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Chemical composition of the essential oil from *Rabdosia lophanthoides*

SHI Hao(石浩), ZOU Jian-kai(邹建凯), PAN Yuan-jiang(潘远江)†

(*Department of Chemistry, Zhejiang University, Hangzhou, 310027, China*)
† E-mail: panyuanjiang@zss.zju.edu.cn

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Abstract: Gas chromatography/mass spectrometry (GC-MS) of the essential oil from the aerial parts of *Rabdosia lophanthoides* resulted in the identification of 108 compounds representing 78.120% of the oil. Hydro-distillation of *Rabdosia lophanthoides* yielded a pale yellow oil. The compounds identified and their relative proportions are listed in Table 1 according to their order of elution on an HP-5MS capillary column. .

Key words: *Rabdosia lophanthoides*, Composition of essential oil, GC-MS analysis, Ladentification of 108 compounds
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INTRODUCTION

Rabdosia lophanthoides is widely distributed in South and Southeast Asia and has long been used as folk medicine in China. Its concoctions are used for treatment of acute icteric hepatitis, acute cholecystis, enteritis, laryngopharyngitis, gynopathy, lepromatous leprosy . To our knowledge this is the first study on the composition of its essential oil. One-hundred and eight compounds representing 78.12% of the oil were identified.

MATERIALS AND METHORDS

1. Plant material

The plant was collected in the mountain near the Shangqiu City, Shanxi province, P. R. China. The identity of the plant was confirmed by Dr. Li bao-lin of Shanxi Normal University.

2. Isolation of the essential oil

The aerial parts of *Rabdosia lophanthoides* were hydro-distilled for 3 h. The oil obtained was dried over anhydrous sodium sulfate.

3. GC-MS analysis

Analysis was performed with a Hewlett Packard 6890 chromatograph linked to a Hewlett Packard 5973 mass spectrometer system equipped with an HP automatic injector and an HP－5MS (30 m× 0.25 mm id, film thickness 0.25 μm) capillary column. The ionization energy was 70eV. A 1.0μL 2% sample solution of the oil in n-heptane was injected at split ratio of 50:1 . The temperature of the injection block was 250℃. The oven temperature programme was 60℃ rising at 5℃/min to a final temperature of 235℃. Peak areas and retention times were calculated using Hewlett-Packard Software. The carrier gas was helium at 1 mL/min at constant volume. Identification of the oil components was established using an NIST98 MS Data Library(Fig. 1, Table 1).

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† Author for correspondence

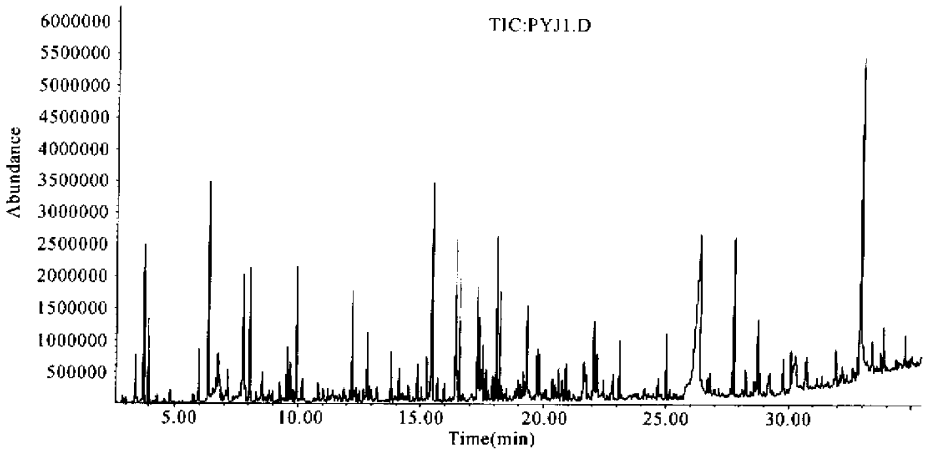

Fig. 1 The GC/MS total ion chromatogram of essential oil in *Rabdosia lophanthoides*

Table 1 Analytical result of chemical constituents of essential oil in *Rabdosia lophanthoides*

