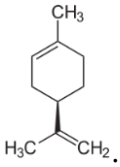
substances. It is widely used for the production of perfume compositions, fragrances, food flavors and household chemicals. The great interest is the use of limonene as a medicinal substance in complex therapy, an auxiliary substance in the manufacture of various dosage forms, an organic solvent in the synthesis of new medicinal substances.

Aim. Isolation and identification of the main component of essential oil of orange - limonene, as a valuable and promising raw material in pharmaceutical production.

Materials and methods. Essential oil (EO) was obtained by hydrodistillation of 100g of dried and crushed orange crusts. The process of EO release was carried out for 3 hours. The aqueous and ether fractions were separated, dried over anhydrous magnesium sulfate, filtered and evaporated in vacuum. A thin layer chromatography (TLC) method was used to test the presence of limonene in the resulting oil. Essential oil test was injected into the chromatography system with microsyringe, the developer was saturated solution of $KMnO_4$ and the eluent was hexane. The comparison was made on the distribution coefficient using a standard sample, an authentic sample of the selected component. The refractive index was determined using a refract meter "IRF-454B2M".

Results and discussion. The resulting oil was a light yellow liquid with a pleasant odor. The yield of the product was 1.2g (≈ 1.2%).

According to the literature, the main component of this type of oil is monocyclic terpene limonene



. The analysis carried out by us showed its presence in the obtained EO. The presence of other compounds is insignificant. The refractive index n_D^{20} was 1.4744 (n_D^{20}= 1.4720 reference data).

Conclusions. As a result of the studies, it was found that the main component of the essential oil of orange is limonene, which is confirmed by TLC and the proximity of the values of n_D^{20}. Advantages of this work were using of natural raw materials and simplicity of limonene isolation.

COMPARATIVE PHYTOCHEMICAL STUDY OF CALENDULA TINCTURE AND FLOWERS PRODUCED BY VARIOUS FIRMS

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Introduction. At present, the issue of expanding the range of domestic preparations, including those based on medicinal plant raw materials, remains topical. Among a large variety of species of medicinal plants of the native flora, the representatives of the family Asteraceae (Compositae) are of great scientific interest. *Calendula officinalis* (marigold), which is belonging to this family, widely used as a source of biologically active substances and has a large area on the territory of Ukraine, have been taken as an object for our research.

Calendula flowers contain such biologically active substances, as: flavonoids, essential oils, organic acids, carotenoids. Carrying out the pharmacognitical analysis of this plant material is of great interest, namely the comparative study of calendula preparations of various manufacturers, which indicates the relevance of the topic and the need for research in this direction.

The **aim** of the work is to conduct a comparative phytochemical analysis of tinctures and flowers of marigold of various manufacturers in the Ukrainian pharmaceutical market.

Materials and methods. For research we used tinctures of marigold flowers of 4 producers namely Viola, Phytopharm, Hippocrates, Liktravy and Rotokan, and flowers of 2 producers, namely Viola and Liktravy.

The preliminary chromatographic study was carried out by paper and thin-layer chromatography methods. The same number of test samples were applied to the start line of the "Silufol" plate and chromatographs by an ascending method in a solvent system ethyl acetate – formic acid – water (10:2:3).

The dried plates were developed in UV light at a wavelength of 364 nm. The paper chromatogram was carried out on a FN-4 paper in a solvent system ethyl acetate – formic acid – water (10:2:3). After drying chromatograms were treated with ammonia vapor.

Results and discussion. In the ethyl acetate – formic acid – water system, 3 spots with Rf 0.52; 0.48; 0.61 and 1 of 3 standards (Rf = 0.61 – hyperoside) appeared on the plate. As a result of paper chromatography research, 23 spots have been identified. Such substances as hyperoside, rutin and coffeic acid were discovered.

Conclusion. According to the results of chromatographic analysis, the most pronounced concentration of BAS substances was found in the tinctures Hippocrates, Viola and Rotokan, and the smallest – in Phytopharm.

COMPARATIVE FITOCHEMICAL STUDY OF ELEUTEROCOCCUS EXTRACT PRODUCED BY VARIOUS FIRMS

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Introduction. *Eleutherococcus senticosus* is an officinal plant belonging to the *Araliaceae* family. Eleutherococcus is similar to ginseng for its medicinal properties, so sometimes it is called "Siberian Ginseng" in the West. In the people you can hear his name: wild or prickly pepper, a freethinker prickly or a drunkard. The chemical composition is very various, since in the roots, stalks and leaves there are substances that are classified into different classes of organic compounds. The main substances are eleuterosids B and E, which cause the greatest interest of scientists.

On the basis of eleutherococcus, various dosage forms have been developed: the liquid extract, the phytotea "Edel-66", it is included in the collection of "Arfazetin" and "Fitonefrol". In the countries of the West, pills, syrup and ointment are also manufactured. Liquid extract of eleutherococcus is used for treatment of physical and mental fatigue, neurasthenia and psychosthenia, functional exhaustion of the nervous system, which is accompanied by a decrease in work efficiency.

At present, information on pharmacological properties and use of underground organs from *Eleutherococcus senticosus* in medical practice is scientifically reasonable. There is insufficient information on the presence of BAS and microelements in the vegetative organs of this plant. In connection with distribution at the pharmaceutical market of various firms, there was a necessity to compare quality and quantitative composition of select preparations of eleutherococcus.

Aim. The purpose of the work was to carry out a comparative phytochemical analysis of the eleutherococcus liquid extract of different producers in the pharmaceutical market of Ukraine.

Materials and methods. For our research, a liquid extract of *Eleutherococcus* manufactured by five domestic producers («Lubnyfarm», «Viola», «Eurasia», «Zhytomyr» and «Ternoparma») was used.

Preliminary chromatographic analysis was carried out by paper (PC) and thin-layer chromatography (TLC). The same amounts of the test examples was applied to the starting position of Silufol plate and chromatographed with a rising method in a solvent system: chloroform-methanol-water (26:14:3) and ethyl acetate-formic acid-water (10:2:3). The dried plates were exposed to UV light at the wavelength of 354 nm.

Results and discussion. In the chloroform - methanol - water system, no visible changes occurred, resulting in the conclusion that this system is not suitable for the determination of the eleutherococcus liquid extract. Instead, in the system of ethyl acetate - formic acid - water, three spots with Rf 0.42, 0.77, 0.94, and one of the three standards (β-methylaesculetin, Rf = 0.94) appeared. The chromatogram was treated with 1% NaOH alcoholic solution, after which fluorescence was intensified. Paper chromatography was carried out on paper FN-4 in the solvent system ethyl acetate - formic acid - water (10:2:3). After drying, the chromatogram was exposed to UV light and processed by the vapor of ammonia. As a result, 16 spots of phenolic nature appeared, five of which were previously attributed to flavonoids, and three to phenylpropanoid compounds (eleutheroside B, chlorogenic and coffeic acids).