

Bioanalytical Characterization of Apple Juice from 88 Grafted and Non-Grafted Apple Varieties Grown in Upper Austria

Peter Lanzerstorfer^{1¥}, Jürgen Wruss^{1¥}, Stefan Huemer¹, Andrea Steininger¹, Markus Himmelsbach², Daniela Borgmann², Stephan Winkler², Otmar Höglinder¹ and Julian Weghuber¹

¹University of Applied Sciences Upper Austria, Wels, Austria

²Johannes Kepler University, Institute for Analytical Chemistry, Linz, Austria

³University of Applied Sciences Upper Austria, Hagenberg, Austria

¥Peter Lanzerstorfer and Jürgen Wruss contributed equally to this work

Correspondence should be addressed to:

Julian Weghuber,

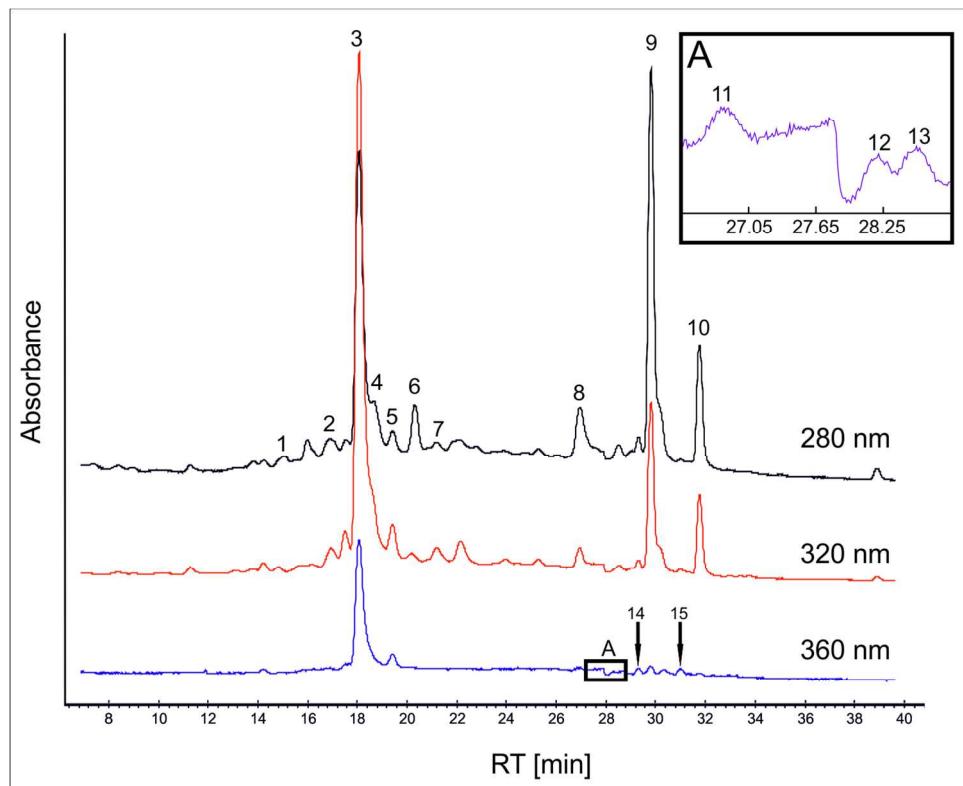
*University of Applied Sciences Upper Austria, Stelzhamerstrasse 23, A-4600 Wels,
Austria*

Tel.: +43 (0)50804 44403

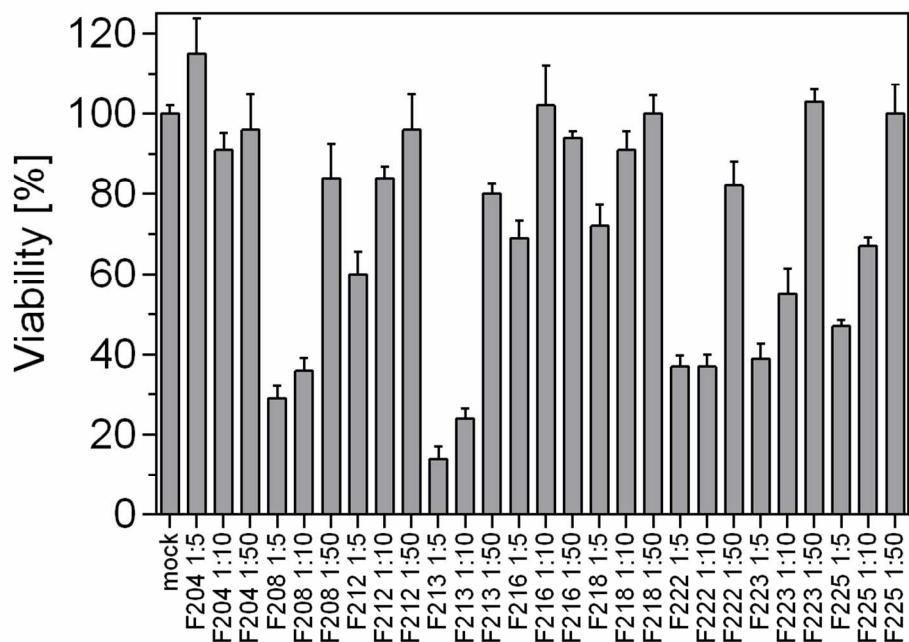
email: julian.weghuber@fh-wels.at

Key words: old apple varieties, polyphenolics, antioxidant activity, phytochemical composition, grafting

SUPPORTING INFORMATION



Supplementary Figure 1: HPLC elution profile of a representative apple juice sample detected at 280 nm, 320 nm and 360 nm, respectively. 1, Procyanidin B1; 2, Epigallocatechin; 3, Chlorogenic acid; 4, Procyanidin B2; 5, Caffeic acid; 6, Epicatechin; 7, 4-p-Coumarylquinic acid; 8, Epicatechingallate; 9, Phloretin 2'-O-xylosyl-glucoside; 10, Phloridzin; 11, Quercetin 3-O-rutinoside; 12, Quercetin 3-O-galactoside; 13, Quercetin; 14, Quercetin 3-O-xyloside; 15, Quercetin 3-O-rhamnoside.



Supplementary Figure 2: Influence of selected apple juice samples with varying total phenolic content (TPC) on HuH-7 cell viability. HuH-7 cells were grown to 90% confluence in 96-well plates and incubated with apple juice diluted in cell culture medium at indicated concentrations for 6 hours. Cell viability is given in percent in comparison to a non-treated sample. Error bars are based on the standard error of the mean ($n = 4$).

