

Effect of Fixation Methods on Biochemical Characteristics of Green Teas and Their Lipid-Lowering Effects in a Zebrafish Larvae Model

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Table S1. Volatile compounds in PGT and SGT.

ID	Name	Retention Index	CAS	Relative Content (%)	
				PGT	SGT
Alcohols					
1	(Z)-3-Hexen-1-ol	868	928-96-1	1.86 ± 0.07	2.26 ± 0.48
2	1-Hexanol	860	111-27-3	-	3.14 ± 0.12
3	5-Methyl-2-heptanol	915	54630-50-1	-	1.27 ± 0.17
4	1-Octen-3-ol	969	3391-86-4	0.83 ± 0.09	1.5 ± 0.1
5	Benzyl alcohol	1036	100-51-6	1.26 ± 0.36	-
6	Myrcenol	1064	543-39-5	1.32 ± 0.11	-
7	1-Octanol	1059	111-87-5	0.76 ± 0.1	1.16 ± 0.11
8	(E)-Linalool oxide (furan)	1164	34995-77-2	1.52 ± 0.22	0.62 ± 0.44
9	Linalool	1082	78-70-6	14.21 ± 0.86	23.7 ± 0.98
10	Phenylethyl Alcohol	1136	60-12-8	1.7 ± 0.15	0.47 ± 0.33
11	(S)-3,7-Dimethyl-1-octanol	1130	68680-98-8	0.1 ± 0.01	-
12	(Z)-3-Nonen-1-ol	1167	10340-23-5	0.1 ± 0	0.09 ± 0.07
13	1-Nonanol	1159	143-08-8	-	0.55 ± 0.06
14	trans-2-Pinanol	1088	4948-29-2	-	1.93 ± 0.18
15	(Z)-Nerol	1228	106-25-2	0.17 ± 0.02	0.26 ± 0.03
16	Geraniol	1228	106-24-1	8.37 ± 1.02	4.93 ± 0.19
17	Cedrenol	1586	28231-03-0	-	2.85 ± 0.28
Aldehydes					
18	Benzaldehyde	982	100-52-7	1.29 ± 0.28	1.58 ± 0.15
19	Nonanal	1104	124-19-6	1.25 ± 0.06	1.17 ± 0.39
20	Decanal	1204	112-31-2	0.55 ± 0.18	0.58 ± 0.08

21	β -Cyclocitral	1204	432-25-7	0.34 ± 0.02	0.48 ± 0.05
22	10-Undecenal	1293	112-45-8	0.18 ± 0.03	-
Hydrocarbons					
23	1,3,5,7-Cyclooctatetraene	888	629-20-9	6.53 ± 1.87	6.24 ± 2.93
24	Myrcene	958	123-35-3	5.3 ± 0.73	3.13 ± 2.22
25	4-Methyl-3-(1-methylethylidene)-cyclohexene	1023	99805-90-0	0.42 ± 0.3	0.46 ± 0.12
26	o-Cymene	1042	527-84-4	0.44 ± 0.07	0.35 ± 0.1
27	D-Limonene	1018	5989-27-5	9.33 ± 3.16	10.91 ± 3.86
28	(E)- β -Ocimene	976	3779-61-1	0.6 ± 0.08	0.46 ± 0.1
29	(Z)- β -Ocimene	976	3338-55-4	0.9 ± 0.2	0.82 ± 0.13
30	γ -Limonene	1013	499-97-8	0.71 ± 0.08	0.87 ± 0.24
31	Terpinolene	1052	586-62-9	0.39 ± 0.06	0.69 ± 0.6
32	1-Undecene	1105	821-95-4	0.3 ± 0.07	-
33	(Z)-4-Undecene	1123	821-98-7	0.45 ± 0.05	-
34	Azulene	1069	275-51-4	-	3.65 ± 0.43
35	Dodecane	1214	112-40-3	0.66 ± 0.19	0.74 ± 0.15
36	Benzocycloheptatriene	1251	264-09-5	0.29 ± 0.04	0.65 ± 0.08
37	1-Tetradecene	1403	1120-36-1	-	0.19 ± 0.02
38	Tetradecane	1413	629-59-4	0.71 ± 0.1	1.09 ± 0.11
39	Cedrene	1398	11028-42-5	0.28 ± 0.03	0.96 ± 0.09
40	Acenaphthylene	1460	208-96-8	0.08 ± 0.01	2.03 ± 0.24
41	Acenaphthene	1478	83-32-9	1.81 ± 0.12	-
42	Pentadecane	1512	629-62-9	0.89 ± 0.5	0.45 ± 0.08
43	β -Bisabolene	1500	495-61-4	1.04 ± 0.29	-
44	cis,cis-5,9-Tetradecadiene	1429	51255-62-0	0.46 ± 0.09	0.56 ± 0.03

