

Investigation on Pyrolysis of Low Lipid Microalgae *Chlorella vulgaris* and *Dunaliella* *Salina*

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Appendix A. Compounds identified by GC-MS after the pyrolysis of *Chlorella Vulgaris* at
500°C

Categories	Compounds	Formula	Area ^a (%)
Carbohydrate- derived	1,4:3,6-Dianhydro- α -d-glucopyranose	C ₆ H ₈ O ₄	0.33
	2(4H)-Benzofuranone, 5,6,7,7a-tetrahydro-4,4,7a-trimethyl-, (R)-	C ₁₁ H ₁₆ O ₂	0.69
	1,2-Cyclopentanedione, 3-methyl-	C ₆ H ₈ O ₂	0.26
	2(3H)-Benzofuranone, hexahydro-3-methylene-	C ₉ H ₁₂ O ₂	0.59
	3,5-Dimethoxybenzaldehyde	C ₉ H ₁₀ O ₃	0.27
	[1,1'-Biphenyl]-2,3-diol	C ₁₂ H ₁₀ O ₂	0.31

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Categories	Compounds	Formula	Area ^a (%)
Protein-derived	Phenol	C ₆ H ₆ O	0.80
	Phenol, 2-methyl-	C ₇ H ₈ O	0.08
	Phenol, 4-methyl-	C ₇ H ₈ O	1.82
	Phenol, 3-ethyl-	C ₈ H ₁₀ O	0.67
	Phenol, 2,5-dimethyl-	C ₈ H ₁₀ O	0.49
	1,4-Benzenediol, 2,6-dimethyl-	C ₈ H ₁₀ O ₂	0.46
	1,4-Benzenediol, 2,3,5-trimethyl-	C ₉ H ₁₂ O ₂	0.41
	Indole	C ₈ H ₇ N	1.9
	1H-Indole, 3-methyl-	C ₉ H ₉ N	1.19
	1H-Indole, 5,6,7-trimethyl-	C ₁₁ H ₁₃ N	0.35
	1H-Indole-2-carboxylic acid, 6-(4-ethoxyphenyl)-3-methyl-4-oxo-4,5,6,7-tetrahydro-, isopropyl ester	C ₂₁ H ₂₅ NO ₄	0.11
	Benzyl nitrile	C ₈ H ₇ N	0.26
	Benzenepropanenitrile	C ₉ H ₉ N	0.72
	2-Methyl-5-(butyn-1-yl)pyridine	C ₁₀ H ₁₁ N	0.43
	Pyridine, 3,4-dimethyl-	C ₇ H ₉ N	0.02
	2-Methyl-6-propylpyridine	C ₉ H ₁₃ N	0.13
	3-Pyridinemethanol	C ₆ H ₇ NO	0.03
	Naphthalene, 1,2,3,4-tetrahydro-5-nitro-	C ₁₀ H ₁₁ NO ₂	0.23
	Benzo[h]quinoline, 2,4-dimethyl-	C ₁₅ H ₁₃ N	0.06
	1H-Imidazole-4,5-dimethanol, 1-methyl-	C ₆ H ₁₀ N ₂ O ₂	0.27
1-Vinyl-2-hydroxymethylimidazole	C ₆ H ₈ N ₂ O	0.38	

Categories	Compounds	Formula	Area ^a (%)
Protein-derived	Pyrimidin-2-amine, 4-isopropoxy-6-methyl-	C ₈ H ₁₃ N ₃ O	0.30
	4,5,6-Trimethyl-2-pyrimidone	C ₇ H ₁₀ N ₂ O	0.25
	2,2-Dimethylcyclopropanecarboxamide	C ₆ H ₁₁ NO	0.38
	9-Octadecenamide, (Z)-	C ₁₈ H ₃₅ NO	0.50
	Octadecanamide	C ₁₈ H ₃₇ NO	0.15
	Hexadecanamide	C ₁₆ H ₃₃ NO	1.56
	2H-Pyrrol-2-one, 1,5-dihydro-4-methoxy-	C ₅ H ₇ NO ₂	2.29
	2-Piperidinone	C ₅ H ₉ NO	0.19
	Cyclotetradecanone oxime	C ₁₄ H ₂₇ NO	0.53
	Benzenesulfonic acid, 2,4,6-trimethyl-, hydrazide	C ₉ H ₁₄ N ₂ O ₂ S	0.35
	5,10-Diethoxy-2,3,7,8-tetrahydro-1H,6H-dipyrrolo[1,2-a;1',2'-d]pyrazine	C ₁₄ H ₂₂ N ₂ O ₂	2.62
	Cyclohexanecarbonitrile, 1-(1-piperidinyl)-	C ₁₂ H ₂₀ N ₂	0.35
	2-Naphthalenamine, 1,2,4a,5,6,7,8,8a-octahydro-4a-methyl-	C ₁₁ H ₁₉ N	0.15
	2-Piperidinethione, 3-(2-propenyl)-	C ₈ H ₁₃ NS	0.34
	3-Piperidinol, 1-acetyl-6-methyl-	C ₈ H ₁₅ NO ₂	0.50
Benzenamine, N-hydroxy-	C ₆ H ₇ NO	0.26	