Supplementary Table 1

Cultivar	TPC [mg/L]	ORAC [mmol/L]	TEAC [mmol/L]	Brix	K ⁺ [mg/L]	Mg ²⁺ [mg/L]	Ca ²⁺ [mg/L]	Cu ²⁺ [mg/L]	Mn ²⁺ [mg/L]	Fe ²⁺ [mg/L]	PO ₄ ³⁻ [mg/L]	TA [% of malic]	Malic acid [mg/L]	Citric acid [mg/L]
Rheinischer Krummstiel	975.4 ± 69.2	15.7 ± 0.9	4.32 ± 0.13	12.0	963.9 ± 2.3	29.5 ± 0.8	20.7 ± 0.1	264.4 ± 1.1	617.9 ± 1.2	n.m.	131.0 ± 1.6	0.67	8598.1	57.5
Retina	252.7 ± 18.8	7.2 ± 0.5	1.44 ± 0.11	11.0	620.4 ± 6.8	19.8 ± 0.4	6.7 ± 0.3	n.m.	n.m.	n.m.	n.m.	0.27	3833.4	173.8
Maschanzker	1340.4 ± 66.4	26.0 ± 1.0	5.48 ± 0.51	14.0	1409.1 ± 5.4	60.3 ± 1.2	53.7 ± 0.6	n.m.	n.m.	n.m.	n.m.	1.01	11598.1	173.8
Carpinet (kleine Weinrenette)	903.1 ± 9.0	22.0 ± 1.7	2.13 ± 0.83	12.0	1976.8 ± 0.6	69.8 ± 1.3	51.1 ± 0.8	n.m.	n.m.	n.m.	n.m.	0.74	7892.2	173.8
Sommerrambour	672.7 ± 24.9	15.9 ± 0.8	3.13 ± 1.54	13.0	1361.7 ± 2.5	47.5 ± 0.9	18.8 ± 0.8	152.9 ± 1.5	562.8 ± 1.2	n.m.	266.5 ± 0.8	1.07	13539.2	522.6
Dülmänen Rosenapfel	1008.7 ± 13.7	25.9 ± 3.6	4.99 ± 0.28	12.9	1080.4 ± 8.1	30.9 ± 0.8	21.4 ± 0.6	n.m.	n.m.	n.m.	n.m.	0.60	8774.5	348.2
Pilot	1266.8 ± 26.2	25.1 ± 0.5	4.12 ± 0.30	14.0	1371.1 ± 6.3	53.8 ± 0.6	36.2 ± 1.2	318.6 ± 0.7	655.5 ± 1.7	n.m.	120.5 ± 1.3	0.87	3892.2	57.5
Roter Passamaner	819.2 ± 44.6	32.1 ± 0.1	2.89 ± 0.84	13.0	977.1 ± 7.1	39.4 ± 0.6	21.2 ± 0.4	n.m.	n.m.	n.m.	n.m.	0.60	2245.1	115.6
Schmidberger Renette	357.7 ± 16.5	10.9 ± 1.7	1.05 ± 0.67	11.9	961.3 ± 8.1	33.7 ± 0.5	16.1 ± 1.3	n.m.	n.m.	n.m.	n.m.	0.74	9656.9	173.8
Gelber Edelapfel	1279.0 ± 47.5	23.6 ± 1.9	2.09 ± 0.77	15.9	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	0.81	8186.3	173.8
Bismarck	297.1 ± 5.9	10.7 ± 0.4	2.15 ± 0.60	13.0	1284.2 ± 1.7	39.5 ± 0.3	10.4 ± 0.3	n.m.	n.m.	n.m.	n.m.	1.28	4598.1	57.5
Schieblers Taubenapfel	578.0 ± 20.1	14.6 ± 0.4	1.87 ± 0.30	11.0	1202.2 ± 6.9	41.3 ± 0.5	24.5 ± 0.2	200.6 ± 0.9	586.1 ± 2.5	n.m.	190.9 ± 0.3	0.87	8068.6	173.8
Liberty	634.2 ± 15.8	16.4 ± 0.5	3.48 ± 1.15	12.0	1346.4 ± 9.8	40.4 ± 2.1	17.8 ± 0.3	n.m.	n.m.	n.m.	n.m.	0.67	3598.1	28.4
Alkmene	676.7 ± 19.0	14.2 ± 0.2	1.91 ± 0.20	16.5	1204.6 ± 4.3	38.4 ± 0.9	16.6 ± 0.2	n.m.	n.m.	n.m.	n.m.	0.94	12009.8	115.6
Jonathan	1493.1 ± 46.7	26.1 ± 0.5	4.15 ± 1.50	14.9	1752.0 ± 1.9	64.4 ± 1.2	34.9 ± 0.6	n.m.	n.m.	n.m.	n.m.	1.07	11774.5	115.6
Herrenapfel	1009.2 ± 70.4	25.8 ± 0.2	5.99 ± 1.07	17.0	856.0 ± 8.7	33.8 ± 2.1	18.5 ± 1.2	530.3 ± 2.1	661.5 ± 3.3	n.m.	170.6 ± 3.2	1.61	17245.1	348.2
Spitzling	939.4 ± 63.4	20.9 ± 2.5	2.52 ± 0.22	14.5	995.9 ± 10.1	48.4 ± 1.2	43.4 ± 1.3	n.m.	n.m.	n.m.	n.m.	0.74	9598.1	115.6
Hausapfel	410.6 ± 1.8	16.8 ± 0.6	3.61 ± 0.22	14.5	663.8 ± 7.7	32.3 ± 0.2	32.9 ± 0.9	n.m.	n.m.	n.m.	n.m.	0.74	10127.5	115.6
Spitzapfel	1092.8 ± 9.3	21.2 ± 2.2	4.11 ± 0.29	12.9	724.0 ± 4.6	27.5 ± 0.6	24.8 ± 0.5	n.m.	n.m.	n.m.	n.m.	0.81	2951.0	57.5
Graue Herbstrenette	624.1 ± 17.5	13.2 ± 0.05	2.61 ± 0.56	17.0	1073.7 ± 8.1	42.3 ± 0.9	25.2 ± 0.1	n.m.	n.m.	n.m.	n.m.	0.54	6421.6	173.8
Harberts Renette	2242.3 ± 75.8	58.9 ± 2.2	6.38 ± 1.83	18.9	636.7 ± 7.1	31.0 ± 1.3	30.6 ± 1.5	n.m.	n.m.	n.m.	n.m.	1.21	16245.1	173.8
Lesans Kalvill	819.7 ± 13.6	15.2 ± 0.2	3.46 ± 0.77	14.9	1162.6 ± 7.4	31.4 ± 0.6	10.7 ± 0.1	289.4 ± 1.8	542.3 ± 3.6	n.m.	278.3 ± 0.9	1.07	8833.4	57.5
Samareiner Rosmarien	846.2 ± 35.7	35.7 ± 0.7	5.80 ± 0.84	15.0	640.9 ± 6.1	24.9 ± 0.9	25.1 ± 0.3	n.m.	n.m.	n.m.	n.m.	0.47	127.5	28.4
Berneder	296.3 ± 47.2	14.0 ± 0.7	2.64 ± 0.20	13.0	949.4 ± 2.5	35.8 ± 0.8	18.9 ± 0.1	312.4 ± 0.8	586.1 ± 1	n.m.	192.7 ± 7.8	1.07	10951.0	115.6
Roter Boskoop	1135.6 ± 1.2	21.3 ± 0.4	4.43 ± 0.33	13.5	650.9 ± 6.1	26.7 ± 0.7	23.7 ± 0.1	332.5 ± 1.9	679.0 ± 2.1	n.m.	255.7 ± 3.9	0.74	7362.8	57.5
Goldrenette Freiherr v. Berlepsch	524.2 ± 63.6	16.8 ± 0.1	3.91 ± 0.12	14.9	1434.3 ± 6.3	42.7 ± 1.2	30.3 ± 0.6	232.4 ± 1.6	552.0 ± 3.1	n.m.	212.8 ± 1.4	1.14	13951.0	173.8
Florianea Rosmarin	1049.5 ± 51.4	17.3 ± 0.5	2.67 ± 0.69	14.9	859.8 ± 5.4	29.3 ± 1.2	12.4 ± 0.1	n.m.	n.m.	n.m.	n.m.	0.74	7715.7	115.6
Boikenapfel	103.2 ± 1.1	8.4 ± 0.3	1.27 ± 0.04	14.0	845.4 ± 7.1	28.1 ± 2.1	17.7 ± 0.4	n.m.	n.m.	n.m.	240.1 ± 0.6	0.94	10951.0	115.6
Roter Stettiner	1511.8 ± 99.1	49.1 ± 3.4	3.80 ± 0.56	13.5	981.0 ± 8.2	30.4 ± 0.5	11.1 ± 0.6	n.m.	n.m.	n.m.	n.m.	0.94	10715.7	115.6
Kammerapfel	800.3 ± 6.3	14.7 ± 0.4	2.56 ± 0.29	13.9	775.9 ± 9.2	25.1 ± 1.4	11.1 ± 0.1	n.m.	n.m.	n.m.	n.m.	0.81	6951.0	173.8
Weißen Winter-Taffetapfel	788.7 ± 55.1	29.8 ± 2.9	4.02 ± 0.53	13.0	1122.1 ± 1.4	31.6 ± 1.3	28.6 ± 0.3	152.4 ± 2.2	612.9 ± 1.6	n.m.	119.4 ± 0.8	0.47	303.9	28.4
Odenwälder	2275.6 ± 92.4	27.7 ± 0.7	6.27 ± 3.16	12.0	n.m.	n.m.	n.m.	209.6 ± 2	549.3 ± 2.6	n.m.	324.4 ± 5	1.21	8245.1	115.6
Damason Renette	592.1 ± 23.9	20.4 ± 0.1	4.60 ± 0.38	13.5	1443.8 ± 5.2	49.9 ± 0.8	29.6 ± 0.6	n.m.	n.m.	n.m.	n.m.	0.94	13480.4	173.8
Champagner Renette	1128.0 ± 35.8	16.7 ± 1.5	5.29 ± 0.77	17.5	1624.7 ± 1.6	34.8 ± 0.7	20.4 ± 0.2	n.m.	n.m.	n.m.	n.m.	1.34	12480.4	57.5
Hauxapfel	655.3 ± 46.9	11.2 ± 0.3	2.80 ± 0.27	15.5	1179.9 ± 7.5	41.7 ± 1.4	23.0 ± 0.1	n.m.	n.m.	n.m.	224.4 ± 3.5	0.47	421.6	28.4
Glockenapfel	1028.7 ± 45.2	19.7 ± 0.6	2.90 ± 1.12	11.0	695.4 ± 1.3	33.8 ± 1.2	27.2 ± 0.2	157.4 ± 1.6	588.6 ± 3.6	n.m.	241.9 ± 3.7	1.14	3715.7	28.4
Zuccalmaglio Renette	2264.6 ± 21.0	29.1 ± 1.9	6.03 ± 2.72	12.5	1298.4 ± 2.3	37.6 ± 1.0	23.6 ± 0.6	n.m.	n.m.	n.m.	n.m.	1.34	15774.5	290.0
Roter James Grieve	503.7 ± 7.5	15.1 ± 1.3	3.58 ± 0.12	14.0	1200.7 ± 4.5	38.6 ± 0.6	17.9 ± 0.9	n.m.	n.m.	n.m.	n.m.	0.87	10774.5	406.3
Weißen Passamaner	401.7 ± 15.1	37.8 ± 0.4	2.21 ± 0.01	14.5	832.5 ± 2.1	37.3 ± 0.9	26.3 ± 0.7	n.m.	n.m.	n.m.	n.m.	1.21	14127.5	406.3
Plankenapfel	671.2 ± 39.2	11.5 ± 0.6	2.51 ± 0.03	13.0	1112.7 ± 8.5	44.4 ± 1.2	36.6 ± 0.1	n.m.	n.m.	n.m.	n.m.	0.67	656.9	28.4

