SUPPLEMENTARY MATERIAL

Characterization of the leaf essential oils of an endemic species *Cinnamomum perrottetii* from Western Ghats, India

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Abstract: Essential oils from the leaf of *Cinnamomum perrottetii* Meissn. collected from three distinct populations in the southern Western Ghats, India were analyzed by GC-FID and GC-MS. A total of 56 volatile constituents representing 92.2% to 96.3% of the oils were identified. Variations in the chemical constituents of the oils were found. Only three major components namely, α -pinene (5.1%-6.6%), tau-cadinol (8.7%-20.5%) and α -cadinol (7.3%-13%) out of ten were found in all three samples. To the best of our knowledge, this is first report on the chemical compositions of leaf essential oil of *C. perrottetii*.

Keywords: *Cinnamomum perrottetii*; essential oil; tau-cadinol; α -cadinol; α -pinene

Experimental part

1. Plant Material:

Plant sample collection trip was conducted in Highwavys mountains in Tamil Nadu and Anamalai hills in Kerala. Leaf samples of *C. perrottetii* were collected from three distant localities namely Manalaru (P₁) in Highwavys Mountains in Tamil Nadu, Top station (P₂) and Thenmalai (P₃) in Munnar, Anamalai hills in Kerala, India. After collection, the leaves were dried in shade for two weeks. The voucher herbarium specimens were prepared (R. Murugan 71, 78 & 88), and deposited in the Herbarium of SASTRA University, Thanjavur, India. The species was identified by referring the revision of the South Indian Species of *Cinnamomum* by Kostermans (1983). The identification was confirmed by the matching the voucher specimens with type specimen [*Perrottet* (L-0035906 - Isotype) available at National Herbarium of Nederland, Leiden University, Leiden (L)].

2. Isolation of essential oils:

The shade-dried leaves of *C. perrottetii* were hydro-distilled in a Clevenger apparatus for about 5 h. The essential oils were obtained and dried over anhydrous sodium sulphate to remove the moisture in the oil. Then the oil samples were stored at 4 °C until further analysis.

3. Analyses of essential oils:

The essential oil samples were quantitative and qualitatively analysed by GC-FID and GC-MS respectively. GC-FID analysis was performed on Agilent 7890B Gas Chromatograph equipped with Flame Ionization Detector. HP-5 capillary, non-polar column (30 m x 0.32 mm x 0.25 μ m) coated with 5% phenyl - 95% methyl polysiloxane was used. The operational conditions were as follows: Oven temperature 60 °C and raised to 240 °C at the rate of 3 °C/min. Injector and detector temperatures were at 250 °C. Helium was carrier gas at a linear velocity of 30 cm/sec. and pressure 93.6 kPa and flow rate was 1 ml/min. One μ l of oil sample was dissolved in hexane and injected. The split ratio was 1:10.

GC-MS analysis was carried out on a PerkinElmer Clarus 500 Gas Chromatograph equipped with Turbo Mass Gold Quadrupole Mass Spectrometer. Elite-5MS capillary, non-polar column (30 m x 0.25 mm x 0.25 μ m) coated with 5% phenyl - 95% dimethyl polysiloxane was used. The operational conditions were as follows: Oven temperature 60 °C and raised to 240 °C at the rate of 3 °C/min with a final hold time of 5 min. Injector temperature 270 °C. Helium as carrier gas at the flow rate of 1 ml/min. One μ l of oil sample was dissolved in hexane and injected. The split ratio was 1:20. Mass operational conditions were as follows: Electron Ionization voltage 70 eV, transfer line and ion source temperatures were 200 °C and 160 °C respectively; scan range was 40-600 amu. The constituents of the essential oils were identified by comparing the retention index (RI) of the GC peaks obtained using homologous series of *n*-alkanes (C₈ to C₂₀) with those reported in literature and matching the mass spectra of the peaks with standard spectra reported in literature (Adams 2007) and NIST 2005 MS library. Peak area percentages were calculated from FID response without the use of correction factors.

References

- Adams RP. 2007. Identification of essential oil components by Gas Chromatography / Quadrupole Mass Spectroscopy, 4th Ed. Allured Publishing Corporation, Carol Stream, Illinois, USA.
- Kostermans AJGH. 1983. The south Indian species of *Cinnamomum* Schaeffer (Lauraceae). Bull. Bot. Surv. India 25(1-4): 90-133.