45	Germacrene D	1515	23986-74-5	0.38 ± 0.05	0.25 ± 0.03
46	1-(o-Ethylphenyl)-1-phenyl-ethane	1715	18908-70-8	0.18 ± 0.02	0.31 ± 0.05
47	7-Methyl-heptadecane	1746	20959-33-5	0.81 ± 0.06	0.19 ± 0.03
48	Anthracene	1782	120-12-7	1.7 ± 0.11	0.4 ± 0.06
Ketones					
49	2-Methyloctan-3-one	988	923-28-4	-	1.21 ± 0.36
50	Acetophenone	1029	98-86-2	0.13 ± 0.04	-
51	3,5-Octadien-2-one	968	38284-27-4	-	0.85 ± 0.18
52	Nona-3,5-dien-2-one	1068	80387-31-1	0.1 ± 0.03	0.55 ± 0.15
53	(<i>R,S</i>)-5-Ethyl-6-methyl-3E-hepten-2-one	1031	57283-79-1	0.39 ± 0.02	0.35 ± 0.01
54	Jasmone	1338	488-10-8	2.14 ± 0.18	0.91 ± 0.06
55	6,10-Dimethyl-5,9-undecadien-2-one	1420	689-67-8	0.89 ± 0.14	0.94 ± 0.02
56	(<i>E</i>)- β -Ionone	1457	79-77-6	0.34 ± 0.02	0.54 ± 0.05
57	2-Heptadecanone	1847	2922-51-2	0.14 ± 0.01	0.08 ± 0.02
58	Phytol	2045	150-86-7	0.85 ± 0.25	-
Esters					
59	Pentyl acetate	884	628-63-7	-	0.33 ± 0.24
60	Ethyl hexanoate	984	123-66-0	3.01 ± 0.49	0.28 ± 0.1
61	cis-3-Hexenyl Acetate	992	3681-71-8	1.65 ± 0.03	-
62	Hexyl acetate	984	142-92-7	0.64 ± 0.4	0.99 ± 0.35
63	2-Ethylhexyl acetate	1118	103-09-3	0.22 ± 0.02	0.21 ± 0.03
64	(<i>E</i>)-3-hexen-1-yl butyrate	1191	53398-84-8	1.13 ± 0.13	0.72 ± 0.02
65	ethyl (<i>Z</i>)-4-octenoate	1191	34495-71-1	0.67 ± 0.1	-
66	Methyl salicylate	1281	119-36-8	-	0.55 ± 0.02
67	Butyl hexanoate	1183	626-82-4	1.83 ± 0.25	-
68	<i>trans</i> -2-Hexenyl butyrate	1191	53398-83-7	0.11 ± 0.02	0.45 ± 0.07