Cultivar	TPC [mg/L]	ORAC [mmol/L]	TEAC [mmol/L]	Brix	K ⁺ [mg/L]	Mg ²⁺ [mg/L]	Ca ²⁺ [mg/L]	Cu ²⁺ [mg/L]	Mn ²⁺ [mg/L]	Fe ²⁺ [mg/L]	PO ₄ ³⁻ [mg/L]	TA [% of malic]	Malic acid [mg/L]	Citric acid [mg/L]
Riesenboikenapfel	828.5 ± 2.2	18.5 ± 1.5	3.23 ± 0.10	16.0	1009.6 ± 9.1	39.9 ± 0.6	30.1 ± 0.3	n.m.	n.m.	n.m.	205.5 ± 2.2	0.67	362.8	28.4
Ananasrenette	708.8 ± 9.6	23.7 ± 5.2	2.50 ± 1.24	11.5	711.5 ± 7.1	26.1 ± 0.7	23.0 ± 0.3	n.m.	n.m.	n.m.	n.m.	0.47	6656.9	115.6
Glasapfel	254.7 ± 28.1	7.1 ± 0.2	2.27 ± 0.95	12.0	932.7 ± 8.1	20.3 ± 1.1	45.5 ± 0.4	n.m.	n.m.	n.m.	n.m.	1.14	1127.5	28.4
Steirischer Maschanzker	975.0 ± 18.7	18.8 ± 0.9	3.45 ± 0.11	10.9	1411.8 ± 7.8	14.6 ± 1.2	28.6 ± 0.5	572.2 ± 2.5	150.9 ± 1.4	n.m.	219.3 ± 1.3	0.60	5362.8	57.5
Pinova	428.6 ± 14.3	7.1 ± 0.4	1.26 ± 0.19	14.0	1153.4 ± 7.6	12.6 ± 0.3	21.3 ± 0.8	n.m.	n.m.	n.m.	n.m.	0.67	9480.4	231.9
Roter Griesapfel	1137.0 ± 38.9	36.0 ± 4.7	3.78 ± 0.23	13.9	760.0 ± 2.6	9.9 ± 0.5	45.2 ± 0.1	n.m.	n.m.	n.m.	n.m.	0.81	8421.6	231.9
Gelber Bellefleur	475.3 ± 9.9	8.4 ± 0.3	2.35 ± 0.17	13.0	1664.3 ± 6.3	13.2 ± 0.1	15.9 ± 1.0	403.2 ± 1.7	117.1 ± 1	n.m.	332.2 ± 5.9	0.60	10186.3	115.6
Rewena	221.0 ± 6.1	10.3 ± 1.3	1.14 ± 0.13	12.0	1137.9 ± 6.5	13.2 ± 0.2	43.8 ± 0.7	439.9 ± 0.8	248.2 ± 0.5	n.m.	162.0 ± 1.1	0.60	9127.5	115.6
Piros	274.9 ± 10.7	7.8 ± 0.4	1.45 ± 0.33	14.9	1269.9 ± 8.2	12.5 ± 0.6	20.5 ± 0.7	n.m.	n.m.	n.m.	n.m.	0.54	6009.8	115.6
Schöner v. Wiltshire	610.4 ± 23.5	18.7 ± 0.2	3.47 ± 0.64	13.0	1226.1 ± 4.5	10.8 ± 0.7	14.9 ± 0.6	408.5 ± 2.1	105.6 ± 1.4	n.m.	190.0 ± 2.4	0.94	5598.1	115.6
Prinzenapfel	671.3 ± 77.9	23.4 ± 0.2	5.04 ± 0.20	12.9	927.4 ± 2.8	9.3 ± 0.1	23.9 ± 0.1	345.4 ± 0.8	136.4 ± 1.3	n.m.	142.1 ± 1.2	1.21	16421.6	115.6
Kleiner Feiner	622.6 ± 5.0	31.2 ± 1.8	2.65 ± 0.23	12.0	980.8 ± 7.5	10.9 ± 0.8	28.5 ± 1.2	392.8 ± 1.3	131.8 ± 1.1	n.m.	120.5 ± 1.3	0.74	8951.0	173.8
Geheimrat Oldenburg	989.8 ± 24	32.2 ± 4.6	3.36 ± 0.13	12.0	1026.3 ± 8.7	9.4 ± 0.5	16.1 ± 0.9	497.7 ± 3.5	91.6 ± 0.7	n.m.	283.7 ± 2.5	1.95	16009.8	173.8
Deans Küchenapfel	950.2 ± 40.4	22.7 ± 0.7	5.14 ± 0.33	12.5	1155.0 ± 9.1	8.4 ± 0.7	11.3 ± 0.3	384.6 ± 1.6	136.8 ± 0.5	n.m.	226.8 ± 1.6	0.54	2362.8	57.5
Zabergau Renette	329.8 ± 30.2	28.7 ± 2.4	1.87 ± 0.36	13.0	1280.4 ± 6.7	12.3 ± 0.7	20.0 ± 0.8	n.m.	n.m.	n.m.	n.m.	0.47	362.8	n.d.
Kanada Renette	700.7 ± 4.5	9.6 ± 0.2	3.42 ± 0.29	14.0	1449.8 ± 6.2	13.1 ± 0.3	15.4 ± 0.6	n.m.	n.m.	n.m.	335.3 ± 5.6	0.60	8362.8	115.6
Winter-Goldparmäne	1869.9 ± 36	28.7 ± 3.2	6.04 ± 1.62	15.0	1255.4 ± 5.2	12.8 ± 0.6	29.5 ± 1.2	381.1 ± 1.9	99.3 ± 1.2	n.m.	309.1 ± 1.2	0.94	8892.2	173.8
Grüner Boskoop	876.2 ± 37.9	12.3 ± 0.6	3.94 ± 0.75	11.9	2064.0 ± 6.8	18.8 ± 0.8	26.4 ± 1.1	383.0 ± 1.7	306.9 ± 1.4	n.m.	310.4 ± 1.6	0.47	5833.4	173.8
Relinda	504.1 ± 13.6	12.2 ± 0.4	1.93 ± 0.35	16.5	1188.9 ± 7.8	15.3 ± 0.9	30.0 ± 0.9	435.5 ± 1.3	225.0 ± 1.3	n.m.	144.9 ± 1.1	0.81	10480.4	115.6
Pom. Kongreß	1315.0 ± 49.8	16.4 ± 0.6	7.78 ± 0.71	12.9	1278.8 ± 4.6	12.0 ± 0.4	10.6 ± 0.2	497.6 ± 1.8	150.6 ± 0.9	n.m.	127.3 ± 2.4	0.94	11833.4	173.8
Fasslapfelp	597.1 ± 37.2	22 ± 0.4	4.28 ± 0.00	14.0	852.3 ± 8.3	9.4 ± 0.7	24.9 ± 0.5	237.6 ± 1.6	608.37 ± 5.1	n.m.	118.5 ± 0.5	0.67	8715.7	115.6
Royal Gala (F204)	185.8 ± 4.7	3.5 ± 0.6	0.90 ± 0.02	10.9	790.5 ± 3.5	25.1 ± 0.2	17.4 ± 0.05	318.0 ± 3.0	94.0 ± 3.0	145.0 ± 15.0	208.6 ± 1.3	0.34	3068.6	57.5
