Supplementary Material 1. Chemical constituents of essential oil form three species of *Citrus*

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Rt | Compounds | Chemical Formula | Molecular Weight (g/mol) | Class | Area (%) | | |
| *C. sinensis* | *C. hystrix* | *C. limon* |
| 1 | 4.24 | Butanoic acid, ethyl ester | C6H12O2 | 116.16 | Carboxylic Acids | 0.22 | - | - |
| 2 | 4.82 | Cyclopentanol, 3-methyl- | C6H12O | 100.16 | Others | - | 0.17 | - |
| 3 | 5.53 | Cyclohexane, ethylidene- | C8H14 | 110.20 | Others | - | 0.07 | - |
| 4 | 6.07 | Hexylene glycol | C6H14O2 | 118.17 | Alcohols | 0.97 | - | - |
| 5 | 6.15 | Bicyclo[3.1.0]hex-2-ene, 2-methyl-5-(1-methylethyl)- | C10H16 | 136.23 | Terpenes | - | 6.95 | 0.25 |
| 6 | 6.29 | L-.alpha.-Pinene | C10H16 | 136.23 | Terpenes | 16.64 | 0.08 | 27.43 |
| 7 | 6.52 | Camphene | C10H16 | 136.23 | Terpenes | 0.28 | 0.32 | 0.84 |
| 8 | 6.56 | Cyclohexanone, 3-methyl- | C7H12O | 112.17 | Ketone | - | 2.07 | - |
| 9 | 6.62 | Bicyclo[3.1.0]hex-2-ene, 4-methylene-1-(1-methylethyl)- | C10H14 | 134.22 | Others | 0.21 | - | - |
| 10 | 6.91 | Bicyclo[3.1.0]hexane, 4-methylene-1-(1-methylethyl)- | C10H16 | 136.23 | Terpenes | 0.51 | 1.64 | 0.70 |
| 11 | 6.97 | Bicyclo[3.1.1]heptane, 6,6-dimethyl-2-methylene-, (1S)- | C10H16 | 136.23 | Terpenes | 0.69 | - | 2.50 |
| 12 | 6.97 | .beta.-Pinene | C10H16 | 136.23 | Terpenes | - | 0.61 | - |
| 13 | 7.17 | .beta.-Myrcene | C10H16 | 136.23 | Terpenes | 0.60 | - | 3.46 |
| 14 | 7.39 | Octanal | C8H16O | 128.21 | Aldehydes | 0.16 | - | 1.38 |
| 15 | 7.43 | p-Menthatriene | C10H14 | 134.22 | Olefin | 0.18 | - | - |
| 16 | 7.50 | (+)-3-Carene | C10H16 | 136.23 | Terpenes | - | 0.78 | 9.26 |
| 17 | 7.52 | (+)-3-Carene | C10H16 | 136.23 | Terpenes | 1.19 | - | - |
| 18 | 7.74 | p-Cymene | C10H14 | 134.22 | Terpenes | - | 5.96 | - |
| 19 | 7.84 | 1-Cyclohexylethanol, methyl ether | C9H18O | 142.24 | Others | - | 2.08 | - |
| 20 | 7.86 | D-Limonene | C10H16 | 136.23 | Terpenes | 27.86 | - | 36.41 |
| 21 | 8.18 | 5-Heptenal, 2,6-dimethyl- | C9H16O | 140.22 | Aldehydes | - | 0.13 | - |
| 22 | 8.26 | 2-Cyclohexen-1-one, 3-methyl- | C7H10O | 110.15 | Cycloparaffins | 0.13 | - | - |
| 23 | 8.29 | .gamma.-Terpinene | C10H16 | 136.23 | Terpenes | 0.22 | - | 0.22 |
| 24 | 8.42 | 1-Octanol | C8H18O | 130,229 | Alcohols | 0.18 | - | - |
| 25 | 8.42 | Cyclohexanol,1-methyl-4-(1-ethylethenyl)-, cis- | C10H18O | 154.25 | Terpenes | - | - | 0.11 |
