

***In vitro* antimycobacterial and adjuvant properties of two traditional South African teas, *Aspalathus linearis* (Burm.f.) R. Dahlgren and *Lippia scaberrima* Sond.**

A. Reid^a, C.B. Oosthuizen^{a*}, N. Lall^{a,b,c}

^a*Department of Plant and Soil Sciences, Faculty of Natural and Agricultural Sciences, University of Pretoria, Pretoria, South Africa.*

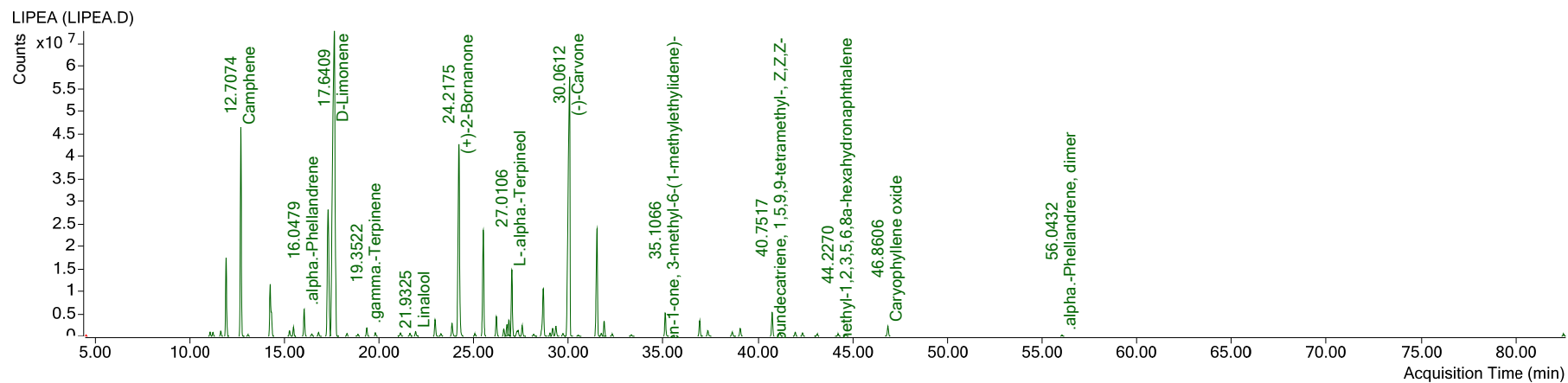
^b*School of Natural Resources, University of Missouri, Columbia, MO, United States*

^c*College of Pharmacy, JSS Academy of Higher Education and Research, Mysuru, Karnataka, India*

*Corresponding author. Tel: +27 114206670.

Email address: carel.oosthuizen@tuks.co.za

- The complete list of compounds identified by GC-MS analysis of the essential oil (Table 1A) together with the chromatograms (Figure 1A)
- TLC chromatogram indicating the presence of verbascoside within the ethanolic extract of *L. scaberrima* (Figure 2A)



• Fig. 1A: TIC chromatogram of the essential oil of *L. scaberrima*

Table. 1A: Constituents found within the essential oil extract of *L. scaberrima* with less than 1% contribution