Categories	Compounds	Formula	Area ^a (%)
Lipid- derived	8-Heptadecene	C ₁₇ H ₃₄	0.79
	n-Hexadecanoic acid	C ₁₆ H ₃₂ O ₂	11.6
	2-Tetradecene, (E)-	C ₁₄ H ₂₈	0.46
	Heptadecane	C ₁₇ H ₃₆	0.92
	2-Hexadecene, 3,7,11,15-tetramethyl-, [R-[R*,R*-(E)]]-	C ₂₀ H ₄₀	2.50
	1-Tridecene	C ₁₃ H ₂₆	0.21
	1-Pentadecene	C ₁₅ H ₃₀	1.12
	Eicosane	C ₂₀ H ₄₂	0.69
	Pentadecane, 2,6,10-trimethyl-	C ₁₈ H ₃₈	0.41
	Naphthalene, 1,2-dihydro-1,1,6-trimethyl-	C ₁₃ H ₁₆	0.32
	9,12,15-Octadecatrienoic acid, (Z,Z,Z)-	C ₁₈ H ₃₀ O ₂	5.98
	2-Dodecen-1-yl(-)succinic anhydride	C ₁₆ H ₂₆ O ₃	1.04
	5-Pentadecen-7-yne, (Z)-	C ₁₅ H ₂₆	0.61
	2(1H)-Naphthalenone, octahydro-4a-methyl-7-(1-methylethyl)-, (4a.alpha.,7.beta.,8a.beta.)-	C ₁₄ H ₂₄ O	0.37
	Methyl 7,9-tridecadienyl ether	C ₁₄ H ₂₆ O	0.41
	Linoleic acid ethyl ester	C ₂₀ H ₃₆ O ₂	0.25
	1-Decene	C ₁₀ H ₂₀	0.21
	Cyclopropane, nonyl-	C ₁₂ H ₂₄	0.41
	Cyclododecane	C ₁₂ H ₂₄	0.42
	Naphthalene, 1,2,3,4-tetrahydro-1,1,6-trimethyl-	C ₁₃ H ₁₈	0.94
5-Cyclohexadecen-1-one	C ₁₆ H ₂₈ O	0.34	

