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ORIGINAL ARTICLE

Essential Oil of the aerial parts of *Artemisia persica* (Asteraceae) from Iran

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ABSTRACT
The aerial parts of Artemisia persica (Asteraceae), have been used in Iranian traditional medicine. Composition of the essential oil, which was obtained from the aerial parts of Artemisia persica collected from Isfahan- Iran, was determined by GC/MS. In total, 30 components (90.06% of essential oil) were identified. Major constituents were α-thujene (10.04%), α-pinene (4.06%), limonene (8.90%), linalool (10.43%), and cis-davanone (50.12%).
Keywords: *Essential oil composition, Artemisia persica, Cis-Davanone, α-Thujene, Limonene.*

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INTRODUCTION

Secondary metabolites plants that are produced as inactive precursors stored in the plant tissues include phenolic compounds, flavonols and flavonoids, glycosides, alkaloids and poly acetylenes. Recently, these compounds have been considered due to their inhibitory and bactericidal properties to kill pathogenic microorganisms [1]. Iran has a long medicinal tradition and traditional learning of plant remedies. *Artemisia* genus belonging to Asteraceae (Compositeae) family which contains 34 species growing in Iran [2], comprises aromatic plants known for their potent chemical constituents in their essential oils with antibacterial, antiviral, antifungal, insecticidal and cytotoxic activity [3,4]. Numerous studies have examined the chemical composition, biological activities, and other industrial characteristics of essential oils of Artemisia sp. [5]. This study reveals the chemical composition of Artemisia persica.

MATERIALS AND METHODS

Plant material and oil isolation

The plant materials were collected from of Isfahan-Iran in 2012- 2013. The *Artemisia persica* aerial parts such as stem, flowers and leaves were ground and the resulting powder was subjected to hydrodistillation for 3 hours in an all glass Clevenger-type apparatus according to the method recommended by the European Pharmacopoeia [6]. The obtained essential oils were dried over anhydrous sodium sulphate and after filtration, stored at +4 ºC until tested and analysed.

Essential oil analysis

The GC/MS analyses were executed on a Hewlett–Packard 5973N gas chromatograph equipped with a column HP-5MS (30 m length × 0.25 mm i.d., film thickness 0.25 lm) coupled with a Hewlett–Packard 5973N mass spectrometer. The column temperature was programmed at 50 ºC as an initial temperature, holding for 6 min, with 3 ºC increases per minute to the temperature of 240 ºC, followed by a temperature enhancement of 15 ºC per minute up to 300 ºC, holding at the mentioned temperature for 3 min. Injector port temperature was 290 ºC and helium used as carrier gas at a flow rate 1.5 ml/min. Ionization voltage of mass spectrometer in the EI-mode was equal to 70 eV and ionization source temperature was 250 ºC. Linear retention indices for all components were determined by coinjection of the samples with a solution containing homologous series of C8-C22 *n*-alkanes
and comparing them and their mass spectra with those of authentic samples or with available library data of the GC/MS system (WILEY 2001 data software) and Adams libraries spectra [7].

RESULT AND DISCUSSION

Chemical composition of essential oil

The chemical compositions of *Artemisia persica* essential oil are shown in Table 1. 30 compounds representing 90.06 % of *Artemisia persica* essential oil were identified. The major organic compounds detected in the oils, were α-thujene (10.04%), α-pinene (4.06%), limonene (8.90%), linalool (10.43%), and cis-davanone (50.12%). Most of the chemical compounds of essential oils of Artemisia sp. are terpenoids, concurring with the results of Li *et al.,* [8] who analysed approximately 171 species of Artemisia in China. The main components of those species were camphor, 1,8-cineole, thujone, *a*-pinene, limonene.The highest proportion compound however, was different in each species. Setzer *et al.,* [9] reported camphor (28.98%) as the main constituent of the *Artemisia douglasiana* essential oil. Analysis of the chemical composition of *Artemisia absinthium* oils extracted from plants grown in USA showed *b*-thujone (17.5–42.3%) and C-sabinyl acetate (15.1-53.4%) as the main components [10]. A study conducted in India showed that ketone (% 58.8), camphor (15.8%), 1, 8 cineole (2.2%) and Gramacidin-D (2.4%) are the main components of the essential oil of this herb [11]. A study conducted in Iran by Verdian *et al.,* [12] showed that there are 32 components in the essential oil of *A.annua* and camphor (48%), 1, 8 cineole (9.31%), camphene% (6.98%) and spathulenol (4.89%) were identified as the main components. Previous research showed that *a*-pinene (10.2%), 1,8-cineole (10.1%), artemisia ketone (11.4%) and camphor (24.6%) were the main components of the essential oil of *Artemisia biennis* grown in Iran [13]. Davanone is reported to occur in *A. pallens* [14, 15] and in *A. rehan* [16]. It has been reported that the chemical compositions of the essential oil are highly influenced by climatic conditions and geographical factors.