69	Ethyl caprylate	1183	106-32-1	4.39 ± 0.82	-
70	2-Ethylhexyl acrylate	1208	103-11-7	1.22 ± 0.25	1.46 ± 0.13
71	<i>cis</i> -3-Hexenyl- α -methylbutyrate	1226	53398-85-9	0.21 ± 0.03	0.26 ± 0
72	Hexyl 2-methylbutyrate	1218	10032-15-2	0.58 ± 0.09	1.2 ± 0.12
73	(2-Methyl-5-oxooxolan-2-yl) acetate	1226	57681-51-3	0.04 ± 0.01	0.27 ± 0.04
74	Ethyl nonylate	1282	123-29-5	0.16 ± 0	-
75	Methyl geranate	1252	2349-14-6	-	0.43 ± 0.03
76	β -Terpinyl acetate	1348	10198-23-9	-	0.28 ± 0.01
77	(<i>Z</i>)-3-hexen-1-yl caproate	1389	31501-11-8	1.69 ± 0.17	0.53 ± 0.02
78	Hexyl hexanoate	1381	6378-65-0	0.49 ± 0.06	0.65 ± 0.02
79	Ethyl caprate	1381	110-38-3	0.36 ± 0.09	-
80	2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	1605	6846-50-0	0.64 ± 0.15	0.58 ± 0.06
81	Heptafluorobutyric acid hexadecyl ester	1733	6385-15-5	0.18 ± 0.06	-
82	Ethyl tetradecanoate	1779	124-06-1	0.22 ± 0.05	-
83	Isopropyl myristate	1814	110-27-0	0.55 ± 0.39	-
84	Monobutyl Phthalate	1828	131-70-4	0.36 ± 0.09	-
85	Butyl isobutyl phthalate	1973	17851-53-5	0.52 ± 0.16	0.06 ± 0.02
86	Ethyl palmitate	1978	628-97-7	1.78 ± 0.58	-
Others					
87	Phthalan	1036	496-14-0	0.39 ± 0.1	1 ± 0.04
88	Tea pyrrole	1054	2167-14-8	0.37 ± 0.01	-
89	Dibenzofuran	1483	132-64-9	0.8 ± 0.14	0.39 ± 0.07
90	Nonanoic acid	1272	112-05-0	0.2 ± 0.04	-
91	9-Hexadecenoic acid	1976	2091-29-4	0.16 ± 0.07	-

PGT, pan-fired green tea; SGT, steamed green tea.

Table S2. VIP values in OPLS-DA model and *p* values of volatiles compounds.

ID	Name	VIP value	<i>P</i> value
9	Linalool	5.903	0.001
27	D-Limonene	2.870	0.679
69	Ethyl caprylate	2.724	0.002
34	Azulene	2.274	0.000
16	Geraniol	2.137	0.009
2	1-Hexanol	1.942	0.000
17	Cedrenol	1.771	0.005
60	Ethyl hexanoate	1.698	0.013
24	Myrcene	1.687	0.259
40	Acenaphthylene	1.217	0.007
14	trans-2-Pinanol	1.203	0.004
23	1,3,5,7-Cyclooctatetraene	1.199	0.916
67	Butyl hexanoate	1.137	0.000
41	Acenaphthene	1.120	0.002
86	Ethyl palmitate	1.109	0.049
61	cis-3-Hexenyl Acetate	1.026	0.000
6	Myrcenol	0.815	0.004
48	Anthracene	0.804	0.000
3	5-Methyl-2-heptanol	0.794	0.009
5	Benzyl alcohol	0.790	0.039
54	Jasmone	0.763	0.001
49	2-Methyloctan-3-one	0.759	0.041
10	Phenylethyl Alcohol	0.756	0.009
77	(Z)-3-hexen-1-yl caproate	0.720	0.010
43	β-Bisabolene	0.646	0.036
8	(E)-Linalool oxide (furan)	0.545	0.061
58	Phytol	0.530	0.040
51	3,5-Octadien-2-one	0.526	0.002
39	Cedrene	0.421	0.001
4	1-Octen-3-ol	0.419	0.002
65	ethyl (Z)-4-octenoate	0.414	0.001
72	Hexyl 2-methylbutyrate	0.388	0.004
47	7-Methyl-heptadecane	0.383	0.000
87	Phthalan	0.379	0.001
83	Isopropyl myristate	0.350	0.183
13	1-Nonanol	0.341	0.000
66	Methyl salicylate	0.338	0.001
42	Pentadecane	0.293	0.338
85	Butyl isobutyl phthalate	0.287	0.052
52	Nona-3,5-dien-2-one	0.284	0.044
33	(Z)-4-Undecene	0.282	0.007
31	Terpinolene	0.274	0.515
75	Methyl geranate	0.268	0.000

