



# DEVELOPMENT OF TECHNOLOGY TUNING FROM THE PLANT OF THE BRAIN OF BIG ARCTIUM LAPPAL

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## ABSTRACT

*The purpose of this work was to select the optimal conditions for obtaining tincture of burdock leaves. The effect was studied in various concentrations of ethyl alcohol. It is established that the most acceptable way to obtain tincture of burdock leaves is maceration. This method allows you to get the tincture with a large yield of tannins with the least time-consuming.*

**KEY WORDS:** *tincture, maceration, medicinal plant, leaves, burdock.*

## INTRODUCTION

In the structure of the modern pharmaceutical market, the share of drugs based on natural origin is steadily increasing. A wide range of their actions is explained by the complexity of the composition of biologically active components, as well as the simultaneous presence of various biological active substances. Since a mild therapeutic effect, low toxicity, minimal amount of occurrence of side effects and economic affordability are few of the advantages of medicinal herbal remedies.

The growing interest in medicinal plants stimulates the expansion and renewal of the range through the introduction of traditional medicine into the scientific medicine of plants and the development of new medicinal tools based on a natural search.

Burdock (Latin name *Arctium lappa*), burdock is one of the plants widely used in folk medicine. Roots are used to a greater extent, less often leaves and fruits. Roots contain essential oil, inulin, fatty acids, sitosterol and stigmasterol. Lignan glycosides (arctine) were found in the seeds.

Leaf infusions are used in diseases of the kidneys and gallbladder, pain in the joints, intestinal disorders (constipation), and diabetes.

Fresh leaves are used as a febrifuge, for rheumatism, mastopathy, and for wound healing. The roots are used in folk medicine in the form of infusions, decoctions, tinctures for rheumatism, gout as diuretic and diaphoretic, externally - for eczema, furunculosis.

There is evidence that burdock preparations are effective in the treatment of malignant tumors. In the lignan aglycone arctigenin, an experiment revealed antitumor activity [1, 2].

Data from literary sources indicate that the technology of making tinctures of one of the most common medicinal forms based on medicinal plant materials. They are simple to manufacture and have a relatively low cost. Considering the fact that biologically active substances in burdock leaves are best extracted with alcohol, and the medicinal form containing ethanol is resistant to microorganisms [3].

## THE PURPOSE OF THE STUDY

Based on the foregoing, the purpose of this work was to find the optimal conditions for obtaining the tincture of burdock leaves.



## RESEARCH METHODS

To develop the technology for setting the burdock leaf tincture, it is necessary to establish the technological parameters of the medicinal raw material, determine the optimal extraction conditions, and study the influence of technological factors on the tincture extraction process. During the experiment, the following parameters were studied: the concentration of the extractant. Ethyl alcohol of various concentrations from 40% to 90% was used as an extractant, the ratio of raw material and extractant was 1: 5 and 1:10, the time of one infusion was from 25 to 60 minutes, the number of maceration was 3, the grinding of raw materials was from 0.5 to 3.5 mm. The alcohol absorption coefficient was 2.76 ml / g.

## RESULTS OF THE RESEARCH

In order to select the optimal conditions for preparing a tincture of burdock leaves, they studied the effect of alcohol concentration, the ratio of components and the mode of extraction.

For the development of tincture technology, it is necessary to determine the technological parameters of plant materials, in this case burdock leaves. To determine the optimal conditions for the extraction, as well as to study the influence of technological factors on the process of extracting the finished product.

Table 1 shows the quality indicators of burdock leaves.

**Table 1**

Indicator	Metrological characteristic		
	(n = 5, P = 95%, tp = 2.07)		
	$\bar{x} \pm \Delta_x$	$S_x$	$\epsilon, \%$
Extractives, %	34,95±0,231	0,1335	1,06
Tannins, %	8,26±0,189	0,0765	2,63
Humidity, %	6,58±0,126	0,0558	2,15

Containing tannins in the leaves of burdock was  $8.26 \pm 0.19\%$ , extractive substances- $34.95 \pm 0.23\%$ , humidity- $6.58 \pm 0.1\%$ .

At the next stage, the technological parameters of burdock leaves were established by the method of I.A.

Muravyova and Yu.G. Pshukova. The results are shown in table2.

**Table 2**

Indicator	Metrological characteristic		
	(n=5, P=95%, tp=2,07)		
	$\bar{x} \pm \Delta_x$	$S_x$	$\epsilon, \%$
Bulk weight, $\text{kg}/\text{m}^3 \cdot 10^{-3}$	0,20±0,003	0,0020	3,06
The filling ratio of dry raw materials, $\text{m}^3/\text{kg} \cdot 10^{-3}$	3,02±0,078	0,0390	3,02
Coefficient of displacement of raw materials, $\text{m}^3/\text{kg} \cdot 10^{-3}$	1,06±0,022	0,0089	2,60
The filling ratio of the swollen raw materials, $\text{m}^3/\text{kg} \cdot 10^{-3}$	1,69±0,031	0,0104	1,55
Coefficient of absorption of raw materials, $\text{m}^3/\text{kg} \cdot 10^{-3}$	2,78±0,028	0,0122	1,12
Коэффициент образования внутреннего сока, $\text{m}^3/\text{кг} \cdot 10^{-3}$	3,06±0,037	0,0177	1,36
The rate of increase in the dissolution of extractives, $\text{m}^3/\text{kg} \cdot 10^{-3}$	0,51±0,011	0,0040	2,65

Taking into account the established technological parameters of the leaves of burdock, the degree of depletion was calculated, which averaged 96.08%.

It is known that tinctures are one of the most common dosage forms based on vegetable raw materials. They are easy to manufacture and have a relatively low cost [4,5].

We have experimentally found that for the preparation of burdock tincture a large optimum is the maceration method in the ratio of 1:10. One part of the raw material was poured into ten parts of the extractant (70% alcohol), taking into account the coefficient of alcohol absorption. Hood drained, squeezed and defended during the day. Then filtered through a paper filter. The finished



tincture of burdock is a clear liquid of light green color, with a characteristic smell, bitter to the taste. Injuries may form a precipitate. Next, we conducted a study of the stability of burdock tincture when stored at room temperature ( $25 \pm 2$  ° C) for 12 months in a dark place. In the process of storing the tincture did not occur significant deviations in appearance.

## CONCLUSIONS

Based on the above, it can be concluded that to obtain tincture of large burdock experimentally selected optimal conditions, which consist in insisting one part of the crushed raw materials in ten parts of 70% alcohol during the day. During stability tests, it was found that burdock tincture is large when stored for 12 months at room temperature ( $25 \pm 2$  ° C) in a dark place. When storing the tincture did not occur significant deviations in appearance.

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