

## Article

# Chemical Composition, Antifungal and Anti-biofilm Activities of Volatile Fractions of *Convolvulus althaeoides* L. Roots from Tunisia

Soukaina Hrichi <sup>1</sup>, Raja Chaâbane-Banaoues <sup>2</sup>, Filippo Alibrando <sup>3</sup>, Ammar B. Altemimi <sup>4,5</sup>, Oussama Babba <sup>2</sup>, Yassine Oulad El Majdoub <sup>6</sup>, Habib Nasri <sup>1</sup>, Luigi Mondello <sup>3,6,7</sup>, Hamouda Babba <sup>2</sup>, Zine Mighri <sup>1</sup> and Francesco Cacciola <sup>8,\*</sup>

<sup>1</sup> Laboratory of Physico-Chemistry of Materials, Faculty of Sciences of Monastir, University of Monastir, 5000 Monastir, Tunisia

<sup>2</sup> Laboratory of Parasitology and Mycology (LP3M), Department of Clinical Biology, Faculty of Pharmacy of Monastir, University of Monastir, 5000 Monastir, Tunisia

<sup>3</sup> Chromaleont s.r.l., c/o Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, 98122 Messina, Italy

<sup>4</sup> Department of Food Science, College of Agriculture, University of Basrah, 61004 Basraq, Iraq

<sup>5</sup> College of Medicine, University of Warith Al-Anbiyaa, Karbala 56001, Iraq

<sup>6</sup> Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, 98122 Messina, Italy

<sup>7</sup> Department of Sciences and Technologies for Human and Environment, University Campus Bio-Medico of Rome, 00128 Rome, Italy

<sup>8</sup> Department of Biomedical, Dental, Morphological and Functional Imaging Sciences, University of Messina, 98122 Messina, Italy

\* Correspondence: cacciola@unime.it

**Table S1.** List of volatile compounds detected in the hexane fraction (VF1) of *C. althaeoides* L. roots by GC-MS.

N. Peak	Compound	Area%	LRI (lib)	LRI (exp)	Library	Compound Class	Formula
1	Hexan-3-ol	0.03	795	799	FFNSC 4.0	Alcohol	C <sub>6</sub> H <sub>14</sub> O
2	<i>n</i> -Hexanal	0.07	801	802	FFNSC 4.0	Aldehyde	C <sub>6</sub> H <sub>12</sub> O
3	Benzaldehyde	0.07	960	963	FFNSC 4.0	Aldehyde	C <sub>7</sub> H <sub>6</sub> O
4	1-Octen-3-ol	0.21	978	979	FFNSC 4.0	Alcohol	C <sub>8</sub> H <sub>16</sub> O
5	<i>n</i> -Octanal	0.02	1006	1004	FFNSC 4.0	Aldehyde	C <sub>8</sub> H <sub>16</sub> O
6	2-Ethylhexanol	0.17	1030	1029	FFNSC 4.0	Alcohol	C <sub>8</sub> H <sub>18</sub> O
7	Benzyl alcohol	0.17	1040	1037	FFNSC 4.0	Alcohol	C <sub>7</sub> H <sub>8</sub> O
8	( <i>E</i> )-Linalool oxide	0.06	1086	1087	FFNSC 4.0	Oxygenated monoterpene	C <sub>10</sub> H <sub>18</sub> O <sub>2</sub>
9	Guaiacol	0.05	1104	1089	FFNSC 4.0	Alcohol	C <sub>7</sub> H <sub>8</sub> O <sub>2</sub>
10	Linalyl anthranilate	0.23	1104	1101	FFNSC 4.0	Ester	C <sub>17</sub> H <sub>23</sub> NO <sub>2</sub>
11	<i>n</i> -Nonanal	0.14	1107	1105	FFNSC 4.0	Aldehyde	C <sub>9</sub> H <sub>18</sub> O
12	Phenethyl alcohol	0.11	1113	1115	FFNSC 4.0	Alcohol	C <sub>8</sub> H <sub>10</sub> O
13	Dodec-1-ene	0.2	1191	1191	FFNSC 4.0	Alkene	C <sub>12</sub> H <sub>24</sub>
14	$\alpha$ -Terpineol	0.17	1195	1197	FFNSC 4.0	Oxygenated monoterpene	C <sub>10</sub> H <sub>18</sub> O
15	Myrtenol	0.93	1202	1198	FFNSC 4.0	Oxygenated monoterpene	C <sub>10</sub> H <sub>16</sub> O
16	<i>n</i> -Decanal	0.12	1208	1207	FFNSC 4.0	Aldehyde	C <sub>10</sub> H <sub>20</sub> O
17	Cuminaldehyde	0.79	1243	1245	FFNSC 4.0	Oxygenated monoterpene	C <sub>10</sub> H <sub>12</sub> O

