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Supplementary Material

Use of Pulsed Electric Field as a Low-Temperature and High-Performance "Green" Extraction Technique for the Recovery of High Added Value Compounds from Olive Leaves

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Table S1. Extraction conditions and PEF procedure parameters.

		PEF 10 µsec	PEF 100 µsec	Control Samples
Extraction conditions	$t_{Extraction}$ (min)	30	30	30
	$T_{Extraction}$ (°C)	30	30	30
	Extraction Chamber	Rectangular	Rectangular	Rectangular
PEF Parameters	t_{Pulse} (µsec)	10	100	-
	t_{Period} (µsec)	1000	1000	
	$V_{PEF\ Voltage\ Generator}$ (kV)	1	1	
	Type of Pulse	Rectangular	Rectangular	
	$E_{PEF\ Field}$ (kV/cm)	1	1	
	N_{Cycles}	1.8×10^{6}	1.8×10^{6}	
	$t_{Total\ Pulse\ Duration}$ (sec)	1.8×10^{1}	1.8×10^{2}	
	Specific Energy Input (kJ/kg)	0.155	1.55	
	Total Energy Input (KWh)	2.52×10^{-6}	2.52×10^{-5}	

* Solvents tested were 0% up to 100% EtOH with a 25% step gradient.

Table S2. Averages (mg g^{-1} dw) of major compounds of olive leaf PEF treated and control extracts, prepared with 25% ethanol.

Pulse duration	Compound	PEF Treated Extract		Control Extract		Increase (%)
		Average	SD	Average	SD	
10 µsec	Peak 1	0.13	0.01	0.08	0.01	49.53
	Quercetin-3-O-rutinoside	0.24	0.04	0.07	0.00	265.67
	Peak 3	0.21	0.00	0.13	0.01	57.32
	Luteolin-7-O-glucoside	0.82	0.02	0.48	0.02	71.87
	Apigenin-7-O-rutinoside	0.31	0.03	0.14	0.01	121.32
	Luteolin-3′-O-glucoside	0.29	0.01	0.20	0.01	41.76
	Oleuropein	0.63	0.19	0.58	0.06	9.22
	Peak 7	0.06	0.01	0.04	0.00	56.84
100 µsec	Peak 1	0.12	0.00	0.08	0.01	44.48
	Quercetin-3-O-rutinoside	0.17	0.04	0.07	0.00	158.36
	Peak 3	0.21	0.01	0.13	0.01	60.30
	Luteolin-7-O-glucoside	0.77	0.04	0.48	0.02	61.52
	Apigenin-7-O-rutinoside	0.27	0.02	0.14	0.01	91.94
	Luteolin-3′-O-glucoside	0.27	0.02	0.20	0.01	33.02
	Oleuropein	0.76	0.11	0.58	0.06	31.95
	Peak 7	0.05	0.00	0.04	0.00	36.92

* Luteolin-3′-O-glucoside as well as peaks 1, 3 and 7 were quantified as luteolin-7-O-glucoside. Apigenin-7-O-rutinoside was quantified as apigenin.