7	1-Octanol	0.260	0.018
62	Hexyl acetate	0.258	0.411
64	(E)-3-hexen-1-yl butyrate	0.255	0.010
89	Dibenzofuran	0.254	0.020
59	Pentyl acetate	0.241	0.188
1	(Z)-3-Hexen-1-ol	0.239	0.309
38	Tetradecane	0.234	0.021
88	Tea pyrrole	0.227	0.001
36	Benzocycloheptatriene	0.227	0.005
79	Ethyl caprate	0.224	0.028
84	Monobutyl Phthalate	0.220	0.030
68	trans-2-Hexenyl butyrate	0.215	0.018
18	Benzaldehyde	0.186	0.273
32	1-Undecene	0.184	0.029
76	β -Terpinyl acetate	0.170	0.000
70	2-Ethylhexyl acrylate	0.149	0.289
73	(2-Methyl-5-oxooxolan-2-yl) acetate	0.146	0.013
30	γ -Limonene	0.146	0.410
19	Nonanal	0.143	0.818
82	Ethyl tetradecanoate	0.139	0.003
56	(E)- β -Ionone	0.125	0.008
90	Nonanoic acid	0.122	0.020
37	1-Tetradecene	0.115	0.000
81	Heptafluorobutyric acid hexadecyl ester	0.112	0.045
22	10-Undecenal	0.111	0.001
91	9-Hexadecenoic acid	0.103	0.037
78	Hexyl hexanoate	0.099	0.026
74	Ethyl nonylate	0.097	0.000
28	(E)- β -Ocimene	0.089	0.226
21	β -Cyclocitral	0.087	0.030
46	1-(o-Ethylphenyl)-1-phenyl-ethane	0.083	0.023
45	Germacrene D	0.079	0.045
50	Acetophenone	0.078	0.047
26	o-Cymene	0.076	0.317
25	4-Methyl-3-(1-methylethylidene)-cyclohexene	0.073	0.889
44	cis,cis-5,9-Tetradecadiene	0.068	0.201
11	(S)-3,7-Dimethyl-1-octanol	0.061	0.009
35	Dodecane	0.055	0.662
15	(Z)-Nerol	0.053	0.023
29	(Z)- β -Ocimene	0.053	0.631
80	2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	0.048	0.599
55	6,10-Dimethyl-5,9-undecadien-2-one	0.044	0.602
57	2-Heptadecanone	0.038	0.018
71	cis-3-Hexenyl- α -methylbutyrate	0.033	0.093

53	(R,S)-5-Ethyl-6-methyl-3E-hepten-2-one	0.026	0.063
20	Decanal	0.023	0.871
63	2-Ethylhexyl acetate	0.006	0.820
12	(Z)-3-Nonen-1-ol	0.001	0.927

Table S3. Contents of chemical compounds in PGT and SGT.

