

Table S1 Volatile components of *V. kulingiana* leaves analyzed by HS-SPME-GC-MS

No.	Formula	Compounds	Types	RI	Odor	I(%)
1	C ₁₃ H ₂₀ O	β -Ionone	Terpenoids	1491	floral, woody, sweet, fruity, berry, tropical, beeswax	8.24
2	C ₁₂ H ₂₆	2,2,4,6,6-Pentamethylheptane	Hydrocarbons	990		3.2
3	C ₁₀ H ₁₄ O	3-(4-Methyl-3-pentenyl)furan	Terpenoids	1101	woody	2.37
4	C ₁₀ H ₁₈ O	Linalool	Terpenoids	1101	floral, green	1.68
5	C ₁₀ H ₁₄ O	2,6,6-Trimethylbicyclo[3.2.0]hept-2-en-7-one	Ketone	1108		1.68
6	C ₁₀ H ₁₄	(3 <i>E</i> ,5 <i>E</i>)-2,6-Dimethyl-1,3,5,7-octatetraene	Hydrocarbons	1131		1.66
7	C ₁₁ H ₁₆ O ₂	Dihydroactinidiolide	Heterocyclic compound	1532	musky, coumari n	1.55
8	C ₁₀ H ₁₄ O	(1-Methoxypropyl)benzene	Aromatics	1104		1.52
9	C ₁₁ H ₁₅ Br	(5-Bromopentyl)benzene	Aromatics	1487		1.43
10	C ₅ H ₆ OS	2-Methyl-3-furanthiol	Heterocyclic compound	870	sulfury, meaty, fishy, metallic	1.35
11	C ₆ H ₁₀ N ₄	3,5-Dimethyl-1 <i>H</i> -pyrazole-1-carboximidamide	Heterocyclic compound	1096		1.28
12	C ₆ H ₁₄ N ₂	1-Methylpyrrolidine-2-methylamine	Heterocyclic compound	1104		1.23
13	C ₉ H ₁₈ O	1-Nonen-4-ol	Alcohol	1103		1.17
14	C ₁₄ H ₂₂	1,5-Cycloundecadiene, 8,8-dimethyl-9-methylene-	Hydrocarbons	1485		1.17
15	C ₈ H ₁₆ O	3-Cyclopentyl-1-propanol	Alcohol	1102		1.06
16	C ₈ H ₇ NO	1,3-Dihydro-2 <i>H</i> -indol-2-one	Heterocyclic compound	1478		1.04
17	C ₁₅ H ₂₄	Eremophilene	Terpenoids	1494		0.96
18	C ₁₅ H ₂₄	.Alpha.-muurolene	Terpenoids	1499	woody	0.94
19	C ₁₅ H ₂₄	1-Methyl-4-(6-methylhept-5-en-2-yl)cyclohexa- 1,3-diene	Terpenoids	1482		0.91
20	C ₈ H ₈ O ₃	1-(2,4-Dihydroxyphenyl)ethanone	Ketone	1538		0.87
21	C ₆ H ₁₂ O	(<i>Z</i>)-Hex-3-en-1-ol	Alcohol	856	fresh, green, grass, foliage, vegetabl	0.86

					e, herbal, oily	
22	C ₁₅ H ₂₄	5-(1,5-Dimethyl-4-hexenyl)-2-methyl-1,3-cyclohexadiene	Terpenoids	1495	spice, fresh, sharp	0.84
23	C ₁₅ H ₂₂	1-Methyl-4-(6-methylhept-5-en-2-yl)benzene	Terpenoids	1483	herbal	0.84
24	C ₁₅ H ₂₂	Eudesma-2,4,11-triene	Terpenoids	1479		0.84
25	C ₄ H ₅ N ₃	Iminodiacetonitrile	Nitrogen compounds	1108		0.83
26	C ₁₀ H ₁₆ O	Carvenone	Terpenoids	1257	spearmint	0.82
27	C ₁₀ H ₁₆ O	6-Isopropyl-3-methylcyclohex-2-enone	Terpenoids	1261	herbal, minty, camphor, medicinal	0.82
28	C ₈ H ₁₁ N	Benzeneethanmine	Amine	1102	ammoniacal, fishy	0.8
29	C ₈ H ₁₄ O ₃	Butanoic acid, anhydride	Others	1120	buttery	0.77
30	C ₈ H ₁₄ O ₃	Hexanoic acid, 3-oxo-, ethyl ester	Ester	1120	fruity, pineapple, green, sweet, licorice, vanilla	0.77
31	C ₁₀ H ₁₆ O	Fenchone	Terpenoids	1096	herbal, cedar leaf, bitter, thuja, camphor, earthy, woody	0.72
32	C ₈ H ₁₈ O	3-Octanol	Alcohol	994	earthy, mushroom, herbal, melon, citrus, woody, spicy,	0.69

