9 ± 2.4	17.65 ± 1.19	35.17 ± 1.29	29.11 ± 1.25	66.51 ± 1.51	49.31 ± 1.45
Pb 206	17.28 ± 0.41	6.77 ± 0.19	54.16 ± 0.43	55.55 ± 0.43	12.12 ± 0.32	7.69 ± 0.19
Sb 121	0.77 ± 0.018	0.39 ± 0.012	0.34 ± 0.011	0.26 ± 0.011	0.17 ± 0.011	0.14 ± 0.010
Se 78	4.47 ± 0.28	4.35 ± 0.27	2.91 ± 0.19	3.06 ± 0.21	3.75 ± 0.23	4.68 ± 0.32
Sn 115	0.74 ± 0.034	<0.021	0.136 ± 0.018	<0.021	<0.021	<0.021
Sr 88	211.1 ± 7.0	196.1 ± 6.5	391.4 ± 5.2	488.1 ± 6.2	212.1 ± 7.0	164.1 ± 6.5
Ti 47	30.14 ± 1.11	33.53 ± 1.14	32.71 ± 1.15	35.41 ± 1.14	28.51 ± 1.00	28.32 ± 1.09
Tl 205	0.56 ± 0.020	0.72 ± 0.019	0.99 ± 0.019	0.82 ± 0.017	0.76 ± 0.019	0.78 ± 0.020
[mg/L]						
Mg 25	59.4 ± 1.5	130 ± 2.5	82.9 ± 1.7	108 ± 1.9	95.5 ± 1.7	98.9 ± 1.8
K 41	1020 ± 22	1220 ± 27	960 ± 14	1190 ± 19	1820 ± 34	2050 ± 28
Mn 55	1.47 ± 0.20	3.94 ± 0.32	2.78 ± 0.28	2.64 ± 0.26	1.56 ± 0.21	1.20 ± 0.16
B 10	1.78 ± 0.15	6.35 ± 0.39	5.92 ± 0.25	4.90 ± 0.22	6.31 ± 0.38	5.98 ± 0.24
Zn 64	3.45 ± 0.27	4.96 ± 0.29	1.66± 0.12	4.19 ± 0.30	4.87 ± 0.31	3.68 ± 0.27
Ca 40	58.8 ± 1.4	74.1 ± 1.8	55.6 ± 1.5	50.4 ± 1.3	60 ± 1.6	56.6 ± 1.5

