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COMPOSITION OF THE ESSENTIAL OIL OF *Ononis viscosa* SUBSP. *breviflora*

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Water-distilled essential oil from Ononis viscosa L. *subsp.* breviflora *(DC.) Nyman was analyzed by GC/MS. Forty compounds were characterized representing 81.3% of the oil. Hexahydrofarnesylacetone (12.5%), carvacrol (10.0%), lauric acid (8.3%), nonanal (5.5%), E-geranylacetone (4.8%), and dodecanal (4.8%) were identified as the major constituents.*

Key words: *Ononis viscosa* subsp. *breviflora, Leguminosae,* essential oil, GC/MS.

The genus *Ononis* (*Leguminosae*) is represented by 18 species and 24 taxa. Four of them are endemic. *Ononis viscosa* L. subsp. *breviflora* (DC.) Nyman (Syn: *O. breviflora* DC.; *Ononis viscosa* L.var. *breviflora* (DC.) Reichb.) is hereby reported as a new record for the Fethiye region of Turkey [1, 2].

Ononis species have been used for centuries as folk remedies in Turkey as diuretic, antiseptic and antimicrobial [3, 4]. Members of the genus have been shown to have antibiotic, antipyretic, antiinflammatory, antifungal, and antiseptic activities [5]. The aerial part of *O. arvensis* has been used in traditional medicine to treat urinary tract infections and skin diseases. *Ononis spinosa* has been reported to possess pharmacological activities due to its aperient, diuretic, antibacterial, analgesic, antiinflammatory, antiviral, cytotoxic, and antifungal effects [5-7]. *Ononis viscosa* was shown to have antibacterial activity against Gram positive bacteria [8].

The first studies on *Ononis* species were made by Barton and Overton in 1955. They isolated some triterpenoids. Additionally, Haznagy et al. isolated triterpene, sterol, isoflavone, and pterocarpane derivatives from *O. spinosa* in 1978 [5]. The presence of resorcinol derivatives in *O. natrix*, *O. natrix* subsp. *natrix*, *O. natrix* subsp. *hispanica*, *O. pubescens*, *O. speciosa*, *O. viscose*, and *O. viscosa* subsp. *breviflora* showed that these substances are characteristic of the genus *Ononis* [9-13]. Moreover,flavonoids and norphenyl propanoid glucosides, isocoumarins, and hydroxycinnamic acids were isolated from several *Ononis* species [9, 10, 14-16].

Previous studies of compounds isolated from *O. viscosa* subsp. *breviflora* showed that the major components have an alkylresorcinol structure and the minor components have a pterocarpan structure [17, 18]. *O. viscosa* subsp. *breviflora* has not been investigated previously for its essential oil.

The purpose of this investigation was to study the composition of the essential oil of *Ononis viscosa* L. subsp. *breviflora*.

The water distilled essential oil of this plant obtained in 0.24% yield was analyzed by GC/MS. The results of analysis are shown in Table 1. Forty compounds were characterized with hexahydrofarnesylacetone (12.5%), carvacrol (10.0%), lauric acid (8.3%), nonanal (5.5%), E-geranylacetone (4.8%), and dodecanal (4.8%) as the main constituents.

EXPERIMENTAL

The oil was analyzed by GC/MS using a Shimadzu GC-MS QP5050A system. A CPSil5CB column (25 m × 0.25 mm id., 0.4 mm film thickness) was used, and helium as a carrier gas. GC oven temperature was kept at 60°C for 10 min, and

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TABLE 1. Chemical Composition of the Oil of *Ononis viscosa* subsp. *breviflora* Growing in Turkey

Compound	RI*	%	Compound	RI*	%
α-Pinene	927	0.4	(*E*)-β-Damascenone	1352	0.5
6-Methyl-5-hepten-2-one	955	0.7	2-Dodecanone	1364	0.4
β-Pinene	964	1.8	**Dodecanal**	1378	4.8
2-Amylfuran	970	0.6	β-Caryophyllene	1407	0.6
Octanal+β-Myrcene	972	0.3	**(*E*)-Geranylacetone**	1418	4.8
1-Octanol	1043	0.8	1-Dodecanol	1446	0.8
6-Methyl-3,5-heptadien-2-one	1066	0.4	2-Tridecanone	1465	3.8
Nonanal	1073	5.5	**Lauric acid**	1540	8.3
(*E*)-2-Nonenal	1124	0.8	Caryophyllene oxide	1559	0.6
Naphthalene+caprylic acid	1151	2.1	2,2,4-Trimethylpentane-1,3-diol diisobytyrate	1568	1.2
Decanal	1175	3.2	Hexadecane	1586	0.4
(*E*)-2-Decenal	1227	0.7	2-Pentadecanone	1667	1.7
Thymol	1257	0.8	Heptadecane	1687	0.9
2-Undecanone	1263	0.6	Myristic acid+antrhacene	1731	1.7
Carvacrol	1268	10.0	Octadecane	1788	0.4
Undecanal	1276	2.2	**Hexahydrofarnesylacetone**	1820	12.5
(*E*,*E*)-2,4-Decadienal	1279	0.7	2-Heptadecanone	1872	1.5
Eugenol	1317	1.0	(*E*,*E*)-Farnesylacetone	1883	0.7
α-Terpenyl acetate	1322	0.3	Palmitic acid	1929	0.8
Capric acid	1340	1.0	Phytol	2086	1.0

RI*: Retention index on nonpolar column.

programmed to 260°C at a rate of 5°C/min, and then kept constant at 260°C for 40 min. Split flow was adjusted at 50 ml/min. The injector temperature was at 250°C. MS were taken at 70 eV. Mass range was between *m/z* 30 to 425. A library search was carried out using the Wiley GC-MS Library and inhouse TBAM Library of Esssential Oil Constituents. The MS were also compared with those of reference compounds and confirmed with the aid of retention indices from published as well as our own sources. Relative percentage amounts of the separated compounds were calculated from total ion chromatograms by a computerized integrator.

Ononis viscosa L. subsp. *breviflora* (DC.) Nyman was collected from Fethiye, Karabel passage, on July in Turkey. Voucher specimens are kept at the Herbarium of the Faculty of Anadolu University (ESSE 13868).

Dried aerial parts were subjected to hydrodistillation using a Clevenger-type apparatus to produce oil in 0.24% yield.

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