18	Carvone	1.77	1246	1246	FFNSC 4.0	Oxygenated monoterpene	C <sub>10</sub> H <sub>14</sub> O
19	Geraniol	0.13	1255	1253	FFNSC 4.0	Oxygenated monoterpene	C <sub>10</sub> H <sub>18</sub> O
20	4-Vinylguaiaicol	12.2	1309	1315	FFNSC 4.0	Alcohol	C <sub>9</sub> H <sub>10</sub> O <sub>2</sub>
21	Methyl 4-formylbenzoate	1.03	-	1370	W11N17	Ester	C <sub>9</sub> H <sub>8</sub> O <sub>3</sub>
22	Butyl benzoate	0.19	1376	1375	FFNSC 4.0	Ester	C <sub>11</sub> H <sub>14</sub> O <sub>2</sub>
23	(E), β-Damascenone	0.13	1379	1380	FFNSC 4.0	Apocarotene	C <sub>13</sub> H <sub>18</sub> O
24	Tetradec-1-ene	0.9	1379	1391	FFNSC 4.0	Alkene	C <sub>14</sub> H <sub>28</sub>
25	n-Tetradecane	0.32	1400	1400	FFNSC 4.0	Alkane	C <sub>14</sub> H <sub>30</sub>
26	α-Methoxynaphthalene	1.52	1450	1453	FFNSC 4.0	Alkene	C <sub>11</sub> H <sub>10</sub> O
27	n-Pentadecane	0.22	1500	1499	FFNSC 4.0	Alkane	C <sub>15</sub> H <sub>32</sub>
28	2,4-Bis(1,1-dimethylethyl)-phenol	1.47	-	1509	W11N17	Alcohol	C <sub>14</sub> H <sub>22</sub> O
29	3-Nonyl-tiglate	0.27	1504	1514	FFNSC 4.0	Ester	C <sub>14</sub> H <sub>26</sub> O <sub>2</sub>
30	2-[[[4-(4-hydroxy-4-methylpentyl)-, 3-cyclohexen-1-yl]methylene]amino]-, Methyl-benzoate	0.89	1589	1590	FFNSC 4.0	Ester	C <sub>21</sub> H <sub>29</sub> NO <sub>3</sub>
31	n-Hexadecene	1.1	1593	1592	FFNSC 4.0	Alkene	C <sub>16</sub> H <sub>32</sub>
32	n-Hexadecane	0.21	1600	1599	FFNSC 4.0	Alkane	C <sub>16</sub> H <sub>34</sub>
33	Benzophenone	0.32	1627	1631	FFNSC 4.0	Apocarotene	C <sub>13</sub> H <sub>10</sub> O
34	Hedione	0.19	1650	1652	FFNSC 4.0	Apocarotene	C <sub>13</sub> H <sub>22</sub> O <sub>3</sub>
35	Cadalene	0.11	1677	1676	FFNSC 4.0	Sesquiterpene hydrocarbon	C <sub>15</sub> H <sub>18</sub>
36	n-Heptadecane	0.13	1700	1699	FFNSC 4.0	Alkane	C <sub>17</sub> H <sub>36</sub>
