In the Beginning was the Bud: Phytochemicals from Olive (*Olea europaea* L.) Vegetative Buds and Their Biological Properties

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Table S1: Composition of volatiles identified in essential oils of olive vegetative buds from cvs. *Lastovka* and *Oblica*

			Lastovka (%)		*Oblica (%)*	
RI	**Lit. RI**	**Compound**	**mean**	**SD**	**mean**	**SD**
867	865	(*Z*)-3-Hexen-1-ol*	0.67	0.14	1.03	0.14
874	875	(*Z*)-2-Hexen-1-ol	0.04	0.00	0.02	0.00
875	876	1-Hexanol	0.11	0.07	0.20	0.01
901	901	Heptanal	0.24	0.01	0.37	0.08
904	906	Methional	0.01	0.00	0.13	0.00
908	910	2,4-Hexadienal*	0.04	0.01	0.04	0.00
931	934	2,7-Dimethyl-oxepine	0.02	0.00	0.02	0.00
952	954	(*E*)-2-Heptenal	0.18	0.13	0.26	0.04
956	961	Benzaldehyde	0.39	0.03	0.49	0.04
986	987	6-Methyl-5-hepten-2-one	0.06	0.00	0.09	0.01
991	992	2-Pentylfuran	0.37	0.01	0.65	0.13
996	998	(*E,Z*)-2,4-Heptadienal	0.11	0.01	0.13	0.02
1002	1001	Octanal	0.29	0.01	0.33	0.08
1009	1008	(*E,E*)-2,4-Heptadienal	0.20	0.02	0.22	0.03
1026	1025	Limonene	0.02	0.00	0.03	0.00
1031	1033	Benzyl alcohol	0.06	0.00	0.14	0.01
1040	1040	Benzeneacetaldehyde	2.91	0.24	3.91	1.04
1047	1011	3-Carene*	n.d.	-	0.02	0.00
1056	1056	(*E*)-2-Octenal	0.13	0.00	0.19	0.04
1067	1067	(*E*)-2-Octen-1-ol	0.09	0.01	0.07	0.02
1070	1068	1-Octanol	0.35	0.03	0.47	0.06
1099	1098	Linalool*	0.17	0.06	0.84	0.06
1104	1105	Nonanal*	4.29	0.11	4.73	0.87
1111	1111	Phenylethyl Alcohol*	0.29	0.02	1.30	0.05
1137	1138	Methyl nicotinate	0.03	0.01	0.08	0.01
1143	1154	6-Methyl-1-octanol	0.27	0.02	0.50	0.07
1152	1151	(*E,Z*)-2,6-Nonadienal	0.07	0.00	0.18	0.02
1158	1159	(*E*)-2-Nonenal	0.25	0.01	0.39	0.06
1171	1171	1-Nonanol	0.29	0.03	0.84	0.19

1189	1188	α-Terpineol	0.06	0.00	0.19	0.03
1191	1191	Methyl salicylate*	0.11	0.02	0.04	0.01
1200	1200	Dodecane	0.23	0.03	0.24	0.04
1205	1206	Decanal*	0.36	0.02	0.58	0.30
1213	1214	(*E*,*E*)-2,4-Nonadienal	0.03	0.00	0.02	0.01
1254	1254	Geraniol	0.40	0.02	1.10	0.18
1260	1260	(*E*)-2-Decenal	0.71	0.04	0.55	0.09
1275	1276	Nonanoic acid	0.11	0.06	0.37	0.05
1285	1285	Dihydroedulan II	0.31	0.02	0.61	0.12
1289	1289	Indole	0.04	0.00	0.04	0.01
1291	1292	Dihydroedulan IA	0.27	0.02	0.06	0.01
1292	1293	(*E*,*Z*)-2,4-Decadienal	0.22	0.02	0.11	0.01
1294	1294	2-Undecanone	0.01	0.00	0.06	0.00
1295	1298	Theaspirane A	0.28	0.02	0.54	0.10
1300	1300	Tridecane	0.05	0.01	0.11	0.01
1307	1307	Undecanal	0.09	0.01	0.15	0.03
1311	1312	2-Vinylguaicol	0.18	0.02	0.38	0.04
1313	1315	Theaspirane B	0.35	0.02	0.66	0.10
1314	1316	(*E*,*E*)-2,4-Decadienal	0.71	0.06	0.53	0.05
1349	-	Methyl 5-vinylnicotinate	0.43	0.06	1.49	0.60
1355	1356	Eugenol*	0.60	0.04	0.32	0.02
1363	1363	2-Undecenal	0.14	0.01	0.24	0.04
1369	1370	n-Decanoic acid	0.02	0.01	0.10	0.05
1383	1384	β-Damascenone	0.04	0.00	0.10	0.01
1397	1397	(*Z*)-Jasmone	0.08	0.00	0.09	0.01
1400	1400	Tetradecane	0.85	0.07	0.88	0.14
1407	1405	1,3,5-Trimethoxybenzene*	12.60	0.97	2.12	0.30
1416	1416	Caryophyllene*	0.14	0.03	0.12	0.02
1437	1436	Dihydro-β-ionone	0.01	0.00	0.04	0.01
1444	1449.2	Dihydro-β-ionol	n.d.	-	0.08	0.00
1452	1452	(*E*)-Geranyl acetone	0.32	0.02	0.29	0.06
1463	1465.1	2,6,10-Trimethyltridecane	0.54	0.07	0.81	0.07
1474	1473	1-Dodecanol	0.03	0.01	0.12	0.01
1478	1478	Germacrene D	0.03	0.00	n.d.	-
1484	1484	(*E*)-β-Ionone	0.29	0.02	0.43	0.04
1496	1496	2-Tridecanone	0.15	0.01	0.33	0.05
1500	1500	Pentadecane	0.22	0.01	0.23	0.04
1508	1508	α-Farnesene	0.18	0.00	0.21	0.03
1512	1512	Butylated Hydroxytoluene	0.49	0.12	0.53	0.40
1563	1562	Nerolidol	0.20	0.04	0.37	0.11
1571	1571	3-Methyl-pentadecane	0.07	0.00	0.12	0.00
1600	1600	Hexadecane	0.59	0.02	0.65	0.07
1612	1612	Tetradecanal	0.24	0.00	0.31	0.03

