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COMPOSITION OF LANTANA CAMARA LEAF ESSENTIAL OIL

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ABSTRACT

Essential oil from Lantana Camara leaves extracted by hydro distillation and compositional investigation carried out by GC and GCMS, which identify fifty two components representing 78.97% of the total oil composition. The major constituents were Trans - β caryophyllene (17.65%), sabinene (9.11%), eucalyptol (7.53%), α -humulene (7.14%), bicyclogermacrene (5.77%), germacrene D (2.35%), β -elemene (2.24%), nerolidol (2.14%) and davanone B (1.22%).

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Key Words

Lantana Camara, Verbenaceae,
Caryophyllene.

INTRODUCTION

Lantana camara that belongs to Verbenaceae family is an evergreen aromatic shrub up to 0.3-3 in height, it is occurring as a weed throughout India. Its flowers are small, usually yellow or orange changing to red, leaf is ovate 2-10 cm long & 2-6 cm wide & its fruits are greenish blue black color 5-7 mm in diameter. The mature plant produced up to 12000 seed annually. Lantana Camara leaves are used in treatment of tumors, tetanus and malaria and having antiseptic properties^[1]. The oil is reported to repellent activities toward bees and mosquitoes^[2]. In Africa, an infusion of the leaves is used to diagnose rheumatism, asthma, coughs and colds^[3].

Objectives:

The use of synthetic pesticide like Malathion, DDT, Deltamethrin etc. Have high operational cost and polluted the environment to eradicate this problem, we can use lantana oil. We also Isolates different chemical from this natural source, Give uniqueness to our blending in fragrance formulation, Promotes use of natural pesticides in place of synthetic pesticides and useful in the research for new medicine.

MATERIALS AND METHODS:

Experimental Work:

Fresh leaves of Lantana Camara were collected from Ghaziabad (U.P, India) in March 2011. Fresh leaves were hydro distilled in five batches (125 gram of fresh leaves with 400 ml water per batch) in Clevenger type apparatus for 4-5 hrs. The distillate was extracted with hexane (5x5ml) each batch, after that the hexane layer was dried over anhydrous sodium sulphate and hexane distilled off on a gently heated water bath. Total oil obtained after distilled off the hexane is 0.812 grams. The yield of oil obtained was found to be 0.13 % (w/w).

GC-MS ANALYSIS:

GCMS analysis of the oil was performed using an Agilent 7890A series GC connected with 5975C MSD and FID connected with splitter. The GC use DB5-MS column (60.0m x 0.25mm x 0.25 micron meter). Mass spectra were acquired over scan mode 20 – 550 amu, the