Categories	Compounds	Formula	Area ^a (%)
Lipid- derived	cis-10-Nonadecenoic acid	C ₁₉ H ₃₆ O ₂	1.43
	Cyclohexene, 4-(4-ethylcyclohexyl)-1-pentyl-	C ₁₉ H ₃₄	0.71
	Pentadecanoic acid, 13-methyl-, methyl ester	C ₁₇ H ₃₄ O ₂	0.40
	Cyclododecyne	C ₁₂ H ₂₀	0.19
	Dodecane, 2,6,11-trimethyl-	C ₁₅ H ₃₂	0.65
	Naphthalene, 2,6-dimethyl-	C ₁₂ H ₁₂	0.48
	Cyclobutene, 4,4-dimethyl-1-(2,7-octadienyl)-	C ₁₄ H ₂₂	0.37
	Cyclododecane, ethyl-	C ₁₄ H ₂₈	0.42
	1-Heptene, 2-isohexyl-6-methyl-	C ₁₄ H ₂₈	0.64
	5-Dodecyne	C ₁₂ H ₂₂	0.68
	Tridecane, 7-methylene-	C ₁₄ H ₂₈	0.29
	Tridecane	C ₁₃ H ₂₈	0.21
	10-Methyl-octadec-1-ene	C ₁₉ H ₃₈	0.36
	Methyl 6,8-dodecadienyl ether	C ₁₃ H ₂₄ O	0.51
	Tetradecanoic acid	C ₁₄ H ₂₈ O ₂	1.40
	Cholesta-3,5-diene	C ₂₇ H ₄₄	0.06
	12-Oxatetracyclo[5,2,1,1(2,6).1(4,10)]dodecan-11-one	C ₁₁ H ₁₄ O ₂	0.24
	Spiro[2.4]heptane, 1,1-diphenyl-5-(diphenylmethylene)-	C ₃₂ H ₂₈	0.08
	Benzaldehyde, 2,5-dimethoxy-	C ₉ H ₁₀ O ₃	0.54
	Z-11-Pentadecenol	C ₁₅ H ₃₀ O	0.83
Methyl 8,11,14-heptadecatrienoate	C ₁₈ H ₃₀ O ₂	0.89	
Ledene oxide-(I)	C ₁₅ H ₂₄ O	0.50	

Categories	Compounds	Formula	Area ^a (%)
Lipid- derived	4-Oxatricyclo[4.3.1.1(3,8)]undecane	C ₁₀ H ₁₆ O	0.72
	i-Propyl 9,12,15-octadecatrienoate	C ₂₁ H ₃₆ O ₂	1.95
	i-Propyl tricosanoate	C ₂₃ H ₄₅ O ₂	0.40
	Z,Z,Z-1,4,6,9-Nonadecatetraene	C ₁₉ H ₃₂	0.27
	Methyl (Z)-5,11,14,17-eicosatetraenoate	C ₂₁ H ₃₄ O ₂	0.78
	3,5-Cyclo-6,8(14),22-ergostatriene	C ₂₈ H ₄₂	0.05
	9-Octadecyne	C ₁₈ H ₃₄	4.05
	1H-1,3a-Ethanopentalen-4-ol, hexahydro-, cis-	C ₁₀ H ₁₆ O	0.32
	1,4-Methanoazulen-7-ol, decahydro-4,8,8,9-tetramethyl-, (+)-	C ₁₅ H ₂₆ O	0.23
	Cycloheptanone, 4-acetyl-7,7-dimethyl-2-(2-oxopropyl)-	C ₁₄ H ₂₂ O ₃	0.22
	3,7-Dimethyl-6-nonen-1-ol acetate	C ₁₃ H ₂₄ O ₂	0.52
	1-Hydroxymethyl-7,7-dimethyl-bicyclo[2.2.1]heptane-2,3-dione	C ₁₀ H ₁₄ O ₃	0.22
	m-Menth-1(7)-ene, (R)-(-)-	C ₁₀ H ₁₈	2.63
	m-Menth-6-ene, (R)-(+)-	C ₁₀ H ₁₈	1.20
	Bicyclo[11.3.0]hexadecane-2,14-dione	C ₁₆ H ₂₆ O ₂	0.32
	1-Tridecene	C ₁₃ H ₂₆	1.04
	Naphthalene, 1,2,3,4-tetrahydro-1-methoxy-	C ₁₁ H ₁₄ O	0.17
	Oxirane, 2-decyl-3-(5-methylhexyl)-, cis-	C ₁₉ H ₃₈ O	0.22
	Geranyl ethyl ether 2	C ₁₂ H ₂₂ O	0.45
	Tetradecane, 3-methyl-	C ₁₅ H ₃₂	0.27
Bicyclo[11.3.0]hexadecane-2,14-dione	C ₁₆ H ₂₆ O ₂	0.39	