No sample	5R	6R	7R	8R	9R	10R
Grape Type	Regent	Pinot Noir.	Rondo	Regent	Marechal Foch. Leon Millot	Frontenac
Region of Poland	P	KP	SC	SC	M	M
Location [Masl]	120	92	320	320	224	151
Color	r	r	r	r	r	r
Metal Content (µg/L) or (mg/L) /Isotope Mass (amu)	0.03 ± 0.002	0.07 ± 0.004	0.02 ± 0.001	0.02 ± 0.002	0.02 ± 0.001	0.05 ± 0.003
[µg/L] Ag 107	201.1 ± 10.8	292.1 ± 7.9	462.1 ± 10.2	680.7 ± 17.8	345.5 ± 9.6	806.6 ± 22.8
[µg/L] Al 27	3.77 ± 0.23	3.38 ± 0.22	7.63 ± 0.43	9.08 ± 0.37	3.83 ± 0.17	7.45 ± 0.25
[µg/L] As 75	1.39 ± 0.11	1.25 ± 0.10	4.02 ± 0.27	2.16 ± 0.26	1.77 ± 0.18	2.55 ± 0.21
[µg/L] Zr 90	85.35 ± 1.20	76.87 ± 1.12	300.3 ± 5.1	285.1 ± 4.9	151.1 ± 3.2	514.1 ± 12.3
[µg/L] Ba 138	3.63 ± 0.21	3.03 ± 0.26	2.19 ± 0.19	1.84 ± 0.17	1.27 ± 0.12	4.04 ± 0.21
[µg/L] Bi 209	0.24 ± 0.056	0.23 ± 0.051	0.68 ± 0.097	0.71 ± 0.099	0.67 ± 0.095	1.22 ± 0.18
[µg/L] Cd 111	0.87 ± 0.067	0.45 ± 0.043	3.25 ± 0.33	2.78 ± 0.33	2.52 ± 0.30	2.42 ± 0.29
[µg/L] Co 59	17.87 ± 0.75	7.99 ± 0.34	15.41 ± 0.70	11.92 ± 0.49	6.36 ± 0.28	6.57 ± 0.26
[µg/L] Cr 52	<0.268	<0.268	77.82 ± 0.64	15.63 ± 0.34	<0.268	<0.268
[µg/L] Cu 63	444.5 ± 12.3	745.6 ± 23.8	1232 ± 31	527.2 ± 13.0	1064 ± 30	1002 ± 29
[µg/L] Fe 56	0.33 ± 0.073	0.33 ± 0.076	0.34 ± 0.071	0.33 ± 0.070	0.32 ± 0.068	0.33 ± 0.069
[µg/L] Hg 201	1.19 ± 0.11	0.48 ± 0.12	5.09 ± 0.24	8.06 ± 0.29	2.89 ± 0.21	19.21 ± 0.45
[µg/L] V 51	2.31 ± 0.29	34.01 ± 1.20	12.16 ± 0.67	18.91 ± 0.56	2.97 ± 0.29	1.61 ± 0.20
[µg/L] Li 7	4.47 ± 0.28	4.96 ± 0.429	3.26 ± 0.26	1.09 ± 0.099	0.98 ± 0.078	3.71 ± 0.37
[µg/L] Mo 98	219.1 ± 7.9	460.4 ± 16.4	2393 ± 29	2042 ± 30	323.1 ± 10.2	279.1 ± 9.8
[µg/L] Na 23	35.22 ± 1.23	13.61 ± 1.16	139.9 ± 2.4	132.5 ± 2.1	81.61 ± 1.65	63.42 ± 1.49
[µg/L] Ni 60	11.61 ± 0.17	9.61 ± 0.17	13.02 ± 0.21	14.35 ± 0.22	16.54 ± 0.20	16.97 ± 0.19
[µg/L] Pb 206	0.15 ± 0.011	0.28 ± 0.013	0.41 ± 0.015	0.29 ± 0.013	0.14 ± 0.011	0.48 ± 0.014
[µg/L] Sb 121	2.58 ± 0.25	12.85 ± 0.87	3.74 ± 0.34	2.74 ± 0.23	3.42 ± 0.30	4.57 ± 0.34
[µg/L] Se 78	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
[µg/L] Sn 115	225.5 ± 7.9	297.1 ± 7.8	1389 ± 12.2	826.5 ± 8.9	526.5 ± 6.2	405.8 ± 6.2
[µg/L] Sr 88	30.07 ± 1.12	27.11 ± 1.07	30.91 ± 1.14	28.55 ± 1.05	28.16 ± 1.05	28.51 ± 1.11
[µg/L] Ti 47	0.51 ± 0.013	0.63 ± 0.017	0.85 ± 0.019	1.31 ± 0.13	1.29 ± 0.18	0.58 ± 0.023
[µg/L] Tl 205	78.4 ± 1.6	74 ± 1.5	106 ± 1.9	106 ± 2.0	106 ± 1.9	91.4 ± 1.8
[mg/L] Mg 25	1980 ± 19	1740 ± 30	2020 ± 31	1670 ± 19	2050 ± 28	1630 ± 21
[mg/L] K 41	0.405 ± 0.091	1.51 ± 0.22	2.62 ± 0.27	2.84 ± 0.28	0.952 ± 0.20	4.560 ± 0.35
[mg/L] Mn 55	5.34 ± 0.27	8.31 ± 0.39	11.8 ± 0.52	12.1 ± 0.51	11.9 ± 0.49	4.49 ± 0.21
[mg/L] B 10	6.27 ± 0.34	3.63 ± 0.26	2.10 ± 0.21	2.29 ± 0.19	5.57 ± 0.30	2.21 ± 0.17
[mg/L] Zn 64	78.2 ± 1.8	86.3 ± 1.9	81.6 ± 1.9	66.4 ± 1.6	78.3 ± 1.8	105 ± 2.5
[mg/L] Ca 40						