1651	1656	Neointermedeol	n.d.	-	0.55	0.39
1670	1669	(*E,E*)-6,8-Heptadecadiene	0.88	0.10	0.55	0.17
1677	1692	(*Z*)-3-Heptadecene	16.25	1.60	8.13	2.15
1700	1700	Heptadecane	2.57	0.21	1.37	0.35
1714	1714	Pentadecanal	0.48	0.02	0.50	0.04
1722	1721	Farnesol	n.d.	-	0.06	0.01
1746	1745	7-Methyl-heptadecane	n.d.	-	0.08	0.01
1772	1771	3-Methyl-heptadecane	0.07	0.00	0.12	0.01
1793	1793	1-Octadecene	n.d.	-	0.05	0.01
1800	1800	Octadecane	0.26	0.01	0.28	0.01
1803	1805	2-Ethylhexyl salicylate	0.07	0.01	n.d.	-
1816	1817	Hexadecanal	0.07	0.00	0.17	0.03
1828	1828	Isopropyl myristate	0.02	0.01	0.03	0.01
1845	1845	Hexahydrofarnesyl acetone	1.02	0.14	2.54	0.66
1874	1875	1-Nonadecene	0.15	0.01	0.19	0.08
1880	1904	Homosalate	0.17	0.01	0.53	0.10
1888	-	(*Z*)-5-Nonadecene	0.05	0.00	0.15	0.07
1900	1900	Nonadecane	1.50	0.06	1.46	0.44
1927	1927	Methyl palmitate	0.04	0.00	0.07	0.02
1965	1965	Hexadecanoic acid	1.06	0.15	2.53	0.55
1972	1972	3-Methyl-nonadecane	0.09	0.01	0.30	0.06
2000	2000	Eicosane	0.35	0.01	0.47	0.10
2005	2006	5,5-Diethylheptadecane	0.01	0.00	0.09	0.00
2020	2021	Octadecanal	0.02	0.00	0.11	0.03
2027	2032	Isopropyl palmitate	0.04	0.01	n.d.	-
2085	2087	1-Henicosene	2.85	0.07	1.68	0.55
2103	2100	Heneicosane	7.92	0.16	6.02	1.39
2114	2114	Phytol	0.12	0.02	1.69	0.35
2200	2200	Docosane	0.83	0.03	0.68	0.13
2274	2274	(*Z*)-9-Tricosene	2.53	0.32	2.39	0.61
2303	2300	Tricosane	7.08	0.55	4.02	0.67
2400	2400	Tetracosane	0.44	0.04	0.40	0.06
2429	2430	Docosanal	0.05	0.01	0.09	0.01
2502	2500	Pentacosane	2.04	0.18	1.51	0.27
2600	2600	Hexacosane	0.16	0.03	0.29	0.04
2693	2700	Heptacosane	2.05	0.25	4.10	0.29
2800	2800	Octacosane	0.31	0.03	0.76	0.06
2821	2833	Squalene	0.54	0.08	0.28	0.03
2888	2900	Nonacosane	3.81	0.44	7.93	0.50
2999	3000	Triacontane	0.15	0.02	0.38	0.01
3103	3100	Hentriacontane	1.28	0.14	2.10	0.16
		Total chromatogram identified:	92.08 %		88.59 %	
		Alcohols	1.69		3.23	