Compounds	Contents (mg/g)	
	PGT	SGT
ECG	27.97 ± 0.27	34.77 ± 0.23
EGC	11.75 ± 0.16	25.41 ± 0.13
C	11.18 ± 0.48	1.62 ± 0.01
EGCG	56.58 ± 0.07	72.03 ± 1.97
EC	3.86 ± 0.14	5.85 ± 0.17
Catechins	111.36 ± 0.67	139.68 ± 1.68
GA	12.23 ± 0.16	16.11 ± 0.12
Theophylline	5.89 ± 0.1	6.15 ± 0.36
Caffeine	30.97 ± 0.16	32.46 ± 0.78
Theobromine	0.88 ± 0.01	1.07 ± 0.01
Alkaloids	37.74 ± 0.26	39.68 ± 1.09
Threonine	0.54 ± 0	0.62 ± 0.01
Valine	0.88 ± 0.05	1.38 ± 0.04
Isoleucine	0.47 ± 0	0.64 ± 0.01
Leucine	0.85 ± 0	0.82 ± 0.02
Phenylalanine	0.8 ± 0.01	1.44 ± 0.04
Tryptophan	0.41 ± 0.01	0.51 ± 0.01
Lysine	0.61 ± 0.02	0.26 ± 0
Aspartate	2.84 ± 0.09	1.54 ± 0.03
Serine	1.05 ± 0.01	0.97 ± 0.01
Asparagine	1.82 ± 0.02	4.9 ± 0.08
Glutamate	1.81 ± 0.2	3.69 ± 0.07
Alanine	0.55 ± 0	0.49 ± 0.01
Tyrosine	0.46 ± 0	0.59 ± 0.02
Arginine	4.19 ± 0.15	0.98 ± 0.03
Histidine	0.66 ± 0	0.4 ± 0.02
Theanine	23.14 ± 0.79	14.4 ± 0.35
GABA	0.38 ± 0	0.17 ± 0.01
TEAA	4.56 ± 0.07	5.67 ± 0.12
TNAA	13.38 ± 0.43	13.56 ± 0.23
TAA	41.47 ± 1.25	33.79 ± 0.68
Umami AA	29.61 ± 1.04	24.53 ± 0.49
Sweet AA	2.15 ± 0.02	2.08 ± 0.03
Bitter AA	8.67 ± 0.19	6.61 ± 0.16
Astrengent AA	0.38 ± 0	0.17 ± 0.01

AAs, amino acids; TEAA, total essential amino acids; TNEAA, total non-essential amino acids;
TAA, total amino acids.

Table S4. VIP values in OPLS-DA model and *p* values of chemical compounds.

ID	Compounds	VIP value	<i>P</i> value
74	Ethyl nonylate	1.135	0.000
61	cis-3-Hexenyl Acetate	1.135	0.000
93	EGC	1.135	0.000
76	β-Terpinyl acetate	1.135	0.000
110	Asparagine	1.134	0.000
117	GABA	1.134	0.000
88	Tea pyrrole	1.134	0.001
66	Methyl salicylate	1.133	0.001
2	1-Hexanol	1.133	0.000
94	C	1.133	0.001
92	ECG	1.133	0.000
97	GA	1.133	0.000
114	Arginine	1.132	0.000
105	Phenylalanine	1.132	0.000
107	Lysine	1.132	0.002
115	Histidine	1.131	0.000
100	Theobromine	1.130	0.000
108	Aspartate	1.130	0.000
103	Isoleucine	1.130	0.000
41	Acenaphthene	1.130	0.002
75	Methyl geranate	1.130	0.000
14	trans-2-Pinanol	1.128	0.004
17	Cedrenol	1.127	0.005
6	Myrcenol	1.127	0.004
96	EC	1.125	0.000
116	Theanine	1.124	0.000
48	Anthracene	1.124	0.000
13	1-Nonanol	1.123	0.000
111	Glutamate	1.122	0.000
33	(Z)-4-Undecene	1.122	0.007
102	Valine	1.122	0.000
47	7-Methyl-heptadecane	1.121	0.000
40	Acenaphthylene	1.121	0.007
34	Azulene	1.121	0.000
67	Butyl hexanoate	1.119	0.000
11	(S)-3,7-Dimethyl-1-octanol	1.118	0.009
22	10-Undecenal	1.117	0.001
113	Tyrosine	1.116	0.001
3	5-Methyl-2-heptanol	1.116	0.009
95	EGCG	1.116	0.000
37	1-Tetradecene	1.116	0.000
77	(Z)-3-hexen-1-yl caproate	1.116	0.010
39	Cedrene	1.115	0.001