RT ^a	Compound Name	Area M	% Contribution ^b	Match Score	Formula
11.0846	5,5-Dimethyl-1-vinylbicyclo[2.1.1]hexane	1489534	0,12	96.9	C ₁₀ H ₁₆
11.2357	Tricyclo[2.2.1.0(2,6)]heptane, 1,7,7-trimethyl-	1301051	0,10	95.5	C ₁₀ H ₁₆
11.6444	Bicyclo[3.1.0]hex-2-ene, 2-methyl-5-(1-methylethyl)-	1834606	0,14	95.9	C ₁₀ H ₁₆
13.0790	Bicyclo[3.1.0]hex-2-ene, 4-methylene-1-(1-methylethyl)-	761019	0,06	92.1	C ₁₀ H ₁₄
15.2743	2,3-Dehydro-1,8-cineole	2528485	0,20	90.3	C ₁₀ H ₁₆ O
15.4811	.beta.-Myrcene	2746572	0,21	93.5	C ₁₀ H ₁₆
16.0479	.alpha.-Phellandrene	11692609	0,91	95.8	C ₁₀ H ₁₆
16.4532	Cyclotetrasiloxane, octamethyl-	1044164	0,08	94.7	C ₈ H ₂₄ O ₄ Si ₄
16.8078	1,3-Cyclohexadiene, 1-methyl-4-(1-methylethyl)-	1742836	0,14	94.8	C ₁₀ H ₁₆
18.3104	(1R)-2,6,6-Trimethylbicyclo[3.1.1]hept-2-ene	1200868	0,09	95.0	C ₁₀ H ₁₆
18.8881	1,3,6-Octatriene, 3,7-dimethyl-, (Z)-	1093058	0,08	92.5	C ₁₀ H ₁₆
19.3522	.gamma.-Terpinene	3465703	0,27	96.3	C ₁₀ H ₁₆
19.8005	Bicyclo[3.1.0]hexan-2-ol, 2-methyl-5-(1-methylethyl)-, (1.alpha.,2.beta.,5.alpha.)-	460972	0,04	95.7	C ₁₀ H ₁₈ O
21.1319	Benzene, 1-methyl-3-(1-methylethenyl)-	1310250	0,10	92.6	C ₁₀ H ₁₂
21.6322	Bicyclo[3.1.0]hexan-2-ol, 2-methyl-5-(1-methylethyl)-, (1.alpha.,2.alpha.,5.alpha.)-	584638	0,05	91.7	C ₁₀ H ₁₈ O
21.9325	Linalool	1305208	0,10	92.9	C ₁₀ H ₁₈ O
22.9576	2-Cyclohexen-1-ol, 1-methyl-4-(1-methylethenyl)-, trans-	7564952	0,59	95.9	C ₁₀ H ₁₆ O
23.2700	.alpha.-Campholenal	1233127	0,10	90.1	C ₁₀ H ₁₆ O
23.8537	2-Cyclohexen-1-ol, 1-methyl-4-(1-methylethenyl)-, trans-	5288538	0,41	93.2	C ₁₀ H ₁₆ O
25.0583	Bicyclo[3.1.0]hexan-2-one, 5-(1-methylethyl)-	267355	0,02	90.0	C ₉ H ₁₄ O
26.1939	Terpinen-4-ol	5778223	0,45	90.2	C ₁₀ H ₁₈ O
26.5853	Ethanone, 1-(3-methylphenyl)-	4270157	0,33	96.2	C ₉ H ₁₀ O
26.7545	Benzenemethanol, .alpha.,.alpha.,4-trimethyl-	6752294	0,52	95.4	C ₁₀ H ₁₄ O
26.8512	p-Mentha-1(7),8-dien-2-ol	5782156	0,45	92.1	C ₁₀ H ₁₆ O
27.3435	Cyclohexanone, 2-methyl-5-(1-methylethenyl)-,trans-	4852062	0,38	91.2	C ₁₀ H ₁₆ O
27.5552	2-Cyclohexen-1-ol, 3-methyl-6-(1-methylethenyl)-	3589063	0,28	94.9	C ₁₀ H ₁₆ O
28.1625	Benzofuran, 4,7-dimethyl-	824411	0,06	91.5	C ₁₀ H ₁₀ O
29.0251	Bicyclo[2.2.1]heptan-2-ol, 1,7,7-trimethyl-,formate, endo-	1643091	0,13	92.2	C ₁₁ H ₁₈ O ₂
29.1672	cis-p-mentha-1(7),8-dien-2-ol	1714273	0,13	96.1	C ₁₀ H ₁₆ O
29.3398	Carveol	2380282	0,18	93.7	C ₁₀ H ₁₆ O
29.7004	Propanal, 2-methyl-3-phenyl-	1262360	0,10	94.3	C ₁₀ H ₁₂ O
30.5302	2-Cyclohexen-1-one, 3-methyl-6-(1-methylethyl)-	482865	0,04	90.1	C ₁₀ H ₁₆ O
31.7302	4-Hydroxy-3-methylacetophenone	1692972	0,13	93.6	C ₉ H ₁₀ O ₂
31.8817	1-methyl-4-(prop-1-en-2-yl)-7-oxabicyclo[4.1.0]heptan-2-one	5021929	0,39	96.4	C ₁₀ H ₁₄ O ₂
32.3019	Bornyl acetate	436615	0,03	92.6	C ₁₂ H ₂₀ O ₂
33.3199	Thymol	631208	0,05	90.9	C ₁₀ H ₁₄ O
35.1066	2-Cyclohexen-1-one, 3-methyl-6-(1-	5970245	0,46	95.3	C ₁₀ H ₁₄ O