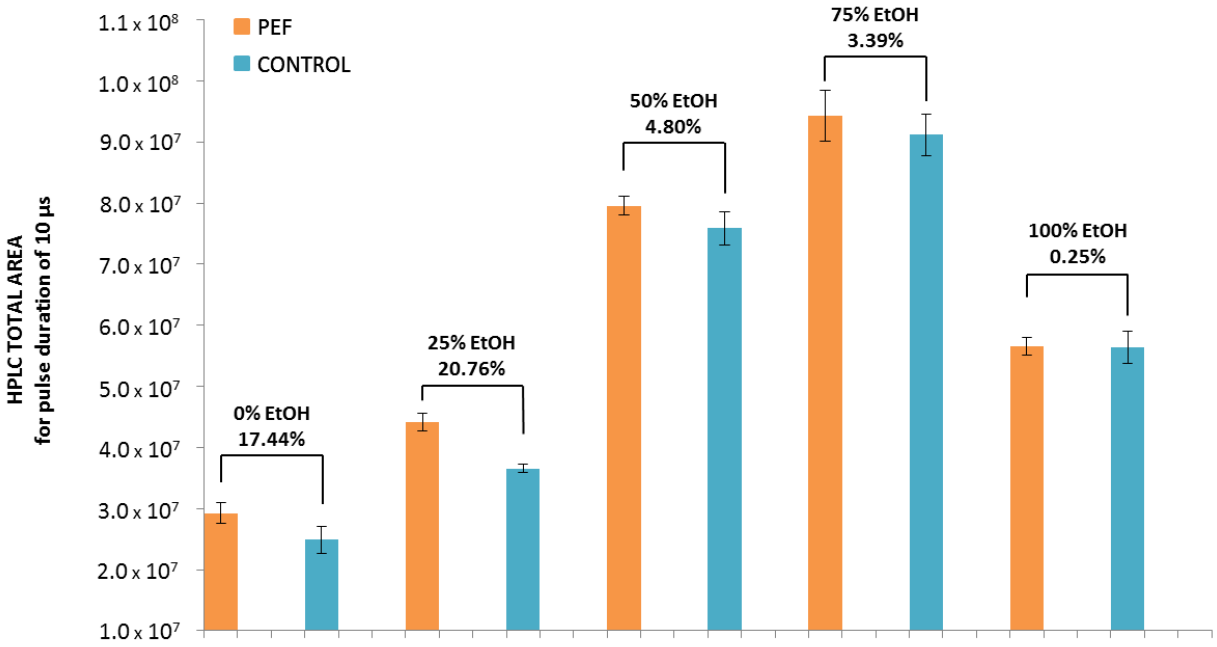

Figure S1. HPLC total area for PEF and Control samples in five different tested solvents and a pulse duration of 10µsec.

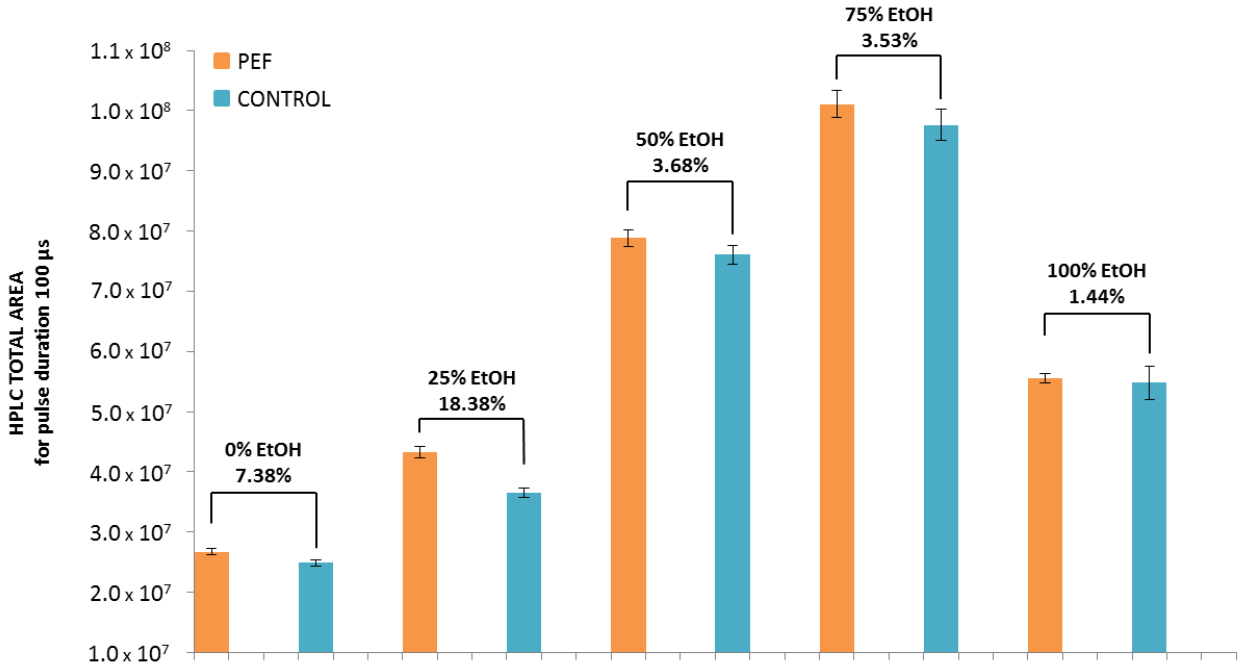

Figure S2. HPLC total area for PEF and Control samples in five different tested solvents and a pulse duration of 100µsec.

