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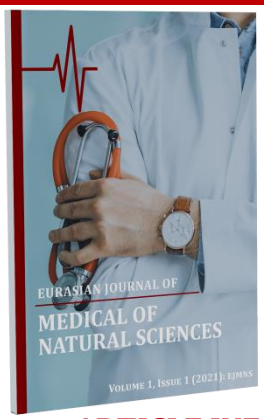

ESTABLISHMENT OF STORAGE CONDITIONS AND SHELF LIFE OF THE DRY EXSTRACT "HEPASILIMARIN"

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ABSTRACT

*This research work was based on determining the shelf life and storage conditions of the dry extract of "**HEPASILIMARIN**" **with hepatoprotective and choleretic effects.** Determination of stagnation was carried out in a natural way. The shelf life and storage conditions of the dry extract of **"HEPASILIMARIN"** in the proposed packaging set as 2 years.*

Plants used in the field of medicine with a certain concentration ensure the uniformity of the biologically active content in each dose and show stability for a long time. Therefore, the use of plants as raw materials for medicinal products and preparations based on plants is considered appropriate [1] . The production of dry extracts is a promising direction in the field of creation of phytopreparations, which is included in actual research today. Extraction of liquid, thick and dry extracts from medicinal raw materials of plants is one of the most common processes in the production of medicinal preparations, which are easy to use, have the least weight, contain less ballast than liquids and are highly transportable. [2]. According to the Decision of the President of the Republic of Uzbekistan dated December 30, 2019 No. PO-4554 "On additional measures to deepen reforms in the pharmaceutical industry of the Republic of Uzbekistan" and its annex, There is a sufficient base of raw materials for the development of the pharmaceutical industry in Uzbekistan, in particular, about 4,500 plant species grow. 51 pharmaceutical enterprises are engaged in processing these types of plants and creating various medicinal preparations.

The use of herbal medicinal products and supplements has increased significantly over the past 30 years, with at least 80% of people worldwide relying on medicinal plant products as part of their primary care. Although treatments using this medicinal plant have shown promising potential with many herbal products clearly proven to be effective, many of them are still untested to date and their use is not high or not at all. . As safety remains a major concern in the use of herbal medicines, it is necessary for relevant regulatory authorities to take appropriate measures to protect public health by ensuring that all herbal medicines are safe and of good quality [3] . Natural plant raw materials are one of the leading sources in the

creation of new drugs. Currently, several drugs with medicinal properties are developed from natural products, the main part of which is plant sources [4].

Nature has been a source of medicinal substances for thousands of years, and a surprising number of modern remedies have been created from natural sources. Although drug discovery from medicinal plants remains an important source of new therapeutic directions, various obstacles remain, including identification and implementation of bioactivity based on high-throughput screening, scaling up delivery methods of bioactive molecules, and plant products. expanding the product range is also relevant at the moment [5].

Herbal medicines have been traditionally used by herbalists and indigenous healers around the world to prevent and treat liver diseases. Clinical studies in this century have confirmed the effectiveness of several plants in the treatment of liver diseases. Clinical application of Silybum marianum (milk thistle) in the treatment of toxic hepatitis, fatty liver, cirrhosis, ischemic injury, radiation toxicity and viral hepatitis with antioxidant, antilipid peroxidizing, antifibrotic, anti-inflammatory, immunomodulatory effects shown. The mint plant and its many parts are used all over the world in different ways and for different purposes. The production of peppermint oil by distilling the cultivated herb is common in the United States and around the world. [6] It is known that our country is rich in medicinal plants that show a positive effect against liver diseases, including the seeds of the Ola plant, peppermint leaves, corn cob, cob poco, which have been used in folk medicine and medicine for liver function since ancient times. It is used among the plants that have a positive effect. Referred to the decision of the President of the Republic of Uzbekistan dated April 10, 2020 " On measures for the protection of wild medicinal plants, cultivation , processing and rational use of available resources" according to the annex, there is a list of areas specializing in the cultivation of the main types of medicinal plants , where the main types of cultivated medicinal plants include milk thistle (*Silybum marianum* L.) and Peppermint (*Mentha piperita L.)* is also included .

Purpose of work. The aim of the research work is to determine the shelf life and storage conditions of the dry extract of “HEPASILIMARIN” with stimulating and choleretic effect on liver function .

Experience part. Materials and methods. The mixture of dry extracts "Hepasilimarin" with hepatoprotective and choleretic effect includes: milk thistle *(Silybum marianum L.)* plant seed extract, peppermint (*Mentha piperita L.)* leaves and corn silk (*Zea mays L.*) cob extracts are included. The shelf life of “HEPASILIMARIN” **dry extract was determined by studying their stability, determination of stability was carried out in a natural way.**

Before starting the experiment , the appearance, purity, solubility, pH index, weight loss on drying, heavy metals, microbiological purity and quantitative analysis of "HEPASILIMARIN" dry extract XI, XII SP has been checked according to the requirements given in SP. In order to study the stability of the dry extract of “HEPASILIMARIN” using the method mentioned above, it was packed in the following container made of materials approved for use in medicine:

- brown glass container with a twist plastic cap (TU -64-2-250-75).
- brown glass jar (OST-64-21-71-80)

Dry extract packaged for natural stability studies at room temperature (20±2 ^{0} C) was kept and quality and quantity indicators were determined every 6 months. Natural stability experiments were followed for 30 months.

"HEPASILIMARIN" were studied: appearance, pH value, amount of dry residue, heavy metals, purity, microbiological purity and amount of silymarin (table 1).