Aldehydes	9.69	11.29
Ketones	1.99	3.97
Esters	0.23	0.21
Fatty acids	1.19	3.00
Phenols	0.66	0.91
Anisole derivative	12.60	2.12
Monoterpens	0.02	0.05
Sesquiterpenes	0.35	0.33
Triterpens	0.54	0.28
Monoterpene alcohols	0.63	2.13
Sesquiterpene alcohol	n.d.	0.06
Diterpene alcohols	0.12	1.69
Furans	0.37	0.65
Heterocyclic compounds	1.70	3.96
Saturated hydrocarbons	33.48	35.36
Unsaturated hydrocarbons	22.71	13.14
Aromatic hydrocarbones	4.11	6.19

Table S2: The MS spectra of corresponding TMS metabolites from olive vegetative bud extracts. MS spectra were obtained from the Golm Metabolome Database[G], MassBank [M], NIST Chemistry WebBook [N], by derivatized analytical standard [S], as well as by comparison with literature data[L].

	RI	Compound	Relative Intensity (m/z)
1	1323	Glyceric acid, 3TMS derivative [G, N]	293 (13), 292 (40), 205 (14), 189 (49), 147 (61), 133 (17), 117 (11), 103 (22), 102 (18), 73 (100)
2	1332	(E)-2-Butenedioic acid, 2TMS derivative [N]	247 (9), 246 (17), 245 (100), 148 (6), 147 (39), 143 (14), 133 (6), 75 (17), 73 (46), 45 (10)
3	1499	Malic acid, 3TMS derivative [G, N]	245 (13), 233 (24), 190 (8), 189 (11), 147 (53), 133 (9), 75 (9), 74 (8), 73 (100), 45 (8)
4	1573	Tyrosol, 2TMS derivative [N]	283 (5), 282 (20), 267 (13), 193 (11), 180 (14), 179 (100), 103 (11), 75 (5), 73 (49), 45 (7)
5	1585	Threonic acid, 4TMS derivative [G,N]	293 (16), 292 (55), 220 (28), 217 (20), 205 (24), 148 (9), 147 (58), 117 (15), 103 (13), 73 (100)
6	1655	Rhamnose, 4TMS derivative [N]	217 (6), 206 (9), 205 (20), 204 (100), 191 (21), 189 (8), 147 (14), 130 (5), 74 (4), 73 (40)
7	1673	Arabinopyranose, 4TMS derivative (isomer 2) [N]	218 (16), 217 (85), 205 (14), 204 (72), 191 (61), 147 (30), 107 (11), 75 (15), 73 (100), 45 (11)
8	1689	Arabinose, 4TMS derivative [N]	219 (8), 218 (19), 217 (100), 205 (13), 204 (71), 192 (11), 191 (63), 189 (8), 147 (27), 73 (94)
9	1755	Xylitol, 5TMS derivative [G,N]	319 (24), 307 (30), 218 (27), 217 (100), 205 (19), 189 (11), 147 (34), 129 (26), 103 (48), 73 (92)
10	1780	2-(3,4-Dihydroxyphenyl) ethanol, TMS derivative [N]	371 (17), 370 (46), 269 (10), 268 (28), 267 (100), 193 (24), 179 (15), 75 (8), 73 (69), 45 (10)
11	1843	Fructofuranose (isomer 2), 5TMS derivative [N]	438 (14), 437 (35), 257 (12), 219 (10), 218 (18), 217 (92), 147 (25), 129 (8), 74 (8), 73 (100)
12	1880	Methyl-α-glucofuranoside, 4TMS derivative[N]	219 (18), 218 (51), 217 (100), 204 (22), 191 (22), 147 (19), 132 (17), 129 (46), 103 (13), 73 (77)
13	1899	Quinic acid, 5TMS derivative [G, N]	347 (16), 346 (28), 345 (100), 334 (9), 256 (9), 255 (38), 204 (10), 191 (10), 147 (26), 73 (69)
14	1922	Gluconolactone, 4TMS derivative [N]	319 (20), 229 (9), 220 (14), 217 (19), 205 (9), 204 (14), 147 (26), 129 (27), 103 (12), 73 (100)
15	1932	Glucose, 5TMS derivative [N]	218 (6), 217 (22), 206 (10), 205 (20), 204 (100), 192 (9), 191 (49), 147 (20), 129 (9), 73 (56)
16	1973	Mannitol, 6TMS derivative [G,N]	319 (34), 218 (44), 217 (52), 205 (62), 157 (34), 147 (41), 129 (15), 117 (19), 103 (27), 73 (100)
17	1990	Galactose, 5TMS derivative [N]	218 (11), 217 (45), 205 (19), 204 (83), 191 (33), 147 (22), 129 (10), 75 (18), 74 (9), 73 (100)
18	2033	Galactopyranose, 5TMS derivative (isomer 2) [N]	217 (30), 206 (12), 205 (30), 204 (100), 192 (16), 191 (78), 147 (33), 129 (12), 74 (10), 73 (94)
19	2045	β-Galactofuranose, 5TMS derivative [N]	305 (14), 219 (10), 218 (19), 217 (100), 204 (14), 191 (12), 147 (22), 129 (11), 75 (8), 73 (65)
20	2054	Palmitic Acid, TMS derivative [N]	314 (20), 313 (77), 145 (24), 132 (50), 129 (39), 117 (100), 75 (53), 73 (76), 55 (20), 43 (25)
21	2105	Ferulic acid, 2TMS derivative [N,S]	339 (24), 338 (100), 324 (19), 323 (62), 308 (51), 293 (34), 249 (39), 191 (20), 147 (30), 73(91)
22	2131	Myo-Inositol, 6TMS derivative [N]	318 (49), 306 (27), 305 (81), 265 (20), 218 (18), 217 (94), 204 (18), 191 (47), 147 (55), 73 (100)