Categories	Compounds	Formula	Area ^a (%)
Lipid-derived	Cyclopentanecarboxylic acid, 2-(2-hydroxyethyl)-4-isopropylidene-, methyl ester, cis-	C ₁₂ H ₂₀ O ₃	0.45
	Undecane, 2,6-dimethyl-	C ₁₃ H ₂₈	0.21
	Bicyclo[2.2.1]heptane, 2,2,3-trimethyl-, exo-	C ₁₀ H ₁₈	0.19
	2,2,6-Trimethyl-1-(3-methylbuta-1,3-dienyl)-7-oxabicyclo[4.1.0]heptan-3-ol	C ₁₄ H ₂₂ O ₂	0.26
	Bicyclo[4.4.1]undeca-1,3,5,7,9-pentaene	C ₁₁ H ₁₀	0.26
	Phosphine, methyl(1-methylethyl)phenyl-	C ₁₀ H ₁₃ P	0.23
	Sulfurous acid, 2-ethylhexyl pentadecyl ester	C ₂₃ H ₄₈ O ₃ S	0.54
	2-(2-N-Benzyl-N-methylaminoethyl)-4-hydroxy-5-methoxyphenylacetic acid,methyl ester	C ₂₀ H ₂₅ NO ₄	0.33
	Benzene, 1-methyl-4-[(2-methylpropyl)thio]-	C ₁₁ H ₁₆ S	0.21
	2-Octenal, 2-butyl-	C ₁₂ H ₂₂ O	0.37
	2-Isopropylphenyl isothiocyanate	C ₁₀ H ₁₁ NS	0.31
Benzene, 1,2,3-trimethyl-	C ₉ H ₁₂	0.29	

^a Based on peak area of GC chromatograph

Appendix B. Compounds identified by GC-MS after the pyrolysis of *Dunaliella Salina* at 500°C

Categories	Compounds	Formula	Area ^a (%)
Carbohydrate-derived	2-Methyl-4-(1-methylethyl)-2-cyclohexenone	C ₁₀ H ₁₆ O	0.20
	2(4H)-Benzofuranone, 5,6,7,7a-tetrahydro-4,4,7a-trimethyl-, (R)-	C ₁₁ H ₁₆ O ₂	1.52
	Benzofuran, 4,7-dimethyl-	C ₁₀ H ₁₀ O	0.12
	3-Buten-2-one, 4-(2,6,6-trimethyl-1-cyclohexen-1-yl)-, (E)-	C ₁₃ H ₂₀ O	1.88
	1H-1,3a-Ethanopentalen-4-ol, hexahydro-, trans-	C ₁₀ H ₁₆ O	0.23
	3-Cyclohexene-1-carboxaldehyde, 1,3,4-trimethyl-	C ₁₀ H ₁₆ O	0.95
	4-Methyl-cyclohex-2-en-1-ol	C ₇ H ₁₂ O	2.21
	Benzenemethanol, 4-hydroxy-	C ₇ H ₈ O ₂	0.48

Categories	Compounds	Formula	Area ^a (%)
Protein-derived	Phenol	C ₆ H ₆ O	1.16
	Phenol, 2-methyl-	C ₇ H ₈ O	0.16
	Phenol, 4-methyl-	C ₇ H ₈ O	2.36
	Phenol, 4-ethyl-	C ₈ H ₁₀ O	0.77
	Phenol, 2,4-dimethyl-	C ₈ H ₁₀ O	0.55
	Phenol, 2-ethyl-6-methyl-	C ₉ H ₁₂ O	0.18
	Phenol, 2,3-dimethyl-	C ₈ H ₁₀ O	0.09
	Phenol, 5-methoxy-2,3-dimethyl-	C ₉ H ₁₂ O ₂	0.36
	1,4-Benzenediol, 2,6-dimethyl-	C ₈ H ₁₀ O ₂	1.71
	Indole	C ₈ H ₇ N	1.77
	1H-Indole, 3-methyl-	C ₉ H ₉ N	1.38
	1H-Indole, 2,3-dimethyl-	C ₁₀ H ₁₁ N	0.63
	Benzyl nitrile	C ₈ H ₇ N	0.30
	Benzenepropanenitrile	C ₉ H ₉ N	0.67
	Hexadecanenitrile	C ₁₆ H ₃₁ N	1.59
	Tetracyclo[3.3.1.1(3,7).0(2,9)]decane-2-carbonitrile	C ₁₁ H ₁₃ N	0.37
	Octadecanenitrile	C ₁₈ H ₃₅ N	0.87
	Isoquinoline-1-carbonitrile, 2-(2-fluorobenzoyl)-1,2-dihydro-	C ₁₇ H ₁₁ FN ₂ O	0.24
	Oleanitrile	C ₁₈ H ₃₃ N	0.29
	2-Hydroxy-3-methoxyphenylacetonitrile	C ₉ H ₉ NO ₂	0.26
4-Acetylaminoethylpyridine	C ₈ H ₁₀ N ₂ O	0.15	
Pyridine, 3,4-dimethyl-	C ₇ H ₉ N	0.13	

