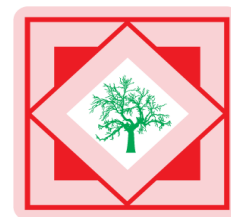




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### Chemical composition of *n*-hexane extract of the fruit from *bereberise integririma* of Iran

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#### ABSTRACT

The chemical compositions of the plant extract obtained by *n*-hexane from the fruit of *bereberise integririma* was analysed by GC/MS and 30 compounds constituting of the extract were identified. The major constituents of the oil were (Z, Z) 9,12-Octadecadienoic acid (11.92%), 9,12,15-Octadecatrienal (7.77%), Gama-sitosterol (5.34%). The most amount of the extract was (Z, Z) 9, 12-Octadecadienoic acid (11.92%). The oil contains Phytosterols (6.87%) and a diterpene (0.51%).

**Keywords:** *Bereberise integririma*, Chemical composition, GC/MS, Extracts.

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#### INTRODUCTION

Barberry family (Beberidacea) with one genera and are 13 species worldwide of which 13 species found in five species in Iran [1]. Species of this genus are found in the northern, eastern, and southeastern highlands of Iran (Alborz, Qaradā in Azerbaijan, ranges of Khorasan, Bārez mountain in Kermān). They reach heights of 1 to 3 m, seldom reaching 4 m, and have long branches, copious thorns, denticulate leaves, and red berries which form in clusters on the outer branches in midspring, after the yellow flowers have shed their petals, and ripen in midsummer [2]. In traditional medicine, barberries are classed as a cold, dry substance and thought to possess the properties that check diarrhea; strengthen the stomach, liver, and heart; eliminate excess bile; relieve thirst; and cool stomach heat, internal inflammations, and blood ebullition [3-4]. A literature survey revealed that no chemical and studies had been performed on the essential oil of *bereberise integririma*. The aim of our study was to evaluate the chemical composition of the fruit of *bereberise integririma* essential oil.

## MATERIALS AND METHODS

### *Plant material*

Fruits of *bereberise integrima* were collected from the Salok protected area of Northern Khorasan Province, Bojnord, Iran, in June 2009, and identified by Mohabat Nadaf, a Botany Department member at the Payame Noor University, Bojnord, Iran. A voucher specimen (voucher specimen number is SUMH 39981) was deposited in the Herbarium of the Department of Botany, Research Centre of Natural Resources of Ferdowsi University, Mashhad, Iran. Fig., shows the plant photo that is taken from the mentioned region of Iran.



**Fig. Photo from *bereberise integrima***

### *Isolation of the essential oil*

Fruit parts of *bereberise integrima* were air-dried in an oven at 60 °C for 48 hours. Then grossly pulverized powdered plant (100 g) was macerated in *n*-hexane for 48 hours, filtered through a Wattman paper, evaporated off the solvent in vacuum to yield light yellow oil.

### *GC-MS analysis*

GC/MS was carried out on a Hewlett Packard 6890 instrument, programmed as follows: a DB-5 capillary column (30 x 0.25 mm, film thickness 0.25 μm), initial temperature of column was 60 °C (held 5 min) and then heated up to 220 °C with a 4 °C min<sup>-1</sup> rate and then heated to 250 °C and kept constant for 2 min., the carrier gas was helium at a flow rate of 1 ml min<sup>-1</sup>, split ratio 1:40; ionization potential 70 eV, scan time 1 s, acquisition mass range m/z 40-400. The oil components were identified by computer matching the WILEY 275.L library and Kovats index and by

comparison of mass spectra with those of authentic samples or with data already available in literature [5-7].

## RESULTS AND DISCUSSION

Extraction of dried fruits of *bereberise integririma* yielded 0.27% of light yellow oil with a pleasant aroma. Thirty components were characterized; representing 72.22% of the total oil components detected which are listed in the Table, with their percentage composition. The major constituents of the oil were (Z, Z) 9,12-Octadecadienoic acid (11.92%), 9,12,15-Octadecatrienal (7.77%), Gama-sitosterol (5.34%). Other components were present in the amounts less than 48%. The other major compositions were *n*-Pentacosane (5.05%), 1-formyl-4-hydroxymethyl cyclohexane (2.88%), cyclooctene (2.59%), 10-Nonadecanol (2.24%) and bicyclo[10.1.0]tridec-1-ene (2.07%). The oil contains Phytosterols (6.87%) and a diterpene (0.51%).

**Table. Percentage composition of fruits extract from *Berberise integririma***

No.	Compound	R <sub>t</sub> (min)	Cont%
1	Decane	5.238	0.35
2	Cycloheptasiloxane	18.569	0.3
3	Hexadecanoic acid (palmitic acid)	28.642	0.02
4	10,13-Octadecadienoic acid methyl ester	30.819	0.28
5	Ethyl linoleolate	30.939	0.48
6	9,12-Octadecadienoic acid(z,z)	31.987	11.92
7	9,12,15-Octadecatrien-1-ol,(z,z,z)	32.254	1.62
8	<i>E,Z</i> -1,3,12-Nonadecatriene	36.353	0.26
9	Methyl(z)-5,11,14,17-eicosatetraenoate	36.466	0.48
10	Bicyclo[10.1.0]tridec-1-ene	37.107	2.07
11	9,12,15-Octadecatrienal	37.234	7.77
12	9,12,15- Octadecatrienoic acid,2,3-dihydroxypropyl	37.441	0.86
13	1,2-Benzenedicarboxylic acid(dioctyl ester)	38.288	0.42
14	Cyclotetracosane	40.758	1.41
15	Triteracotane	40.845	0.81
16	<i>n</i> -Pentacosane	44.463	5.05
17	<i>Z,Z</i> -3,13-Octadecadien-1-ol	44.204	1.06
18	Anti-10-methyl-endo-tricyclo[5.2.1.0(2.6)]decane	45.932	0.39
19	1H-Indene	46.232	0.23
20	5-Methoxy-3,6,8-tri-t-buthylphenanthren-1,4-dione	46.579	0.25
21	10-Nonadecanol	48.429	2.24
22	2-Methyl-z,z-3.13-Octadecadienol	48.702	0.08
23	Neophytadiene	49.216	0.51
24	Stigmasterol	50.491	0.18
25	Cyclododecyne	50.631	0.18
26	Gama-sitosterol	51.593	5.34
27	Cholest -4-en-3-ol	51.873	1.39
28	2(1 <i>H</i> )-Naphthalenone	54.743	0.64
29	1-Formyl-4-hydroxymethyl cyclohexane	58.188	2.88
30	Cyclooctene	58.362	2.59
Total			72.22

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