No.	Compounds	Retention time of GC (min)	Molecular weight (M_w)	Relative content(%)	Quality (%)
1	propanoic acid, 2-methyl-	2.34	88	0.06	91
2	3-hexanol	2.85	102	0.07	90
3	Hexanal	2.91	100	0.06	84
4	3(2H)-Furanone, dihydro-2-methyl-	3.01	100	0.07	91
5	Furfural	3.39	96	0.55	91
6	Butanoic acid, 2-methyl-	3.66	102	0.04	84
7	2-Furanmethanol	3.73	98	3.39	93
8	2-Hexen-1-ol, (E)-	3.90	100	0.21	91
9	1-Hexanol	3.94	102	0.35	83
10	Pentanoic acid	4.12	102	0.06	83
11	2-Cyclopentene-1, 4-dione	4.26	96	0.11	81
12	Ethanone, 1-(2-furanyl)-	4.79	110	0.24	91
13	1R-. alpha. -Pinene	5.31	136	0.04	95
14	Benzaldehyde	5.92	106	0.07	94
15	2-Furancarboxaldehyde, 5-methyl-	5.96	110	0.72	94
16	1-Octen-3-ol	6.36	128	4.25	82
17	Furan, 2-pentyl-	6.66	138	0.16	85
18	Cyclopentanethiol, 2-methyl-, cis-3-heptanol, 6-methyl-	6.75	130	0.38	82
19	Hexanoic acid	6.80	116	0.17	83
20	3-Hexenoic acid	7.09	114	0.04	86
21	2, 4-Heptadienal, (E, E)-	7.15	110	0.42	90

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No.	Compounds	Retention time of GC (min)	Molecular weight (M_w)	Relative content(%)	Quality (%)
22	4(H)-Pyridine, N-acetyl-	7.38	123	0.06	80
23	Limonene	7.63	136	0.09	83
24	Benzyl Alcohol	7.78	108	2.62	94
25	2-Hexenoic acid, (E)-	7.85	114	0.12	94
26	Benzeneacetaldehyde	8.04	120	2.06	94
27	Ethanone, 1-(1H-pyrrol-2-yl)-	8.56	109	0.89	94
28	Benzaldehyde, 4-methyl-	8.68	120	0.05	83
29	3,5-Octadien-2-one, (E,E)-	8.76	124	0.09	80
30	2-Furanmethanol, 5-ethenyltetrahyd-Linaloloxide	8.83	170	0.22	82
31	Phenyl, 2-methoxy-	9.27	124	0.29	94
32	1,6-Octadien-3-ol, 3,7-dimethyl	9.56	154	0.86	94
33	Nonanal	9.68	142	0.62	86
34	2,5-Furandione, 3-ethyl-4-methyl	9.75	140	0.11	87
35	Phenylethyl alcohol	9.94	122	1.35	95
36	1H-Pyrrole-2-carboxaldehyde, 1-methyl	10.25	109	0.05	84
37	Camphor	10.83	152	0.28	96
38	2,6-Nonadienal, (E,Z)-	11.04	138	0.22	84
39	2-Nonenal, (E)-	11.21	140	0.18	97
40	Borneol	11.41	154	0.26	94
41	(+)-.alpha.-Terpineol	12.10	154	0.17	83
42	Methyl Salicylate	12.20	152	1.02	91
43	Decanal	12.49	156	0.15	91
44	1-cyclohexene-1-carboxaldehyde, 2,6,6-trimethyl-	12.94	152	0.16	93
45	Benzothiazole	12.99	135	0.09	94
46	Naphthalene, 1,2,3,4-tetrahydro-1,1,6trimethyl-	13.80	174	0.85	96
47	1-Cyclohexene-1-acetaldehyde, 2,6,6-trimethyl	13.94	166	0.04	97
48	Benzene, 2-(2-butenyl)-1,3,5-trimethyl-	14.12	174	0.51	86
49	Nonanoic acid	14.26	158	0.16	85
50	Bornyl acetate	14.70	292	0.11	81
51	Indole	14.88	117	0.79	90
52	Tridecane	15.03	184	0.21	97
53	Naphthalene, 1,2,3,4-tetrahydro-1,1,6-trimethyl	15.24	174	0.71	94
54	Benzene, 1,2,3,4-tetramethyl-4-(1-methylethenyl)-	15.35	174	0.07	93
55	2-Methoxy-4-vinylphenol	15.45	150	4.37	90
56	Benzene, 1,2,3,4-tetramethyl-4-(1-methylethenyl)-	15.69	174	0.41	90
57	Naphthalene, 1,2,3,4-tetrahydro-1,5,8-trimethyl-	16.43	172	1.37	93
58	Naphthalene, 1,2-dihydro-1,1,6-trimethyl-	16.47	172	0.11	97
59	Eugenol	16.58	164	1.20	96

