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NOTE

Chemical Constituents of *Thymus eriocalyx* Leaves of Iranian Origin Plant

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The chemical composition of the volatile oil of the fresh leaves of *Thymus eriocalyx* growing wild in Lorestan state of Iran was analyzed by gas chromatography-mass spectrometry. Fifteen compounds consisting of 98.77% of the oil were identified. The major constituents identified were 1,8-cinole (3.07%), L-linalool (1.01%), thymol (66.34%), caryophyllene oxide (2.96%) and carvacrol (7.5%).

Key Words: *Thymus eriocalyx*, Essential oils composition, Labiatae.

The genus Thymus L. (Labiatae) consists of about 11 species in west of Iran which (*Thymus fallaxs*, *Thymus daenensis subsp. daenensis*, *Thymus transcaneasicus*, *Thymus persicus*, *Thymus kotschyamus*, *Thymus fedtschenjoi*, *Thymus migricus*, *Thymus caucasicus*, *Thymus eriocalyx*, *Thymus tranutvetteri* and *Thymus kotshyanus*) are endemic[1]. *Thymus eriocalyx* (Ronniger) Jalas is an aromatic hairy shrub or small frutescent with small leaves and pink flowers commonly known as Avishan in Iran[2]. It often growing up to an altitude of 1800 m[3]. The aromatic leaves, which retain their flavor and other qualities even after drying, are cooled, weakly acidic in taste and are considered as tonic, antihelmintic, analgesic, digestive activities[4]. Other studies on its oil demonstrated, a literature survey showed that the analysis of the leaf oil growing in the Lorestan region in the west of Iran had not been done. This study describes the detailed analysis of the essential oil of *Thymus eriocalyx* leaf oil by GC-MS.

The fresh leaves of *Thymus eriocalyx (Ronniger)* Jalas (Family: Labiatae)[1] were collected from 1800 m of Zagros Mountain in the Lorestan state, west of Iran, in July 2005. The plant was identified and authenticated

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by Dr. H. Amiri, Department of Biology, University of Lorestan. Voucher specimens were deposited in the Herbarium of Research Institute of Forest and Rangeland, Tehran.

Isolation of essential oil: Fresh leaves (45 g) of *Thymus eriocalyx* were hydrodistilled in a clevenger-type apparatus for 3.5 h. The distillate was extracted with diethyl ether, the ethereal layer was dried over anhydrous sodium sulphate and ether distilled off on heated water bath. The yield of the oil obtained was found to be 1.05 %.

Gas chromatography-mass spectrometry: GC analyses was carried out on a Shimutzu 17A gas chromatograph and a BP-5 (non-polar and 95% dimethyl polysiloxane) capillary column (30 m × 0.25 mm; 0.25 μm film thickness). The oven temperature was held at 60°C for 3 min then programmed at 5°C/min to 300°C. Other operating conditions were as follows: carrier gas He, with a flow rate of 5 mL/min; injector temperature 230°C; detector temperature 300°C; split ratio, 1:8. GC-MS analyses was performed on a Shimutsu 17A GC coupled with Shimutsu QGD5050 Mass system. The operating conditions were the same conditions as described above but the carrier gas was He Mass spectra were taken at 70 eV. Mass range was from m/z 50-450 amu. Quantitative data were obtained from the electronic integration of the peak areas. Retention indices were calculated using co-chromatographed standard hydrocarbons (Table-1).

TABLE-1
COMPOSITION OF *Thymus eriocalyx* LEAVES

Compound	Retention time	Retention indices	%
1,8-Cineol	6.454	1011	3.07
L-Linalool	8.802	1088	1.01
Terpineol	10.208	1159	0.83
1-Borneol	10.562	1141	1.46
Carvacrol methyl ether	11.061	995	0.61
trans-Caryophyllene	13.658	1414	9.51
Thymol	13.788	1162	66.34
carvacrol	13.977	1287	7.50
β-Bisabolene	14.790	1485	0.88
cis-Bisabolene	15.283	1661	1.75
Ethyl cinamate	15.567	1432	2.05
(+)-Spathulenol	17.133	1577	0.67
Caryophllene oxide	17.274	1548	2.96
β-Ocimene	20.601	1028	0.59

Identification of constituents: The individual compounds were identify by MS and their identity was confirmed by comparing their retention indices relatives to C_6-C_{28} *n*-alkanes and by comparing their mass spectra

and retention times with those of authentic samples or the components of the oil were identified by comparison of their mass spectra and retention indices with those published in the literature[5].

The volatile oil of the fresh leaves of *Thymus eriocalyx* was obtained by a conventional hydrodistillation method using a Clevenger-type apparatus and the yield of the oil was found to be in 1.05 % (w/w). GC-MS analysis resulted in the identification of 15 compounds accounting for 99.25% of the oil while 0.75% of the oil remained unidentified. Monoterpene phenols were the main constituents (74.67%) of the oil and contained thymol (66.34%), carvacrol (7.5%), as the main compounds. The oxygenated monoterpenes, which constituted (5.36%) of the oil, were found to contain 1-borneol (1.46%) and terpinenol (0.83%) as the main compounds. Further analysis of the volatile leaf oil showed that sesquiterpene hydrocarbons (12.14%) contained *trans*-caryophyllene (9.51%) as major components. It is worth mentioning here that there is variation in the chemical composition of *Thymus eriocalyx* oil and other thymus spices of the west of Iran)[6-8]. This study showed that the leaves of *Thymus eriocalyx* growing in this region contained a maximum amount of thymol (66.34%). On the basis of above studies, it may be summarized that the leaves of *Thymus eriocalyx*, growing wild and abundant in this region of Iran may be utilized for the isolation of flavoring oil and a source of natural thymol.

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