37	Pentadecanal	0.15	-	1715	W11N17	Aldehyde	C <sub>15</sub> H <sub>30</sub> O
38	n-Pentadecanol	0.17	1782	1786	FFNSC 4.0	Alcohol	C <sub>15</sub> H <sub>32</sub> O
39	Octadec-1-ene	1.03	1793	1792	FFNSC 4.0	Alkene	C <sub>18</sub> H <sub>36</sub>
40	n-Octadecane	0.27	1800	1799	FFNSC 4.0	Alkane	C <sub>18</sub> H <sub>38</sub>
41	Phytone	0.32	1841	1841	FFNSC 4.0	Ketone	C <sub>18</sub> H <sub>36</sub> O
42	diisobutyl phthalate	1.55	1858	1860	FFNSC 4.0	Ester	C <sub>16</sub> H <sub>22</sub> O <sub>4</sub>
43	Pentadecylic acid	0.42	1869	1870	FFNSC 4.0	Oxygenated sesquiterpene	C <sub>15</sub> H <sub>30</sub> O <sub>2</sub>
44	n-Hexadecanol	0.36	1884	1884	FFNSC 4.0	Alcohol	C <sub>16</sub> H <sub>34</sub> O
45	n-Nonadecane	0.28	1900	1899	FFNSC 4.0	Alkane	C <sub>19</sub> H <sub>40</sub>
46	7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione	0.65	-	1905	W11N17	Apocarotene	C <sub>17</sub> H <sub>24</sub> O <sub>3</sub>
47	Methyl hexadecanoate	0.51	1925	1925	FFNSC 4.0	Fatty acid	C <sub>17</sub> H <sub>34</sub> O <sub>2</sub>
48	n-Hexadecanoic acid	29.77	1977	1983	FFNSC 4.0	Fatty acid	C <sub>16</sub> H <sub>32</sub> O <sub>2</sub>
49	n-Eicosene	3.98	1994	1993	FFNSC 4.0	Alkene	C <sub>20</sub> H <sub>40</sub>
50	n-Eicosane	2.11	2000	1999	FFNSC 4.0	Alkane	C <sub>20</sub> H <sub>42</sub>
51	n-Octadecanol	2.89	2081	2087	FFNSC 4.0	Alcohol	C <sub>18</sub> H <sub>38</sub> O
52	5-dodecyldihydro-2(3H)-furanone	0.52	-	2104	W11N17	Ketone	C <sub>16</sub> H <sub>30</sub> O <sub>2</sub>
53	Ethyl linoleate	1.75	2164	2160	FFNSC 4.0	Fatty acid	C <sub>20</sub> H <sub>36</sub> O <sub>2</sub>
54	Ethyl linolenate	1.47	2165	2166	FFNSC 4.0	Fatty acid	C <sub>20</sub> H <sub>34</sub> O <sub>2</sub>
55	n-Docosane	0.4	2200	2199	FFNSC 4.0	Alkane	C <sub>22</sub> H <sub>46</sub>
56	n-Tricosane	0.81	2300	2299	FFNSC 4.0	Alkane	C <sub>23</sub> H <sub>48</sub>