					minty	
33	C ₆ H ₈ S	3-Ethyl-thiophene	Heterocyclic compound	869	styrene	0.64
34	C ₇ H ₁₂ O ₂	2,2-Dimethyl-3-pentenoic acid	Acid	997		0.63
35	C ₁₀ H ₁₈ O	2-Methyl-6-methylene-7-octen-4-ol	Terpenoids	1097		0.62
36	C ₆ H ₁₃ N	CyclohexylAmine	Amine	862		0.6
37	C ₁₀ H ₁₆	1,6-Dimethyl-1,5-cyclooctadiene	Hydrocarbons	1103		0.6
38	C ₁₁ H ₂₄	Undecane	Hydrocarbons	1100	alkane	0.58
39	C ₈ H ₁₆ O	1-Octen-3-ol	Alcohol		fatty,	0.58
					fruity,	
					grassy,	
				980	mushro	
					om,	
					perfumy	
					, sweet	
40	C ₉ H ₁₆ O ₂	(Z)-Hex-3-en-1-yl propionate	Ester		green,	0.56
					fresh,	
					fruity,	
					apple,	
				1100	pear,	
					vegetabl	
					e,	
					melon,	
					banana,	
					peach	
41	C ₄ H ₇ N ₃ O	1-(2-Hydroxyethyl)-1,2,4-triazole	Heterocyclic compound	1095		0.55
42	C ₁₁ H ₂₀	1-Undecyne	Hydrocarbons	1095		0.54
43	C ₁₀ H ₁₆ O	2,7,7-Trimethyl-3-oxatricyclo[4.1.1.0 ^{2,4}]octane	Terpenoids	1103	green	0.53
44	C ₅ H ₁₁ NS ₃	N,N-Dimethyl-1,2,3-trithian-5-Amine	Heterocyclic compound	1491		0.52
45	C ₈ H ₁₀ O	(4-Methylphenyl)methanol	Alcohol	1106	mild,	0.49
					floral	
46	C ₇ H ₈ O	2-Methylphenol	Phenol	1053	phenol	0.48
47	C ₈ H ₁₄ O ₂	5-Butyldihydrofuran-2(3H)-one	Ester		sweet,	0.46
					coconut,	
					waxy,	
				1261	creamy,	
					tonka,	
					dairy,	
					fatty	
48	C ₁₅ H ₃₂	Pentadecane	Hydrocarbons	1499	waxy	0.46
49	C ₁₃ H ₂₀ O	1,1,4A-Trimethyl-3,4,4a,5,6,7-hexahydronaphthalen-2(1H)-one	Ketone	1491		0.44

