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The Composition of the Essential Oil of the Plant Phlomoides Nuda Growing in Uzbekistan

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Abstract

This article is the first to study the chemical composition of the essential oils of the vegetative organs of the plant Phlomoidies nuda, distributed in Yangikurgan district of Namangan region of the Republic of Uzbekistan. The essential oils of the plant are separated by hydro-distillation, the chemical composition of which is studied by gas chromatography-mass spectrometry. According to the data, the volatile components of the surface during the flowering period of Ph nuda are 1-Butanol (5.3%), 3-Carene (6.7%), D-Limonene (8.7%),1,8-Cineole (11.1%), m-Cymene (5.7%) was detected.

Keywords:*Phlomoides Nuda;Aromadendren;Pulegone; Distillation; Alloaro Madendren; Caryophyllene; A – Terpinolin; Monoterpene*

Introduction

There are 43 species of Phlomoides in Uzbekistan and 8 species in Namangan region. Plants of this genus are ephemeral plants [1-2]. Herbs are used in folk medicine as infusions and decoctions. The tincture is used in bronchitis, pulmonary tuberculosis, pneumonia, acute respiratory infections, chronic and hypoazid gastritis, gastritis, anemia, hemorrhoids (hemorrhoids), asthenia, malaria, tumors, hypertensive patients. The tincture has a tonic, diuretic effect, enhances immunity and accelerates blood flow; tincture is applied to wounds with pus on the outside. It is shown that *Zopnik prickly* and *Zopnik tuberouslar* have a clear fire-driving properties.

Zopnik tuberouslar root, flowers and seed powder, tincture, decoction in Tibetan, Mongolian medicine and in a number of Siberian peoples in pulmonary tuberculosis; Used in Tibetan medicine in bronchitis, general strengthening, local oral diseases, chronic syphilitic ulcers, purulent wounds, mastitis, bullousness, headache, deafness; when the bath is swollen feet; instead of tea, the leaves and roots were used in the form of condiment.

The Main Findings and Results

The chemical composition of *Ph. Pungens* and *Ph. Tuberosa* herbs includes alkaloids, flavanoids, additives, vitamins, essential oils, macro- and micronutrients that cause their therapeutic activity and can be used in complex medicinal products [4-6]. The chemical composition of Ph. nuda growing in Yangikurgan district of Namangan region has not been studied.

Based on the above, the aim of this study was to compare the qualitative and quantitative composition of essential oils obtained from the surface of the *Phlomoides nuda* plant at the time of flowering with the above-ground part harvested at the time of non-flowering [7-9].

Materials and methods. We used the method of hydro-distillation collected from the surface in April and May to study the essential oils of the *Phlomoides nuda* plant.

The essential oil separation method. The surface of the ***Phlamoides nuda*** plant (200 g) was hydrolyzed for 2 h using a Clevenger apparatus. The essential oil was extracted with dichloromethane to separate the obtained distillate and dried using anhydrous sodium sulfate. The resulting essential oil was stored in a glass jar in the dark at -4 ° C until the experiment. ***Phlamoides nuda*** essential oil composition in Agilent 5977A mass-selective detector (Agilent Technologies) VF-Wax CP 9205 column (100% polyethylene glycol, 30 m × 0.25 mm, film thickness 0.25 μm, Agilent Technologies, Netherlands) Agilent 7890B gas liquid analyzed using chromatography. The results were identified using the chromato-mass spectrometric data library, the Wiley Registry of Mass Spectral Data (9th edition), the NIST Mass Spectral Library (2011) database, and catalogs [10].

Results and Discussion

Mass-spectra of essential oils extracted from the surface of the phlomoides nuda plant at the time of flowering were obtained and analyzed using gas-chromatography mass spectrometry. Analysis of the results of chromatography - mass - spectra of essential oils is shown in Table 1.