Table S1 Comparison of the chemical constituents of the leaf essential oils of *Cinnamomum perrottetii* from three distinct populations

Name of compound	RI _{Exp.}	RI _{Lit.}	Content (%)		
			P ₁	P ₂	P ₃
α -Pinene	937	939	5.8	5.1	6.6
Camphene	951	954	0.6	2.0	1.2
Sabinene	976	975	-	1.3	0.2
β -Pinene	981	979	3.2	3.5	5.7
Myrcene	992	990	0.9	0.7	0.6
δ -3-Carene	1013	1011	19.7	-	-
o-Cymene	1027	1026	2.9	-	-
Limonene	1031	1029	3.8	-	4.1
1,8-Cineole	1035	1031	1.1	12.1	1.0
<i>trans</i> -Ocimene	1048	1050	1.8	0.1	0.2
γ -Terpinene	1061	1059	0.2	-	-
Terpinolene	1090	1088	1.5	-	0.1
Linalool	1100	1096	1.4	1.0	1.0
<i>trans</i> -Sabinene hydrate	1101	1098	-	0.1	-
<i>cis</i> -Thujone	1102	1102	0.1	-	-
Camphene hydrate	1151	1149	0.1	0.1	-
Borneol	1169	1169	0.2	3.0	1.0
Terpinen-4-ol	1180	1177	0.2	-	-
α -Terpineol	1192	1188	0.3	2.0	0.3
<i>trans</i> -Piperitol	1211	1208	0.2	-	-
Bornyl acetate	1288	1288	0.3	0.2	-
δ -Elemene	1341	1338	0.5	0.3	0.1
α -Cubebene	1350	1348	-	0.2	0.1
α -Copaene	1377	1376	0.1	0.2	0.1
β -Cubebene	1390	1388	-	-	0.1
β -Elemene	1394	1390	0.9	0.4	0.6
Dodecanal	1410	1408	0.3	0.2	0.2
β -Caryophyllene	1422	1419	3.5	1.7	0.6
γ -Elemene	1439	1436	0.2	-	-
<i>trans</i> -Muurolo-3,5-diene	1455	1453	-	-	0.2
α -Humulene	1458	1454	0.7	-	-
<i>allo</i> -Aromadendrene	1466	1460	2.5	3.0	4.3
γ -Muuroloene	1481	1479	-	-	0.1
Germacrene D	1488	1485	4.9	2.8	3.9

β -Selinene	1491	1490	-	0.1	0.6
α -Muurolene	1500	1500	2.2	5.9	3.3
δ -Amorphene	1513	1512	0.2	0.3	0.2
γ -Cadinene	1516	1513	1.2	-	-
δ -Cadinene	1525	1523	4.2	1.7	7.7
<i>trans</i> -Cadina-1,4-diene	1536	1534	0.3	-	-
α -Cadinene	1542	1538	0.3	0.8	0.3
α -Calacorene	1548	1545	-	0.7	0.2
Germacrene B	1562	1561	0.5	0.3	0.7
Germacrene D-4-ol	1578	1575	2.1	1.7	3.4
Spathulenol	1582	1578	-	2.5	-
Globulol	1593	1590	1.3	3.0	4.5
Ledol	1606	1602	2.1	0.6	2.2
1,10-di-epi-Cubenol	1620	1619	0.6	1.9	3.6
1-epi-Cubenol	1632	1628	0.6	3.2	0.9
<i>cis</i> -Cadin-4-en-7-ol	1635	1636	-	-	0.5
<i>tau</i> -Cadinol	1643	1640	8.7	17.3	20.5
α -Cadinol	1657	1654	7.3	10.6	13.0
α -Bisabolol	1689	1685	0.3	1.0	1.2
Shyobunol	1692	1689	6.1	-	0.5
2 <i>e</i> ,6 <i>z</i> -Farnesal	1717	1713	0.3	0.5	0.5
Oplopanone	1742	1740	0.1	0.1	-
Monoterpenes			40.4	12.7	18.7
Oxygenated monoterpenes			3.9	18.5	3.3
Sesquiterpenes			22.2	18.4	23.1
Oxygenated sesquiterpenes			29.5	42.4	50.8
Aliphatic compounds			0.3	0.2	0.2
Total			96.3	92.2	96.1

RI_{Exp.} – Retention Index on HP-5 capillary column (30 m x 0.32 mm x 0.25 μ m); RI_{Lit.} – Retention index from literature (Adams, 2007); P₁ – oil from Manalaru population in Highwavys mountains; P₂ – oil from Thenmalai population in Munnar in Anamalai hills; P₃ – oil from Top station population in Munnar in Anamalai hills.