57	Bis(2-ethylhexyl)-adipate	9.69	2392	2391	FFNSC 4.0	Ester	C <sub>22</sub> H <sub>42</sub> O <sub>4</sub>
58	<i>n</i> -Tetracosane	1.23	2400	2399	FFNSC 4.0	Alkane	C <sub>24</sub> H <sub>50</sub>
59	<i>n</i> -Pentacosane	1.59	2500	2499	FFNSC 4.0	Alkane	C <sub>25</sub> H <sub>52</sub>
60	Bis(2-ethylhexyl)-phthalate	0.69	2531	2532	FFNSC 4.0	Ester	C <sub>24</sub> H <sub>38</sub> O <sub>4</sub>
61	2-Methylpentacosane	0.11	-	2561	W11N17	Alkane	C <sub>26</sub> H <sub>54</sub>
62	<i>n</i> -Hexacosane	1.77	2600	2598	FFNSC 4.0	Alkane	C <sub>26</sub> H <sub>54</sub>
63	2-Methylhexacosane	0.1	-	2671	W11N17	Alkane	C <sub>27</sub> H <sub>56</sub>
64	<i>n</i> -Heptacosane	1.64	2700	2699	FFNSC 4.0	Alkane	C <sub>27</sub> H <sub>56</sub>
65	2-Methylheptacosane	0.06	-	2771	W11N17	Alkane	C <sub>28</sub> H <sub>58</sub>
66	<i>n</i> -Octacosane	1.37	2800	2798	FFNSC 4.0	Alkane	C <sub>28</sub> H <sub>58</sub>
67	Squalene	0.28	2810	2811	FFNSC 4.0	Triterpene	C <sub>30</sub> H <sub>50</sub>
68	<i>n</i> -Nonacosane	1.12	900	2898	FFNSC 4.0	Alkane	C <sub>29</sub> H <sub>60</sub>
69	<i>n</i> -Triacontane	0.69	3000	2998	FFNSC 4.0	Alkane	C <sub>30</sub> H <sub>62</sub>
70	<i>n</i> -Hentriacontane	0.47	3100	3098	FFNSC 4.0	Alkane	C <sub>31</sub> H <sub>64</sub>
71	<i>n</i> -Dotriacontane	0.31	3200	3199	FFNSC 4.0	Alkane	C <sub>32</sub> H <sub>66</sub>
72	<i>n</i> -Tritriacontane	0.12	3300	3298	FFNSC 4.0	Alkane	C <sub>33</sub> H <sub>68</sub>
73	3,5-bis(1,1-dimethylthyl)-4-hydroxy-, octadecyl ester	2.71	-	3596	W11N17	Carboxylic acid	C <sub>35</sub> H <sub>62</sub> O <sub>3</sub>