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No.	Compounds	Retention time of GC (min)	Molecular weight (M_w)	Relative content(%)	Quality (%)
60	Copaene	17.10	204	0.15	94
61	2-Buten-1-one,1-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-	17.30	190	0.97	95
62	Naphthalene,1,2-dihydro-1,5,8-trimethyl	17.46	172	0.19	90
63	Caryophyllene	18.22	204	1.17	93
64	Phenol,2-methoxy-4-(1-propenyl)-	18.91	164	0.10	97
65	5,9-Undecadien-2-one,6,10-dimethyl-	18.98	194	0.21	95
66	.alpha.-Caryophyllene	19.06	204	0.24	97
67	Germacrene D	19.74	204	1.12	97
68	3-Buten-2-one,4-(2,6,6-trimethyl-1-cyclohexen-1-yl)-	19.84	192	0.80	97
69	Pentadecane	20.10	212	0.23	95
70	Naphthalene,1,2-dihydro-2,5,8-trimethyl-	20.36	172	0.49	84
71	Butylated Hydroxytoluene	20.48	220	0.18	95
72	2(4H)-Benzofuranone, 5, 6, 7, 7a-tetrahydro-4, 4, 7a-trimethyl-	20.90	180	0.72	97
73	Megastigmatrienone	22.04	190	0.94	99
74	2-Butanone,1-(2,3,6-trimethylphenyl)-	22.09	190	0.07	89
75	Caryophyllene oxide	22.18	220	0.66	91
76	Hexadecane	22.45	226	0.27	96
77	Cedrol	22.61	222	0.07	90
78	3-Hydroxy-.beta.-damascone	22.84	208	0.39	80
79	Magastigmatrienone	23.11	190	1.09	98
80	alpha-Cadinol	23.78	222	0.06	90
81	Heptadecane	24.68	240	0.34	98
82	Pentadecane,2,6,10,14-tetramethyl	24.81	268	0.12	80
83	Hexadecanal	25.01	240	0.91	95
84	Phenol,2-(1-phenylethyl)-	25.16	198	0.16	93
85	cis-2-Methyl-7-octadecene	25.34	266	0.09	91
86	Tetradecanoic acid	26.35	228	12.53	99
87	Octadecane	26.80	254	0.32	98
88	Tetradecanal	27.15	212	0.12	93
89	(-)-E-Pinane	27.62	138	0.15	86
90	2-Pentadecanone,6,10,14-trimethyl-	27.76	268	2.82	99
91	1,2-Benzendicarboxylic acid,bis(2-methylpropyl)ester	28.24	278	0.66	94
92	9,17-Octadecadienal,(Z)-	28.60	264	0.19	97
93	11,14,17-Eicosatrienoic acid,methyl ester	28.73	320	1.44	90
94	Nonadecane	28.82	268	0.47	98
95	5,9,13-Pentadecatrien-2-one,6,10,14-trimethyl	29.22	262	0.29	82
96	Hexadecanoic acid,methyl ester	29.35	270	0.06	95

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No.	Compounds	Retention time of GC (min)	Molecular weight (M_w)	Relative content(%)	Quality (%)
97	Isophytol	29.77	296	0.81	91
98	Dibutyl phthalate	30.08	278	0.58	96
99	Hexadecanoic acid, ethyl ester	30.67	284	0.29	93
100	n-Hexadecanoic acid	30.89	256	0.04	91
101	Pentadecanoic acid	31.16	254	0.23	81
102	Fluoranthene	31.86	202	0.06	87
103	1-Eicosene	32.01	308	0.04	86
104	Octadecane	32.60	254	0.41	92
105	Phytol	32.91	296	9.17	95
106	9,12,15-Octadecatrienoic acid, ethylest	33.85	306	0.95	99
107	Tetracosane	34.37	339	0.15	90
108	9-Tricosene,(Z)-	34.50	322	0.22	80

RESULTS AND DISCUSSION

Hydro-distillation of *Rabdosia lophanthoides* yielded a pale yellow oil. The compounds identified and their relative proportions are listed in Table 1 according to their order of elution on an HP-5MS capillary column. Out of the 193 constituents seperated by GC, 108 compounds among them were identified by their EI (electron impact) mass spectral data.

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