

Sample Information

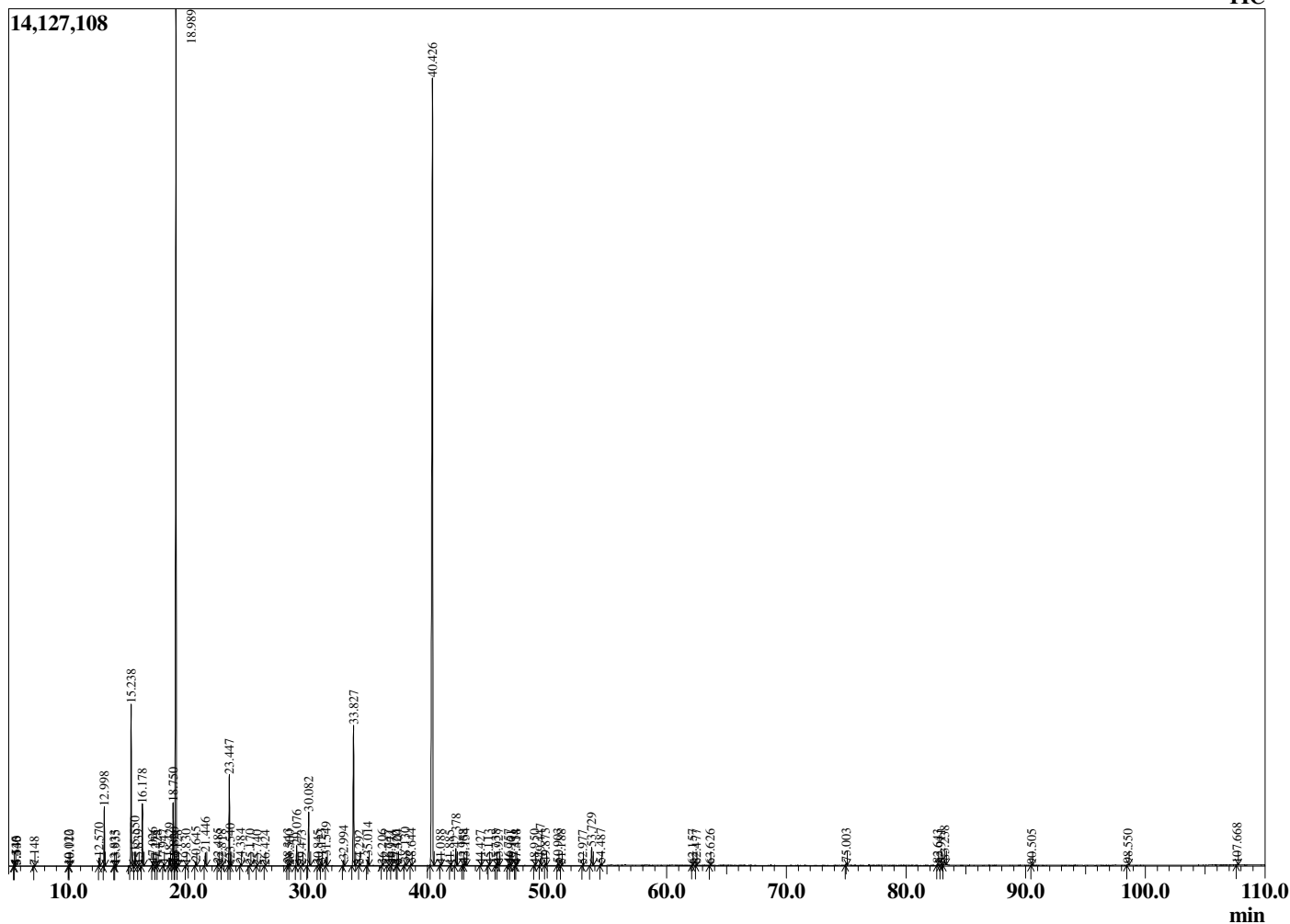
Analyzed by : Dr. Robert S. Pappas
 Analyzed : 7/17/2020 7:27:36 AM
 Sample Type : Essential Oil
 Sample Name : Cardamom, Dark - Barefut
 Sample ID : 0109
 Injection Volume : 0.10
 Instrument ID : GC-3



