Chemistry of Natural Compounds, Vol. 43, No. 6, 2007

CHEMICAL COMPOSITION OF THE ESSENTIAL OIL OF *Ocimum Basilicum* CULTIVATED IN MONGOLIAN DESERT-GOBI

S. Shatar,[1] Sh. Altantsetseg,[1] I. Sarnai,[2] D. Zoljargal,[2] Tran Dinh Thang,[3] and Nguyen Xuan Dung[4]

UDC 547.913

Ocimum Basilicum L. (*Sweet Basil*) is cultivated commercially in many countries (e.g., India, France, Marocco, Italy) mainly for its essential oil, which is used extensively in the pharmaceutical and cosmetics industries. The medicinal properties of the plant are highlighted by its use as a carminative and stimulant.

The seeds are said to have demulcent and diuretic properties [1, 2] and the oil's pleasant odor is responsible for its use in expensive perfumes, liqueurs, and expensive seasonings [3].

They are also commonly cultivated in many other tropical countries, such as South America, Madagascar, Sri Lanka, Cambodia, Malaysia, Indonesia, the Philippines, etc. [4].

Ocimum Basilicum L. is an introduced species to Fiji and is recognized as a useful therapeutic agent among these peoples [1, 5]. The aromatic leaves are used fresh or dried as a flavoring agent for food and confectionery products and possess antimicrobial activity [6].

A number of different chemotypes of *Sweet Basil* exist. Varieties rich in methyl cinnamate, linalool, 1.8-cineole, methyl chavicol, and eugenol have been established [7, 8].

Seeds of *Ocimum Basilicum* L. from the USA were used in this study.

The air-dried parts of *Ocimum Basilicum* were hydrodistilled in a Clevenger-type apparatus [9] for 2 h.

About 15 mg of oil, which was dried with anhydrous sodium sulfate, was dissolved in 1 mL of CH_3OH (for spectroscopy or for chromatography). GC analysis was performed on an HP 6890 Plus gas chromatograph equipped with a FID and fitted with an HP-5 column (L = 25 m, ID = 0.25 mm). The analytical conditions were: carrier gas H_2, injector temperature (PTV) 250°C, detector temperature 260°C, temperature programmed 60° (2 min hold) to 220° (10 min hold) at 4°C/min.

The Hewlett–Packard 6890 Plus chromatograph was fitted with the fused silica capillary column HP-5. The conditions of use were the same as described above with He as carrier gas, interface with the mass spectrometer HP 5972 MSD (70 eV).

The temperature was programmed as reported above. Component identification was carried out by comparing MS data with those reported in the Wiley library on Chemstation HP, and in some cases with substances identified from the oil's known composition and also with standard substances [10].

Oxygenated constituents are the most important compounds: 1.8-cineol (8.54%), linalool (27.26%), methylchavicol (19.77%), and (*Z*)-α-bergamotene (10.00%) (Table 1).

ACKNOWLEDGMENT

This work was done within the framework of the project "Antimicrobial Activity and Components of Essential Oil of Mongolian Traditional Useful Plants" supported by the Asia Research Center in Mongolia and the Korea Foundation for advanced studies.

1) Institute of Chemistry and Chemical Technology of the Mongolian Academy of Science, Ulaanbaatar-51, Mongolia, e-mail: sshatar@yahoo.com; 2) University of Mongolian Science and Technology; 3) Faculty of Chemistry, Vinh University, 182-Le Duan. Vinh. Vietnam; 4) Faculty of Chemistry, Hanoi National University, 19 Le Thanh Tong. Hanoi, Vietnam. Published in Khimiya Prirodnykh Soedinenii, No. 6, pp. 603-604, November-December, 2007. Original article submitted August 18, 2006.

 0009-3130/07/4306-0726

TABLE 1. Composition of the Essential Oil of *Sweet Basil* (*Ocimum Basilicum*) from Mongolian Desert-Gobi

Compounds	Mongolia	Iran	Fiji	Compounds	Mongolia	Iran	Fiji
α-Pinene	0.22-0.28	0.09	Tr.	Eugenol	-	3.14-5.92	Tr.
Sabinene	0.28-0.33	0.44-1.79	Tr.	Methyl eugenol	-	1.38-5.62	3.20
β-Pinene	0.56-0.57	0.71	Tr.	Methyl cinnamate	-	-	24.7
Myrcene	0.43-0.47	2.85-4.20	Tr.	β-Elemene	1.56-2.71	0.08-1.40	23.60
1,8-Cineole	8.54-8.64	6.58-16.46	4.6	(*Z*)-α-Bergamotene	10.00-11.22	4.60-6.97	-
(*E*)-β-Ocimene	0.33-0.36	1.97-3.44	Tr.	α-Humulone	0.85-0.99	0.27-0.41	-
Linalool	24.49-27.26	25.14-53.70	22.3	Germacrene D	3.51-3.80	0.13	-
Camphor	1.05-1.10	0.08-0.34	-	Bicyclogermacrene	0.45-0.55	0.46-0.47	-
Terpineole	0.90-1.18	0.17-0.45	Tr.	Nerolidol	3.21-3.72	-	-
Terpin-4-ol	1.66-1.72	0.22-0.27	Tr.	*t*-Cadinol	5.72-7.44	-	
Methylchavicol	19.77-19.85	6.25-6.64	Tr.	β-Eudesmol	-	3.63-5.65	
Bornyl acetate	1.22-1.54	0.78-1.31					

REFERENCES

1. J. J. Brophy, *Flavour Fragr. J.*, **1**, 53 (1986).
2. K. M. Nadkarni, *Indian Materia Medica, 3rd edn, Popular Book Depot Bombay*, India, 1954.
3. S .R. Robbins, *Rep. Trop. Prod. Inst*. London, 121, 171, (1979).
4. *Selected Medicinal Plants in Hanoi, Vietnam* , **2**, 146 (1998).
5. E. Guenther, *The Essential Oils*, Vol. **3**, Krieger, New York (1949).
6. R. A . Omidbaigi and A. Hassanil, *J. Essential Oil Bearing Plants*, **6**, No. 1, 104 (2003).
7. B. M. Lawrence and D. M. Peele, in: *Proceedings of the 8th International Congress of Essential Oils*. Cannes, France, 1980, p. 111.
8. B. Skrubis and P. Markakis, *Econ. Bot.*, **30**, 389 (1984).
9. R. P. Adams, Cedar Wood Oil-Analysis and Properties in: Modern Methods of Plant Analysis-Oils and Waxes, H. F. Linskens and J. F. Jackson (eds), Springer-Verlag, Berlin, 1991.
10. R. P. Adams, Identification of Essential Oil Components by Gas Chromatography/Mass Spectroscopy, Allured Publishing Co. Carol Stream, Illinois (1995).