65	ethyl (Z)-4-octenoate	1.115	0.001
9	Linalool	1.114	0.001
101	Threonine	1.114	0.001
54	Jasmone	1.112	0.001
106	Tryptophan	1.108	0.001
112	Alanine	1.108	0.001
69	Ethyl caprylate	1.105	0.002
60	Ethyl hexanoate	1.104	0.013
73	(2-Methyl-5-oxooxolan-2-yl) acetate	1.104	0.013
87	Phthalan	1.103	0.001
90	Nonanoic acid	1.101	0.020
51	3,5-Octadien-2-one	1.098	0.002
4	1-Octen-3-ol	1.097	0.002
82	Ethyl tetradecanoate	1.094	0.003
68	trans-2-Hexenyl butyrate	1.092	0.018
32	1-Undecene	1.087	0.029
84	Monobutyl Phthalate	1.086	0.030
79	Ethyl caprate	1.079	0.028
109	Serine	1.078	0.004
43	β -Bisabolene	1.077	0.036
72	Hexyl 2-methylbutyrate	1.073	0.004
36	Benzocycloheptatriene	1.073	0.005
5	Benzyl alcohol	1.072	0.039
58	Phytol	1.070	0.040
10	Phenylethyl Alcohol	1.066	0.009
50	Acetophenone	1.059	0.047
16	Geraniol	1.056	0.009
81	Heptafluorobutyric acid hexadecyl ester	1.054	0.045
64	(E)-3-hexen-1-yl butyrate	1.054	0.010
56	(E)- β -Ionone	1.052	0.008
49	2-Methyloctan-3-one	1.051	0.041
7	1-Octanol	1.048	0.018
86	Ethyl palmitate	1.043	0.049
52	Nona-3,5-dien-2-one	1.040	0.044
85	Butyl isobutyl phthalate	1.040	0.052
57	2-Heptadecanone	1.019	0.018
38	Tetradecane	0.998	0.021
89	Dibenzofuran	0.998	0.020
15	(Z)-Nerol	0.998	0.023
46	1-(o-Ethylphenyl)-1-phenyl-ethane	0.995	0.023
78	Hexyl hexanoate	0.991	0.026
91	9-Hexadecenoic acid	0.980	0.037
104	Leucine	0.978	0.033
21	β -Cyclocitral	0.974	0.030
45	Germacrene D	0.936	0.045
8	(E)-Linalool oxide (furan)	0.924	0.061

99	Caffeine	0.909	0.057
53	(R,S)-5-Ethyl-6-methyl-3E-hepten-2-one	0.905	0.063
71	cis-3-Hexenyl- α -methylbutyrate	0.903	0.093
59	Pentyl acetate	0.883	0.188
83	Isopropyl myristate	0.830	0.183
24	Myrcene	0.741	0.259
44	cis,cis-5,9-Tetradecadiene	0.734	0.201
42	Pentadecane	0.729	0.338
26	o-Cymene	0.723	0.317
18	Benzaldehyde	0.696	0.273
62	Hexyl acetate	0.693	0.411
28	(E)- β -Ocimene	0.676	0.226
27	D-Limonene	0.665	0.679
98	Theophylline	0.630	0.377
1	(Z)-3-Hexen-1-ol	0.619	0.309
70	2-Ethylhexyl acrylate	0.604	0.289
55	6,10-Dimethyl-5,9-undecadien-2-one	0.588	0.602
30	γ -Limonene	0.577	0.410
31	Terpinolene	0.564	0.515
20	Decanal	0.452	0.871
23	1,3,5,7-Cyclooctatetraene	0.441	0.916
29	(Z)- β -Ocimene	0.374	0.631
80	2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	0.324	0.599
19	Nonanal	0.299	0.818
35	Dodecane	0.269	0.662
12	(Z)-3-Nonen-1-ol	0.167	0.927
63	2-Ethylhexyl acetate	0.138	0.820
25	4-Methyl-3-(1-methylethylidene)-cyclohexene	0.118	0.889