Categories	Compounds	Formula	Area ^a (%)
Protein-derived	2-Methyl-6-propylpyridine	C ₉ H ₁₃ N	0.11
	Pyridine, 2-methyl-3-(2-nitrophenyl)-	C ₁₂ H ₁₀ N ₂ O ₂	0.86
	2-Methyl-5-(2-furylmethyl)pyridine	C ₁₁ H ₁₁ NO	0.57
	Pyridine, 2-(ethylthio)-	C ₇ H ₉ NS	0.137
	Pyridine, 4-ethyl-	C ₇ H ₉ N	0.19
	Cyclohexanone, 2-(1-methyl-2-nitroethyl)-	C ₉ H ₁₅ NO ₃	0.27
	9-Dimethylamino-10-ethoxycarbonyl-9-aza[3.3.2]propellane	C ₁₄ H ₂₄ N ₂ O ₂	0.19
	1-[3-Aminopropyl]-2[1H]-pyridone	C ₈ H ₁₂ N ₂ O	0.14
	2,6-Dimethyl-3-aminobenzoquinone	C ₈ H ₉ NO ₂	0.41
	2,5-Dimethyl-1-[(2-hydroxymethyl)phenyl]pyrrole	C ₁₃ H ₁₅ NO	0.52
	1H-Pyrrole, 2,3-dimethyl-	C ₆ H ₉ N	0.07
	1H-Imidazole, 2-ethyl-4-methyl-1-propyl-	C ₉ H ₁₆ N ₂	0.33
	1,2-Benzisothiazole, 3-(hexahydro-1H-azepin-1-yl)-, 1,1-dioxide	C ₁₃ H ₁₆ N ₂ O ₂ S	0.91
	(R)-(-)-2-Methyl-5-isopropenyl-2-cyclohexen-1-one oxime	C ₁₀ H ₁₅ NO	0.16
	2-Cyclohexen-1-one, 2-methyl-5-(1-methylethenyl)-, O-methyloxime, (+)-	C ₁₁ H ₁₇ NO	0.88
	Cycloundecanone, oxime	C ₁₁ H ₂₁ NO	0.21
	Butanal, 3-methyl-, oxime	C ₅ H ₁₁ NO	0.15
	2-Bornanone oxime	C ₁₀ H ₁₇ NO	0.33
	Nonadecanamide	C ₁₉ H ₃₉ NO	0.66
	Acetamide, N-[1-(1-naphthalenyl)ethyl]-	C ₁₄ H ₁₅ NO	0.22
Cyanamide, dibutyl-	C ₉ H ₁₈ N ₂	0.26	

Categories	Compounds	Formula	Area ^a (%)
Protein-derived	9-Octadecenamide, (Z)-	C ₁₈ H ₃₅ NO	0.50
	Hexadecanamide	C ₁₆ H ₃₃ NO	2.92
	Octadecanamide	C ₁₈ H ₃₇ NO	0.22
	Quinoline, 7-chloro-4-methoxy-	C ₁₀ H ₈ ClNO	0.36
	2-[3-Keto-1-hydroxybutyl]quinoline	C ₁₃ H ₁₃ NO ₂	0.72
	Piperidine, 1-(5-trifluoromethyl-2-pyridyl)-4-(1H-pyrrol-1-yl)-	C ₁₅ H ₁₆ F ₃ N ₃	0.59
	Ethanone, 1-(1H-pyrrol-2-yl)-	C ₆ H ₇ NO	0.11
	Tetrabutylammonium cyanide	(CH ₃ CH ₂ CH ₂ CH ₂) ₄ N(CN)	0.20
	Benzenamine, 3-methoxy-	C ₇ H ₉ NO	0.19
	2-Cyclohexen-1-one, 2-methyl-5-(1-methylethenyl)-, O-methyloxime, (+)-	C ₁₁ H ₁₇ NO	0.88
	1,5-Naphthyridine, 4-methyl-	C ₉ H ₈ N ₂	0.27
	2H-Pyrrol-2-one, 1,5-dihydro-4-methoxy-	C ₅ H ₇ NO ₂	2.44
Fluorodopan	C ₉ H ₁₃ ClFN ₃ O ₂	0.51	
1,8-Diazabicyclo[5.4.0]undec-7-en-11-one	C ₉ H ₁₄ N ₂ O	0.26	