50	C ₁₁ H ₂₄	5-Methyl-decane	Hydrocarbons	1057		0.41
51	C ₁₅ H ₂₄	Beta-eudesmene	Terpenoids	1486	herbal	0.41
52	C ₆ H ₈ O ₂	5-Ethyl-2(5 <i>H</i>)-furanone	Heterocyclic compound	966	spice	0.41
53	C ₁₀ H ₁₈ O	Isoborneol	Terpenoids	1170	pine, woody, camphor	0.41
54	C ₁₀ H ₁₈ O	Endo-borneol	Terpenoids	1170	pine, woody, camphor, balsamic	0.41
55	C ₆ H ₁₂ O ₂	Isobutyl acetate	Ester	773	sweet, fruity, ethereal, banana, tropical	0.4
56	C ₁₇ H ₃₆	2,6,10-Trimethyl-tetradecane	Hydrocarbons	1539		0.4
57	C ₈ H ₇ NO ₃	7-Hydroxy-6-methylfuro[3,4- <i>c</i>]pyridin-1(3 <i>H</i>)-one	Heterocyclic compound	1484		0.4
58	C ₆ H ₁₀ O	Trans-2-hexenal	Aldehyde	853	sweet, almond, fruity, green, leafy, apple, plum, vegetable	0.4
59	C ₆ H ₁₀ O	(<i>E</i>)-Hex-2-enal	Aldehyde	853	green, grassy	0.4
60	C ₁₀ H ₁₈ O	7-Methyl-3-methylene-6-octen-1-ol	Terpenoids	1195		0.39
61	C ₁₃ H ₂₈	5,7-Dimethylundecane	Hydrocarbons	1190		0.39
62	C ₈ H ₈ O ₂	Benzoic acid, methyl ester	Ester	1098	phenol, wintergreen, almond, floral, canga	0.39
63	C ₁₅ H ₃₂	4-Methyltetradecane	Hydrocarbons	1459		0.37
64	C ₁₃ H ₂₈	2,3,5-Trimethyldecane	Hydrocarbons	1411		0.37
65	C ₁₀ H ₁₄ O	2,6,6-Trimethylcyclohexa-1,3-dienecarbaldehyde	Terpenoids	1206	fresh, herbal, phenol,	0.36

					metallic, rosemar y, tobacco, spicy	
66	C ₈ H ₈ O	BenzeneacetAldehyde	Aldehyde	1046	floral, honey, rose, cherry	0.36
67	C ₁₀ H ₁₄ O	2,6,6-Trimethyl-2,4-cycloheptadien-1-one	Terpenoids	1243	minty	0.36
68	C ₁₄ H ₃₀	4,6-Dimethyldodecane,	Hydrocarbons	1325		0.36
69	C ₁₄ H ₃₀	Tetradecane	Hydrocarbons	1400	mild, waxy	0.36
70	C ₁₀ H ₂₀ O	Levomenthol	Terpenoids	1177	minty	0.34
71	C ₁₀ H ₁₄	1-Butylbenzene	Aromatics	1054		0.33
72	C ₄ H ₄ N ₂	Pyrazine	Heterocyclic compound	726	pungent , sweet, corn, roasted, hazelnut , barley	0.33
73	C ₁₃ H ₂₈	3-Methyl-5-propylnonane	Hydrocarbons	1185		0.33
74	C ₁₀ H ₁₈ O	Tetrahydro-4-methyl-2-(2-methyl-1-propenyl)- 2H-pyran	Terpenoids	1113	sweet, floral, aromatic , rose, fresh, bay, leafy	0.31
75	C ₅ H ₆ S ₂	2-Thiophenemethanethiol	Heterocyclic compound	1105	roasted, coffee, fishy	0.31
76	C ₁₀ H ₈ O ₂	3-Methyl-2H-chromen-2-one	Heterocyclic compound	1490		0.3
77	C ₁₀ H ₁₆ O	(Z)-(3,3-Dimethylcyclohexylidene)acetaldehyd e	Aldehyde	1226		0.3
78	C ₉ H ₁₂ O ₂	3,4-Dimethoxytoluene	Aromatics	1233		0.3
79	C ₁₀ H ₁₈ O	3,7-Dimethyl-3Z,6-octadien-1-ol	Terpenoids	1240		0.3
80	C ₆ H ₁₀ O ₂	5-Ethyl-dihydrofuran-2(3H)-one	Ester	1055	sweet, caramel	0.3
81	C ₇ H ₁₀ O ₃	5-Ethyl-3-hydroxy-4-methylfuran-2(5H)-one	Heterocyclic compound	1195	sweet, fruity, caramel, maple,	0.3