Winterzitrone (F208)	1029.6 ± 38.1	21.9 ± 2.2	3.83 ± 0.12	12.9	686.0 ± 1	22.8 ± 0.1	21.7 ± 2.0	373.5 ± 7.5	94.0 ± 1.0	245.0 ± 5.0	169.8 ± 0.6	0.67	3833.4	57.5
Weißer Winterkalvill (F210)	728.6 ± 43.0	10.9 ± 0.8	1.76 ± 0.15	13.0	1258.0 ± 10	29.6 ± 0.2	13.4 ± 0.1	368.5 ± 38.5	118.5 ± 1.5	525.0 ± 55.0	278.2 ± 1.6	0.67	1833.4	28.4
Staubli 2 (F212)	318.5 ± 18.1	9.3 ± 0.3	1.34 ± 0.20	10.0	696.0 ± 15	26.2 ± 0.4	13.5 ± 0.4	267.0 ± 20.0	152.0 ± 1.0	225.0 ± 125.0	158.2 ± 3.3	0.81	3480.4	28.4
Christkindler (F213)	1022.0 ± 3.5	21.9 ± 0.5	5.25 ± 0.16	12.0	1389.0 ± 9	35.8 ± 0.2	17.6 ± 0.2	355.0 ± 2.0	179.0 ± 1.0	195.0 ± 35.0	260.7 ± 1.9	1.07	9480.4	57.5
Freyperg (F215)	370.3 ± 14.0	6.6 ± 0.5	1.50 ± 0.16	14.5	1180.0 ± 1	37.2 ± 0.2	15.3 ± 0.2	552.5 ± 17.5	120.5 ± 1.5	170.0 ± 10.0	338.4 ± 0.3	0.47	3539.2	57.5
Topaz (F216)	257.4 ± 10.6	5.2 ± 0.2	1.10 ± 0.06	10.9	1037.5 ± 4.5	33.6 ± 0.1	19.3 ± 0.4	483.5 ± 5.5	190.0 ± 1.0	360.0 ± 60.0	261.9 ± 0.7	0.67	6068.6	57.5
Florina (F218)	224.2 ± 5.5	2.9 ± 0.6	0.85 ± 0.07	10.0	898.5 ± 8.5	28.1 ± 0.3	19.0 ± 0.2	549.0 ± 4.0	156.5 ± 4.5	185.0 ± 15.0	183.5 ± 1.0	0.40	3833.4	173.8
Wachsrenette (F219)	919.9 ± 21.1	17.2 ± 0.7	3.31 ± 0.14	12.5	970.5 ± 2.5	28.4 ± 0.2	11.9 ± 0.7	507.0 ± 3.0	106.5 ± 4.5	415.0 ± 15.0	236.3 ± 0.6	0.87	7539.2	57.5
Discovery (F221)	836.8 ± 12.7	23.5 ± 1.0	4.05 ± 0.21	8.0	812.0 ± 5	21.8 ± 0.1	17.6 ± 1.2	417.0 ± 38.0	59.5 ± 0.5	190.0 ± 60.0	166.3 ± 0.7	0.34	1539.2	28.4
Sponheimer Flurapfelp (F222)	881.3 ± 4.2	16.3 ± 0.9	4.27 ± 0.65	10.0	1032.5 ± 2.5	35.1 ± 0.1	22.2 ± 0.0	432.0 ± 10.0	189.0 ± 7.0	220.0 ± 20.0	227.0 ± 0.7	0.60	3598.1	57.5
Roter von Siemonff (F223)	1094.6 ± 30.2	21.6 ± 0.9	4.36 ± 0.54	11.0	701.5 ± 0.5	26.5 ± 0.2	18.4 ± 0.2	237.0 ± 4.0	121.5 ± 1.5	160.0 ± 10.0	160.5 ± 0.7	0.74	5362.8	57.5
Grüter Edelapfelp (F225)	785.9 ± 14.3	12.7 ± 0.7	3.25 ± 0.26	9.9	772.5 ± 0.5	20.8 ± 0.2	14.5 ± 0.4	370.5 ± 0.5	77.0 ± 1.0	235.0 ± 5.0	151.4 ± 0.0	0.54	3127.5	57.5
Rheinischer Winternrambur (L200)	1087.4 ± 43.1	31.1 ± 1.3	4.45 ± 0.14	12.0	756.5 ± 3.5	29.8 ± 0.3	20.9 ± 1.3	343.5 ± 0.5	189.5 ± 3.5	305.0 ± 35.0	199.2 ± 3.3	0.47	4715.7	28.4
Dr. Seeligs Orangenpepping (L201)	527.8 ± 23.9	10.8 ± 1.1	1.32 ± 0.21	11.0	889.5 ± 1.5	33.7 ± 0.3	18.1 ± 0.1	386.5 ± 3.5	211.5 ± 6.5	670.0 ± 60.0	251.8 ± 1.3	0.67	1774.5	28.4
Von Zuccalmaglio Renette (L202)	1035.7 ± 64.0	26.3 ± 1.2	4.15 ± 0.31	14.0	1301.0 ± 10	38.2 ± 0.3	14.3 ± 0.9	208.5 ± 8.5	165.0 ± 2.0	260.0 ± 10.0	219.9 ± 0.7	0.60	2362.8	28.4
Mostzigeuner (L203)	1283.5 ± 66.0	21.6 ± 0.9	7.33 ± 0.74	11.0	1085.0 ± 21	35.0 ± 0.6	40.0 ± 0.7	303.0 ± 6.0	222.0 ± 1.0	130.0 ± 20.0	180.2 ± 3.0	1.14	12362.8	115.6
Blenheim (L205)	554.6 ± 6.5	12.2 ± 0.2	2.37 ± 0.23	12.0	982.5 ± 2.5	32.9 ± 0.1	12.9 ± 0.0	236.5 ± 3.5	187.5 ± 1.5	335.0 ± 5.0	261.3 ± 0.1	0.47	3186.3	57.5
Hallauer Maienapfelp (L206)	863.8 ± 20.4	25.4 ± 1.8	4.57 ± 0.20	11.5	904.5 ± 9.5	27.6 ± 0.4	16.7 ± 0.7	177.5 ± 5.5	185.5 ± 5.5	225.0 ± 15.0	195.3 ± 1.2	0.60	5774.5	57.5
Seeländer Reinette (L207)	270.9 ± 18.7	11.4 ± 1.3	1.07 ± 0.12	12.5	870.5 ± 2.5	32.2 ± 0.0	22.7 ± 0.4	198.0 ± 2.0	174.0 ± 5.0	475.0 ± 75.0	212.3 ± 0.1	0.67	4186.3	115.6
Rajka (L209)	408.0 ± 21.8	20.3 ± 0.5	2.15 ± 0.13	10.9	919.0 ± 6	39.7 ± 0.2	27.1 ± 0.1	237.5 ± 3.5	247.5 ± 2.5	155.0 ± 5.0	173.9 ± 0.1	0.47	4068.6	57.5