Categories	Compounds	Formula	Area ^a (%)
Lipid-derived	8-Heptadecene	C ₁₇ H ₃₄	0.51
	n-Hexadecanoic acid	C ₁₆ H ₃₂ O ₂	14.67
	2-Tetradecene, (E)-	C ₁₄ H ₂₈	0.48
	Heptadecane	C ₁₇ H ₃₆	2.04
	2-Hexadecene, 3,7,11,15-tetramethyl-, [R-[R*,R*-(E)]]-	C ₂₀ H ₄₀	1.39
	Pentadecane	C ₁₅ H ₃₂	0.82
	Naphthalene, 1,2,3,4-tetrahydro-1,5,8-trimethyl-	C ₁₃ H ₁₈	0.48
	9,12-Octadecadienoic acid (Z,Z)-	C ₁₈ H ₃₂ O ₂	4.60
	2(1H)-Naphthalenone, octahydro-4a-methyl-7-(1-methylethyl)-, (4a.alpha.,7.beta.,8a.beta.)-	C ₁₄ H ₂₄ O	0.66
	Naphthalene, 1,2-dihydro-1,1,6-trimethyl-	C ₁₃ H ₁₆	0.24
	n-Propyl hexadecanoate	C ₁₉ H ₃₈ O ₂	0.77
	dl- alpha.-Tocopherol	C ₂₉ H ₅₀ O ₂	0.19
	2-Dodecen-1-yl(-)succinic anhydride	C ₁₆ H ₂₆ O ₃	0.82
	2H-Benzocyclohepten-2-one, 3,4,4a,5,6,7,8,9-octahydro-	C ₁₁ H ₁₆ O	0.23
	Ethyl 6,9,12-hexadecatrienoate	C ₁₈ H ₃₀ O ₂	0.95
	Cyclopropaneoctanal, 2-octyl-	C ₁₉ H ₃₆ O	0.87
	trans-Decalin, 2-methyl-	C ₁₁ H ₂₀	0.26
	Butanedioic acid, decyl phenylmethyl ester	C ₂₁ H ₃₂ O ₄	0.15
	9-Octadecenal, (Z)-	C ₁₈ H ₃₄ O	0.59
	Cyclohexene, 4-(4-ethylcyclohexyl)-1-pentyl-	C ₁₉ H ₃₄	0.44
1-Heptene, 2-isoheptyl-6-methyl-	C ₁₄ H ₂₈	0.53	

Categories	Compounds	Formula	Area ^a (%)
Lipid-derived	1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	C ₁₆ H ₂₂ O ₄	0.59
	Naphthalene, 1,7-dimethyl-	C ₁₂ H ₁₂	0.62
	12-Oxatetracyclo[5,2,1,1(2,6).1(4,10)]dodecan-11-one	C ₁₁ H ₁₄ O ₂	0.31
	9-Octadecyne	C ₁₈ H ₃₄	2.59
	1-Decene	C ₁₀ H ₂₀	0.20
	Hexadecane, 2,6,10,14-tetramethyl-	C ₂₀ H ₄₂	0.29
	1,4-Benzenediol, 2,3,5-trimethyl-	C ₉ H ₁₂ O ₂	0.77
	2-Butanone, 4-(2,2,6-trimethylcyclohexyl)-	C ₁₃ H ₂₄ O	0.53
	Cyclopropanecarboxylic acid, heptadecyl ester	C ₂₁ H ₄₀ O ₂	0.31
	1,3-Cyclopentanedione, 4-hydroxy-2-pentyl-	C ₁₀ H ₁₆ O ₃	0.36
	Cyclooctaneacetic acid, 2-oxo-	C ₁₀ H ₁₆ O ₃	0.42
	Ethyl methyl ethylphosphonate	C ₅ H ₁₃ O ₃ P	0.11
	1-Methoxy-1,3-cyclohexadiene	C ₇ H ₁₀ O	0.39
	Decane	C ₁₀ H ₂₂	0.19
	1,4-Dimethyladamantane, [1.alpha., 3.beta., 4.beta., 5.alpha., 7.beta.]-	C ₁₂ H ₂₀	0.39
	2-Hydroxyfluorene	C ₁₃ H ₁₀ O	0.53
	Bicyclo[2.2.1]heptane, 2,2,3-trimethyl-	C ₁₀ H ₁₈	0.17
	Hexadecane, 2-methyl-	C ₁₇ H ₃₆	0.38
	3-(3,4-Dimethyl-6-Phenylcyclohex-3-enyl)prop-2-enoic acid	C ₁₇ H ₂₀ O ₂	0.10
	9-Octadecenoic acid (Z)-, 2,3-dihydroxypropyl ester	C ₂₁ H ₄₀ O ₄	0.11
2-Propanol, 1-(isooctyloxy)-2-methyl-	C ₁₂ H ₂₆ O ₂	0.22	
2(1H)-Naphthalenone, 4a,5,6,7,8,8a-hexahydro-4a-methyl-, trans-	C ₁₁ H ₁₆ O	0.25	