					fenugreek, brown, sugar, nutty, chicory, praline, butterscotch	
82	C ₉ H ₁₂ O ₂	2-Acetyl-4,4-dimethyl-cyclopent-2-enone	Ketone	1213		0.3
83	C ₁₂ H ₁₆ O ₃	2-Phenoxyethyl isobutyrate	Ester		green, fruity, 1488 waxy, apple, nuances	0.29
84	C ₁₀ H ₁₆ O	(2Z)-3,7-Dimethylocta-2,6-dienal	Terpenoids		sweet, 1240 citral, lemon, peel	0.29
85	C ₈ H ₁₇ N	N-Allyl-N-methylbutylamine	Amine	856		0.29
86	C ₂ H ₄ N ₄	Dicyandiamide	Nitrogen compounds	866		0.29
87	C ₁₅ H ₂₄	Germacrene D	Terpenoids	1481	woody, spice	0.28
88	C ₉ H ₁₂	1-Ethyl-3-methylbenzene	Aromatics	957		0.28
89	C ₉ H ₁₈ O	1-Nonanal	Aldehyde		aldehyde, 1105 citrus, orange peel	0.27
90	C ₁₅ H ₂₄	Bicyclosesquiphellandrene	Terpenoids	1489		0.27
91	C ₁₅ H ₂₄	Beta-guaiene	Terpenoids		sweet, woody, dry, 1490 guaiacwood, spicy, powdery	0.27
92	C ₁₀ H ₁₈ O ₃	2-Methylbutanoic anhydride	Others	1190		0.26
93	C ₈ H ₁₂ O	3,5-Octadien-2-one	Ketone		fruity, 1073 green, grassy	0.26
94	C ₈ H ₁₂ O	3,5-Octadien-2-one	Ketone	1091	fruity, fatty,	0.26

						mushroom	
95	C ₈ H ₈ O ₃	4-Hydroxyphenylacetic acid	Acid	1551			0.24
96	C ₆ H ₈ O ₄	2-Furancarboxylic tetrahydro-3-methyl-5-oxo-	acid, Heterocyclic compound	1304			0.23
97	C ₁₀ H ₈	0phthalene	Aromatics			pungent	0.23
				1190		, dry, tarry	
98	C ₁₀ H ₁₈ O ₂	1-Octen-1-ol, acetate	Alcohol	1191			0.22
99	C ₇ H ₆ O	BenzAldehyde	Aldehyde			sweet,	0.21
				962		bitter, almond, cherry	
100	C ₉ H ₈ S	3-Methylbenzothiophene	Heterocyclic compound	1315			0.21
101	C ₉ H ₁₆ O	(Z)-6-Nonenal	Aldehyde			green, cucumb	0.21
						er, melon, cantalou	
						pe,	
				1104		honeyde	
						w,	
						waxy,	
						vegetabl	
						e, orris,	
						violet,	
						leafy	
102	C ₁₃ H ₂₀ O	4-(4-Methyl-3-pentenyl)cyclohex-3-ene-1-carbaldehyde	Aldehyde			citrus,	0.21
						grassy,	
				1540		aldehydi	
						c, floral,	
						marine	
103	C ₁₄ H ₃₀	3,5-Dimethyldodecane	Hydrocarbons	1285			0.2
104	C ₅ H ₁₀ O ₂	2-Methylbutanoic acid	Acid			pungent	0.2
				863		, acid,	
						roquefor	
						t, cheese	
105	C ₁₃ H ₂₈	Tridecane	Hydrocarbons	1300		alkane	0.2
106	C ₈ H ₁₄ O ₂	5-Hydroxyoctanoic acid lactone	Heterocyclic compound	1288		coconut	0.2
107	C ₁₀ H ₁₆ O ₂	3-Methyl-3-(4-methylpent-3-enyl)oxirane-2-carbaldehyde	Aldehyde	1234			0.19
108	C ₄ H ₃ NO ₂	1H-Pyrrole-2,5-dione	Heterocyclic	987			0.19