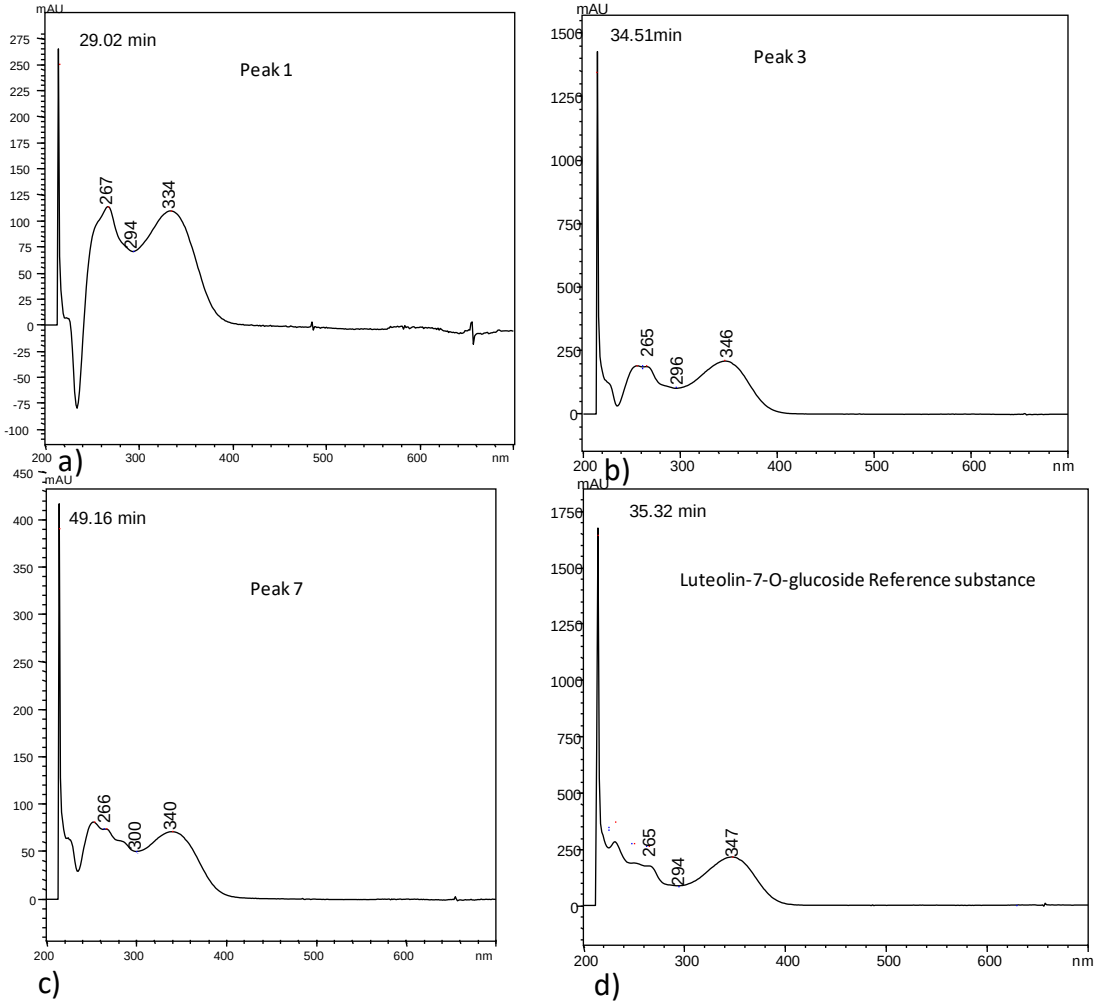

Figure S3. UV-Vis spectras obtained by HPLC-DAD analysis of **a**) peak 1, **b**) peak 3, **c**) peak 7 and **d**) Luteolin-7-O-glucoside reference substance.