FFNSC: Flavor and Fragrance Natural and Synthetic Compounds; LRI: Linear Retention Indices; W11N17: Wiley11-Nist17.

**Table S2.** List of volatile compounds detected in the chloroform fraction (VF2) of *C. althaeoides* L. roots by GC-MS.

N. Peak	Compound	Area%	LRI (lib)	LRI (exp)	Library	Compound Class	Formula
1	1-Methyl- cyclopentanol	0.07	-	798	W11N17	Alcohol	C <sub>6</sub> H <sub>12</sub> O
2	Hexan-3-ol	0.07	795	799	FFNSC 4.0	Alcohol	C <sub>6</sub> H <sub>14</sub> O
3	Hexan-2-ol	0.91	802	812	FFNSC 4.0	Alcohol	C <sub>6</sub> H <sub>14</sub> O
4	Furfural	3.24	845	832	FFNSC 4.0	Aldehyde	C <sub>5</sub> H <sub>4</sub> O <sub>2</sub>
5	Furfuryl alcohol	0.3	849	852	FFNSC 4.0	Alcohol	C <sub>5</sub> H <sub>6</sub> O <sub>2</sub>
6	Hex-(3Z)-enol	0.37	853	852	FFNSC 4.0	Alcohol	C <sub>6</sub> H <sub>12</sub> O
7	<i>n</i> -Hexanol	0.23	867	866	FFNSC 4.0	Alcohol	C <sub>6</sub> H <sub>14</sub> O
8	2-acetyl-furan	0.1	913	911	FFNSC 4.0	Ketone	C <sub>6</sub> H <sub>8</sub> ClO <sub>2</sub>
9	β-Lutidine	1.29	955	955	FFNSC 4.0	Pyridine	C <sub>7</sub> H <sub>9</sub> N
10	5-Methyl furfural	0.21	960	961	FFNSC 4.0	Aldehyde	C <sub>6</sub> H <sub>6</sub> O <sub>2</sub>
11	Benzaldehyde	0.75	960	963	FFNSC 4.0	Aldehyde	C <sub>7</sub> H <sub>6</sub> O
12	3-Ethenylpyridine	2.43	-	966	W11N17	Pyridine	C <sub>7</sub> H <sub>7</sub> N
13	1-Octen-3-ol	0.1	978	980	FFNSC 4.0	Alcohol	C <sub>8</sub> H <sub>16</sub> O
14	2,4,6-Trimethylpyridine	0.16	986	990	FFNSC 4.0	Pyridine	C <sub>8</sub> H <sub>11</sub> N
15	<i>n</i> -Hexanoic acid	1.91	997	1004	FFNSC 4.0	Carboxylic acid	C <sub>6</sub> H <sub>12</sub> O <sub>2</sub>
16	2-Ethyl-hexanol	0.07	1030	1029	FFNSC 4.0	Hexanol	C <sub>6</sub> H <sub>14</sub> O <sub>2</sub>
17	Benzyl alcohol	7.86	1040	1037	FFNSC 4.0	Alcohol	C <sub>7</sub> H <sub>8</sub> O
18	Phenylacetaldehyde	0.1	1045	1045	FFNSC 4.0	Aldehyde	C <sub>8</sub> H <sub>8</sub> O
19	γ-Hexalactone	0.09	1060	1053	FFNSC 4.0	Ester	C <sub>6</sub> H <sub>10</sub> O <sub>2</sub>
20	<i>o</i> -Cresol	0.11	1051	1055	FFNSC 4.0	Alcohol	C <sub>7</sub> H <sub>8</sub> O
21	Diethyl malonate	0.19	1071	1068	FFNSC 4.0	Oxygenated monoter- pene	C <sub>10</sub> H <sub>16</sub> O <sub>5</sub>
22	(Z)-Linalool oxide	0.3	1069	1071	FFNSC 4.0	Oxygenated monoter- pene	C <sub>10</sub> H <sub>18</sub> O <sub>2</sub>
23	2-Methoxyphenol	1.27	-	1088	W11N17	Alcohol	C <sub>7</sub> H <sub>8</sub> O <sub>2</sub>
24	Linalyl anthranilate	0.16	1104	1101	FFNSC 4.0	Ester	C <sub>17</sub> H <sub>23</sub> NO <sub>2</sub>

