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SOME TECHNOLOGICAL PARAMETERS OF THE DRY EXTRACT UROLOGICAL COLLECTION

Farmanova N.T
Docent Of The Pharmacognozy Department, Tashkent Pharmaceutical Institute, Uzbekistan

Nurullaeva D.Kh.
Assistant Of The Pharmacognozy Department, Tashkent Pharmaceutical Institute, Uzbekistan

Ibragimova D.M.
Assistant Of The Pharmacognozy Department, Tashkent Pharmaceutical Institute, Uzbekistan

ABSTRACT

In this article there were developed the technology for obtaining a dry extract of a urological collection for the first time, the influence of extraction conditions depending on temperature, the degree of grinding of raw materials, the type of extractant, the ratio of raw materials and extractants has been investigated. As a result of the studies, it was proved that when obtaining a dry extract of urological collection, the grinding of raw materials should be 2-3 mm, purified water is recommended as an extractant, the hydromodule is 1:30, t = 70-800C, the extraction time is 120 minutes, the method is maceration.

KEYWORDS:- Urology, Collection, Technology, Extracts, Extractive Substances, Solvent, Raw Material.

INTRODUCTION

The total extraction preparations retain all the properties of multicomponent collections and ensure the maximum content of biologically active substances, dosing accuracy, ease of use,

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storage stability, as well as the complex pharmacological action of the collection components. In this connection, it is relevant to obtain a dry extract based on plant objects [1].

Given the presence of a number of advantages in comparison with traditional dosage forms (infusions, decoctions), the aim of the study was to obtain a dry extract of the studied urological herbal collection. (At the same time, a simple, economical and safe technology was used that allows maintaining the physiological activity of the original collection.) [2,3].

Experimental part: urological collection, which includes flowers of meadowsweet, licorice roots and ziziphora herb. The collection was prepared in accordance with the requirements of State Pharmacopeia of the Republic of Uzbekistan "Collection" [5].

To develop a technology for obtaining a dry extract of urological collection [6], at the initial stage, the yield of extractive substances was studied depending on the extractant [7].

Determination of extractives. Purified water and ethyl alcohol in various concentrations: 30%, 50%, 70% and 96% were used as an extractant. About 1 g (accurately weighed) of the collection sifted through a sieve with 1 mm holes was placed in a conical flask with a capacity of 200 - 250 ml, 50 ml of solvent was added, the flask was closed with a stopper, weighed (with an error of ± 0.01 g) and left at 1 h. Then the flask was connected to a reflux condenser, heated, maintaining a slight boil for 2 h. After cooling, the flask with the contents was again closed with the same stopper and weighed. The mass loss of the contents of the flask was replenished with the same solvent. The contents of the flask were thoroughly shaken and filtered through dry cotton wool into a dry flask with a capacity of 150-200 ml. 25.0 ml of the obtained filtrate was pipetted into a porcelain dish with a diameter of 7 - 9 cm, pre-dried at a temperature of 100 to 105 ° C to constant weight and accurately weighed, and the contents were evaporated to dryness in a water bath. The cup with the dry residue was dried at a temperature from 100 to 105 ° C to constant weight, cooled for 30 min in a desiccator, at the bottom of which there is anhydrous calcium chloride, and immediately weighed.

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The content of extractives in absolutely dry medicinal plant material in percent (X) was calculated by the formula 6:

$$X = \frac{m \cdot 100 \cdot 100 \cdot V}{a \cdot (100 - W) \cdot 25}$$

There is: m — dry residue weight, r;a — sample of medicinal plant raw materials, r;V – volume of extractant used in one-carat processing of medicinal plant materials, ml; W — moisture content of medicinal plant materials, %.

The results are shown in the figure 1.