"**HEPASILIMARIN**", a 5% aqueous solution was prepared from the obtained dry extract and tested in the "Seven Easy" pH universal potentiometer developed by Mettler Toledo, Switzerland. The pH was determined. Determining the amount of dry residue of **"HEPASILIMARIN"** dry extract was carried out using the method given in UzR DF and XII DF. To determine the amount of heavy metals in the dry extract of **"HEPASILIMARIN" the method given in UzR DF and XII DF was used.** According to the requirements of UzR DF, the color of the test solution should not be more intense than the color of the reference solution when determining heavy metals in the extracts.

"HEPASILIMARIN" is dry qualitative reactions specific to biologically active substances were performed to perform qualitative analysis of the extract **.** 1). 0.1 g of "HEPASILIMARIN"dry extract was placed in a 25 ml volumetric flask and mixed with 10 ml of water. Made up to volume with distilled water , filtered through filter paper (Solution A). Taking 2 ml of this solution and adding 5-6 drops of 5% alcohol solution of aluminum (III) chloride, a yellow color was formed (qualitative reaction characteristic of flavonoids).

"HEPASILIMARIN" total amount of flavonoids in dry extract was analyzed by YuSSX method. The experiments were carried out on an "Agilent 1200" high performance liquid chromatograph. The experiments were carried out on an "Agilent 1200" high-performance liquid chromatograph. The experiments were carried out under the following conditions: the mobile phase was a mixture of 0.1% solution of trifluoroacetic acid and acetonitrile (70:30); chromatographic column Agilent Eclipse XDB – C18 with a particle size of 5 µm, size 4.6x250 mm; the total flow rate of the eluent is 1.0 ml/minute; sample volume for analysis 10, 20 µl; detection wavelength 254, 320 nm.

"HEPASILIMARIN" was tested for microbiological purity in accordance with the instructions of the article SP of the Republic of Uzbekistan (5.1.8. Microbiological testing of oral medicinal preparations and extracts used in their preparation, obtained from raw plant materials purity. Part B) .

Results.

Packaged in containers made of material approved for medical use were monitored and studied for 30 months. Stability of the dry extract of **"HEPASILIMARIN".** learning according to received the results are presented in Table 1 .

According to the results of the research, the packed dry extract of "HEPASILIMARIN" is a hygroscopic powder with a brown color, a specific smell and a bitter taste . The pH index of the dry extract of "HEPASILIMARIN" was 4.54 on average when studied by the method mentioned above, and the amount of dry residue was 3.56% on average when determined using the method mentioned in UzR DF and XII DF . To determine the amount of heavy metals in the dry extract of "HEPASILIMARIN" **the method given in UzR DF and XII DF was used.** According to the requirements of UzR DF, when determining heavy metals in extracts, the color of the test solution should not be more intense than the color of the reference solution.

Experiments have shown that heavy metals in the extraction preparation are at the required level. The amount of heavy metals in the dry extract of “HEPASILIMARIN” did not exceed 0.001%.

“HEPASILIMARIN”dry extract: flavonoid-specific reaction with 5% alcohol solution of aluminum (III) chloride produced a yellow color. A characteristic qualitative reaction of caustic substances was the formation of a brown precipitate with a solution of lead acetate.

When determining the total amount of flavonoids, the average amount of total flavonoids contained in the dry extract of "**HEPASILIMARIN**" (based on silymarin) was no less than 40.23.

According to the results of determining the microbiological purity of the “HEPASILIMARIN” dry extract, the total number of aerobic bacteria in 1 g of the drug did not exceed 10^{*5} KOE, the total number of fungi in 1 g did not exceed 500 KOE, and the number of bile-resistant gram-negative bacteria in 1 g did not exceed 10^{*2} KOE · , there was no *Escherichia coli in 1 g and Salmonella* in 10 g . This sample fully met the requirements for medicinal products in terms of microbiological purity. The results are presented in Table 1.

"**HEPASILIMARIN**" were maintained in accordance with the regulatory and technical documents and the requirements specified in the DF of the Republic of Uzbekistan. According to the obtained results, the dry extract stored at room temperature for 2 years was at the required level in terms of quality and quantity, and serves as a basis for setting the storage period as at least 2 years.

Table 1
" HEPASILIMARIN " is dry the results of studying the stability of the extract

No	Packaging view	Quality parameters of dry extract according to MH	Initial indicators	6 months	12 months	18 months	24 months	30 months
1.	With twisting plastic cap and plug (TU-64-2-250-75),	Appearance	A *	fits	fits	fits	fits	fits
		The truth	positive	positive	positive	positive	positive	positive
		Moisture %	3.8 %	fits	fits	fits	fits	fits
		Heavy metal content %	0.01	fits	fits	fits	fits	fits
		Amount of silymarin , %	40.24	40.24	40.20	40.10	40.01	40.01
		microbiological purity	According to the requirement	fits	fits	fits	fits	fits
2.	Brown glass jar (OST-64-21-71-80)	Appearance	A *	fits	fits	fits	fits	fits
		The truth	positive	positive	positive	positive	positive	positive
		Moisture %	3.8 %	fits	fits	fits	fits	fits
		Heavy metal content %	0.01	fits	fits	fits	fits	fits
		Amount of silymarin , %	40.23	40.23	40.17	40.12	40.03	40.03
		microbiological purity	According to the requirement	fits	fits	fits	fits	fits

Conclusion . The recommended dry extract of **"HEPASILIMARIN".** storage conditions and shelf life are specified as 2 years in the proposed packaging container.

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