

GC-MS Profiling Analysis Prepared for Jade Bloom, Inc

Date: March 9, 2018

Sample: Citronella

Type: Essential Oil

Source: *Cymbopogon winterianus*

Batch: 121614

ANALYSIS SUMMARY

| Identification | DB-5 (%) | DB-WAX (%) | Classe |
|-----------------------------------|----------|------------|------------------------|
| 3-Methylcyclopentene | 0.01 | | Alkene |
| Methylcyclopentane | tr | | Alkane |
| Unknown | 0.01 | 0.02* | Unknown |
| Unknown | 0.01 | [0.02]* | Unknown |
| α -Thujene | 0.01 | tr | Monoterpene |
| α -Pinene | 0.02 | 0.02 | Monoterpene |
| Sabinene | 0.01* | 0.01 | Monoterpene |
| β -Pinene | [0.01]* | tr | Monoterpene |
| 6-Methyl-5-hepten-2-one | 0.05 | 0.05 | Aliphatic ketone |
| Myrcene | 0.05 | 0.05 | Monoterpene |
| α -Phellandrene | 0.01 | 0.01 | Monoterpene |
| Octanal | 0.01 | 0.01 | Aliphatic aldehyde |
| Δ^3 -Carene | tr | tr | Monoterpene |
| α -Terpinene | 0.01 | 0.01 | Monoterpene |
| para-Cymene | 0.01 | 0.01 | Monoterpene |
| Limonene | 2.85* | 2.87 | Monoterpene |
| 1,8-Cineole | [2.85]* | 0.03* | Monoterpenic ether |
| β -Phellandrene | [2.85]* | [0.03]* | Monoterpene |
| (Z)- β -Ocimene | 0.01 | 0.01* | Monoterpene |
| (E)- β -Ocimene | 0.01 | 0.01 | Monoterpene |
| 2,6-Dimethyl-5-heptenal (melonal) | 0.05 | 0.06 | Aliphatic aldehyde |
| γ -Terpinene | 0.01 | [0.01]* | Monoterpene |
| Terpinolene | 0.05 | 0.05 | Monoterpene |
| Linalool | 0.58 | 0.61 | Monoterpenic alcohol |
| cis-Rose oxide | 0.03 | 0.02 | Monoterpenic ether |
| Unknown | 0.01 | 0.01 | Oxygenated monoterpene |
| trans-Rose oxide | 0.01 | 0.01 | Monoterpenic ether |
| Melonol ? | 0.01 | | Normonoterpene |
| Isopulegol | 1.01* | 1.06 | Monoterpenic alcohol |
| neo-Isopulegol | [1.01]* | 0.05 | Monoterpenic alcohol |
| Citronellal | 33.85* | 33.50* | Monoterpenic aldehyde |
| iso-Isopulegol | [33.85]* | 0.32 | Monoterpenic alcohol |
| Isomenthone | [33.85]* | [33.50]* | Monoterpenic ketone |
| Borneol | 0.08* | 2.30* | Monoterpenic alcohol |
| neoiso-Isopulegol | [0.08]* | 0.06* | Monoterpenic alcohol |
| Terpinen-4-ol | 0.03 | 0.05 | Monoterpenic alcohol |
| α -Terpineol | 0.06 | [2.30]* | Monoterpenic alcohol |
| Decanal | 0.11 | 0.15 | Aliphatic aldehyde |
| Nerol | 0.17 | 0.21 | Monoterpenic alcohol |
| Citronellol | 11.75 | 12.07 | Monoterpenic alcohol |
| Neral | 0.44 | 2.87* | Monoterpenic aldehyde |
| Geraniol | 18.79 | 19.17 | Monoterpenic alcohol |
| Geranial | 0.50 | 0.48 | Monoterpenic aldehyde |
| Citronellyl formate | 0.03 | [0.06]* | Monoterpenic ester |
| Geranyl formate | 0.03 | 0.06 | Monoterpenic ester |
| δ -Elemene isomer | 0.39 | 0.01 | Sesquiterpene |
| Citronellic acid | [0.39]* | 0.17 | Monoterpenic acid |
| 8-Hydroxy-neo-menthol | [0.39]* | 0.20 | Monoterpenic alcohol |