Peak Report TIC

| R.Time | Name | Area% |
|--------|------------------------------|-------|
| 4.230 | 3-Methylbutanal | 0.01 |
| 4.343 | 2-Methylbutanal | 0.00 |
| 5.446 | Isoamyl alcohol | 0.01 |
| 5.530 | 2-Methyl butanol | 0.01 |
| 7.148 | Hexanal | 0.01 |
| 10.022 | Isopentyl acetate | 0.01 |
| 10.110 | 2-Methylbutyl acetate | 0.01 |
| 12.570 | alpha-Thujene | 0.23 |
| 12.998 | alpha-Pinene | 1.66 |
| 13.833 | alpha-Fenchene | 0.01 |
| 13.935 | Camphene | 0.03 |
| 15.238 | Sabinene | 4.72 |
| 15.550 | beta-Pinene | 0.40 |
| 15.839 | 6-Methyl hept-5-en-2-one | 0.03 |
| 16.178 | Myrcene | 1.83 |
| 17.026 | Octanal | 0.10 |
| 17.275 | alpha-Phellandrene | 0.01 |
| 17.428 | delta-3-Carene | 0.01 |
| 17.947 | alpha-Terpinene | 0.05 |
| 18.429 | para-Cymene | 0.26 |
| 18.750 | Limonene | 2.35 |
| 18.820 | beta-Phellandrene | 0.07 |
| 18.989 | 1,8-cineole | 30.96 |
| 19.128 | cis-beta-Ocimene | 0.03 |
| 19.830 | trans-beta-Ocimene | 0.03 |
| 20.645 | gamma-Terpinene | 0.15 |
| 21.446 | trans-Sabinene hydrate | 0.47 |
| 22.485 | Terpinolene | 0.08 |
| 22.818 | 6,7-Epoxyterpinene | 0.03 |
| 23.447 | Linalool | 3.23 |
| 23.540 | cis-Sabinene hydrate | 0.20 |
| 24.384 | Unidentified | 0.05 |
| 25.170 | cis-para-Menth-2-en-1-ol | 0.03 |
| 25.740 | cis-Limonene oxide | 0.01 |
| 26.424 | Unidentified | 0.01 |
| 28.343 | delta-Terpineol | 0.07 |
| 28.500 | Borneol | 0.01 |
| 29.076 | Terpinen-4-ol | 0.76 |
| 29.473 | para-Cymen-8-ol | 0.02 |
| 30.082 | alpha-Terpineol | 2.03 |
| 30.845 | Decanal | 0.02 |
| 31.123 | Octyl acetate | 0.08 |
| 31.549 | cis-Sabinene hydrate acetate | 0.33 |
| 32.994 | Neral | 0.20 |
| 33.827 | Linalyl acetate | 5.36 |
| 34.292 | Unidentified | 0.01 |
| 35.014 | Geranial | 0.32 |
| 36.206 | Bornyl acetate | 0.02 |
| 36.747 | 2-Undecanone | 0.01 |
| 36.974 | Unidentified | 0.01 |
| 37.420 | Unidentified | 0.01 |
| 37.504 | alpha-Terpinyl formate | 0.02 |
| 38.130 | delta-Terpinyl acetate | 0.11 |
| 38.644 | Methyl geranate | 0.07 |
| 40.426 | alpha-Terpinyl acetate | 40.53 |
| 41.088 | Neryl acetate | 0.02 |
| 41.885 | Unidentified | 0.00 |
| 42.378 | Geranyl acetate | 0.66 |
| 42.968 | Unidentified | 0.05 |
| 43.154 | beta-Elementene | 0.10 |
| 44.427 | Unidentified | 0.01 |
| 45.113 | beta-Caryophyllene | 0.01 |

Chromatogram Cardamom, Dark - Barefut



Comments:

The analysis of this Cardamom, Dark batch sample meets the expected chemical profile for authentic essential oil of *Elettaria cardamomum*. No contamination or adulteration was detected.

The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.

| R.Time | Name | Area% |
|---------|------------------------------|--------|
| 45.738 | Unidentified | 0.03 |
| 45.927 | alpha-Terpinyl propionate | 0.06 |
| 46.757 | Unidentified | 0.05 |
| 46.961 | Aromadendrene | 0.01 |
| 47.354 | Unidentified | 0.01 |
| 47.418 | Unidentified | 0.03 |
| 48.950 | Germacrene D | 0.02 |
| 49.447 | beta-Selinene | 0.27 |
| 49.873 | alpha-Selinene | 0.08 |
| 50.903 | gamma-Cadinene | 0.08 |
| 51.188 | Unidentified | 0.02 |
| 52.977 | Unidentified | 0.01 |
| 53.729 | trans-Nerolidol | 0.79 |
| 54.487 | Dendaralasin | 0.07 |
| 62.157 | Unidentified | 0.01 |
| 62.477 | (2E,6E)-Farnesol | 0.02 |
| 63.626 | Farnesal | 0.02 |
| 75.003 | Palmitic acid | 0.08 |
| 82.643 | Unidentified | 0.04 |
| 82.911 | Methyl 9,12-octadecadienoate | 0.04 |
| 83.238 | cis-Vaccenic acid | 0.22 |
| 90.505 | Tricosane | 0.03 |
| 98.550 | Pentacosane | 0.04 |
| 107.668 | Unidentified | 0.03 |
| | | 100.00 |