23	2154	Caffeic acid, 3TMS derivative [G,N,S)	398 (13), 397 (28), 396 (80), 381 (19), 249 (9), 220 (17), 219 (100), 191 (15), 45 (12), 73 (61)
24	2216	Linoleic acid, TMS derivative [M, N]	337 (52), 129 (36), 117 (36), 95 (43), 81 (67), 75 (91), 73 (100), 67 (74), 55 (49), 41 (38)
25	2222	Oleic acid, TMS derivative [N]	339 (81), 145 (36), 129 (75), 117 (96), 96 (28), 75 (90), 73 (100), 55 (55), 43 (29), 41 (37)
26	2250	Stearic acid, TMS derivative [M,N]	342 (21), 341 (76), 145 (30), 132 (50), 129 (42), 117 (100), 75 (51), 73 (75), 55 (21), 43 (30)
27	2417	Oleamide, TMS derivative [N]	338 (38), 144 (62), 131 (100), 128 (43), 116 (53), 75 (71), 73 (87), 55 (29), 43 (22), 41 (26)
28	2428	Uridine, 3TMS derivative [G, M, N]	259 (26), 219 (10), 218 (28), 217 (95), 169 (12), 147 (21), 129 (13), 103 (20), 75 (10), 73 (100)
29	2448	Arachidic acid, TMS derivative [N]	369 (71), 145 (38), 132 (71), 131 (46), 129 (43), 117 (100), 75 (66), 73 (87), 55 (28), 43 (43)
30	2609	1-Monopalmitin, 2TMS derivative [N]	372 (28), 371 (100), 239 (17), 204 (19), 203 (18), 147 (31), 129 (21), 73 (61), 57 (21), 43 (21)
31	2714	Sucrose, 8TMS derivative [G,N]	437 (19), 363 (15), 362 (31), 361 (100), 271 (13), 217 (35), 169 (11)
32	2803	Glycerol monostearate, 2TMS derivative [N]	400 (29), 399 (100), 203 (17), 147 (24), 129 (17), 73 (33), 71 (12), 57 (20), 55 (12), 43 (20)
33	3055	Methyloleoside, 5TMS derivative [N]	362 (33), 361 (100), 297 (21), 217 (29), 169 (20), 165 (69), 147 (26), 129 (19), 103 (18), 73 (97)
34	3179	Chlorogenic acid, 6TMS derivative [N,S]	397 (18), 347 (17), 346 (33), 345 (99), 324 (17), 307 (44), 256 (17), 255 (67), 147 (19), 73 (100)
35	3236	Quercetin, 5TMS derivative [N,S]	651 (4), 650 (12), 649 (33), 648 (57), 647 (100), 561 (3), 560 (5), 559 (9), 73 (21), 45 (2)
36	3312	Luteolin, 4TMS derivative [N]	562 (8), 561 (27), 560 (51), 559 (100), 472 (4), 471 (10), 452 (3), 399 (6), 73 (21), 45 (3)
37	3360	β-Sitosterol, TMS derivative [G,N]	486 (44), 396 (84), 357 (70), 129 (100), 121 (34), 95 (40), 81 (34), 73 (56), 57 (40), 43 (51)
38	3569	Erythrodiol, 2TMS derivative [N]	497 (36), 496 (75), 217 (27), 216 (100), 204 (37), 203 (53), 201 (21), 189 (28), 161 (26), 73 (50)
39	3682	Oleanolic acid, 2TMS derivative [G, N]	483 (14), 482 (25), 320 (34), 204 (16), 203 (100), 202 (63), 190 (25), 189 (31), 75 (14), 73 (44)
40	3702	Betulinic acid, 2TMS derivative [N]	320 (29), 292 (26), 202 (27), 190 (44), 189 (71), 188 (26), 187 (27), 129 (27), 75 (35), 73 (100)
41	3750	Ursolic acid, 2TMS derivative [N]	321 (20), 320 (74), 203 (100), 202 (39), 190 (20), 189 (27), 133 (45), 119 (21), 75 (18), 73 (43)
42	4002	Maslinic acid, 3TMS derivative [L]	570 (22), 320 (43), 204 (20), 203 (100), 202 (69), 189 (29), 187 (20), 147 (30), 133 (20), 73 (83)

