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NOTE

Study on the Chemical Constituents of Essential Oils from the Leaves of *Viscum ovalifolium* and *Loranthus pentapetalus* Roxb. Parasitizing on *Guaiacum* spp.

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The chemical composition of the essential oils obtained from the leaves of *Viscum ovalifolium* and *Loranthus pentapetalus* Roxb. parasitizing on *Guaiacum* spp. were examined by GC-MS analysis. Fourty seven compounds were isolated and 20 compounds were identified in the *V. ovalifolium* that composed about 72.91 % of the total essential oils. Besides, 42 compounds were isolated and 33 compounds were identified in the *L. pentapetalus* that composed about 87.88 % of the total essential oils. There were 12 same constituents in these two samples and the main constitutes of them were phytol, phytone, 1,3-dichloro-benzene and dibutyl phthalate, *etc.*, which might be related to their host.

Key Words: *Viscum ovalifolium*, *Loranthus pentapetalus*, Roxb., Essential oils, Chemical constituents, GC-MS.

Viscum ovalifolium distributed in Guangdong, Guangxi and Yunnan province in china, belonging to the Loranthaceae family. All plants are widely used for various applications in traditional medicine, exhibiting a remedy for measles, rubella, pain in hernia, internal traumatic injury and diarrhea *etc.*[1]. The literature shows that the dominant chemical constituents of *V. ovalifolium* are such as Lupeol acetate, β-amyrin and oleanolic acid[2]. In addition, *Loranthus pentapetalus* Roxb. has the obvious effects on dispelling wind and removing dampness, relieving cough and treating dysentery[3]. But no phytochemical studies on *L. pentapetalus* have been previously carried out to date. It has been proved that the chemical constituents and biological activities of parasites plants depend to a large extent on the host plant[4]. There is scanty information about the chemical constituents of different parasites living parasitically on the same host trees. Therefore, the objectives of this study were to compare the chemical constituents of the essential oils from the leaves of *V. ovalifolium* and *L. pentapetalus* parasitizing on *Guaiacum* spp., in order to contribute to a better knowledge and use of these plants.

Fresh samples of leaves for this study were collected from Guangxi Provnice, in August 2009 (summer) and authenticated by professor Song Ji Wei, department of Zhuang Pharmacy, GuangXi traditional Chinese Medical University.

Isolation of the essential oils: The essential oils were obtained by water-distillation of freshly leaves of *Viscum ovalifolium* and *Loranthus pentapetalus* Roxb. Parasitizing on *Guaiacum* spp. for 5 h using a Clevenger-type apparatus and the yield were 0.01 % and 0.02 %, respetively.

Gas chromatography-mass spectrometry: The GC analysis was performed on a Agilent 5973 N gas chromatograph with FID detector, equipped with a HP-5 MS column (30 m × 0.25 mm *i.d.*, film thickness 0.25 μm). The GC oven temperature was kept at 60 ºC for 3 min and programmed to 150 ºC at a rate of 8 ºC/min and kept at 150 ºC for 2 min to 200 ºC at a rate of 8 ºC/min and then kept at 200 ºC for 2 min to 250 ºC at a rate of 10 ºC/min. Other operating conditions were as follows: the carrier gas nitrogen with a flow rate of 1.0 mL/min; ionization voltage 70 eV; ion source temperature 230 ºC; splitless.

Further identification was made by comparison of their mass spectra on both columns with those stored in NIST 98 and Wiley 5 libraries.The identified compounds and their percentages in essential oils are presented in Table-1. Fourty seven compounds were isolated and 20 compounds were identified representing 72.91 % of the essential oils of the leaves of *V. ovalifolium*. The major compounds were 2-(acetylmethyl)-(+)-3-carene (43.95 %), phytol (8.72 %), 1,3-dichloro-benzene (4.77 %), 6-methyl-5-(1-methylethylidene)-6,8-nonadien-2-

TABLE-1
IDENTIFIED COMPONENTS IN THE ESSENTIAL OILS OF *V. ovalifolium* AND *L. pentapetalus*

No.	RT（min）	Compound	Area (%)	
			V. ovalifolium	*L. pentapetalus*
1	4.57	Chlorobenzene	0.27	0.12
2	4.65	(E)-2-Hexenal	0.51	-
3	8.05	1,3-dichloro-Benzene	4.77	2.26
4	8.71	Benzeneacetaldehyde	1.26	1.19
5	9.22	1-Octanol	0.37	2.60
6	13.56	Dihydroedulan II (cis)	1.36	0.19
7	14.81	6,8-Nonadien-2-one, 6-methyl-5-(1-methylethylidene)-	2.52	-
8	15.26	*trans*-β-Damascenone	0.26	-
9	15.47	2-(Acetylmethyl)-(+)-3-Carene	43.95	-
10	16.63	*trans*-Geranylacetone	0.33	1.21
11	17.42	β-Ionone	1.50	0.29
12	17.87	3,5-Di-*tert*-butylphenol	0.50	-
13	20.44	9-Octadecyne	1.15	-
14	20.84	Hexacosane	0.80	0.28
15	22.73	Phytone	2.08	6.49
16	23.06	Phthalic acid, isobutyl isoporpyl ester	0.72	-
17	24.11	Dibutyl phthalate	1.37	2.19
18	25.40	Undecane	0.45	-
19	25.57	Phytol	8.72	51.55
20	4.34	Furfurol	0.18	0.28
21	4.78	(Z)-Leaf alcohol	-	3.30
22	7.30	Benzaldehyde	-	0.52
23	7.74	Mushroom alcohol	-	1.40
24	10.22	2-Methyl-6-Hepten-1-ol	-	0.80
25	8.64	(Z)-linalool oxide, furanoid	-	2.26
26	10.90	Phantol	-	2.10
27	13.26	α-Terpineol	-	0.84
28	15.31	Hexadecane	-	0.24
29	20.94	2,4-*tert*-butylphenol	-	0.44
30	23.06	Tetratetracontane	-	0.39
31	25.32	Heptadecane	-	0.58
32	27.35	Octadecane	-	0.61
33	27.76	Diphenyl-Glyoxal,	-	0.45
34	28.74	Isobutyl phthalate	-	1.17
35	29.22	Tricyclo[4.1.1.$0^{7,8}$]octane	-	0.33
36	29.28	Nonadecane	-	0.76
37	33.32	Heneicosane	-	1.45
38	34.89	Octacosane	-	1.55
39	36.11	Cyclohexadecane	-	0.75
40	36.26	Eicosane	-	2.14
41	37.13	Tetracosane	-	2.67

RT = Retention time

one (2.52 %), phytone (2.08 %). On the other hands, 42 compounds were isolated and 33 compounds were identified in leaves of *L. pentapetalus* that composed about 87.88 % of the total essential oils. The major constituents were phytol (51.55 %), phytone (6.49 %), (Z)-leaf alcohol (3.30 %), tetracosane (2.67 %), 1-octanol (2.60 %), 1,3-dichloro-benzene (2.26 %), (Z)-linalool oxide, furanoid (2.26 %), dibutyl phthalate (2.19 %), eicosane (2.14 %), phantol (2.10 %). There were just 9 same compounds existing in these two plants,such as phytol, phytone, 1,3-dichloro-benzene and dibutyl phthalate, *etc*., which might be related to their host. And a detailed study on the connection between parasites and hosts is in progress.

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