Cultivar	TPC [mg/L]	ORAC [mmol/L]	TEAC [mmol/L]	Brix [°]	K ⁺ [mg/L]	Mg ²⁺ [mg/L]	Ca ²⁺ [mg/L]	Cu ²⁺ [mg/L]	Mn ²⁺ [mg/L]	Fe ²⁺ [mg/L]	PO ₄ ³⁻ [mg/L]	TA [% of malic]	Malic acid [mg/L]	Citric acid [mg/L]
Gewürzluiken (L211)	592.1 ± 43.8	16.1 ± 0.6	2.25 ± 0.24	10.5	715.5 ± 4.5	28.1 ± 0.2	23.0 ± 2.4	255.5 ± 3.5	165.0 ± 3.0	245.0 ± 25.0	176.2 ± 0.6	0.54	4009.8	57.5
Berlepsch (L214)	580.6 ± 9.4	16.9 ± 0.9	1.82 ± 0.30	12.0	872.0 ± 6	32.7 ± 0.1	33.6 ± 0.3	268.5 ± 8.5	164.0 ± 1.0	240.0 ± 10.0	171.6 ± 0.3	0.87	7362.8	28.4
Roter Herbstkalvill (L217)	875.9 ± 62.6	18.8 ± 2.3	4.11 ± 0.58	9.0	1016.0 ± 5	29.6 ± 0.0	21.9 ± 1.2	218.0 ± 2.0	127.5 ± 0.5	220.0 ± 20.0	187.3 ± 1.5	0.60	4951.0	115.6
Magna Super (L220)	223.3 ± 4.2	10.1 ± 1.2	0.94 ± 0.03	10.0	931.5 ± 1.5	39.7 ± 0.0	20.6 ± 0.3	372.0 ± 3.0	207.0 ± 3.0	230.0 ± 40.0	216.6 ± 0.4	0.60	5656.9	28.4
London Pepping (L224)	674.4 ± 42.6	23.7 ± 2.0	3.20 ± 0.32	10.0	1083.5 ± 1.5	27.2 ± 0.2	20.3 ± 0.8	178.0 ± 1.0	177.5 ± 2.5	325.0 ± 35.0	183.5 ± 1.4	0.67	6127.5	173.8
Ribston Pepping (L226)	182.3 ± 5.3	4.3 ± 1.7	0.85 ± 0.07	13.5	1572.5 ± 2.5	55.1 ± 0.2	20.6 ± 1.2	525.0 ± 3.0	276.0 ± 5.0	160.0 ± 10.0	420.3 ± 3.7	0.60	4127.5	57.5