| 26 | 8.18 | 5-Heptenal, 2,6-dimethyl- | C9H16O | 140.22 | Aldehydes | - | 0.13 | - |
| 27 | 8.51 | Ethyl 2-(5-methyl-5-vinyltetrahydrofuran-2-yl)propan-2-yl carbonate | C13H22O4 | 242.31 | Others | 0.42 | 7.02 | - |
| 29 | 8.76 | (+)-4-Carene | C10H16 | 136.23 | Terpenes | - | - | 0.77 |
| 30 | 8.78 | Benzene, 1-methyl-4-(1-methylethenyl)- | C10H12 | 132.20 | Styrenes | 0.98 | - | - |
| 31 | 8.91 | Linalool | C10H18O | 154.25 | Terpenes | 1.91 | 2.09 | 0.93 |
| 32 | 8.95 | 3-Oxatricyclo[4.1.1.0(2,4)]octane, 2,7,7-trimethyl- | C10H16O | 152.23 | Terpenes | 1.53 | - | - |
| 33 | 9.25 | 2-Cyclohexen-1-ol, 1-methyl-4-(1-methylethenyl)-, trans- | C10H16O | 152.23 | Terpenes | 2.98 | - | 0.27 |
| 34 | 9.34 | 5-Hepten-1-ol, 2,6-dimethyl- | C9H18O | 142.24 | Alcohols | - | 0.14 | - |
| 35 | 9.48 | cis-(-)-1,2-Epoxy-p-menth-8-ene | C10H16O | 152.23 | Terpenes | 5.24 | 3.19 | - |
| 36 | 9.54 | Limonene oxide, trans- | C10H16O | 152.23 | Terpenes | 1.63 | - | 0.16 |
| 37 | 9.58 | 6-Octenal, 7-methyl-3-methylene- | C10H16O | 152.23 | Terpenes | - | - | 0.13 |
| 38 | 9.61 | Bicyclo[3.1.0]hexan-3-ol, 4-methylene-1-(1-methylethyl)-, [1S-(1.alpha.,3.beta.,5.alpha.)]- | C10H16O | 152.23 | Terpenes | 0.57 | - | - |
| 39 | 9.65 | 3-Cyclohexene-1-carboxaldehyde | C7H10O | 110.15 | Others | - | - | 0.14 |
| 40 | 9.66 | trans-Verbenol | C10H16O | 152.23 | Terpenes | 1.31 | - | - |
| 41 | 9.67 | Isopulegol | C10H18O | 154.25 | Terpenes | - | 15.95 | - |
| 42 | 9.72 | 6-Octenal, 3,7-dimethyl-, (R)- | C10H18O | 154.25 | Terpenes | 0.29 | 2.08 | 0.65 |
| 43 | 9.77 | 2,4-Cycloheptadien-1-one, 2,6,6-trimethyl- | C10H14O | 150.22 | Terpenoids | 0.41 | - | - |
| 44 | 9.87 | Isoneral | C10H16O | 152.23 | Terpenes | - | - | 0.30 |
| 45 | 9.96 | 1-Nonanol | C9H20O | 144.25 | Alcohols | 1.35 | - | - |
| 46 | 9.97 | endo-Borneol | C10H18O | 154.25 | Terpenes | - | - | 0.11 |
| 47 | 10.16 | Terpinen-4-ol | C10H18O | 154.25 | Terpenes | - | 0.44 | - |
| 48 | 10.18 | m-Cymen-8-ol | C10H14O | 150.22 | Terpenoids | 0.17 | - | - |
| 49 | 10.29 | trans-p-mentha-1(7),8-dien-2-ol | C10H16O | 152.23 | Terpenes | 1.04 | - | - |
| 50 | 10.34 | .alpha.-Terpineol | C10H18O | 154.25 | Terpenes | 0.69 | 0.31 | 0.83 |
| 51 | 10.44 | (-)-Myrtenol | C10H16O | 152.23 | Terpenes | - | 0.33 | - |
| 52 | 10.43 | Spiro[cyclopropane-1,2'-[6.7]diazabicyclo[3.2.2]non-6-ene] | C9H14N2 | 150.22 | Others | 1.09 | - | - |
| 53 | 10.48 | Decanal | C10H20O | 156.26 | Aldehydes | - | - | 1.16 |