| | | | |
|--------------------------------------|---------------|---------------|-------------------------|
| Citronellyl acetate | 3.65 | [2.87]* | Monoterpenic ester |
| Eugenol | [3.65] | 1.16 | Phenylpropanoid |
| Neryl acetate | 0.04 | 0.03 | Monoterpenic ester |
| α -Copaene | 0.04 | 0.10 | Sesquiterpene |
| β -Bourbonene | 0.13 | 0.14 | Sesquiterpene |
| <i>cis</i> - β -Elemene | 0.10 | 0.09 | Sesquiterpene |
| Geranyl acetate | 3.06 | 3.11 | Monoterpenic ester |
| β -Elemene | 2.52 | 2.62* | Sesquiterpene |
| Methyleugenol | 0.01 | 0.01 | Phenylpropanoid |
| Dodecanal | 0.01 | 0.02* | Aliphatic aldehyde |
| β -Caryophyllene | 0.14 | [2.62]* | Sesquiterpene |
| β -Copaene | 0.04 | 0.04 | Sesquiterpene |
| <i>trans</i> - α -Bergamotene | 0.01 | [2.62]* | Sesquiterpene |
| α -Humulene | 0.14 | 0.13 | Sesquiterpene |
| <i>trans</i> -Cadina-1(6),4-diene | 0.07 | 0.06 | Sesquiterpene |
| γ -Muuroolene | 0.17 | 0.25 | Sesquiterpene |
| Germacrene D | 2.32 | [2.30]* | Sesquiterpene |
| β -Selinene | 0.10 | 0.12 | Sesquiterpene |
| α -Selinene | 0.16* | [0.02]* | Sesquiterpene |
| epi-Cubebol | [0.16]* | 0.10 | Sesquiterpenic alcohol |
| α -Muuroolene | 0.57 | 0.56 | Sesquiterpene |
| Germacrene A | 0.76 | 0.97 | Sesquiterpene |
| γ -Cadinene | 0.58 | 2.63* | Sesquiterpene |
| Cubebol | 0.07 | 0.09 | Sesquiterpenic alcohol |
| δ -Cadinene | 2.28* | [2.63]* | Sesquiterpene |
| <i>trans</i> -Calamenene | [2.28]* | 0.01 | Sesquiterpene |
| Unknown | 0.06 | | Sesquiterpene |
| α -Cadinene | 0.14 | 0.19 | Sesquiterpene |
| α -Elemol | 4.31 | 4.35 | Sesquiterpenic alcohol |
| Geranyl butyrate | 0.01 | 0.01 | Monoterpenic ester |
| (<i>E</i>)-Nerolidol | 0.84* | 0.05 | Sesquiterpenic alcohol |
| Germacrene D-4-ol | [0.84]* | 0.89 | Sesquiterpenic alcohol |
| Caryophyllene oxide | 0.02 | 0.02 | Sesquiterpenic ether |
| 10-epi-Cubenol | 0.20 | | Sesquiterpenic alcohol |
| γ -Eudesmol | 0.41 | 0.33 | Sesquiterpenic alcohol |
| τ -Cadinol | 0.70* | 0.38 | Sesquiterpenic alcohol |
| τ -Muurolol | [0.70]* | 0.38 | Sesquiterpenic alcohol |
| α -Muurolol | 0.48* | 0.10 | Sesquiterpenic alcohol |
| β -Eudesmol | [0.48]* | 0.44 | Sesquiterpenic alcohol |
| α -Eudesmol | 0.43 | 0.34 | Sesquiterpenic alcohol |
| α -Cadinol | 0.82 | 0.72 | Sesquiterpenic alcohol |
| (2 <i>E</i> ,6 <i>Z</i>)-Farnesal | 0.01 | | Sesquiterpenic aldehyde |
| (2 <i>E</i> ,6 <i>E</i>)-Farnesol | 0.14 | 0.15* | Sesquiterpenic alcohol |
| (2 <i>E</i> ,6 <i>E</i>)-Farnesal | 0.04 | 0.26 | Sesquiterpenic aldehyde |
| Cryptomeridiol | 0.01 | | Sesquiterpenic alcohol |
| Unknown | 0.01 | 0.04 | Oxygenated diterpene |
| Unknown | 0.07 | 0.08 | Oxygenated diterpene |
| Citronellyl citronellate | 0.01 | [0.15]* | Monoterpenic ester |
| Unknown | 0.03 | | Unknown |
| Unknown | 0.11 | | Unknown |
| Unknown | 0.11 | | Unknown |
| Total identified | 96.57% | 97.40% | |

PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid

Refractive index: 1.4705 \pm 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.