n.d., not detectable; n.m., not measured; TPC, Total phenolic content; ORAC, Oxygen radical antioxidant capacity; TEAC, Trolox equivalent antioxidant capacity; TA, Titratable acidity.

Supplementary Table 1: Overview of the phytochemical composition of juice prepared from 88 apple cultivars collected from the region of Eferding/Upper Austria. Total phenolic content (TPC) was measured using the Folin-Ciocalteu method. Total antioxidant capacity was measured using TEAC and ORAC method. Quantitation of K⁺, Mg²⁺ and Ca²⁺ was performed by ion chromatography; Cu²⁺, Fe²⁺ and Mn²⁺ were quantitated by inductively coupled plasma mass spectrometry; phosphate (PO₄³⁻) was determined using a phosphomolybdate method. Titratable acidity was determined by acid titration; malic and citric acid was quantified with HPLC. Error bars are based on the standard error of the mean (n = 3).

Supplementary Table 2

Cultivar	Dihydrochalcones		Flavan-3-ols					Flavonols					Hydroxycinnamic acids			TPC (FC)	TPC (HPLC)	Anthocyanins
	Phlor.	P-2-O-xylosyl-glucoside	EC	ECG	EGC	PCB1	PCB2	Q-3-O-rhamno.	Q-3-O-xylo.	Q-3-O-rutino.	Q-3-O-galacto.	Querc.	CA	Caff. acid	4-p-C-qui. acid			
Rheinischer Krummstiel	3.9	9.8	14.5	8.7	n.d.	1.1	32.8	1.8	2.1	n.d.	0.6	3.4	335.9	1.2	1.2	975.4 ± 69.2	416.8	n.d.
Retina	0.4	0.6	n.d.	2.2	4.8	n.d.	4.4	n.d.	n.d.	n.d.	n.d.	n.d.	26.9	2.5	1.7	252.7 ± 18.8	43.5	n.d.
Maschanzker	14.2	23.1	13.8	14.6	9.7	5.1	51.7	0.6	3.4	+	1.8	3.8	247.6	5.4	29.7	1340.4 ± 66.4	424.6	n.d.
Carpetin (kleine Weinrenette)	4.7	11.2	33.8	12.0	n.d.	9.1	92.5	8.3	3.4	n.d.	0.6	5.8	156.3	3.7	9.0	903.1 ± 9.0	350.4	0.23
Sommerrambour	5.9	8.3	4.4	29.7	n.d.	n.d.	48.1	2.1	1.8	n.d.	n.d.	1.0	366.3	0.8	2.3	672.7 ± 24.9	470.5	n.d.
Dülmäner Rosenapfel	7.4	30.4	29.5	16.5	4.6	0.6	42.5	6.9	3.5	0.3	1.8	7.0	375.7	2.5	13.9	1008.7 ± 13.7	542.9	n.d.
Pilot	6.0	17.3	11.6	7.0	1.4	6.5	52.8	1.6	1.4	n.d.	+	1.0	322.1	7.0	26.5	1266.8 ± 26.2	462.3	n.d.
Roter Passamaner	11.4	13.6	104.7	46.2	38.2	20.7	170.0	25.2	41.1	15.7	26.4	49.2	441.8	10.1	19.3	819.2 ± 44.6	1033.7	n.d.
Schmidberger Renette	3.6	9.4	1.1	2.5	0.6	0.6	11.9	+	n.d.	n.d.	n.d.	n.d.	47.6	3.4	2.4	357.7 ± 16.5	83.3	n.d.
Gelber Edelapfel	7.6	19.7	7.3	27.5	6.9	3.1	66.4	2.1	1.3	+	n.d.	1.1	423.1	9.8	4.7	1279.0 ± 47.5	580.8	n.d.
Bismarck	4.9	11.8	4.0	51.0	n.d.	n.d.	42.8	1.1	1.6	0.5	n.d.	0.6	141.0	4.9	3.2	297.1 ± 5.9	267.3	n.d.
Schieblers Taubenapfel	0.8	4.4	1.8	6.4	3.1	1.7	16.4	0.6	0.3	n.d.	n.d.	0.3	76.9	3.1	5.2	578.0 ± 20.1	121.1	n.d.
Liberty	1.6	3.2	4.0	3.9	2.3	2.3	31.4	0.6	1.6	n.d.	0.3	1.3	170.6	4.4	3.3	634.2 ± 15.8	230.8	n.d.
Alkmene	2.6	5.1	4.4	31.1	n.d.	n.d.	30.3	1.3	1.4	n.d.	+	1.4	181.1	4.9	0.3	676.7 ± 19.0	264.1	n.d.
Jonathan	12.6	15.6	21.1	5.6	6.9	8.0	102.2	n.d.	n.d.	n.d.	n.d.	n.d.	776.5	16.2	24.5	1493.1 ± 46.7	989.2	n.d.
Herrenapfel	19.9	24.4	37.5	6.4	n.d.	n.d.	104.4	6.4	2.7	0.3	n.d.	3.7	484.0	8.2	16.2	1009.2 ± 70.4	714.2	n.d.
Spitzling	9.1	16.5	5.5	10.1	n.d.	4.0	n.d.	3.7	2.6	n.d.	0.8	2.9	257.1	4.5	36.7	939.4 ± 63.4	353.4	n.d.
Hausapfel	3.8	10.4	21.5	26.3	n.d.	11.6	28.1	1.4	0.5	n.d.	0.3	0.8	208.7	2.1	9.3	410.6 ± 1.8	324.8	n.d.
Spitzapfel	11.3	14.9	13.1	9.8	10.0	3.1	51.1	2.1	4.8	+	2.2	5.0	236.4	6.2	45.1	1092.8 ± 9.3	415.3	n.d.
Graue Herbstrenette	2.5	5.2	4.0	11.2	+	+	22.2	1.1	0.6	+	n.d.	0.3	131.0	5.0	2.0	624.1 ± 17.5	185.8	n.d.
Harberts Renette	23.6	21.4	55.3	5.3	3.5	10.8	192.2	2.4	2.6	+	n.d.	1.6	1209.2	11.3	17.5	2242.3 ± 75.8	1556.8	n.d.
Lesans Kalvill	1.9	6.0	5.8	3.1	3.1	1.4	25.6	1.4	1.1	+	+	1.0	141.7	3.8	9.7	819.7 ± 13.6	205.8	n.d.
Samareiner Rosmarien	5.4	14.5	14.9	6.2	n.d.	23.0	51.7	n.d.	n.d.	n.d.	n.d.	n.d.	92.5	3.9	14.9	846.2 ± 35.7	226.9	0.87
Berneder	3.4	6.7	8.0	5.3	n.d.	3.4	15.6	2.9	1.3	n.d.	+	1.6	168.7	3.5	5.4	296.3 ± 47.2	225.8	n.d.
Roter Boskoop	4.9	9.7	6.2	17.4	4.8	n.d.	51.1	4.8	2.2	0.3	n.d.	1.9	257.5	5.5	40.9	1135.6 ± 1.2	407.2	n.d.
Goldrenette Freiherr v. Berlepsch	11.8	15.2	12.7	10.6	n.d.	n.d.	41.4	2.2	0.8	n.d.	n.d.	1.1	362.8	8.5	16.9	524.2 ± 63.6	484.0	n.d.
Florianaer Rosmarin	5.0	4.1	6.5	8.7	2.7	3.4	28.1	1.6	3.5	n.d.	+	2.9	251.0	4.8	43.4	1049.5 ± 51.4	365.8	n.d.
Boikenapfel	5.9	14.8	2.9	12.9	n.d.	1.1	40.3	1.3	1.4	+	0.3	0.3	78.4	5.1	5.7	103.2 ± 1.1	170.6	n.d.
Roter Stettlinger	11.6	40.9	19.6	11.2	n.d.	n.d.	117.5	1.1	2.9	n.d.	n.d.	0.6	781.8	9.4	37.8	1511.8 ± 99.1	1034.5	0.29
Kammerapfel	5.5	5.8	6.9	5.9	1.2	2.3	33.6	2.7	0.8	+	n.d.	1.3	179.1	6.0	7.3	800.3 ± 6.3	258.4	n.d.
Weißer Winter-Taffetapfel	6.6	19.6	51.3	27.7	7.1	17.3	77.5	3.2	3.2	n.d.	0.5	3.8	206.0	2.1	5.6	788.7 ± 55.1	431.6	0.23
Odenwälder	19.2	54.3	75.6	3.0	n.d.	n.d.	338.1	1.0	3.4	n.d.	n.d.	1.0	1027.7	1.8	12.1	2275.6 ± 92.4	1564.0	0.39
Damason Renette	11.8	39.0	24.0	26.3	n.d.	n.d.	n.d.	3.8	2.6	+	+	1.3	736.6	n.d.	21.0	592.1 ± 23.9	866.7	n.d.
Champagner Renette	3.0	13.0	8.0	7.6	3.5	2.0	56.7	n.d.	n.d.	n.d.	n.d.	n.d.	323.5	8.1	51.3	1128.0 ± 35.8	476.5	n.d.
Hauxapfel	2.2	6.8	2.9	9.8	n.d.	n.d.	23.1	4.3	3.5	+	1.1	3.8	83.0	1.8	14.7	655.3 ± 46.9	157.1	n.d.
Glockenapfel	5.8	11.9	20.4	3.6	5.2	1.4	75.6	2.2	1.6	n.d.	0.5	1.0	425.0	7.3	8.9	1028.7 ± 45.2	570.3	n.d.
Zuccalmaglios Renette	14.3	16.9	43.3	10.4	2.1	3.1	37.5	5.4	7.5	+	1.6	5.0	284.5	5.7	12.7	2264.6 ± 21.0	450.2	n.d.
Roter James Grieve	2.8	7.0	16.0	10.6	4.6	n.d.	59.2	6.1	3.2	n.d.	n.d.	2.1	177.6	1.9	4.3	503.7 ± 7.5	295.3	n.d.
Weißen Passamaner	2.4	5.2	n.d.	16.2	n.d.	n.d.	42.5	3.7	2.7	+	0.3	2.6	136.1	32.5	0.5	401.7 ± 15.1	244.8	n.d.