Table 1. Composition of the essential oil of *Artemisia persica*

	Component	Retention Index	%
1.	α-Thujene	923	10.04
2.	α-Pinene	930	4.06
3.	Camphene	942	0.33
4.	Sabinene	970	0.11
6.	B-Pinene	985	0.31
6.	Limonene	1024	8.90
7.	1,8-Cineol	1032	0.76
8.	γ-Terpinene	1057	0.11
9.	c-Sabinene hydrate	1061	0.17
10.	a-Terpinolene	1080	0.01
11.	Linalool	1091	10.43
12.	Verbenol	1140	0.10
13.	Lavandulol	1163	0.18
14.	4-Terpineol	1173	0.10
15.	p-Cymen	1181	0.01
16.	α-Terpineol	1183	0.40
17.	Myrtenol	1190	0.14
18.	Decanal	1196	0.12
19.	Nordavanone	1224	0.10
20.	Bornyl acetate	1282	0.11
21.	Lavandulyl acetate	1282	0.17
22.	Carvacrol	1296	0.17
23.	Hexyl Tiglate	1322	0.43
24.	Eugenol	1357	0.23
25.	Methyl Eugenol	1395	0.70
26.	*trans* Caryophyllene	1410	0.66
27.	α-Humulene	1440	0.18
28.	D-Germacrene	1468	0.44
29.	Caryophyllene oxide	1571	0.47
30.	*Cis*-Davanone	1600	50.12
	Total		90.06

REFERENCES

1. Das S., Pal S., Mujib A., editors. Biotechnology of medicinal plants recent advances and potential. 1st ed. Hyderabad: UK 992 Press; (1999) 126-139.
2. Mozaffarian V., A dictionary of Iranian plant names, 3rd ed.Tehran: Farhang Mo'aser; 1996. p. 56.
3. Sinico C., De Logu A., Lai F., Valenti D., Manconi M., Loy G., Liposomal incorporation of *Artemisia arborescens* L. essential oil and in vitro antiviral activity. Eur J Pharm Biopharm. 59 (2005) 161-168.

4. Nibret E., Wink M., Volatile components of four Ethiopian Artemisia species extracts and their in vitro antitrypanosomal and cytotoxic activities. Phytomedicine. 17 (2010) 369-374.
5. Bicchi C., Frattini C., Sacco T., Essential oils of three Asiatic Artemisia species. Phytochemistry. 24 (10) (1985) 2440–2442.
6. Adams RP., Identification of Essential Oils Components by Gas Chromatography/Quadra pole Mass Spectroscopy. Carol Stream, IL, Allured. (2001) 61- 367
7. European Pharmacopoeia. Vol. 3, Maisonneuve S. A., Sainte–Ruffine. 1975.
8. Li B.L., Zhu L.F., Lin Y.R., Lu B.Y., Study on the chemotaxonomy of Artemisia L. (compositae) in China—the correlation of chemical constitution of the essential oil with the plant classification. Bot. J. South China 1 (1992) 87–100.
9. Setzera W.N., Voglera B., Schmidta J.M., Leahy J.G., Rivesc R., Antimicrobial activity of *Artemisia douglasiana* leaf essential oil. 75 (2004) 192–200.
10. Lawrence, B.M., Progress in essential oils. Perfumer & Flavorist 17 (1992) 39–42.
11. Gupta P.C., Dutta B., Pant D., In vitro antibacterial activity of Artemisia annua Linn. growing in India. Int J Green Pharm. 3(3) (2009) 255-258.
12. Verdian-rizi M.R., Sadat-Ibrahimi E., Hadjiakhoondi A., Chemical composition and antimicrobial activity of Artemisia annua L. essential Oil from Iran. J Med Plants 7 (2008) 59-62.
13. Nematollahi F., Rustaiyan A., Larijani K., Nadimi M., Essential oil composition of *Artemisia biennis* Willd. and Pulicaria undulata (L.) C.A. Mey., two composite herbs growing wild in Iran. J. Essential Oil Res. 18 (2006) 339–341.
14. Baslas KK., A Review of Investigations on 30 Indian Essential Oils. Perfume Essent. Oil Rec.58(7) (1967) 437.
15. Lewis Y.S., Nambudiri E.S., Composition of Davana Oil, Some Preliminary Studies. Perfume Essent. Oil Rec. 58(9) (1967) 613.
16. Abegaz B., Yohannes P.G., Constituents of Essential Oil of *Artemisia rehan*. Phytochemistry(1982) 21:1791.

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