Nosample	R 11	R 12	R 13	R 14	R 15	R 16
Grape Type	Frontenac	Regent	Regent. Frontenac	Heridian	Leon Millot. Marechal Foch.	Leon Millot.
Region of Poland	M	M	M	M	M	M
Location [Masl]	151	151	151	151	151	151
Color	r	r	r	r	r	r
Ag 107	0.04 ± 0.001	0.02 ± 0.0005	0.17 ± 0.005	0.06 ± 0.0008	<0.001	<0.001
Al 27	217.7 ± 4.8	110.4 ± 3.1	341.2 ± 7.2	294.6 ± 5.8	530.8 ± 17.8	104.1 ± 4.3
As 75	6.41 ± 0.27	1.93±0.12	2.43 ± 0.14	4.49 ± 0.17	5.52 ± 0.25	3.54 ± 0.23
Zr 90	0.99 ± 0.056	1.08 ± 0.097	1.03 ± 0.067	1.86 ± 0.11	2.12 ± 0.15	0.98 ± 0.045
Ba 138	373.1 ± 9.3	206.2 ± 4.2	307.3 ± 5.2	746.3 ± 14.5	507.1 ± 13.2	593.1 ± 13.3
Bi 209	3.11 ± 0.20	2.51 ± 0.10	2.03 ± 0.14	7.32 ± 0.71	1.07 ± 0.10	0.42 ± 0.011
Cd 111	0.73 ± 0.097	0.42 ± 0.061	0.66 ± 0.091	0.62 ± 0.090	0.51 ± 0.091	0.44 ± 0.071
Co 59	0.42 ± 0.054	0.22 ± 0.021	1.58 ± 0.26	0.44 ± 0.056	1.53 ± 0.25	0.68 ± 0.067
Cr 52	4.62 ± 0.22	3.74 ± 0.20	8.31 ± 0.40	10.81 ± 0.55	7.64 ± 0.38	3.56 ± 0.20
Cu 63	404.1 ± 11.9	<0.268	91.91 ± 1.34	475.1 ± 12.5	41.81 ± 0.49	42.44 ± 0.50
Fe 56	715.1 ± 23.1	584.7 ± 17.8	861.9 ± 23.8	752.8 ± 21.8	482.8 ± 11.8	782.5 ± 23.8
Hg 201	0.34 ± 0.074	0.33 ± 0.059	0.33 ± 0.067	0.31 ± 0.059	0.31 ± 0.057	0.31 ± 0.064
V 51	0.11 ± 0.01	<0.003	0.43 ± 0.013	0.25 ± 0.011	7.81±0.37	<0.003
Li 7	0.57 ± 0.11	1.97 ± 0.18	2.18 ± 0.20	0.42 ± 0.056	1.55 ± 0.21	0.95 ± 0.040
Mo 98	3.25 ± 0.30	0.31 ± 0.021	5.26 ± 0.40	4.64 ± 0.37	1.74 ± 0.21	0.86 ± 0.021
Na 23	16.02 ± 1.11	118.3 ± 2.8	152.4 ± 7.4	12.21 ± 1.09	138.3 ± 7.1	19.15 ± 1.00
Ni 60	33.31 ± 1.21	18.46 ± 1.129	73.99 ± 1.51	61.24 ± 1.47	42.51 ± 1.42	32.82 ± 1.32
Pb 206	79.16 ± 0.79	8.97 ± 0.49	7.62 ± 0.54	46.11 ± 0.43	22.21 ± 0.36	34.71 ± 0.21
Sb 121	0.32 ± 0.013	0.11 ± 0.010	0.25 ± 0.012	0.83 ± 0.016	0.24 ± 0.011	0.12 ± 0.010
Se 78	2.83 ± 0.28	1.31 ± 0.17	2.12 ± 0.19	3.67 ± 0.26	4.33 ± 0.34	4.02 ± 0.36
Sn 115	<0.021	<0.021	<0.021	0.81 ± 0.012	<0.021	<0.021
Sr 88	420.8 ± 6.1	262.1 ± 7.9	265.1 ± 7.6	560.5 ± 8.2	472.2 ± 7.4	700.3 ± 8.2
Ti 47	27.32 ± 1.09	25.13 ± 1.04	27.21 ± 1.02	26.24 ± 1.09	24.55 ± 1.04	28.35 ± 1.11
Tl 205	0.62 ± 0.021	0.63±0.020	0.62 ± 0.023	0.64 ± 0.019	0.71 ± 0.023	0.71 ± 0.024
Mg 25	99.2 ± 1.7	96.5±1.9	140 ± 2.5	139 ± 2.4	98.2 ± 1.9	106 ± 1.9
K 41	2100 ± 34	1500 ± 19	2380 ± 40	2240 ± 37	97.1 ± 1.9	2840 ± 39
Mn 55	3.81 ± 0.31	2.22 ± 0.29	4.62 ± 0.42	9.22 ± 0.56	3.94 ± 0.32	4.32 ± 0.35
B 10	6.03 ± 0.27	2.54 ± 0.19	4.31 ± 0.25	7.20 ± 0.32	3.83 ± 0.23	7.05 ± 0.40
Zn 64	4.52 ± 0.27	0.87 ± 0.034	0.29 ± 0.011	0.38 ± 0.009	0.121 ± 0.024	0.399 ± 0.034
Ca 40	96.3 ± 2.4	53.9 ± 1.5	83.5 ± 1.8	98.2 ± 1.9	72.1 ± 1.7	93.2 ± 2.0