			compound			
109	C ₈ H ₁₆ O	3,5-Dimethylcyclohexanol	Alcohol	1030		0.19
110	C ₆ H ₁₀ O ₂	5-Methyl-delta-valerolactone	Heterocyclic compound	1095	creamy, fruity, coconut	0.19
111	C ₉ H ₁₆ O	Trans-4-nonenal	Aldehyde	1105	fruity	0.18
112	C ₇ H ₁₄ O ₂	Hexanoic acid, methyl ester	Ester		ethereal, fruity, pineapple, apricot, strawberry, tropical, banana, bacon	0.17
113	C ₁₂ H ₂₅ Br	2-Bromo dodecane	Halogenated hydrocarbons	1505		0.17
114	C ₁₀ H ₂₂	Decane	Hydrocarbons	1000	alkane	0.16
115	C ₆ H ₉ NOS	5-Thiazoleethanol, 4-methyl-	Heterocyclic compound	1278	fatty, cooked, beefy, juice	0.16
116	C ₁₀ H ₁₆ O	Hotrienol	Alcohol	1106	sweet, tropical, ocimene, fennel, ginger, myrcene	0.16
117	C ₁₂ H ₂₃ N	Dodecanenitrile	Nitrogen compounds	1490	citrus, orange, peel, metallic, spicy	0.16
118	C ₁₀ H ₁₆ O	3,7-Dimethylocta-1,5,7-trien-3-ol	Alcohol	1107	mouldy	0.16
119	C ₈ H ₁₃ NO ₂	Heliotridine	Heterocyclic compound	1495		0.16
120	C ₁₆ H ₃₄	Hexadecane	Hydrocarbons	1600	alkane	0.16
121	C ₁₇ H ₃₆	Heptadecane	Hydrocarbons	1700	alkane	0.16
122	C ₉ H ₂₀ O	1-Nonanol	Alcohol	1171	fresh, clean, fatty, floral, rose,	0.15

					orange, dusty, wet, oily pungent	0.15
123	C ₉ H ₁₆ O	2,6,6-Trimethylcyclohexanone	Ketone		, thujone, labdanu m, honey, cistus	
				1036		
124	C ₁₀ H ₂₀ O ₂	<i>n</i> -Amyl isovalerate	Ester		apple, fresh fruit	0.15
				1110		
125	C ₁₀ H ₁₈	2,6-Dimethyl-trans-2,6-octadiene	Hydrocarbons	978		0.15
126	C ₅ H ₁₀ N ₂	5,5-Dimethyl-4,5-dihydro-1 <i>H</i> -pyrazole	Heterocyclic compound	983		0.15
127	C ₁₀ H ₁₆ O ₂	Lilac aldehyde <i>D</i>	Aldehyde	1169	sweet, flowery	0.15
128	C ₁₀ H ₁₆ O ₂	Lilac aldehyde <i>C</i>	Aldehyde	1167	sweet, flowery	0.15
129	C ₉ H ₁₆ O ₂	2,2,5-Trimethylhexane-3,4-dione	Ketone	1039		0.14
130	C ₁₀ H ₂₀ O ₂	Butanoic acid, 3-methyl-, 2-methylbutyl ester	Ester		herbal, fruity, earthy, cheese, apple, green	0.14
				1107		
131	C ₁₀ H ₁₈ O	2-Isopropyl-5-methylhex-2-enal	Aldehyde		herbal, lavender , woody, green, blueberr y, tomato	0.14
				1106		
132	C ₁₀ H ₂₀ O	4-Methyl-5-nonanone	Ketone	1116		0.14
133	C ₁₀ H ₂₀ O ₂	3-Methylheptyl acetate	Ester	1118		0.14
134	C ₈ H ₈ O ₂	Benzeneacetic acid	Acid		sweet, honey, floral, honeysu ckle, sour, waxy, civet	0.13
				1262		