| 54 | 10.54 | Acetic acid, octyl ester | C10H20O2 | 172.26 | Acetates | - | - | 0.16 |
| 55 | 10.65 | Bicyclo[3.1.1]hept-3-en-2-one, 4,6,6-trimethyl-, (1S)- | C10H14O | 150.22 | Terpenes | 1.32 | - | - |
| 56 | 10.74 | trans-Carveol | C10H16O | 152.23 | Terpenoids | - | 6.79 | - |
| 57 | 10.77 | 2-Cyclohexen-1-ol, 2-methyl-5-(1-methylethenyl)-, cis- | C10H16O | 152.23 | Terpenoids | 3.24 | - | 0.10 |
| 58 | 10.82 | Bicyclo[3.1.1]hept-3-en-2-one, 4,6,6-trimethyl- | C10H14O | 150.22 | Terpenes | 0.28 | - | - |
| 59 | 10.83 | Citronellol | C10H20O | 156.26 | Terpenes | - | 0.18 | - |
| 60 | 10.93 | Carveol | C10H16O | 152.23 | Terpenes | 2.42 | - | - |
| 61 | 11.03 | Neral | C10H16O | 152.23 | Terpenes | - | - | 1.42 |
| 62 | 11.07 | beta.-Pulegone | C10H16O | 152.23 | Terpenoids | - | 6.91 | - |
| 63 | 11.29 | 1,3-Pentanediol, 2-methyl- | C6H14O2 | 118.17 | Alcohols | - | 1.79 | - |
| 64 | 11.14 | Carvone | C10H14O | 150.22 | Terpenes | 4.65 | - | 0.12 |
| 65 | 11.18 | 2,6-Octadien-1-ol, 3,7-dimethyl-, (Z)- | C10H18O | 154.25 | Terpenes | - | - | 0.09 |
| 66 | 11.45 | 2,6-Octadienal, 3,7-dimethyl-, (E)- | C10H16O | 152.23 | Terpenoids | - | - | 2.16 |
| 67 | 11.56 | 1-Cyclohexene-1-carboxaldehyde, 4-(1-methylethenyl)- | C10H14O | 150.22 | Terpenes | - | - | 0.25 |
| 68 | 11.66 | 2,4-Hexadiene, 3,4-dimethyl-, (Z,Z)- | C8H14 | 110.20 | Others | - | - | 0.05 |
| 69 | 11.88 | p-Mentha-1,8-dien-7-ol | C10H16O | 152.23 | Terpenes | 0.59 | - | - |
| 70 | 11.91 | Undecanal | C11H22O | 170.29 | Aldehydes | - | - | 0.04 |
| 71 | 12.03 | Cyclopropane, 1,1-dimethyl-2-(3-methyl-1,3-butadienyl)- | C10H16 | 136.23 | Others | 0.19 | - | - |
| 72 | 12.37 | p-Menthane-3,8-diol, cis-1,3,trans-1,4- | C10H20O2 | 172.26 | Terpenoids | - | 3.56 | - |
| 73 | 12.38 | Limonene oxide, trans- | C10H16O | 152.23 | Others | 0.30 | - | - |
| 74 | 12.42 | 1,2-Cyclohexanediol, 1-methyl-4-(1-methylethenyl)- | C10H18O2 | 170.25 | Terpenoids | - | - | 0.06 |
| 75 | 12.43 | 1,2-Cyclohexanediol, 1-methyl-4-(1-methylethenyl)- | C10H18O2 | 170.25 | Terpenoids | 0.47 | - | - |
| 76 | 12.51 | 2-Cyclohexen-1-one, 3-methyl-6-(1-methylethylidene)- | C10H14O | 150.22 | Terpenes | 0.46 | - | - |
| 77 | 12.52 | 2,6-Octadiene, 2,6-dimethyl- | C10H18 | 138.25 | Others | - | - | 0.09 |
| 78 | 12.54 | 2,6-Octadiene, 2,6-dimethyl- | C10H18 | 138.25 | Others | - | 0.52 | - |
| 79 | 12.63 | 1,3-Cyclooctadiene | C8H12 | 108.18 | Cycloparaffins | 0.24 | - | - |