Cultivar	Dihydrochalcones		Flavan-3-ols					Flavonols				Hydroxycinnamic acids			TPC (FC)	TPC (HPLC)	Anthocyanins	
	Phlor.	P-2-O-xylosyl-glucoside	EC	ECG	EGC	PCB1	PCB2	Q-3-O-rhamno.	Q-3-O-xylo.	Q-3-O-rutino.	Q-3-O-galacto.	Querc.	CA	Caff. acid	4-p-C-qui. acid			
Plankenapfel	3.3	11.8	20.4	16.5	n.d.	n.d.	48.3	3.0	4.5	n.d.	+	9.4	82.3	4.1	4.1	671.2 ± 39.2	207.9	0.24
Riesenbookenapfel	2.2	8.8	4.4	6.7	2.5	3.1	26.4	2.4	4.6	+	1.0	3.8	203.9	5.8	0.5	828.5 ± 2.2	276.2	n.d.
Ananasrenette	3.0	13.3	10.5	6.7	0.8	2.3	77.8	1.8	1.3	+	+	1.4	350.2	4.4	30.7	708.8 ± 9.6	504.4	n.d.
Glasapfel	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	3.5	2.6	n.d.	0.3	6.9	n.d.	n.d.	n.d.	254.7 ± 28.1	13.3	0.10
Steirischer Maschanzker	7.3	15.5	7.3	9.5	n.d.	7.4	39.7	0.5	3.2	n.d.	n.d.	1.8	278.4	9.3	55.5	975.0 ± 18.7	435.4	n.d.
Pinova	1.8	1.9	0.7	3.1	n.d.	n.d.	10.0	1.0	1.6	n.d.	n.d.	0.6	135.7	3.5	7.0	428.6 ± 14.3	166.9	n.d.
Roter Griesapfel	11.9	16.2	10.9	7.0	n.d.	4.3	23.3	4.5	2.9	n.d.	1.8	6.7	266.8	5.9	27.2	1137.0 ± 38.9	389.3	n.d.
Gelber Bellefleur	2.6	8.4	5.1	4.2	n.d.	2.6	16.1	3.8	0.3	n.d.	n.d.	1.1	117.5	1.6	5.5	475.3 ± 9.9	168.8	n.d.
Rewena	1.5	2.6	2.9	1.4	n.d.	n.d.	7.5	n.d.	n.d.	n.d.	n.d.	n.d.	44.4	0.6	n.d.	221.0 ± 6.1	61.0	n.d.
Piros	+	n.d.	1.1	2.5	2.1	0.9	7.8	3.2	2.7	n.d.	0.3	2.7	26.0	1.4	0.1	274.9 ± 10.7	51.1	n.d.
Schöner v. Wiltshire	29.5	11.1	1.8	1.4	1.0	n.d.	13.6	13.4	18.4	0.3	9.3	25.2	98.1	4.3	6.3	610.4 ± 23.5	233.8	0.64
Prinzenapfel Fasslapfel	4.5	9.7	41.5	7.6	n.d.	10.2	58.1	n.d.	n.d.	n.d.	n.d.	n.d.	250.0	3.7	13.7	671.3 ± 77.9	398.9	n.d.
Kleiner Feiner	2.1	7.9	5.5	8.4	n.d.	3.7	21.4	2.2	1.1	n.d.	+	1.3	73.6	2.3	10.7	622.6 ± 5.0	140.3	n.d.
Geheimrat Oldenburg	19.0	32.7	13.1	18.2	n.d.	n.d.	114.4	8.6	8.9	n.d.	1.3	11.2	700.2	8.4	16.4	989.8 ± 24	952.6	n.d.
Deans Küchenapfel	7.2	4.2	16.0	6.4	1.9	12.5	43.1	5.4	9.7	+	2.7	7.8	200.3	6.9	20.1	950.2 ± 40.4	344.5	n.d.
Zabergau Renette	8.6	17.6	12.7	10.4	4.6	11.4	34.7	3.7	1.8	+	1.4	2.1	128.7	3.1	1.3	329.8 ± 30.2	242.2	n.d.
Kanada Renette	2.5	5.7	19.3	22.4	10.2	4.3	33.3	3.5	2.2	+	+	1.6	194.9	6.8	1.9	700.7 ± 4.5	308.9	n.d.
Winter-Goldparmäne	6.3	27.2	21.1	24.6	1.5	2.0	131.1	4.3	9.3	+	+	5.9	617.0	7.6	21.5	1869.9 ± 36	879.7	n.d.
Grüner Boskoop	4.1	15.5	17.5	16.8	12.0	5.7	30.8	3.2	0.5	0.6	1.0	1.4	549.3	4.9	38.5	876.2 ± 37.9	701.7	n.d.
Relinda	1.7	10.9	3.6	8.1	n.d.	n.d.	21.7	n.d.	0.5	0.3	0.5	1.1	109.9	1.0	3.9	504.1 ± 13.6	163.2	n.d.
Pom. Kongreß	20.6	22.2	49.1	12.6	13.9	12.8	77.5	1.9	3.0	+	0.6	2.6	224.3	4.2	27.3	1315.0 ± 49.8	472.7	n.d.
Fasslapfel	11.8	45.9	41.8	41.5	n.d.	16.5	38.6	1.1	2.6	+	+	2.6	274.7	6.0	15.7	597.1 ± 37.2	499.0	n.d.
Royal Gala (F204)	+	n.d.	n.d.	n.d.	n.d.	n.d.	0.8	n.d.	n.d.	n.d.	n.d.	n.d.	1.79	n.d.	0.3	185.8 ± 4.7	3.1	0.34
Winterzitrone (F208)	7.6	14.3	n.d.	6.1	n.d.	n.d.	10.0	1.9	2.4	+	1.6	7.5	65.0	n.d.	2.7	1029.6 ± 38.1	119.1	n.d.
Weißer Winterkalvill (F210)	5.0	4.9	2.8	2.2	n.d.	n.d.	0.8	2.0	1.2	+	+	1.4	75.3	n.d.	3.9	728.6 ± 43.0	99.6	n.d.
Stäubli 2 (F212)	4.9	13.7	n.d.	4.4	n.d.	n.d.	4.4	0.8	0.9	n.d.	0.4	2.2	42.9	n.d.	3.1	318.5 ± 18.1	77.7	n.d.
Christkindler (F213)	17.8	20.1	15.7	6.4	n.d.	12.0	55.0	0.4	1.1	n.d.	0.3	1.6	76.4	n.d.	44.4	1022.0 ± 3.5	251.2	0.70
Freyperg (F215)	1.3	1.6	n.d.	1.3	n.d.	n.d.	1.4	n.d.	n.d.	n.d.	n.d.	0.3	10.0	n.d.	1.6	370.3 ± 14.0	17.5	n.d.
Topaz (F216)	0.9	2.7	7.2	6.6	n.d.	1.8	0.5	n.d.	n.d.	+	n.d.	0.4	13.6	n.d.	n.d.	257.4 ± 10.6	33.7	n.d.
Florina (F218)	0.5	0.8	n.d.	n.d.	n.d.	n.d.	1.4	2.7	n.d.	n.d.	n.d.	0.8	6.3	n.d.	n.d.	224.2 ± 5.5	12.5	n.d.
Wachsrenette (F219)	1.4	2.9	4.4	n.d.	n.d.	n.d.	3.8	0.8	0.8	n.d.	0.3	3.3	40.8	n.d.	2.8	919.9 ± 21.1	61.3	n.d.
Discovery (F221)	3.7	9.9	7.2	3.6	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	139.4	1.3	3.9	836.8 ± 12.7	169.0	n.d.
Sponheimer Flurapfel (F222)	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	881.3 ± 4.2	n.d.	n.d.
Roter von Siemonff (F223)	20.0	18.5	31.9	n.d.	n.d.	n.d.	34.1	1.1	1.1	n.d.	n.d.	1.6	275.6	2.4	5.7	1094.6 ± 30.2	392.0	0.35
Grüter Edelapfel (F225)	4.0	1.9	8.1	n.d.	n.d.	n.d.	3.5	3.3	1.1	0.3	0.3	0.8	41.4	n.d.	0.8	785.9 ± 14.3	65.2	0.30
Rheinischer Winternrambour (L200)	8.3	13.3	7.2	16.1	8.8	4.8	22.9	1.4	0.6	+	+	2.4	111.7	1.1	10.3	1087.4 ± 43.1	209.1	n.d.
Dr. Seeligs Orangenpepping (L201)	7.5	8.1	n.d.	21.1	n.d.	n.d.	14.4	0.3	n.d.	+	+	0.4	80.0	n.d.	5.8	527.8 ± 23.9	137.8	n.d.
Von Zuccalmaglio Renette (L202)	13.5	24.0	13.7	n.d.	n.d.	13.5	40.9	1.2	2.2	+	0.6	6.2	149.7	1.6	7.0	1035.7 ± 64.0	274.2	2.29
Mostzigeuner (L203)	10.3	14.4	n.d.	10.3	n.d.	n.d.	8.8	1.1	1.6	n.d.	n.d.	4.3	145.8	1.7	1.4	1283.5 ± 66.0	199.7	6.79
Blenheim (L205)	7.1	23.1	n.d.	13.6	3.3	3.9	8.5	+	0.4	+	n.d.	1.1	132.4	1.3	2.2	554.6 ± 6.5	197.1	n.d.
Hallauer Maienapfel (L206)	11.5	18.2	n.d.	17.2	22.1	18.4	33.2	1.4	2.4	+	0.4	3.0	62.8	n.d.	21.2	863.8 ± 20.4	211.9	0.74

