

COMPOSITION OF THE ESSENTIAL OIL OF *Hymenocrater platystegius* IN IRAN

Hashem Akhlaghi,^{1*} Mohamad-Reza Saiidi Asl,²
and Majid Mohamad-Hosseini³

UDC 547.913

Nine species of the genus *Hymenocrater* are found in Iran: four are endemic [1, 2]. One of these is *H. platystegius*, which occurs in Khorasan Province, northeastern Iran.

Hymenocrater spp. grow as low shrubs and perennial herbs [3]. There are only a few reports on the essential oil content of members of this genus [4, 5]. In one of these studies, the hydrodistilled essential oil from the aerial parts of *H. elegans* Bunge was found to contain mostly spathulenol (49.5%) and caryophyllene oxide (12.9%). In another study, the hydrodistilled essential oils were obtained from the aerial parts of *H. calycinus* Boiss. collected in three different locations in northeastern Iran: Bojnourd village of Yekeh-Shakh (sample A), Nodeh village (sample B), and the Golestan forest (sample C). The major constituents were α -pinene (10.5%) and sabinene (10.5%) in sample A, spathulenol (35.4%) and abietatriene (13.4%) in sample B, and β -caryophyllene (32.8%) and caryophyllene oxide (16.1%) in sample C [5].

Our study deals with the analysis of the essential oil isolated from aerial parts of *Hymenocrater platystegius* Rech. f., which grows wild in Iran.

The composition of the oil of the aerial parts of *H. platystegius* is shown in Table 1, which lists the percentage yields of the components found, as well as their retention indices. As can be seen, seventeen components representing 90.7% of the aerial parts oil of *H. platystegius* were identified. The major components of the oil were α -pinene (23.4%) and limonene (23.2%). The other sizable component was β -pinene (11.7%). These results can be compared to those for the oil of *H. incanus* (from Iran), namely, β -caryophyllene (17.6%) and 1,8-cineole (16.9%). As also can be seen from Table 1, the monoterpene hydrocarbon fraction in the oil of aerial parts of *H. platystegius* contains six compounds comprising 64.8%. In addition, three oxygenated monoterpenes account for 4.3% of the essential oil, and eight sesquiterpene hydrocarbons account for 21.6%.

TABLE 1. Retention Indices and Percentages of Components in the Aerial Part Essential Oil of *Hymenocrater platystegius*

Compound	RI	%	Compound	RI	%
α -Pinene	939	23.4	α -Copaene	1374	0.8
β -Pinene	980	11.7	β -Bourbonene	1387	0.2
β -Myrcene	991	1.1	β -Caryophyllene	1418	4.3
Limonene	1026	23.2	β -Gurjunene	1440	2.8
1,8-Cineole	1033	3.8	Germacrene D	1480	4.0
(<i>E</i>)- β -Ocimene	1044	1.7	α -Muurolene	1500	4.1
γ -Terpinene	1054	3.7	γ -Cadinene	1513	1.3
Linalool	1098	0.4	δ -Cadinene	1522	4.1
Terpinen-4-ol	1174	0.1	Total		90.7

RI: relative retention indices as determined on a DB-5 column using the homologous series of *n*-alkanes; $t < = 0.05\%$.

1) Department of Basic Sciences, Islamic Azad University, Sabzevar Branch, Sabzevar, Iran, e-mail: sh_akhlaghi2001@yahoo.com; 2) Department of Food Science, Islamic Azad University, Sabzevar Branch, Sabzevar, Iran; 3) Department of Chemistry, Islamic Azad University, Shahroud Branch, Shahroud, Iran. Published in *Khimiya Prirodnykh Soedinenii*, No. 3, p. 379, May–June, 2009. Original article submitted November 12, 2007.

ACKNOWLEDGMENT

We are grateful to Dr. R. Laursen, Boston University for reviewing this article and for his comments.

REFERENCES

1. K. H. Rechinger, *Hymenocrater*, in: Flora Iranica, Labiatae, No. 150, K. H. Rechinger and I. C. Hedge (eds.), Akademische Druck and Verlagsanstalt, Graz, Austria, 1982.
2. V. Mozaffarian, *A Dictionary of Iranian Plant Names*. Farhange Moaser, Tehran, Iran, 1996.
3. P. H. Davis, *Flora of Turkey* Vol. 7, p. 293, Edinburgh, Scotland, UK, 1982.
4. A. Firouznia, A. Rustaiyan, M. Nadimi, S. Masoudi, and M. Bigdeli, *J. Essent. Oil Res.*, **17**, 527 (2005).
5. M. Mirza, L. Ahmadi, and M. Tayebi, *Flav. Fragr. J.*, **16**, 239 (2001).