Metal Content (µg/L) or (mg/L) /Isotope Mass (amu)

[µg/L]

[mg/L]

No sample	Grape Type	Region of Poland	Location [Masl]	Color	Metal Content (μg/L) or (mg/L) /Isotope Mass (amu)																											
					[μg/L]																						[mg/L]					
					Ag 107	Al 27	As 75	Zr 90	Ba 138	Bi 209	Cd 111	Co 59	Cr 52	Cu 63	Fe 56	Hg 201	V 51	Li 7	Mo 98	Na 23	Ni 60	Pb 206	Sb 121	Se 78	Sn 115	Sr 88	Ti 47	Tl 205	Mg 25	K 41	Mn 55	B 10	Zn 64	Ca 40
17 R	Foch. Marechal	M	151	r	<0.001	336.1 ± 12.1	2.18 ± 0.19	1.15 ± 0.13	474.1 ± 12.5	1.35 ± 0.091	0.93 ± 0.16	1.83 ± 0.28	4.37 ± 0.22	35.47 ± 0.46	791.5 ± 25.9	0.32 ± 0.065	<0.003	4.12 ± 0.32	1.46 ± 0.20	90.12 ± 2.13	30.34 ± 1.26	8.79 ± 0.19	0.11 ± 0.010	1.51 ± 0.21	<0.021	522.1 ± 8.0	27.21 ± 1.11	0.72 ± 0.020	134 ±2.3	3170 ± 51	7.07 ± 0.45	5.16 ± 0.24	0.449 ± 0.31	86.6 ± 1.9
18 R	St.Croix. Sabrevois	M	151	r	<0.001	109.1 ± 2.2	2.91 ± 0.17	0.93 ± 0.089	478.1 ± 12.3	0.17 ± 0.010	0.32 ± 0.045	0.16 ± 0.019	4.01 ± 0.21	13.69 ± 0.84	249.1 ± 2.8	0.31 ± 0.060	<0.003	4.11 ± 0.40	0.41 ± 0.018	98.48 ± 2.43	23.55 ± 1.17	11.31 ± 0.17	0.16 ± 0.013	1.55 ± 0.12	<0.021	478.1 ± 6.2	25.72 ± 1.06	0.76 ± 0.022	115 ± 2.1	3250 ± 54	5.13 ± 0.43	6.60 ± 0.30	0.075 ± 0.005	77 ± 1.8
19 R	Rondo.Regent	KP	92	r	0.03 ± 0.001	602.1 ± 17.8	6.21 ± 0.42	1.11 ± 0.094	60.51 ± 1.10	0.66 ± 0.011	0.58 ± 0.091	0.66 ± 0.067	17.03 ± 0.75	1284 ± 17	891.2 ± 23.8	0.32 ± 0.058	2.12 ± 0.21	29.91 ± 1.0	2.49 ± 0.28	380.9 ± 10.9	64.17 ± 1.45	349.9 ± 9.12	1.47 ± 0.14	11.55 ± 0.87	<0.021	197.1 ± 7.9	24.71 ± 1.05	0.57 ± 0.019	66.6 ± 1.4	1330 ± 23	2.27 ± 0.27	6.03 ± 0.29	2.409 ± 0.21	68.9 ± 1.6
20 R	Rondo	SC	320	r	0.03 ± 0.003	2489 ± 35.8	7.57 ± 0.46	12.32 ± 0.56	200.6 ± 4.2	1.48 ± 0.10	0.45 ± 0.067	1.89 ±	13.12 ± 0.61	1101 ± 16	2209 ± 39	0.32 ± 0.072	6.03 ± 0.28	18.94 ± 0.98	1.96 ± 0.21	3554 ± 42	138.9 ± 2.1	23.35 ± 0.26	0.54 ± 0.015	1.68 ± 0.14	<0.021	610.1 ± 8.2	23.81 ±1.11	0.95 ± 0.024	68.5 ± 1.3	1750 ± 19	2.19 ± 0.28	8.73 ± 0.43	0.122 ± 0.001	88.1 ± 1.9

KP, Kuyavian-Pomerania; LP, Lesser Poland; M, Masovia; P, Pomerania; r, red; SC, Subcarpatia; w, white; WP, West Pomerania

Table S2. Calibration curve parameters, LOD and LOQ values of ICP-MS/ICP-OES analytical techniques.

