



## TECHNOLOGY OF OBTAINING DRY EXTRACT OF ROOT OF RUBIA TINCTORUM L.

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### ABSTRACT

In this article, the technology of obtaining a dry extract of the medicinal plant *Rubia tinctoru* L. their use in medicine is highlighted.

**Key words:** *Rubia tinctorum* L, *Rubia iberica*, technology, alizarin, anthracene, ruberythric acid, haliozin, purpurin, xanthopurpurin, pseudopurpurin, rubiadin-glucoside, munistin, lucidin, ibericin

### INTRODUCTION

Today, comprehensive measures are being taken to organize scientific research at a high level and to supply the national pharmaceutical market with high-quality drugs in the direction of developing the creation of effective drugs based on local raw materials. On the basis of the measures implemented in this direction, a number of important practical results are being achieved in terms of organizing the development of competitive preparations based on natural plant raw materials. It is known that studying the biology of *Rubia tinctorum* plant species, which has been used by people for many years, and preparing a cheap and high-quality drug that replaces imports by separating natural medicines from local raw materials is the first step. creation of material bases is of urgent importance. Such preparations can be isolated from the medicinal plant *Rubia tinctorum* and used in medical practice and folk economy.

### THEORETICAL PART

*Rubia tinctorum* L. (Dyed roan) and Georgian roan, *Rubia iberica* C. Koch. (*Rubia tinctorum* L. var. *Iberica* Fisch. ex DC) belongs to the Rubicaeae family. It is found in Ukraine, Moldova, the south and southeast of the European part of Russia, the Caucasus (Azerbaijan, Georgia, Armenia, Dagestan) and Central Asia. In Uzbekistan,





it mainly grows along streams, among bushes, along canals, in fields and gardens [1-4]

The species of the dyed royan plant is a perennial herb with a height of 30-150 cm. The rhizome is long, creeping, branched, cylindrical, thick, jointed, with many heads. The stem is covered with coarse hairs with multiple, four-pointed, jointed, horned and looped hairs. The leaf is oval-ovate, shiny, the veins on the lower side are covered with rough hairs with loops, they are arranged in bundles of 4-6 on the stem with a very short band. The flowers are small, greenish-yellow, gathered in a semi-umbrella growing from the axils of the leaves, forming a flower cluster. The calyx is not clearly known, the corolla is 5, united, funnel-shaped, the paternity is 5, the maternal node is 2-digit, located below. The fruit is a 1-2-seeded, spherical, first red, then black wet fruit. It blooms in June-August, the fruit ripens in August-September, *Rubia tinctorum* Fruit top, bottom and seeds [1-4] (Fig. 1).



**Figure 1.** The dyed royan plant

The ready-made product of the harvested plant consists of rhizomes and root pieces. The thickness of rhizome pieces depends on the year they were dug up from the ground. One-year-olds are thin, two-year-olds are thick, and they get thicker every year. The upper side is reddish brown. When it is cut crosswise, the bark layer is red-brown, and the wood part is red. The product has a characteristic weak smell, sweeter at first, and then a slightly sour and bitter taste. The rhizome turns the water brownish-red, the underground part (root) of *Rubia tinctorum* sapling is shown to grow from thinness in the first year to the second and third year (Fig. 2).



**Figure 2.** The root of the dyed royan plant grows from thinness in the first year to the second and third year.

The moisture content of the product harvested from the dyed roan plant is 13%, total ash is 10%, other parts of the roan (stems, leaves, etc.) are 1.5%, organic impurities are 1%, and mineral impurities are 1%. most, the amount of anthraglycosides (those combined in the form of glycosides) in the product should not be less than 3% [5-7].