	methylethylidene)-				
36.9252	.alfa.-Copaene	6468008	0,50	96.4	C ₁₅ H ₂₄
37.3503	(-).beta.-Bourbonene	2205151	0,17	96.7	C ₁₅ H ₂₄
38.6408	1H-3a,7-Methanoazulene, 2,3,4,7,8,8ahexahydro-3,6,8,8-tetramethyl-, [3R-(3.alpha.,3a.beta.,7.beta.,8a.alpha.)]-	1984235	0,15	96.5	C ₁₅ H ₂₄
39.0611	Caryophyllene	3846934	0,30	96.5	C ₁₅ H ₂₄
4.5376	Toluene	478657	0,04	90.5	C ₇ H ₈
40.7517	1,4,7,-Cycloundecatriene, tetramethyl-,Z,Z,Z-	7906812	0,61	96.3	C ₁₅ H ₂₄
41.1440	(1R,4R,4aS,8aR)-4,7-Dimethyl-1-(prop-1- en-2-yl)-1,2,3,4,4a,5,6,8a- octahydronaphthalene	1235537	0,10	91.3	C ₁₅ H ₂₄
41.9734	Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-7- methyl-4-methylene-1-(1-methylethyl)- ,(1.alpha.,4a.beta.,8a.alpha.)-	1539194	0,12	96.6	C ₁₅ H ₂₄
42.3517	Benzene, 1-(1,5-dimethyl-4-hexenyl)-4- methyl-	1157360	0,09	95.2	C ₁₅ H ₂₂
43.1347	.alpha.-Muurolene	739346	0,06	94.7	C ₁₅ H ₂₄
44.2270	1-Isopropyl-4,7-dimethyl- 1,2,3,5,6,8ahexahydronaphthalene	719367	0,06	91.8	C ₁₅ H ₂₄
44.6406	cis-Calamenene	803273	0,06	93.8	C ₁₅ H ₂₂
46.8606	Caryophyllene oxide	1820639	0,14	90.5	C ₁₅ H ₂₄ O
56.0432	.alpha.-Phellandrene, dimer	420714	0,03	92.8	C ₂₀ H ₃₂
82.5253	Bis(2-ethylhexyl) phthalate	306367	0,02	91.5	C ₂₄ H ₃₈ O ₄

^aRT: retention time, ^bConstituents contributing <1% add up to a total of 90%.

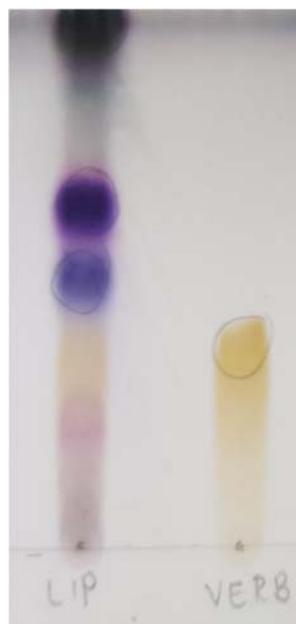


Fig 2A: TLC chromatogram indicating the presence of verbascoside within the ethanolic extract of *L. scaberrima* (MeOH:DCM, 2:8)