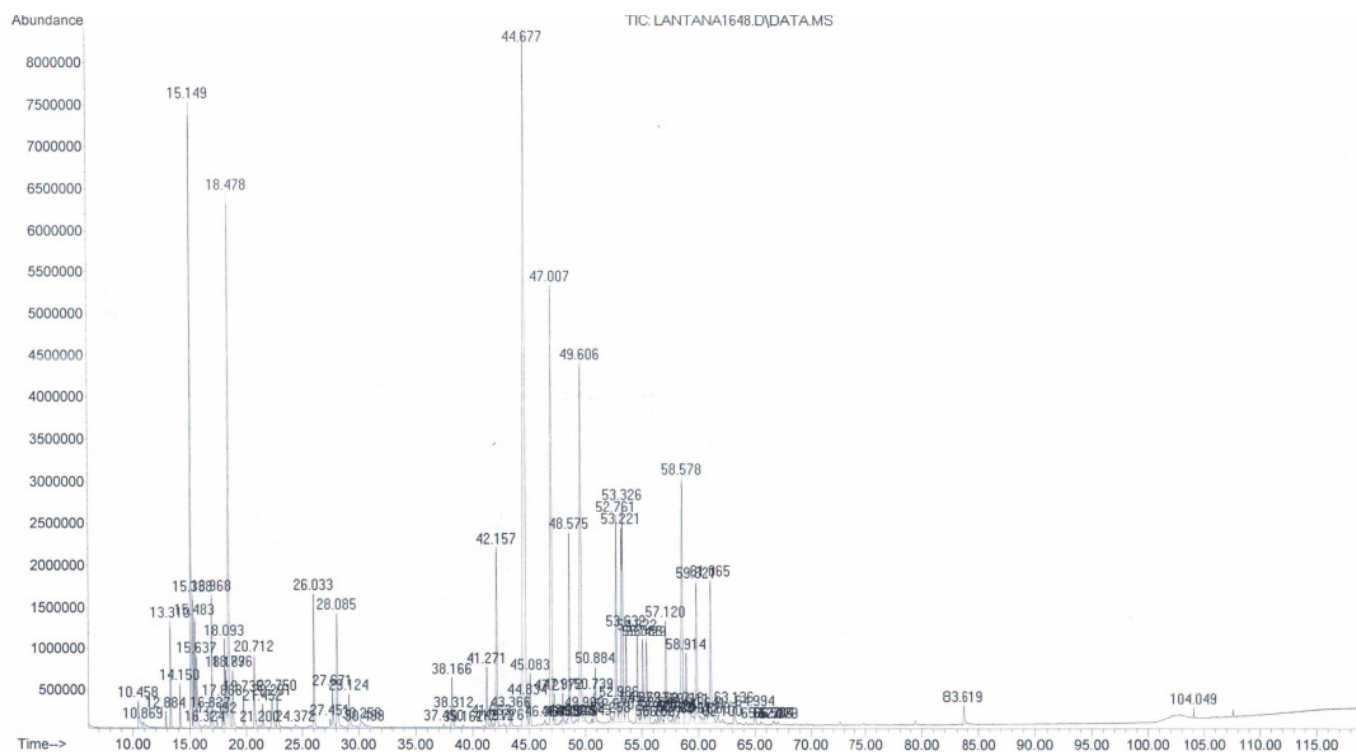
column oven temperature was 70°C programmed at 2°C/min up to 270°C then held for 20 min, with split ratio 1:50, carrier gas helium at constant pressure of 21 psi. The injector and detector temperature were kept at 270°C. The MS operate in electron ionization at 70eV. Identification of component was carried out by matching mass fragmentation pattern with NIST, Willey and Adam's library. The identification has done by GCMS & KI while quantification done by FID.

RESULTS:

The chemical composition analyzed on GC & GCMS by above instrumentation parameter identify 52 components representing 78.07 % of the oil. The identified peak detailed given in Table 1. The major components were Trans - β caryophyllene (17.65%), sabinene (9.11%), eucalyptol (7.53%), α -humulene (7.14%), bicyclogermacrene (5.77%), germacrene D (2.35%), β -elemene (2.24%), nerolidol (2.14%), and davanone B (1.22%).

DISCUSSION:

The earlier investigation of leaf oil from India shows Trans - β -caryophyllene (9.40%), α -copaene (5.0%), β -elemene (7.3%), Germacrene D (20.5%)^[4]. The major component of oil from Bangladesh is Trans - β -caryophyllene (13.57%), α -humulene (11.76%), Germacrene D (10.88%)^[5]. While the same oil from India shows α -farnesene (28.8%), α -phellandrene (15.0%), longifolene (10.0%), α -cedrene (8.6%), Trans - β -caryophyllene (7.1%)^[6]. The oil from North Brazil major contents are Trans - β -caryophyllene (10.8%), α -phellandrene (16.4%), limonene (16.5%)^[8]. The above report shows that different geographical region there is great variation in the chemical composition of Lantana Camara leaf oils reported up to now from different countries^[4-8] and Trans - β -caryophyllene is common component in all analysis of Lantana Camara leaf oil.

FIGURES & TABLES:**Figure 1:** GC Graph of Lantana Camara leaf essential oil**Table 1:** Composition of Lantana Camara leaf essential oil

S.No	RT	% Comp. (from FID)	Component	KI	Mode Of Identification
1	10.46	0.60	Cis -3- hexenol	859	a,b
2	10.87	0.29	Hexanol <1->	870	a,b
3	12.88	0.15	α -thujene	930	a,b
4	13.31	0.98	α -pinene	939	a,b
5	14.15	0.44	Camphene	954	a,b
6	15.14	9.11	Sabinene	975	a,b
7	15.34	1.64	octen-3-ol <1->	979	b
8	15.48	1.44	β -pinene	979	a,b
9	15.64	1.01	β -myrcene	990	a,b
10	16.32	0.08	3-octanol	991	a,b
11	16.83	0.14	α -phellandrene	1002	a,b