| 80 | 12.67 | Cyclohexanol, 2-(2-hydroxy-2-propyl)-5-methyl- | C10H20O2 | 172.26 | Terpenoids | - | 0.56 | - |
| 81 | 12.68 | 2,6-Octadien-1-ol, 3,7-dimethyl-, acetate, (Z)- | C12H20O2 | 196.29 | Acetates | - | - | 1.02 |
| 81 | 12.71 | Caryophyllene oxide | C15H24O | 220.35 | Terpenes | 0.14 | - | - |
| 82 | 12.82 | 2-Allyl-4-methylphenol | C10H12O | 148.2 | Others | 0.28 | - | - |
| 83 | 12.93 | Geranyl isobutyrate | C14H24O2 | 224.34 | Terpenoids | - | 0.44 | 0.84 |
| 84 | 12.97 | Copaene | C15H24 | 204.35 | Terpenes | 0.36 | 0.11 | - |
| 85 | 13.16 | 1H-Cyclopropa[a]naphthalene, 1a,2,3,5,6,7,7a,7b-octahydro-1,1,7,7a-tetramethyl-, [1aR-(1a.alpha.,7.alpha.,7a.alpha.,7b.alpha.)]- | C15H24 | 204.35 | Others | 0.23 | - | - |
| 86 | 13.27 | Dodecanal | C12H24O | 184.32 | Aldehydes | 0.28 | - | - |
| 87 | 13.59 | Caryophyllene | C15H24 | 204.35 | Terpenes | - | 0.16 | 1.09 |
| 88 | 13.70 | Bicyclo[4.4.0]dec-1-ene, 2-isopropyl-5-methyl-9-methylene- | C15H24 | 204.35 | Terpenoids | 0.18 | - | 0.04 |
| 89 | 14.02 | Humulene | C15H24 | 204.35 | Terpenes | - | - | 0.11 |
| 90 | 14.51 | Naphthalene, 1,2,3,5,6,7,8,8a-octahydro-1,8a-dimethyl-7-(1-methylethenyl)-, [1R-(1.alpha.,7.beta.,8a.alpha.)]- | C15H24 | 204.35 | Terpenoids | 0.44 | 0.22 | 1.18 |
| 91 | 14.61 | .beta.-Bisabolene | C15H24 | 204.35 | Terpenes | - | - | 0.13 |
| 92 | 15.15 | Bicyclo[3.1.0]hexan-3-ol, 4-methyl-1-(1-methylethyl)- | C10H18O | 154.25 | Others | 0.09 | - | - |
| 93 | 15.23 | 1,6,10-Dodecatrien-3-ol, 3,7,11-trimethyl-, (E)- | C15H26O | 222.37 | Terpenes | - | - | 0.17 |
| 94 | 15.24 | Nerolidol | C15H26O | 222.37 | Terpenes | - | 0.32 | - |
| 95 | 15.56 | (-)-Spathulenol | C15H24O | 220.35 | Terpenes | - | 1.93 | - |
| 96 | 15.63 | Diethyl Phthalate | C12H14O4 | 222.24 | Carboxylic Acids | - | - | 0.39 |
| 97 | 15.64 | Caryophyllene oxide | C15H24O | 220.35 | Terpenes | 0.25 | 0.06 | - |
| 98 | 15.82 | Tricyclo[2.2.1.0(2,6)]heptane, 1,7-dimethyl-7-(4-methyl-3-pentenyl)-, (-)- | C15H24 | 204.35 | Terpenes | - | 0.45 | - |
| 99 | 15.95 | (1R,3E,7E,11R)-1,5,5,8-Tetramethyl-12-oxabicyclo[9.1.0]dodeca-3,7-diene | C15H24O | 220.35 | Cyclic ether | - | 0.16 | - |
| 100 | 16.06 | Benzene, (1-butylheptyl)- | C17H28 | 232.4 | Arene | - | - | 0.10 |
| 101 | 16.26 | .tau.-Muurolol | C15H26O | 222.37 | Terpenes | - | 0.19 | - |
| 102 | 16.41 | .alpha.-Cadinol | C15H26O | 222.37 | Terpenoids | - | 0.19 | - |
| 103 | 20.91 | Neopentylidenecyclohexane | C11H20 | 152.28 | Others | - | 0.45 | - |