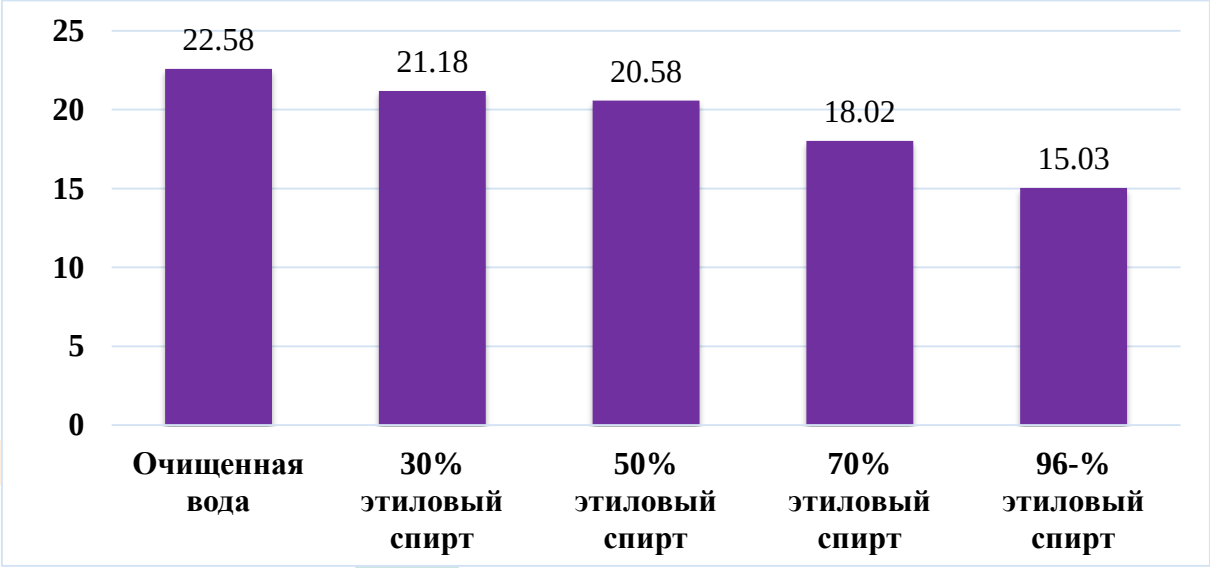

Fig.1. The yield of extractives depending on the extractant

According to the results obtained, shown in Figure 1, it was found that for further research it is advisable to use purified water, since the yield of extractive substances was 22.58%.

The next stage of the study was aimed at studying the effect of the degree of grinding of raw materials. For this, the object under study was crushed in the following particle sizes: 2-3 mm, 5-6 mm, and 7-8 mm. The extract was obtained using the maceration method and purified water. The results obtained are shown in fig 2.

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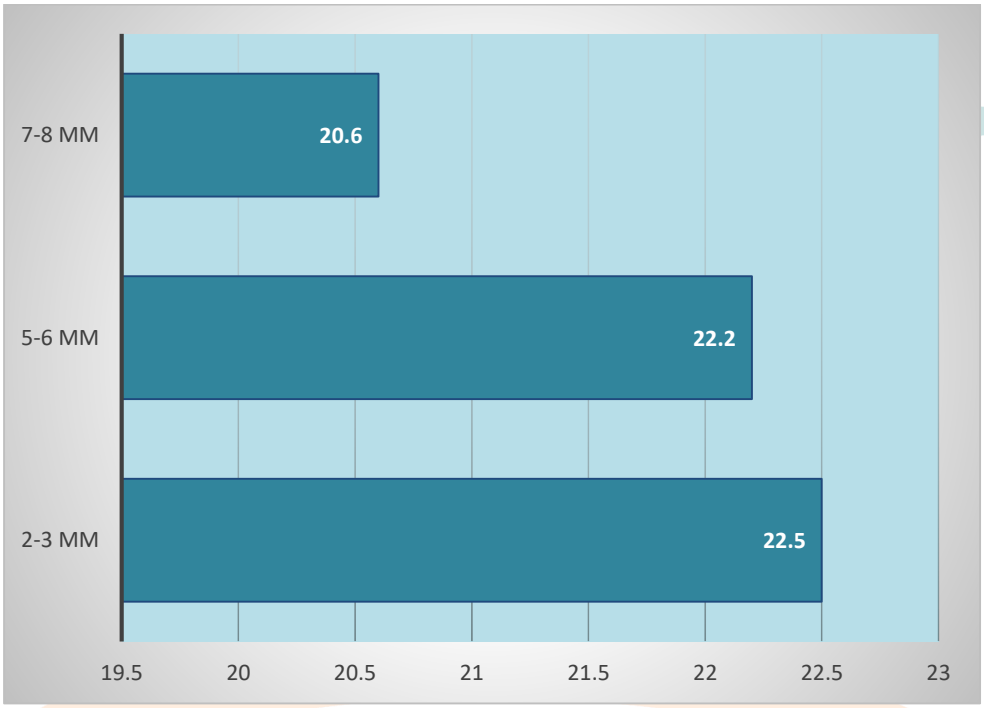