Table S3: Significance level ($p < 0.05$) of metabolically active human breast adenocarcinoma MDA-MB-231, human breast metastatic adenocarcinoma MCF7, and human ovarian carcinoma OVCAR-3 cell lines in comparison to non-treated cell line samples after 24, 48 and 72 h of incubation with different concentrations of olive vegetative bud essential oil (a) and extract (b) from cvs. *Lastovka* and *Oblica*

a)	MDA-MB-231			MCF-7			OVCAR-3		
Lastovka									
conc. (μg/mL)	24 h	48 h	72 h	24 h	48 h	72 h	24 h	48 h	72 h
1	0.095	0.157	0.099	0.282	0.049	1.000	0.649	0.515	0.338
5	0.114	0.126	0.052	0.183	0.019	0.013	0.681	0.572	0.480
10	0.147	0.084	0.074	0.308	0.010	0.024	0.705	0.525	0.708
50	0.087	0.088	0.071	0.168	0.006	0.043	0.889	0.627	0.742
100	0.098	0.170	0.053	0.107	0.050	0.004	0.996	0.755	0.457
200	0.087	0.092	0.041	0.092	0.001	0.008	0.779	0.882	0.491
Oblica									
conc. (μg/mL)	24 h	48 h	72 h	24 h	48 h	72 h	24 h	48 h	72 h
1	-	0.085	0.081	0.132	0.024	0.070	0.903	0.604	0.383
5	0.075	0.052	0.039	0.061	0.002	0.043	0.623	0.979	0.399
10	0.128	0.156	0.064	0.044	0.018	0.010	0.611	0.840	0.248
50	0.136	0.111	0.121	0.039	0.014	0.017	0.733	0.569	0.263
100	0.136	0.201	0.578	0.669	0.039	0.009	0.811	0.414	0.124
200	0.155	0.132	0.112	0.137	0.003	0.012	0.357	0.408	0.124

b)	MDA-MB-231			MCF-7			OVCAR-3		
Lastovka									
conc. (μg/mL)	24 h	48 h	72 h	24 h	48 h	72 h	24 h	48 h	72 h
1	0.048	0.008	0.014	0.020	0.046	0.013	0.364	0.607	0.535
5	0.043	0.001	0.026	0.417	0.004	0.006	0.287	0.498	0.462
10	0.035	0.004	0.012	0.080	0.251	0.003	0.303	0.770	0.738
50	0.027	0.010	0.084	0.388	0.240	0.029	0.405	0.970	0.904
100	0.224	0.011	0.027	0.073	0.154	0.033	0.566	0.612	0.362
200	0.016	0.000	0.000	0.003	0.004	0.001	0.579	0.475	0.720
Oblica									
conc. (μg/mL)	24 h	48 h	72 h	24 h	48 h	72 h	24 h	48 h	72 h
1	0.049	0.048	0.013	0.004	0072	0.492	0.957	0.881	0.943
5	0.121	0.005	0.003	0.483	0.137	0.142	0.934	0.882	0.646
10	0.153	0.008	0.004	0.827	0.018	0.011	0.762	0.702	0.561
50	0.252	0.003	0.023	0.299	0.061	0.111	0.562	0.579	0.485
100	0.055	0.001	0.000	0.135	0.002	0.003	0.421	0.417	0.304
200	0.010	0.000	0.000	0.006	0.003	0.002	0.473	0.696	0.235