

ESSENTIAL OIL OF *Cyclotrichium longiflorum* LEBLEBICIS. Aslan,¹ M. Firat,² and B. Konuklugil¹

UDC 547.913

The Genus *Cyclotrichium* is represented in Turkey by six species, of which two are endemic [1]. *Cyclotrichium longiflorum* grows in Eastern Anatolia. No studies on the chemical composition of the essential oil of *Cyclotrichium longiflorum* has previously been reported. This is the first study of the essential oil of this species.

The aim of this work was to examine the chemical composition of the essential oil of *Cyclotrichium longiflorum* collected from Hakkari (Cukurca yol ayrimi) in Turkey during flowering (July 2004). The voucher specimen were identified by Mehmet Firat at the Department of Biology, Faculty of Education, University of 100 Yil, Van –Turkey and has been deposited at the Herbarium of the Department of Biology, Van-Turkey (VANF 4454).

TABLE 1. Composition of the Essential Oils of Four Turkish *Cyclotrichium* Species, %

Compounds	1a	1b	1c	1d	1e	2	3	4
Pinocamphone						33.78		
Isopinocamphone						13.67		
Myrtenyl acetate						9.11		
Naphthalene						7.36		
Terpinen-4-ol						7.22		
β -Pinene		6.97		1.13		5.52		
<i>p</i> -Cymene						5.25		
Myrtenol						3.35		
β -Caryophyllene							14.14	
Camphor							11.92	
<i>p</i> -Menth-3-en-8-ol							11.44	
1,8-Cineole	1.64	1.15					9.26	1.48
α -Fenchone							5.95	
Limonene							4.13	1.97
<i>t</i> -Cadinene							3.86	
Naphthalene							3.86	
<i>p</i> -Cymene							3.03	
Pulegone						49.8		56.11
Neral	1.27							
Menthone	9.76			1.38		32.5		
Limonene						6.0		
Isomenthone	1.98	2.74	23.91	30.67		1.6		35.36
Isomenthol						1.59	11.22	7.19
Piperitone				1.3		1.3		
Piperitenone				1.2		1.2		
<i>cis</i> -Isopulegone	52.17	16.98	3.66	3.52				
Isopinocamphone		26.93						
Linalol		2.16						
Sabinene		1.14						
<i>trans</i> -Isopulegone	3.88							

1,a,b,c,d,e - aerial parts of the plant were collected from five localities of *Cyclotrichium organifolium*; 2 - *Cyclotrichium stamineum*; 3 - *Cyclotrichium leucotrichum*; 4 - *Cyclotrichium niveum* [3, 5].

1) Faculty of Pharmacy, Department of Pharmacognosy, Ankara University, 06100 Tandogan-Ankara, Turkey;
2) Faculty of Education, 100, Yil University, Van, Turkey. Published in Khimiya Prirodnikh Soedinenii, No. 6, pp. 601-602, November-December, 2007. Original article submitted August 7, 2006.

TABLE 2. Composition of the Essential Oil of *Cyclotrichium longiflorum*, %

Compound	RI ^a	Area, % ^b	Compound	RI ^a	Area, % ^b
α -Pinene	1007	1.89	Isopinocampnone	1539	67.66
β -Pinene	1101	9.67	4-Terpineol	1586	0.98
Sabinene	1112	2.19	Myrtenal	1613	0.31
β -Myrcene	1152	0.98	α -Terpineol	1684	0.36
Limonene	1186	4.30	Germacrene D	1691	0.91
1,8-Cineol	1195	0.39	Bicyclogermacrene	1716	1.36
<i>p</i> -Cymene	1256	0.52	Myrtenol	1804	2.44
Pinocampnone	1499	1.29	Spathulenol	2115	2.81

^aRetention index relative to *n*-alkanes on the INNOWAX column, ^b%calculated from FID data.

Some members of Genus *Cyclotrichium* are used to make herbal teas and as flavoring agents in soups and salads in Turkey [2].

The chemical composition of the essential oils of five *Cyclotrichium* species is reported in Table 1. The air-dried and finely ground aerial part of *C. longiflorum* was submitted for 3 h to water distillation using a Clevenger-type apparatus (yield 0.04%).

Sixteen compounds from the essential oil of *C. longiflorum* were identified by GC-MS representing 98.04% of the total oil (Table 2). The major components of the oil were isopinocampnone (67.66%), β -pinene (9.67%), limonene (4.30%), and spathulenol (2.81%).

The identity of the components was assigned by comparison of their retention indices, relative to *n*-alkanes, and mass spectra with corresponding data from reference compounds and from the literature [3–5]. The percentages of the components were calculated from the GC peak areas using the normalization method.

REFERENCES

1. P. H. Davis, *Flora of Turkey and the East Aegean Islands*, Vol. 7, University Press Edinburg, 1982, p. 346; Vol. 10, 1988, p. 208.
2. T. Baytop, *Therapy with Medicinal Plants in Turkey*, 2nd Edition, Nobel Tip Kitapevleri, 1999, 304.
3. B. Tepe, M. Sokmen, A. Sokmen, D. Daferera, and M. Polissiou, *J. Food Eng.*, **69**, 335 (2005).
4. K. H. C. Baser, S. Sarikardasoglu, and G. Tumen, *J. Essent. Oil Res.*, **6**, 9 (1994).
5. K. H. C. Baser, M. Kurkcuglu, T. Ozbek, and G. Tumen, *J. Essent. Oil Res.*, **8**, 569 (1996).