Fig. 2. Dependence of the yield of extractive substances on the degree of fineness

According to the results of the diagram (Fig. 2), when the degree of grinding of the raw material is 2-3 mm, an optimal yield of extractive substances and complete wetting of the raw material without its forced mixing are observed.

As you know, the extraction rate also depends on the temperature regime. In this regard, the effect of the temperature regime was studied in the intervals 20-400C, 50-600C, 70-800C and 90-1000C, the hydromodule is 1:20, the extraction time is 2 hours. -800C depletion of raw materials occurs faster than at low temperatures. [Table 2].

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Table 2

Dependence of the yield of extractives on the extraction temperature

№	Temperature, ^{0}C	Extractives yield, %
1.	20-40	18,5
2.	50-60	21,1
3.	70-80	22,5
4.	90-100	22,9

As can be seen from table 2, a further increase in temperature was impractical, since it did not lead to a significant increase in the yield of extractives and requires additional energy consumption. Thus, the optimum temperature for extraction is t = 70-800C.

Further studies were aimed at determining the optimal method for obtaining the extract. At the same time, the methods of maceration have been tested [8]. In the obtained extracts, the yield of extractive substances was determined by the methods of maceration and repercolation. The results obtained to determine the optimal extraction method are shown in Table 3.

Table 3

The yield of extractive substances obtained by the methods of maceration and repercolation from the dietary supplement "Urological collection"

№	**Extraction methods**	**outcome, %**
1	Maceration method	22,7
2	Repercolation method	21,9

According to the results obtained, the extract yield when using both methods practically did

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not differ (22.7% and 21.9%). Taking into account the data of the analysis, the maceration method was chosen for further research.

The next stage of research was to determine the ratio of raw materials and extractant (hydromodule). To select this ratio, the yield of extractives was studied when grinding 2-3 mm and using purified water in the range of 1: 5, 1:10, 1:20 and :30 (temperature 70-800C) [Fig. 2].

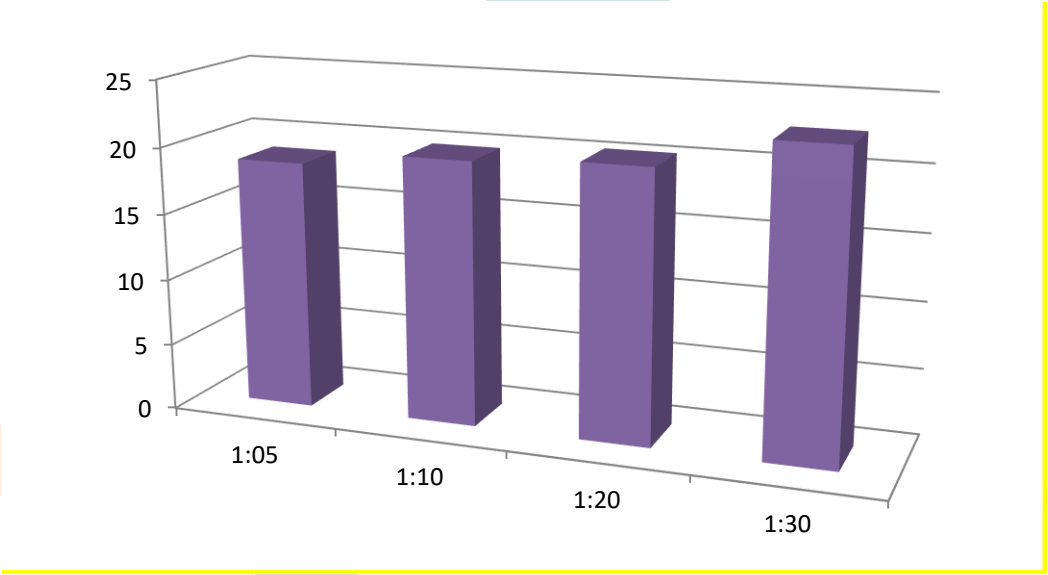

Fig. 3. Influence of the ratio of raw materials and extractant on yield of extractives

The yield of extractive substances was 18.7 g at a hydromodule of 1: 5; 1:10 - 19.8 g; 1:20 - 20.3g and 1:30 - 22.7g. Based on the analysis results, it was recommended to use the ratio of raw materials and extractant equal to 1:30.