Element	Mass	R	1st term	Const.	LOD [µg L^{-1}] 3s	LOQ [µg L^{-1}] 10s
Ag	107	0.99999	0.107421	-0.00542	0.001	0.003
Al	27	0.99997	0.037549	-1.30754	0.031	0.103
As	75	0.99999	2.699769	-0.01012	0.006	0.021
B	11	0.99946	0.236112	-2.76755	0.418	1.395
Ba	138	0.98317	0.423326	4.314401	0.001	0.005
Bi	209	0.99939	0.153274	-0.09111	0.008	0.029
Cd	114	0.99957	0.311808	0.011723	0.002	0.007
Co	59	0.99999	0.143494	-0.0302	0.002	0.006
Cr	52	0.99896	0.30841	0.131909	0.036	0.123
Cu	63	0.99993	0.161124	-3.20904	0.368	1.227
Fe	56	0.99828	0.231216	2.390056	0.354	1.183
Hg	201	0.99731	0.586196	0.022925	0.004	0.016
Li	7	0.99996	0.120225	-0.06093	0.001	0.003
Mn	55	0.99974	0.584364	-1.07639	0.011	0.034
Mo	95	0.98929	0.467504	-0.07762	0.003	0.012
Na	23	0.99735	0.002412	-13.8966	0.032	0.106
Ni	60	0.98474	0.489872	-0.93239	0.03	0.115
Pb	206	0.99691	0.472782	0.402906	0.004	0.013
Sb	121	0.99962	0.41178	-0.01728	0.002	0.006
Se	78	0.99998	46.57817	-0.06415	0.061	0.202
Sn	115	0.99646	0.970044	-0.06483	0.021	0.069
Sn	116	0.99999	0.763471	-0.11474	0.020	0.067
Sr	88	0.98165	0.643907	4.663796	0.003	0.011
Ti	47	0.99617	14.98718	2.094714	0.082	0.274
Tl	205	0.99997	0.124699	0.040403	0.0002	0.0006
V	51	0.99844	0.52999	-0.02537	0.003	0.012
Zn	66	0.98432	0.680617	5.323809	0.017	0.059
Zr	90	1	0.175333	0.06953	0.002	0.009
Element	Wavelength	r	c	d	LOD [ug L^{-1}] 3s	LOQ [ug L^{-1}] 10s
Ca (7 L min^{-1})	393.3	0.99936	0.2546	-2.661	0.333	1.110
Ca (10 L min^{-1})	393.3	0.99922	0.2271	-0.0513	0.375	1.250
Mg (7 L min^{-1})	279.5	0.99997	0.0404	-0.4139	0.070	0.233
Mg (10 L min^{-1})	279.5	0.99891	0.0493	-0.0047	0.042	0.140
K (7 L min^{-1})	766.4	0.99854	0.5249	0.0434	1.465	4.884
K (10 L min^{-1})	766.4	0.99811	0.3773	-2.8110	0.332	1.108

Table S3. Validation report of ICP-MS analytical technique.

No Gas

Inten. / Peak

Elem	Mass	Inten. Min (kcps)	Inten.(kcps)	Inten. Judge	RSD Max(%)	Meas. RSD (%)	RSD Judge
Be	9	50	90.1738	Good	3	2.4	Good
In	115	200	390.4566	Good	3	0.7	Good
Bi	209	150	385.1826	Good	3	1.2	Good

Mass axis

Elem	Mass	Max gap (u)	Meas. gap (u)	Meas. ga Judge	Resoluti R value(	Meas. resolution (u)	Resolution Judge
Be	9	0.10	0.05	Good	0.9	0.77	Good
In	115	0.10	0.06	Good	0.9	0.73	Good
Bi	209	0.10	0.08	Good	0.9	0.74	Good

Oxide / Divalent / BG

Item	Formula	Unit	Max	Meas.	Judge	Output intensity	Standard element int
Ce Oxid	156 / 14	%	5.00	1.27	Good	5.5901	439.6427
Ce Dival	70.0 / 14	%	5.00	1.23	Good	5.5486	452.5296
BG	5	kcps	0.10000	0.00548	Good		
BG	220	kcps	0.01000	0.00044	Good		

Use Gas

Inten. / Peak

Elem	Mass	Inten. Min (kcps)	Inten.(kcps)	Inten. Judge	RSD Max(%)	Meas. RSD (%)	RSD Judge
Co	59	30	80.8148	Good	3	1.0	Good

Mass axis

Elem	Mass	Max gap (u)	Meas. gap (u)	Meas. ga Judge	Resoluti R value(	Meas. resolution (u)	Resolution Judge
Co	59	0.10	0.06	Good	0.9	0.73	Good

Oxide / Divalent / BG

Item	Formula	Unit	Max	Meas.	Judge	Output intensity	Standard element int
BG	78	kcps	0.10000	0.00448	Good		