25	<i>n</i> -Nonanal	0.22	1107	1106	FFNSC 4.0	Aldehyde	C <sub>9</sub> H <sub>18</sub> O
26	1-(3-Pyridinyl)-ethanone	0.07	-	1112	W11N17	Pyridine	C <sub>7</sub> H <sub>7</sub> NO
27	Phenethyl alcohol	2.07	1113	1115	FFNSC 4.0	Alcohol	C <sub>8</sub> H <sub>10</sub> O
28	Methyl nicotinate	0.81	1142	1140	FFNSC 4.0	Ester	C <sub>7</sub> H <sub>7</sub> NO <sub>2</sub>
29	Oxophorone	0.07	1148	1146	FFNSC 4.0	Ketone	C <sub>9</sub> H <sub>12</sub> O <sub>2</sub>
30	Benzyl acetate	0.06	-	1164	W11N17	Ester	C <sub>9</sub> H <sub>10</sub> O <sub>2</sub>
31	Dodec-1-ene	0.12	1191	1191	FFNSC 4.0	Alkene	C <sub>12</sub> H <sub>24</sub>
32	α-Terpineol	0.07	1195	1197	FFNSC 4.0	Oxygenated monoter- pene	C <sub>10</sub> H <sub>18</sub> O
33	Myrtenol	0.46	1202	1199	FFNSC 4.0	Oxygenated monoter- pene	C <sub>10</sub> H <sub>16</sub> O
34	<i>n</i> -Decanal	0.21	1208	1207	FFNSC 4.0	Aldehyde	C <sub>10</sub> H <sub>20</sub> O
35	4-Vinylphenol	0.98	1217	1223	FFNSC 4.0	Alcohol	C <sub>8</sub> H <sub>8</sub> O
36	Benzosulfonazole	0.08	1226	1227	FFNSC 4.0	-	C <sub>7</sub> H <sub>5</sub> NS
37	1-Azanaphthalene	0.11	1237	1240	FFNSC 4.0	Pyridine	C <sub>9</sub> H <sub>7</sub> N
38	Cuminaldehyde	0.23	1243	1244	FFNSC 4.0	Oxygenated monoter- pene	C <sub>10</sub> H <sub>12</sub> O
39	Carvone	0.68	1246	1246	FFNSC 4.0	Oxygenated monoter- pene	C <sub>10</sub> H <sub>14</sub> O
40	<i>p</i> -Anisaldehyde	0.14	1257	1258	FFNSC 4.0	Aldehyde	C <sub>8</sub> H <sub>8</sub> O <sub>2</sub>
41	Benzopyridine	1	1259	1263	FFNSC 4.0	Pyridine	C <sub>9</sub> H <sub>7</sub> N
42	<i>p</i> -Cymen-7-ol	0.23	1291	1295	FFNSC 4.0	Oxygenated monoter- pene	C <sub>10</sub> H <sub>14</sub> O
43	4-Vinylguaiaicol	2.87	1309	1314	FFNSC 4.0	Alcohol	C <sub>7</sub> H <sub>8</sub> O <sub>2</sub>
44	γ-Nonalactone	0.18	1362	1362	FFNSC 4.0	Ester	C <sub>9</sub> H <sub>16</sub> O <sub>2</sub>
45	Methyl 4-formylbenzoate	0.76	-	1370	W11N17	Ester	C <sub>9</sub> H <sub>8</sub> O <sub>3</sub>
46	Tetradec-1-ene	0.25	1392	1391	FFNSC 4.0	Alkene	C <sub>14</sub> H <sub>28</sub>
47	Vanillin	1.49	1394	1399	FFNSC 4.0	Aldehyde	C <sub>8</sub> H <sub>8</sub> O <sub>3</sub>
48	bis-1,1'-(1,3-phenylene) Ethanone	0.06	-	1434	W11N17	Ketone	C <sub>14</sub> H <sub>12</sub> O
49	5,6,7,7a-Tetrahydro- 4,4,7a-trimethyl-2(4H)- benzofuranone	0.07	-	1530	W11N17	Apocarotene	C <sub>11</sub> H <sub>16</sub> O <sub>2</sub>
50	2-[[[4-(4-hydroxy-4- methylpentyl)-, 3-cyclo- hexen-1-yl]meth- ylene]amino]-, Methyl- benzoate	0.27	1589	1589	FFNSC 4.0	Ester	C <sub>21</sub> H <sub>29</sub> NO <sub>3</sub>
51	<i>n</i> -Hexadecene	0.51	1593	1592	FFNSC 4.0	Alkene	C <sub>16</sub> H <sub>32</sub>
52	<i>n</i> -Hexadecane	0.17	1600	1599	FFNSC 4.0	Alkane	C <sub>16</sub> H <sub>34</sub>
53	5,7-diepi-alpha-eudesmol	0.1	1610	1608	FFNSC 4.0	Oxygenated sesquiter- pene	C <sub>15</sub> H <sub>26</sub> O
54	<i>n</i> -Tetradecanal	0.08	1614	1614	FFNSC 4.0	Alkane	C <sub>14</sub> H <sub>28</sub> O
55	Benzophenone	0.1	1627	1631	FFNSC 4.0	Apocarotene	C <sub>13</sub> H <sub>10</sub> O
56	1,6-dimethyl-4-(1-meth- ylethyl)-naphthalene	0.09	-	1675	W11N17	Sesquiterpene hydro- carbon	C <sub>15</sub> H <sub>18</sub>
57	<i>n</i> -Pentadecanal	0.15	-	1716	W11N17	Aldehyde	C <sub>15</sub> H <sub>30</sub> O
58	(E)-Coniferyl alcohol	0.64	1732	1741	FFNSC 4.0	Phenylpropanoid	C <sub>10</sub> H <sub>12</sub> O <sub>3</sub>
59	Octadec-1-ene	0.67	1793	1792	FFNSC 4.0	Alkene	C <sub>18</sub> H <sub>36</sub>