The study of the yield of extractive substances of urological collection, depending on the duration of extraction, was carried out in the range from 30 to 180 min (dispersion 2.0-3.5 mm, extractant - purified water, hydromodule 1:30, temperature 70-800C) [Table 4]

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Table 4

Effect of time duration on exitextractives

(dispersion 2.0-3.5 mm, extractant - purified water, hydromodule 1:30, temperature 70-80^{0}C).

№	Extraction time, min	Yield of extractive substances,%
1	30	18,9
2	60	19,5
3	90	20,2
4	120	22,7
5	150	22,9
6	180	23,1

As can be seen from the data shown in Table 4, the maximum yield of extractives of the studied object is observed during extraction within 120 and 180 minutes. In order to save energy costs and time, extraction is recommended to be carried out within 120 minutes.

As you know, the process of extraction of biologically active substances is an important element in the study of plant raw materials also includes the establishment of technological parameters, in particular, specific, volume and bulk mass, porosity, porosity, free volume of the raw material layer, the absorption coefficient of the extractant [9]. In this regard, the technological parameters were studied to substantiate the technology for obtaining a dry extract of the herbal collection (Table 5).

Table 5

Methods for determining technological parameters

Parameters	Methods	Results, g/sm^3
Determination of specific gravity	Collection weighing 5.0 g (so-called) was placed in a volumetric flask with a capacity of 100 ml, filled with purified water to 2/3 of the volume and kept in	1,09

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	a boiling water bath for 1.5 - 2 hours, stirring occasionally to remove air. After the flask was cooled to 200C, the volume was brought to the mark with purified water. Then the flask was weighed with raw materials and water. The weight of the flask with water, filled to the mark, was preliminarily determined.		
Determination of bulk density	10.0 g of the collection was placed in a measuring cylinder with 50 ml of purified water and the volume was determined by the difference in volumes in the measuring cylinder before placing the raw material and then the volume occupied by the raw material was determined.		0,43
Determination of bulk density	The collection was placed in a graduated cylinder, slightly shaken to level the raw material and the total volume that it occupied was determined. Thereafter, the weight was determined		0,153
Determination of porosity	Porosity characterizes the size of the voids inside the plant tissue and is defined as the ratio of the difference between the specific gravity and the bulk density, (completely) and the bulk density to the specific gravity		0,60
Porosity definitions	Porosity is the amount of free space between the particles of plant material. Defined as the ratio between bulk and bulk mass to bulk density.		0,64
Determination of the free volume of the raw material layer	The free layer volume is the relative volume of voids in a unit of the raw material layer (voids within and between particles) and is defined as the ratio between the difference in specific gravity and bulk density to mass.		0,86
Determination of the absorption coefficient of the extractant	About 5.0 g of the collection (accurately weighed) was placed in graduated cylinders and poured with an extractant (ethanol 30%, 50%, 70%, 96% and purified water) so that the raw material was	Purified water	3,59
		Ethyl alcohol 30%	4,07
		Ethyl alcohol 50%	3,43

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	completely covered and left for several hours. Then the raw material was filtered through a paper filter into another measuring cylinder and the volume of the extractant obtained was recorded.	Ethyl alcohol 70%	2,85
		Ethyl alcohol 96%	2,26

As can be seen from table 5, the specific, volumetric and bulk density of the dry extract of the urological collection is 1.09; 0.43 and 0.153 g /cm3, respectively, porosity - 0.60, porosity - 0.64 and free volume of the layer - 0.86, the absorption coefficient of the extractant is maximum when using 30% ethyl alcohol (4.07) and purified water (3,59).

On the basis of the results obtained, a technology for obtaining a dry extract of urological collection was developed (Fig. 4).