12	16.97	1.48	δ -3- carene	1011	a,b
13	17.39	0.12	α -terpinene	1017	a,b
14	17.89	0.29	ρ -cymene	1024	a,b
15	18.09	0.99	Limonene	1029	a,b
16	18.19	0.78	Cis - β - ocimene	1037	b
17	18.48	7.53	Eucalyptol	1031	a,b
18	18.80	0.75	Trans - β - ocimene	1050	a,b
19	19.74	0.39	γ -terpinene	1059	a,b
20	20.71	0.85	Cis - Sabinene hydrate	1070	a,b
21	21.45	0.28	α -terpinolene	1088	a,b
22	22.29	0.56	Linalool	1096	a,b
23	22.75	0.49	Trans - Sabinene hydrate	1098	a,b
24	24.38	0.06	Cis-p-menth-2-en-1-ol	1121	a,b
25	26.03	1.56	Camphor	1146	a,b
26	27.67	0.49	Borneol	1169	a,b
27	28.09	1.40	Terpin -4- ol	1177	a,b
28	29.12	0.49	α -terpineol	1188	a,b
29	38.16	0.48	Bicycloelemene	1324	a,b
30	38.31	0.17	α -Terpinyl acetate	1349	b
31	39.16	0.02	α -cubebene	1348	a,b
32	41.27	0.57	α -copaene	1376	a,b
33	41.92	0.03	β -bourbonene	1388	a,b
34	42.16	2.24	β -elemene	1390	a,b
35	43.37	0.21	isocaryophyllene	1408	a,b
36	44.67	17.65	Trans - β -caryophyllene	1419	a,b
37	44.83	0.33	γ -elemene	1436	b
38	45.08	0.55	β -Copaene	1432	a,b
39	47.00	7.14	α -humulene	1454	a,b
40	47.21	0.35	Alloaromadendrene	1460	a,b
41	47.97	0.35	γ -muurolene	1479	a,b

42	48.57	2.35	Germacrene D	1485	a,b
43	49.14	0.11	β -selinene	1490	a,b
44	49.61	5.77	Bicyclogermacrene	1500	a,b
45	50.54	0.08	γ -cadinene	1513	a,b
46	50.74	0.32	δ -cadinene	1523	a,b
47	53.32	2.14	Trans - Nerolidol	1563	a,b
48	53.63	1.22	Davanone B	1566	a,b
49	55.09	0.87	Spathulinol	1578	a,b
50	55.43	1.07	Caryophyllene oxide	1583	a,b
51	64.99	0.20	Mintsulfide	1741	a,b
52	83.62	0.36	Phytol	1943	a,b

Note: RT = Retention time, a = Kovats index on DB-5, b = GC/MS.

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REFERENCES:

1. Raju RA, Wild plants of Indian sub-continent and their economic uses. P 65, CBS Pub & Distribution, New Delhi, 65, 2000.
2. Attri BS and Singh RP, A note on Biological activity of the oil of Lantana Camara L., Indian Entomol J. 39, 384-385 (1978).
3. Oliver-Sever B, Medicinal plant in West Africa, Cambridge University Press, London, 118, 1982.
4. Khan M, Srivastva SK, Swamisunder KV, Singh M and Naquvi AA, Chemical Composition of Leaves & Flower oil of Lantana Camara L. From India. Flav. Fragr. J. 17, 75-77, 2002.
5. Chowdhury JU, Nandi NC and Bhuiyan NI, Chemical Composition of leaf essential oil of Lantana Camara L. from Bangladesh. Bangladesh Bot. J. 36(2), 193-194, 2007.
6. Singh G, Srivastva KP, Narayanan CS, Padmkumari KP and Singh G, Chemical Investigation of the essential oil of Lantana Camara, Indian perf. 35, 209-212, 1991.
7. Ngassoum MB, Yonkeu S, Jirovertz L, Buchbauer G, Schmaus G and Hammerschmidt FJ, Chemical Composition of Lantana Camara leaves and flowers from Camroon and Madagascar, Flav. Fragr. J. 14, 245-250, 1999.
8. Dasilva MHL, Andrade EHA, Das M, Zoghbi EB, Luz AIR, Dasilva JD and Maila JGS, The essential oil of Lantana Camara L. occurring in North Brazil, Flav. Fragr. J. 14, 208-210, 1999.