Table 1. The chemical composition of *phlomoides nuda* vegetable essential oil

No	Connection name	The upper part of the ground where the plant blooms	The upper part of the ground where the plant does not bloom
		%	%
Hydrocarbons	Tricosane	0,8	0,5
	Pentacosane	1,1	-
	Heptacosane	2,6	1,9
	Nonacosane	1,6	0,22
	Tetracosane	-	2,2
Alcohols	1-butanol	5,3	-
	3-Penten-2-ol	1,7	0,09
	1-Octen-3-ol	0,29	0.16
	Terpinen-4-ol	-	0,22
	2-Furanmethanol	0.38	-

	endo-Borneol	0,7	
	α-Terpineol	-	1,1
	cis-Geraniol	0,3	-
	trans-Geraniol	0,9	-
	Phytol	9,2	-
	1-Hexanol		0,7
	E-3-Hexenol	1	5,1
	3-Octanol	-	0,4
	(E)-2-Hexen-1-ol	--	1,1
	1-Octen-3-ol	-	1,2
	Neoisopulegol	-	0,6
	Terpinen-4-ol	-	1,2
	α-Terpineol	-	1,1
	Benzyl alcohol	-	1,4
	Phenylethyl Alcohol	-	0,7
Aldehydes and ketones	(E)-2-Hexenal	1,7	-
	Furfural	2,6	-
	3-Octanone	0,5	0,4
	Methyl 1-cyclohexenyl ketone	2,7	
	Furfural	2,6	1
	α-Campholena	0,5	-
	Benzeneacetaldehyde	4,5	-
	cis-Citral	-	11
Aromatic compounds	m-Cymene	5,7	0,8
	Benzaldehyde	0,6	0,5
Carboxylic acids	Hexadecanoic acid	1,8	2,6
Ethers	Linalylacetate	5,5	4,2
	Myrtanolacetate	-	0,8
	Tau-Cadinolacetate	-	0.7
Heterocyclic compounds	Furfural	2,6	1
	Pyridine	2,3	-

Monocyclic monoterpenes	1,8-Cineole	11,1	3,4
	Sabinene	0,8	-
	α- terpinolen	5.10	0,62
	D-Carvone	-	13,1
	Fenhol	-	0.21
	D – Limonen	8,7	14,4
Cyclic monoterpenes	b- Pinen	0,09	-
	3-Carene	6,7	
Acyclic monoterpine	*β*-Myrcene		2,8
	α-Ocimene	0,6	

According to the analysis, the main components of essential oil plants are α-terpinolene (5.10%), (+) - pulegone (8.26%), caryophyllene (24.21%) and aromadendren (19.89%) that consists of monoterpene and sesquiterpene. 79 compounds were detected and identified in the essential oil of the plant leaves. The essential oil of these leaves was found to contain mainly caprylic acid (4.22%), butyloctyl phthalate (3.47%), trans-b- caryophyllene (11.25%), g- muurelen - (5.11%), (+) aromadendren (25.66%), alloaromadendren (6.51%).

The analysis of the studies *revealed* differences in the qualitative and quantitative composition of volatile compounds in the flowers and leaves of the plant *Helichrysum nuratavicum*. For example, the non-flowering surface of the plant was found to contain hydrocarbons (6.1%), alcohols (12.7%), aldehydes and ketones (15.1%), terpenes (33%). In the essential oil extracted from the surface of the plant during the flowering period, these values vary significantly: alcohols (14.9%), aldehydes and ketones (11.4%), monoterpenes (24.23%).

From the above analysis, it can be seen that the composition of the essential oil of the non-flowering surface of the plant differs from the ether obtained from the above-ground part during the flowering period. This difference depends on where the plant grows and the growing season.

Conclusion

Thus, during the study, essential oils were extracted from the non-flowering surface of the *Phlomoides nuda* plant and from the above-ground part at the time of flowering. The release time of the compounds in the essential oil relative to the standard was determined. The comparative qualitative and quantitative composition of the essential oils of the non-flowering topsoil of the *Phlomoides nuda* plant and the topsoil at the time of flowering were studied.

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