60	<i>n</i> -Octadecane	0.16	1800	1799	FFNSC 4.0	Alkane	C <sub>18</sub> H <sub>38</sub>
61	Phytone	0.36	1841	1841	FFNSC 4.0	Ketone	C <sub>18</sub> H <sub>36</sub> O
62	diisobutyl phthalate	0.63	1858	1860	FFNSC 4.0	Ester	C <sub>16</sub> H <sub>22</sub> O <sub>4</sub>
63	Pentadecylic acid	0.36	1869	1870	FFNSC 4.0	Oxygenated sesquiterpene	C <sub>15</sub> H <sub>30</sub> O <sub>2</sub>
64	<i>n</i> -Hexadecanol	0.2	1884	1883	FFNSC 4.0	Alcohol	C <sub>16</sub> H <sub>34</sub> O
65	Methyl hexadecanoate	0.43	1925	1936	FFNSC 4.0	Fatty acid	C <sub>17</sub> H <sub>34</sub> O <sub>2</sub>
66	<i>n</i> -Hexadecanoic acid	34.01	1977	1983	FFNSC 4.0	Fatty acid	C <sub>16</sub> H <sub>32</sub> O <sub>2</sub>
67	<i>n</i> -Octadecanol	3.53	2081	2087	FFNSC 4.0	Alcohol	C <sub>18</sub> H <sub>38</sub> O
68	5-Dodecyldihydro-2(3 <i>H</i> )-furanone	0.58	-	2104	W11N17	Ketone	C <sub>16</sub> H <sub>30</sub> O <sub>2</sub>
69	Linoleic acid	7.3	2144	2154	FFNSC 4.0	Fatty acid	C <sub>18</sub> H <sub>32</sub> O <sub>2</sub>
70	<i>n</i> -Docosane	2.43	2200	2199	FFNSC 4.0	Alkane	C <sub>22</sub> H <sub>46</sub>
71	<i>n</i> -Tricosane	0.52	2300	2299	FFNSC 4.0	Alkane	C <sub>23</sub> H <sub>48</sub>
72	Bis(2-ethylhexyl)-adipate	3.57	2392	2390	FFNSC 4.0	Ester	C <sub>22</sub> H <sub>42</sub> O <sub>4</sub>
73	<i>n</i> -Tetracosane	0.35	2400	2399	FFNSC 4.0	Alkane	C <sub>24</sub> H <sub>50</sub>
74	<i>n</i> -Pentacosane	1.47	2500	2499	FFNSC 4.0	Alkane	C <sub>25</sub> H <sub>52</sub>
75	Bis(2-ethylhexyl)-phthalate	0.79	2531	2532	FFNSC 4.0	Ester	C <sub>24</sub> H <sub>38</sub> O <sub>4</sub>
76	Benzyl hexadecenoate	0.33	-	2578	W11N17	Ester	C <sub>23</sub> H <sub>38</sub> O <sub>2</sub>
77	<i>n</i> -Hexacosane	0.43	2600	2598	FFNSC 4.0	Alkane	C <sub>26</sub> H <sub>54</sub>
78	<i>n</i> -Heptacosane	0.78	2700	2699	FFNSC 4.0	Alkane	C <sub>27</sub> H <sub>56</sub>
79	<i>n</i> -Octacosane	0.61	2800	2799	FFNSC 4.0	Alkane	C <sub>28</sub> H <sub>58</sub>
80	Squalene	0.34	2810	2811	FFNSC 4.0	Triterpene	C <sub>30</sub> H <sub>50</sub>
81	<i>n</i> -Nonacosane	0.56	2900	2899	FFNSC 4.0	Alkane	C <sub>29</sub> H <sub>60</sub>
82	<i>n</i> -Triacontane	0.34	3000	2998	FFNSC 4.0	Alkane	C <sub>30</sub> H <sub>62</sub>
83	<i>n</i> -Hentriacontane	0.3	3100	3098	FFNSC 4.0	Alkane	C <sub>31</sub> H <sub>64</sub>
84	<i>n</i> -Dotriacontane	0.18	3200	3199	FFNSC 4.0	Alkane	C <sub>32</sub> H <sub>66</sub>
85	<i>n</i> -Tritriacontane	0.13	3300	3299	FFNSC 4.0	Alkane	C <sub>33</sub> H <sub>68</sub>
86	3,5-bis(1,1-dimethylthyl)-4-hydroxy-, octadecyl ester	0.95	-	3595	W11N17	Carboxylic acid	C <sub>35</sub> H <sub>62</sub> O <sub>3</sub>

FFNSC: Flavor and Fragrance Natural and Synthetic Compounds; LRI: Linear Retention Indices; W11N17: Wiley11-Nist17.