Cultivar	Dihydrochalcones		Flavan-3-ols					Flavonols				Hydroxycinnamic acids			TPC (FC)	TPC (HPLC)	Anthocyanins	
	Phlor.	P-2-O-xylosyl-glucoside	EC	ECG	EGC	PCB1	PCB2	Q-3-O-rhamno.	Q-3-O-xylo.	Q-3-O-rutino.	Q-3-O-galacto.	Querc.	CA	Caff. acid	4-p-C-qui. acid			
Seeländer Reinette (L207)	2.3	3.7	3.6	6.9	n.d.	n.d.	5.0	0.3	0.4	+	n.d.	1.1	12.7	n.d.	1.7	270.9 ± 18.7	37.8	n.d.
Rajka (L209)	3.9	3.8	10.1	8.9	n.d.	n.d.	13.5	3.6	n.d.	n.d.	0.3	0.9	23.2	n.d.	4.7	408.0 ± 21.8	72.9	n.d.
Gewürzluiken (L211)	13.5	6.4	n.d.	35.9	21.0	6.3	27.6	0.8	1.9	n.d.	0.3	6.2	69.5	n.d.	17.0	592.1 ± 43.8	206.4	n.d.
Berlepsch (L214)	8.6	20.7	n.d.	16.4	n.d.	n.d.	11.1	n.d.	n.d.	+	n.d.	0.3	108.9	1.0	0.6	580.6 ± 9.4	167.7	n.d.
Roter Herbstkalvill (L217)	5.7	6.8	n.d.	7.2	28.8	3.6	12.0	0.3	0.3	n.d.	n.d.	1.1	72.0	n.d.	3.6	875.9 ± 62.6	141.4	0.23
Magna Super (L220)	1.3	2.7	n.d.	1.6	n.d.	n.d.	1.4	n.d.	n.d.	n.d.	n.d.	n.d.	10.1	n.d.	+	223.3 ± 4.2	17.2	n.d.
London Pepping (L224)	6.5	11.0	6.0	6.4	21.0	2.4	27.9	2.7	3.6	+	n.d.	3.6	67.7	n.d.	0.9	674.4 ± 42.6	159.8	n.d.
Ribston Pepping (L226)	2.8	8.2	n.d.	1.9	n.d.	n.d.	n.d.	n.d.	n.d.	+	n.d.	0.3	36.9	n.d.	3.3	182.3 ± 5.3	53.5	n.d.

n.d., not detectable; n.m., not measured; +, not quantifiable; PCB1, Procyanidin B1; EGC, Epigallocatechin; CA, Chlorogenic acid; PCB2, Procyanidin B2; Caff. acid, Caffeic acid; EC, Epicatechin; 4-p-C-qui. acid, 4-p-Coumarylquinic acid; ECG, Epicatechingallate; Phlor., Phloridzin; P-2-O-xylosyl-glucoside, Phloretin-2'-O-xylosyl-glucoside; Q-3-O-rhamno., Quercetin-3-O-rhamnoside; Q-3-O-xylo., Quercetin-3-O-xyloside; Q-3-O-rutino., Quercetin-3-O-rutinoside; Q-3-O-galacto., Quercetin-3-O-galactoside; Querc., Quercetin; TPC, total phenolic content.

Supplementary Table 2: Overview of single polyphenol content of juice prepared from 88 apple cultivars collected from the region of Eferding/Upper Austria. Polyphenols were identified using HPLC-MS and were quantified with HPLC using known standards. Total anthocyanins were determined using a differential pH method. Error bars are based on the standard error of the mean (n = 3).