## DISCUSSION OF RESULTS

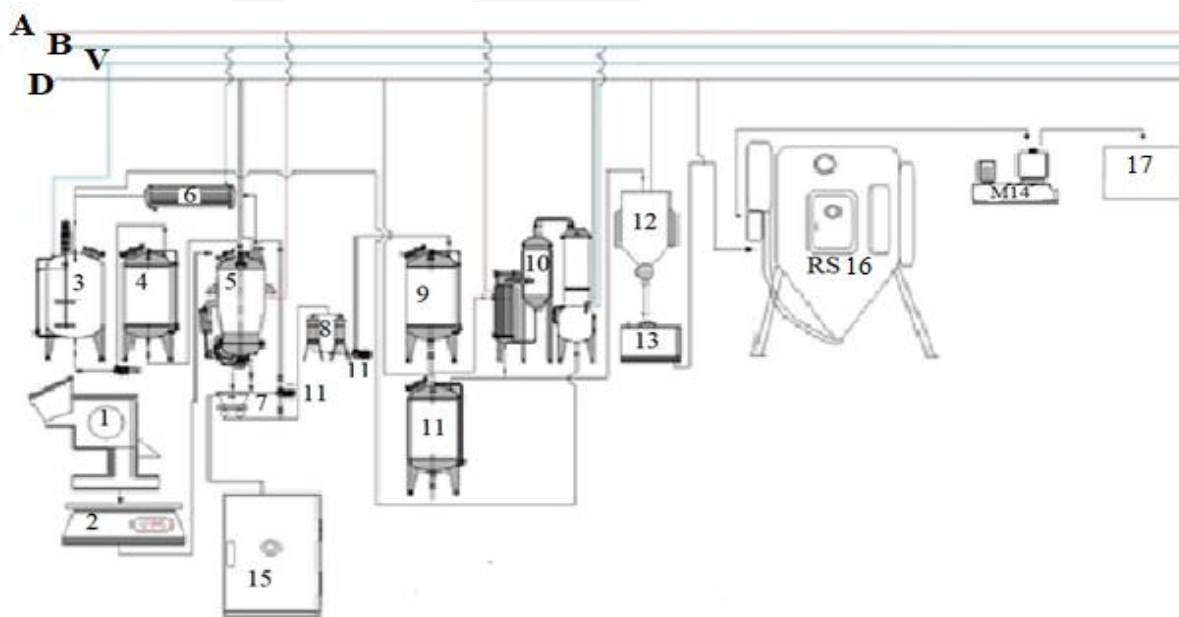
Today, by developing the field of pharmaceuticals and medicine based on natural medicinal plants through a scientific approach, a new product, a bioactive supplement (BFQ), is created and put into production, and jobs are created, the number of unemployed will decrease, and the internal demand of our Republic will be satisfied, and even abroad. Many of our scientists are conducting scientific research to create the possibility of export. Experiments were carried out as follows in the ZPG 150 (XPR) spray drying extractor, which allows drying of 200 l of solution per hour in the scientific and technological center adapted to GMP conditions, launched at the production enterprise, in the device that allows extraction methods to be carried out as follows. 10.0 kg of 4-6 mm shriveled Rhododendron plant was placed in the extraction device, and 100.0 l (hydromodule 1:10) of 80% etonol was poured into the extraction device, then the "steam jacket" of the extractor " was injected with steam, heated to a temperature of 60°C and left for 24 hours. The extract was drawn from the lower part of the extractor by a specially installed pump, and 80% ethanol was driven in a specially equipped rotary equipment, and the aqueous extract of the dyed roan plant was collected and poured. The extraction process was carried out under the same conditions as the first one. For this purpose, another 100.0 l (hydromodule 1:10) of 80% etonol was prepared from the extracted ethanol and poured from the upper part of the extractor again with rain. The extraction was carried out three times. At the end of the extraction process, the extract (60, l) was poured and the results were analyzed (Table 1).



**1 – Table.** The effectiveness of extraction methods in the extraction of *Rubia tinctorum* plant with 80% ethanol under a temperature of 60°C

Number of extract infusions	Raw material weight kg	Extraction time, hours	Raw materials and 80% ethanol	Amount of 80% ethanol extract (ml)	Station %
1	10	24	1:10	100	-
2	again	24	1:10	100	-
3	again	24	1:10	100	-
total	10	24	1:10	300	16,9

A technological general block scheme for production and drying of dry extract of *Rubia tinctorum* was developed. *Rubia tinctorum* plant is crushed in a mill (1) in size 4-6 mm, weighed on a scale (2), placed in an extractor (5) in the amount of 10 kg, and from a scale (3, 4) 100 l (hydromodule 1:10) 80 % etonol was added and kept for 24 hours for a day. In this method, the raw material was extracted 3 times. The resulting 280 l of extract was filtered on a nut filter (8) and collected in a container (9) and condensed in a vacuum evaporator (10) until 25 l, i.e. 15% of the dry residue remained, and cooled (12). Then (13) was poured into a container and spray drying was carried out in the device "Anhydro #2" (Denmark). It was dried in a spray dryer with hot air inlet at an average temperature of 170°C, outlet at 80°C, and an air pressure of 0.2 MPa for 50 minutes (RS-12). Dry extract substance (M-16) with a content of not less than 16-17% of the obtained product was crushed and packaged as a finished product. The technological process and device scheme for extracting dry extract from the plant was developed (Scheme 1).



**Scheme 1** Technological scheme of the process of obtaining the substance "*Rubia tinctorum*"



A-par, V-water, V-pure water. D-vacuum

(1-mill, 2-scale, 3,4- (60°C 80% etanol) tank, 5,6,7-extractor, cooler, trolley for shot, 8-filter, 9-tank for filtered extract, 10 -vacuum evaporator equipment, 11-container for extracted solvent, 12- separator funnel, 13-container, RS-16 spray dryer, M-14 grinder, 15- drying cabinet, 17-finished product

The appearance of the substance obtained by the extraction method of the 80% ethanol extract of the root of the dyed rhododendron plant in a spray-drying extractor is presented in (Fig. 4).



**Figure 4.** The substance of the extract of the root of the dyed royan plant in 80% ethanol.

The extract of the root of the dyed royan plant in 80% ethanol was obtained by the extraction method in a spray-drying extractor. In the spray dryer, the inlet of the hot air stream was set to 170°C, and the outlet to 80°C. The amount of the obtained product is not less than 16-17% dry extract substance was crushed and packaged as a finished product.

## SUMMARY

1. The protective substance was obtained by the extraction method of the extract of the root of the dyed royan plant in 80% ethanol in an extractor, and it was determined that the amount of the obtained product should not be less than 16-17%.
2. When extracting the substance of the root of the dyed royan plant in the spray drying device, the inlet of the hot air stream was set at an average of 170°C, and the outlet at 80°C.



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