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Steam Volatiles of *Vaccinium arctostaphylos*

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Abstract

The essential oil constituents of the flowering aerial parts of *Vaccinium arctostaphylos* L. (Ericaceae) were analysed by GC/MS. Twenty-six compounds, constituting 80.43% of the oil, were identified. The major compounds are alpha-terpineol (14.99%) and linalool (13.7%).

Keywords: Ericaceae, essential oil, *Vaccinium arctostaphylos*.

Introduction

The genus *Vaccinium* (Ericaceae) comprises nearly 200 species, most of them are found in the Northern hemisphere (Morazzoni & Bombardelli 1996). Among these, only one species – *Vaccinium arctostaphylos* L. – is native to Iran (Wendelbo, 1965).

Vaccinium arctostaphylos L. is a shrub up to 3 m in height which grows wild in the Northern forests of Iran (Wendelbo, 1965; Mozaffarian, 1998). Its berries are edible cherry and are used as antihypertensive and antidiabetic agents in Iranian folk medicine (Amin, 1991).

Phytochemical analyses have confirmed the occurrence of flavonol glycosides (Mzhavandaze, 1971) and coumarins (Mzhavanadze et al., 1971) in leaves, and phenolic acids and their derivatives in leaves (Mzhavanadze et al., 1971) and unripe fruits (Mzhavanadze et al., 1972).

The present study is the first study on the chemical composition of the essential oil from the flowering parts of *Vaccinium arctostaphylos*.

Materials and methods

Plant material

Flowering aerial parts of *Vaccinium arctostaphylos* were collected from the forest region of Kelardasht on the North

slope of the Albourz Mountains in Iran at an altitude of 1600–1800 m, during June 2000. Voucher specimens have been deposited in the herbarium of the Faculty of Pharmacy, Medical Sciences University of Tehran, Tehran, Iran (No. 6519THE).

Oil isolation

The air-dried flowering aerial parts (250 g) were crushed and hydrodistilled for 4 h in a Clevenger apparatus. The distillate was extracted with petroleum- benzene 40–60 °C. The organic layer was separated, dried over anhydrous sodium sulphate and concentrated to 0.5 mL under reduced pressure. The concentrated extract had a strong odor and yellow color.

GC/MS analysis

The oil was analysed by GC/MS using a Hewlett Packard 6890/5972 system with a HP-5 capillary column (30 m × 0.25 mm; 0.25 µm film thickness). The carrier gas was helium with flow 2 mL/min. The column temperature was programmed from 60–275 °C at 4 °C/min. MS were taken at 70 eV. Mass range was from *m/z* 50–300. Relative percentage amounts were calculated from peaks total area by apparatus software. The compounds were identified by comparing mass spectra and Kovats' Retention Indices with those in literature (Adams, 1995) and by computer searching followed by matching the mass spectra data with those held in computer library (Wiley 275.L).

Results and discussion

This investigation is the first study on the volatile constituents of the flowering aerial parts of *Vaccinium arctostaphylos* L. The essential oil from the plant was analysed

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Table 1. Chemical composition of the steam volatiles of *Vaccinium arctostaphylos* L.

Compound	RT	Area%	KI	Ident.
(E,E)-2,4-Heptadienal	5.38	0.23	1012	MS, KI
Benzene acetaldehyde	6.22	0.80	1044	MS, KI
cis-Linalool oxide	7.03	3.19	1075	MS, KI
trans-Linalool oxide	7.46	2.31	1091	MS, KI
Linalool	7.91	13.7	1107	MS, KI
n-Nonanal	7.94	1.51	1108	MS, KI
Ho-trienol	7.99	2.10	1110	MS, KI
Benzene ethanol	8.22	0.56	1117	MS, KI
alpha-Terpineol	10.7	14.99	1196	MS, KI
Safranal	10.85	1.55	1201	MS
beta-Cyclocitral	11.53	0.89	1222	MS, KI
beta-Citronellol	11.87	3.40	1232	MS, KI
trans-Geraniol	12.78	6.27	1260	MS, KI
Vitispirane	13.41	2.8	1279	MS
Thymol	14.03	6.54	1298	MS, KI
Carvacrol	14.34	1.76	1307	MS, KI
(E,E)-2,4-Decadienal	14.69	0.87	1318	MS, KI
(E)-beta-Damascenone	16.9	0.52	1386	MS, KI
(E)-alpha-Ionone	18.29	1.19	1429	MS, KI
(E)-Geranyl acetone	19.11	1.16	1455	MS, KI
(E)-beta-Ionone	20.21	7.53	1489	MS, KI
Dihydroactinidiolide	21.55	2.33	1532	MS, KI
n-Heptadecane	26.62	0.77	1699	MS, KI
n-Octadecane	29.59	0.57	1799	MS, KI
n-Nonadecane	32.60	1.16	–	MS
n-Eicosane	35.77	1.73	–	MS

RT = Retention Time; KI = Kovats' Retention Index; MS = Mass Spectrum.

by GC/MS. Twenty-six compounds were identified. The components identified are listed in Table 1. The compounds represent over 80% of total volatiles of the oil. The oxygenated monoterpenoids comprise over 56% of the volatiles. The major components are alpha-terpineol (14.99%) and

linalool (13.7%). Other main compounds are *trans*-beta-Ionone (7.53%), thymol (6.54%) and geraniol (6.27%).

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References

- Adams RP (1995): *Identification of Essential Oil Components by Gas Chromatography/Mass Spectroscopy*. IL, Allured Publishing Corp.
- Amin Gh (1991): *Popular Medical Plants of Iran*. Vol. 1. Tehran, Research Deputy of Health Ministry.
- Morazzoni P, Bombardelli E (1996): *Vaccinium myrtillus* L. *Fitoterapia LXVII*: 3–29.
- Mozaffarian V (1998): *A Dictionary of Iranian Plants Names*. Tehran, Farhang Moaser Publishers.
- Mzhavanadze VV (1971): Kaempferol glycosides from the leaves of the Caucasian bilberry, *Vaccinium arctostaphylos*. *Soobsch Akad Nauk Gruz SSR* 62: 445–447; Chem. Abs. 75, 95417b.
- Mzhavanadze VV, Targamadze IL, Dranik IL (1971): Polyphenols from *Vaccinium arctostaphylos* leaves. *Khim Prir Soedin* 7: 546; Chem. Abs. 76, 124113c.
- Mzhavanadze VV, Targamadze IL, Dranik IL (1972): Phenolic compounds of unripe blueberry *Vaccinium arctostaphylos* fruits. *Soobsch Akad Nauk Gruz SSR* 68: 205–208; Chem. Abs. 78, 26516h.
- Wendelbo P (1965): Ericaceae. In: Rechinger KH, ed., *Flora Iranica*, Vol. 11. Graz, Akademische Druck-U. Verlagsanstalt.