Categories	Compounds	Formula	Area ^a (%)
Lipid- derived	Trans-4a-Methyl-decahydronaphthalene	C ₁₁ H ₂₀	0.24
	5H-Cyclopropa[a]naphthalen-5-one, 1,1a,2,3,6,7,7a,7b-octahydro-3-hydroxy-1,1,7,7a-tetramethyl-	C ₁₅ H ₂₂ O ₂	0.18
	Sulfide, bis(2-chloropropyl)	C ₆ H ₁₂ C ₁₂ S	0.26
	4,7-Diisopropenyldecan-3,8-diol	C ₁₆ H ₃₀ O ₂	0.18
	Tridecane, 7-methylene-	C ₁₄ H ₂₈	0.45
	11-Hexadecen-1-ol, acetate, (Z)-	C ₁₈ H ₃₄ O ₂	0.51
	Phosphine, methyl(1-methylethyl)phenyl-	C ₁₀ H ₁₅ P	0.24
	Coumarin-8-ol, 7-methoxy-4-methyl-	C ₁₁ H ₁₀ O ₄	0.36
	Isobutyric acid, 2-chlorophenyl ester	C ₁₀ H ₁₁ ClO ₂	0.36
	2-Pentenoic acid, 2-methyl-	C ₆ H ₁₀ O ₂	0.37
	Cyclopentaneethanol, .beta.,2,3-trimethyl-	C ₁₀ H ₂₀ O	0.15
	Tricyclo[4.3.1.1(3,8)]undecane, 3-methoxy-	C ₁₂ H ₂₀ O	0.37
	2,2-Dimethyl-1-(3-oxo-but-1-enyl)-cyclopentanecarboxaldehyde	C ₁₂ H ₁₈ O ₂	0.38
	Bicyclo[10.8.0]eicosane, (E)-	C ₂₀ H ₃₈	2.38
	Benzene, 1,1'-(1-butenylidene)bis-	C ₁₆ H ₁₆	0.43
	Cyclopropanecarboxaldehyde, 2-methyl-2-(4-methyl-3-pentenyl)-, trans-(+.-)-	C ₁₁ H ₁₈ O	0.13
	5-Hepten-1-ol, 2,6-dimethyl-	C ₉ H ₁₈ O	0.06
	(E)-1-Ethanesulfinyl-2-phenylethene	C ₁₀ H ₁₂ OS	0.46
	2-Hepten-6-one, 5-phenyl-, (Z)-	C ₁₃ H ₁₆ O	0.25
	Benzyl heptyl maleate	C ₁₈ H ₂₄ O ₄	0.43

Categories	Compounds	Formula	Area ^a (%)
Lipid- derived	8-Methyl-7-thiabicyclo[4.2.1]nonane	C ₉ H ₁₆ S	0.51
	2-Acetyl- 1,5-dimethyl-8-oxabicyclo [3.2.1] octane	C ₁₁ H ₁₈ O ₂	0.53

^a Based on peak area of GC chromatograph

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