Chemistry of Natural Compounds, Vol. 48, No. 4, September, 2012 [Russian original No. 4, July–August, 2012]

GC-MS ANALYSIS OF ESSENTIAL OIL FROM THE BARK OF *Lindera obtusiloba*

Liu Zekun[1] and Chen Haixia[2*]

UDC 547.913

Lindera obtusiloba Blume, a deciduous tree with a height of 3–10 meters, belongs to the Lauraceae family and is rich in essential oils. The bark of this plant is used as a treatment for rheumatism in Chinese medicine. It is traditionally called Trigeminal or Sanzuan Feng. Rheumatism is traditionally treated by heating the bark under the patient′s knee. Therefore, the essential oils are the most likely active compounds. The plant has also been shown to have antiplatelet and antithrombotic activity by Lee et al. [1], and the antioxidant and whitening effects of *Lindera obtusiloba* Blume 70% EtOH extract was found by [2]. Although Chung, Ill-Min et al. have investigated the components of *Lindera obstusiloba* from leaves [3], there is no literature regarding essential oils from the bark of *L. obstusiloba*, nor is there a definite relationship between the essential oil and its treatment. Therefore, in this study, we report on the essential oil composition of the bark of *Lindera obstusiloba* by GC-MS analysis.

TABLE 1. The Components of the Essential Oil from *Lindera obtusiloba*

Compound	RRI	%	Compound	RRI	%
Camphene	947	0.7	Calamenene	1517	1.0
Terpinolene	1086	5.7	α-Himachalene	1450	0.7
(4*E*,6*Z*)-2,6-Dimethyl-2,4,6-octatriene	1131	0.8	α-Muurolene	1495	0.3
Camphor	1148	0.6	α-Calacorene	1546	0.3
Borneol	1173	0.3	Hedycaryol	1548	9.8
α-Terpineol	1175	0.6	9-Methoxycalamenene	1687	0.3
Piperitone	1211	0.2	Calarene epoxide	1337	0.4
Bornyl acetate	1289	2.8	Palustrol	1570	0.5
Elixene	1443	2.0	*ent*-Spathulenol	1576	3.6
Citronellyl butyrate	1525	0.2	Globulol	1571	2.4
α-Cubebene	1345	0.8	Viridiflorol	1558	0.9
Isoledene	1377	0.3	Ledol	1590	0.8
Copaene	1375	0.7	Cubenol	1645	1.7
α-Elemene	1373	4.8	Eudesmol	1626	5.1
α-Gurjunene	1405	0.6	α-Guaiene	1442	0.6
Caryophyllene	1442	6.4	*T*-Cadinol	1632	6.2
τ-Gurjunene	1509	0.08	Isoaromadendrene epoxide	1579	0.4
α-Humulene	1448	0.6	α-Cadinol	1652	11.8
Alloaromadendrene	1460	0.2	α-Eudesmol	1642	9.7
τ-Muurolene	1486	0.9	α-Bisabolol	1685	0.6
Cyclosativene	1367	0.1	Aromadendrene oxide-(2)	1472	0.3
Eremophilene	1474	1.8	Cedrane-8,13-diol	1780	0.2
Elemene	1425	4.0	Methoprene	1927	0.3
Cadinene	1497	4.3			

RRI: relative retention index on DB-5 capillary column.

1) Department of Biology, Faculty of Marine Sciences, Shandong University, Weihai; e-mail: 423603242@qq.com; 2) Qilu Hospital of Shandong University, Drug Procurement Center, Chief Pharmacist; e-mail: wenjun1965@163.com. Published in *Khimiya Prirodnykh Soedinenii*, No. 4, July–August, 2012, p. 621. Original article submitted March 20, 2011.

The results from a chemical analysis of the essential oil of *L. obstusiloba* are shown in Table 1. Forty-seven compounds, which represent 98.2% of the oil, were identified. The essential oil was characterized by alcohol (60.6%) and was categorized as sesquiterpenes (32.7%), esters (2.9%), oxygenated compounds (1.4%), and a minority of ketones and other substances. The predominant constituents were α-cadinol (11.8%), hedycaryol (9.7%), α-eudesmol (9.7%), caryophyllene (6.4%), τ-cadinol (6.2%), terpinolene (5.7%), and τ-eudesmol (5.1%).

GC-MS analysis was done with an Agilent 7890A/5975C GC/MS spectrometer. An HP-5MS 5% phenyl methyl siloxane (30 m × 0.25 mm × 0.25 μm) capillary column was used with a helium carrier gas at 1.2 mL/min. GC oven temperature was kept at 60°C for 2 min, then adjusted to 180°C at a rate of 15°C/min, then kept constant for 5 min. The temperature was then increased to 250°C at a rate of 5°C/min and then kept constant for 3 min. The injection port temperature was 250°C, the column pressure was 72 kPa, and the injection volume was 1 μL (95% in hexane). For the mass spectrometry an EI ion source at a temperature of 230°C was used. The electron energy was 70 eV, the interface temperature was 270°C with a solvent delay time of 3 min, and the scanning mass range was 60–600 *m/z.*

REFERENCES

1. Lee Jung-Ok, Kim Chulyoung, Lee Seung-Woo, and Oak Min-Ho, *Biomolec. Therapeut*., **2** (18), 205 (2010).
2. C. Y. Bang and S. Y. Choung, *Planta Med*., **75** (9), 1025 (2009).
3. Chung Il-Min and Moon Hyung-In, *Immunopharmacol. Immunotoxicol*., **33** (1), 146 (2011).