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CHEMICAL ANALYSIS OF ESSENTIAL OILS EXTRACTED FROM MEDICINAL PLANTS GROWING IN UZBEKISTAN

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Annotation
The plant Helichrysum nuratavicum belongs to the Asteraceae family of the genus Helichrysum Mill., and has more than 500 species. In the flora of Uzbekistan there are 4 species of plants of the genus Helichrysum Mill.
Helichrysum nuratavicum is a perennial plant with a height of 5-35 cm, forming several vegetative shoots (3-6). The leaves are elongated lance late, bent down, their length is 1.5-2.5, width is 1-2 mm. Inflorescences have up to 20 flowers located on a stem densely covered with short white villi, of which 2-6 are shaped like an inverse cone or bell-shaped, 4-6 mm long, 3-4 mm wide. The plant reproduces mainly from seeds and roots. Helichrysum nuratavicum is found only in the Nurata botanical and geographical area of the Navoi region of Uzbekistan.

Keywords: essential oil, caprylic acid, experimental thyrotoxicosis
Many plants belonging to the genus Helichrysum Mill are used as a medicinal product in official and folk medicine, and their chemical composition has also been studied. However, there is little data in the literature on the chemical composition and biological activity of Helichrysum nuratavicum. Based on the above, the purpose of this work was a comparative study of the qualitative and quantitative composition of essential oils isolated from the flowers and leaves of the plant Helichrysum nuratavicum.

The objects of the study were the flowers and leaves of the plant Helichrisum nuratavicum, collected during flowering in August 2019 in the Nurata district of Navoi region. The raw materials were dried according to the rules of plant drying. Essential oils of petals and stigmas were obtained by hydro distillation from air-dry raw materials for 4 hours, using a glass flask and a Clevenger nozzle. To separate the essential oils, the resulting water extract was washed 3 times with chloroform.

The chemical composition of the obtained essential oils was analyzed by chromatography-mass spectrometry on an Agilent 5975C inert MSD/7890A GC MS instrument. The separation of the components in the composition of essential oils was carried out by the temperature gradient method: 50 oC (1 min) - 4 oC /min to 200 oC (6 min) - 15 oC /min to 250 oC (25 min). An Agilent HP-INNOWax quartz column (30m x 250^m x 0.25 p,m) is used. The sample volume was 1 pl at a flow rate of 1.1 ml / min and Split 500/1. The injector temperature is 240 ° C. The mass spectra of the ethers were recorded in the range El-MS m/z 10550 a. u. m.

45 substances contained in the essential oil of plant flowers have been identified and identified. According to the results of the analysis, the main component of the essential oil of the plant flowers is monoterpenes and sesquiterpenes, such as a-terpinolene (5.10%), (+)-pulegon (8.26%), caryophyllene (24.21%), aromadendrene (19.89%). 79 compounds have been identified and identified in the essential oil of the plant's leaves. It was found that the essential oil of the leaves contains mainly caprylic acid (4.22%), butyloctyl phthalate (3.47%), trans - p-caryophyllene (11.25%), u-muurolene (5.11%), (+)- aromadendrene (25.66%), alloaromadendrene (6.51%).

As a result of the analysis of the conducted studies, differences in the qualitative and quantitative composition of volatile compounds contained in the flowers and leaves of the plant Helichrysum nuratavicum were determined. For example, it was found that the essential oil of the plant leaves contains hydrocarbons (1.38%), alcohols (0.58%), aldehydes and ketones (1.27%), monoterpenes (3.51%), sesquiterpenes (63.25%), while in the essential oil of plant flowers, these indicators vary significantly: alcohols (0.67%), aldehydes and ketones (3.4%), monoterpenes (22.48%), sesquiterpenes (56.82%). From the above analysis, it can be seen that the essential oil of the plant flowers differs from the essential oil of the leaves in a lower qualitative composition of substances, a large number of monoterpenes and the absence of hydrocarbons. This difference apparently depends on the place of growth and the growing season of the plant.