135	C ₁₃ H ₂₆ O	Tridecane	Aldehyde		fresh, clean, aldehydi c, soapy, 1513 citrus, petal, waxy, grapefru it, peel	0.13
136	C ₈ H ₁₆ O	(E)-2-Octen-1-ol	Alcohol		green, 1068 citrus, vegetabl e, fatty	0.13
137	C ₉ H ₁₆ O ₂	Cyclohexanecarboxylic acid, ethyl ester	Ester		fruity, 1136 cheese, winey	0.13
138	C ₁₀ H ₂₀ O	1-Methyl-4-propan-2-ylcyclohexan-1-ol	Terpenoids	1138		0.13
139	C ₉ H ₁₀ O ₃	Apocynin	Ketone		faint, 1493 sweet, vanillin	0.13
140	C ₁₄ H ₂₀ O ₂	Butanoic acid, 1,1-dimethyl-2-phenylethyl ester	Ester		floral, green, 1493 herbal, fruity, plum, prune	0.12
141	C ₆ H ₁₀ O	Cyclohexanone	Ketone	894	minty, acetone	0.12
142	C ₃ H ₁₀ N ₂	1,3-PropanediAmine	Amine	805		0.12
143	C ₁₂ H ₂₀ O ₂	Fenchyl acetate	Ester		fresh, sweet, 1224 pine, fir, herbal, citrus	0.12
144	C ₇ H ₁₂ O ₂	2-Propenoic acid, butyl ester	Ester	896		0.12
145	C ₇ H ₉ NO ₂	3-Ethyl-4-methylpyrrole-2,5-dione	Heterocyclic compound	1239		0.12
146	C ₉ H ₁₈ O	2-Nonen-1-ol	Alcohol		sweet, fatty, melon, 1105 cucumb er, vegetabl e	0.12

147	C ₁₆ H ₃₄	5,8-Diethyldodecane	Hydrocarbons	1572		0.12
148	C ₁₀ H ₁₈ O	2,6,6-Trimethylbicyclo[3.1.1]heptan-3-ol	Terpenoids	1179		0.12
149	C ₁₁ H ₂₂ O ₂	Butanoic acid, 3-methyl-, hexyl ester	Ester		sweet, green fruit, apple, 1244 unripe apple skin, strawber ry	0.11
150	C ₁₀ H ₁₂ O ₂	Acetic acid, 2-phenylethyl ester	Ester		floral, rose, 1260 sweet, honey, fruity, tropical	0.11
151	C ₁₀ H ₁₈ O	1,7,7-Trimethylbicyclo[2.2.1]heptan-2-ol	Terpenoids	1138		0.11
152	C ₇ H ₁₅ NO ₂	2-Propanol, 1-(dimethylamino)-, acetate (ester)	Ester	869		0.11
153	C ₆ H ₁₀ N ₂	2-Propyl-1 <i>H</i> -imidazole	Heterocyclic compound	1095		0.11
154	C ₉ H ₁₀ O ₂	Paroxypropione	Ketone	1534	phenol	0.11
155	C ₁₀ H ₁₈ O	(<i>E</i>)-2,6-Dimethylocta-5,7-dien-2-ol	Alcohol	1169		0.11
156	C ₉ H ₁₀ O ₃	3,4-Dimethoxybenzaldehyde	Aldehyde		sweet, 1489 woody, vanilla	0.1
157	C ₁₅ H ₂₄	Ylangene	Terpenoids	1372		0.1
158	C ₉ H ₁₄ O	2-Amylfuran	Heterocyclic compound		fruity, green, earthy, 993 beany, vegetabl e, metallic	0.1
159	C ₅ H ₇ ClO	Cyclobutanecarboxylic acid chloride	Halogenated hydrocarbons	853		0.1
160	C ₁₁ H ₁₃ NO ₃	<i>N</i> -Benzyloxy-2-carbomethoxyaziridine	Heterocyclic compound	1550		0.1
161	C ₁₀ H ₁₈ O	1-Decen-3-one	Ketone	1141		0.1
162	C ₁₀ H ₁₆ O	Isopinocarveol	Terpenoids		woody, 1178 warm, balsamic	0.1
163	C ₁₃ H ₂₂ O ₂	3-Cyclohexene-1-methanol, .alpha.,.alpha.,4-tri methyl-, propanoate	Terpenoids	1432	herbal, green,	0.1

					old wood, citrus, geraniu m, tropical	
164	C ₉ H ₁₆ O	3-Nonen-5-one	Ketone	1052		0.1
165	C ₁₅ H ₂₄	Isodene	Terpenoids	1375	Odor	0.1
		Total				79.83

(RI: Retention index of compounds on non-polar chromatographic column; Odor: describes the substance's aroma; I: shows the relative abundance of detected VOCs.)