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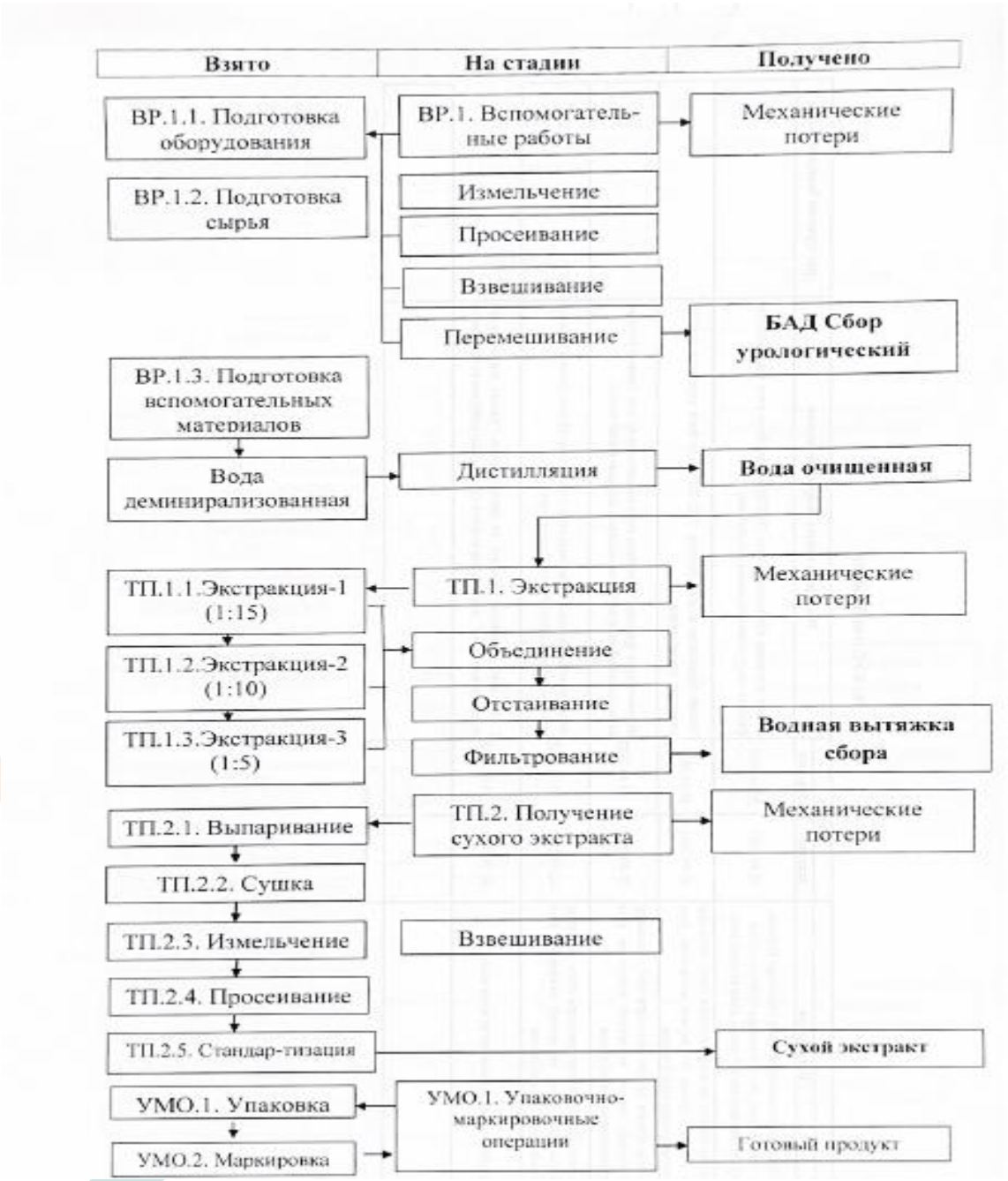

Fig. 4. The technology of obtaining a dry extract of the collection of urological

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CONCLUSIONS

As a result of the studies, it was proved that when obtaining a dry extract, the collection of urological grinding of raw materials should be 2-3 mm, purified water is recommended as an extractant, the optimal ratio of raw materials and extractants is 1:30, t = 70-800C, time extraction - 120 minutes. In the course of the experiments, the optimal method for obtaining a dry extract of the urological collection was chosen - maceration.

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