Phenolic compounds were isolated and identified by 1H NMR, 13C NMR, UV spectroscopy, and HPLC-MS: caffeic acid ethyl ether, protocatech aldehyde, 5,3¢,4¢-trihydroxy-6,7-dimethoxyflavone, apigenin, apigenin-7-glucuronide ethyl ether, luteolin, luteolin-7-glucuronide methyl ether, ethyl ether luteolin-7-glucuronide, caffeic acid, rosmarinic acid, rosmarinic acid methyl ester. The sum of phenolic compounds in terms of rosemary acid and absolutely dry extract of European zyuznik was 3.5%. Alefirov et al. [1] after studying a number of studies on the effect of extracts from the European zyuznik grass on the thyroid gland and tissue metabolism of iodine in experimental animals (guinea pigs, etc.), they confirmed the presence of antihyperthyroid activity in extracts from the European zyuznik grass on the model of experimental thyrotoxicosis in rats, which was expressed in the normalization of the state and behavior of animals, the level of thyroid hormones in the blood serum. It turned out that the water extraction of zyuznik grass showed the most pronounced therapeutic effect, comparable to the effect of tyrazole. Study of the pharmacological activity of plant raw materials of European zyuznik by Alefirov et al. it showed the antithyroid effect of extracts from the herb of this plant, which opens up the possibility of using drugs based on European zyuznik in the treatment of diffuse toxic goiter as an alternative to intolerance to hormonal antithyroid drugs. At the Department of Organic, Inorganic and Pharmaceutical Chemistry of the Astrakhan State University, we previously found hydrolyzable and condensed tannins in the water extracts of the plant raw materials of these plants during qualitative reactions during phytochemical studies of the ground part of the European and high zyuznik [2, 3]. The content of tannin in the leaves of the high zyuznik (Lycopus exaltatus L.) and the European zyuznik (Lycopus europaeus L.) was 0.01% and 1.6%, respectively. The determination of the amount of flavonoids in terms of luteolin-7-glycoside in water-alcohol (60%) extracts of high zyuznik showed 7.2 mg in the stems, 11.7 mg in the leaves; in extracts of European zyuznik, 5.3 mg in the stems, 8.5 mg in the leaves per 100 g of dry raw materials. The amount of flavonoids in terms of rutin in the stems and leaves was: 6.8 and 12.2 mg per 100 g of dry raw materials, respectively, for the high zyuznik; 5.3 and 6.25 mg per 100 g of dry raw materials, respectively, for the European zyuznik.

The qualitative composition of the samples of high-grade and grade zyuznik essential oil was carried out by chromatography-mass spectrometry on an Agilent device with a library of 40 thousand chemical compounds, by gas-liquid chromatography on a chromatograph with a mass-selective detector Shimadzu QP 2010. The NIST 05 mass spectrum library was used to identify the components.

The essential oil sample was dissolved in benzene to a concentration of 0.1% by volume. For chromatography, a column was used-MDN-1 (methylsilicon, solid-bonded) 30 m, diameter 0.25 mm. Chromatography mode: injector-180 ° C; detector-200°C; interface-210°C; carrier gas-helium (99.99999%), 1 ml / min with a flow division of 20:1; thermostat-60°C 1 min, 2 deg / min-up to 70°C, 5 deg / min - up to 90°C, 10 deg/min - up to 180°C, 20 deg/min-up to 280°C, then the isotherm 1 min. The quantitative content of the essential oil components was calculated from the areas of the gas chromatographic peaks without the use of correction factors. The components were identified by comparing the values of linear retention indices, retention times, and total mass spectra of the components with a library of chromatography-mass spectrometric data of pure volatile substances of plant origin.

The obtained samples of essential oil are light-moving yellow liquids with a characteristic pleasant smell. The essential oil of European zyuznik has a pronounced floral smell with a slight aroma of menthol and bergamot. The essential oil of zyuznik high shows a faint floral smell. The content of essential oil in the plant raw materials of high zyuznik (Lycopus exaltatus L.) and European zyuznik (Lycopus europaeus L.) was 0.9% and 0.7%, respectively, during the flowering period of plants; 0.7% and 0.5% per 100 g of air-dry raw materials, respectively, during the growing season.

Taking into account the total content of different groups of terpenoids in the essential oil of European zyuznik, in particular alcohols (at least 22.53%), phenols (at least 12.43%), ketones (at least 3.96%), aldehydes (at least 1.39%) and others, it can be assumed that it shows antiseptic (stops the growth or kills bacteria, viruses, fungi), analgesic and anti-inflammatory effects, stimulates the immune system.

In the essential oil of zyuznik high, the component composition is less diverse. However, it has a high content of terpene derivatives: aldehydes (at least 52.8%) and alcohols (at least 19.16%). Perhaps, it is characterized by a higher antimicrobial activity, antipyretic and anti-inflammatory effects, and others, compared to the essential oil of European zyuznik.

In general, the determination of the direction of the pharmacological and possibly toxic effects of the essential oils of European zyuznik and high zyuznik suggests further research.

The content of essential oil in wild plants of the Astrakhan region, European zyuznik and high zyuznik, is higher when the plant is collected in the flowering phase.When determining the chemical composition of essential oils by chromatography-mass spectrometry, 31 and 12 components were identified in the grass of European zyuznik

(Lycopus europaeus L.) and high zyuznik (Lycopus exaltatus L.), respectively. European zyuznik and high zyuznik are of interest as raw materials for the pharmaceutical, perfume and cosmetics industry and aromatherapy.

Thus, in the course of the conducted studies, essential oils were isolated from the flowers and leaves of the Helichrysum nuratavicum plant. The time of release of compounds in the composition of the essential oil relative to the standard is determined. The comparative qualitative and quantitative composition of the obtained essential oils of the flowers and leaves of the plant Helichrysum nuratavicum was studied.

Literatures:

1. The determinant of plants in Central Asia.- Tashkent, 1993. - T. X.-p. 464-467.
2. Flora of Uzbekistan. - Tashkent, 1962. -. T. VI. - pp. 78-81.
3. Ange Bianchini, Pierre Tomi, Jean Coşta and Franchois Bernardini. Composition of Helichrysum italicum(Roth) G. Don fil. subsp. Italicum essential oils Corsica(France) // Flavour and fragrance journal. 2001. 16: 30-34.