# BIOLOGY AND APPLICATION OF RUBIA TINCTORUM L IN VARIOUS INDUSTRIES IN SURKHANDARYA REGION

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**Annotation**: *This article describes the biology of the Rubia tinctorum L plant, the mineral substances contained in its root, and the information about its use in medicine.*

**Key words**: *Rubia tinctorum L, anthracene, alizarin, ruberythric acid, galiosin, purpurin, xanthopurpurin, pseudopurpurin, rubiadin-glucoside, ibericin, urinary stone, kidney stone, gout.*

INTRODUCTION

There are 10-12 thousand species of medicinal plants on earth. The chemical, pharmacological and medicinal properties of more than 1000 plant species have been investigated. There are 750 species of medicinal plants in Uzbekistan. Of these, 112 types are currently registered for use in scientific medicine, 70 types are widely used in the pharmaceutical industry. The effect of medicinal plants on the body depends on the amount of compounds in their composition. These compounds accumulate in different amounts in different parts of the plant. The necessary parts of the plant for the preparation of medicine are collected at different times. For example, bark, buds are taken in early spring, leaves are taken before flowering or when the plant blooms, flowers are in full bloom, fruits and seeds are ripe, and underground organs (roots, rhizomes and bulbs) are taken in early spring or late autumn. Today, on a global scale, scientific research is being conducted at a high level in the direction of developing the creation of effective drugs based on local raw materials, comprehensive measures are being implemented to provide the national pharmaceutical market with high-quality, inexpensive drugs. A number of important practical results are being achieved in organizing the development of competitive medicinal preparations and natural dyes based on plant raw materials in the local and world markets. It is important to study the biology of the species of dyed roan (Rubia tinctorum L.) have Such products can be isolated from the medicinal plant Rubia tinctorum L and used in medical practice and in the national economy.

LITERATURE ANALYSIS

Rubia tinctorum L. belongs to the Rubiaceae family. Royan plant Mediterranean countries. It is found in Ukraine, Moldova, the southeast of the European part of Russia, the Caucasus, Azerbaijan, Georgia, Armenia, Dagestan

and Central Asia. In Uzbekistan, in Tashkent, Fergana, Samarkand, Andijan and Surkhandarya regions, it grows as a weed mainly on the banks of streams, among bushes, along canals, in fields and gardens [1-4]. There are 6 types of painted roan in Central Asia. Rubia tinctorum L is a perennial herb, 30-150, sometimes up to 200 cm tall. The rhizome is long, creeping, branched, cylindrical, thick, jointed, with many heads. The stem is covered with several, four-sided, jointed, tufted and looped coarse hairs. The leaf is ribbon-ovate, the tips are sharp and shiny, the veins on the lower side are covered with rough hairs with a loop, and they are arranged in bundles of 4-6 on the stem with a very short band. The flowers are small, greenish-yellow in color, gathered in a semi-umbrella growing from the axils of the leaves, forming an umbrella-shaped inflorescence. The calyx is not clearly known, the petals are 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, later turning black berry. It blooms in June-August, the fruit ripens in August-September, the underground part of Rubia tinctorum L. Fig. 1. [1-4]

Figure 1. Rhizome and powder of Rubia tinctorum plant.

The finished product of the Rubia tinctorum plant consists of rhizomes and root pieces. The thickness of rhizome pieces is 2-18 mm, the upper side is painted in reddish-brown color. When it is cut crosswise, the bark layer is red-brown, and the wood part is red. The rhizome has a characteristic weak smell, sweeter at first, and then a slightly astringent and bitter taste. The rhizome turns the water brown-red, the moisture content of the harvested product of Rubia tinctorum plant is 13%, total ash is 10%, other parts of the plant (stem, leaf, etc.) are 1.5%, organic impurities 1%, mineral impurities more than 1%, the amount of anthraglycosides (combined as glycosides) in the product should not be less than 3%. [1-4] The rhizome of Rubia tinctorum contains 5-6% of anthracene compounds (alizarin, ruberythric acid, haliozin, purpurin, xanthopurpurin, pseudopurpurin, rubiadin-glucoside, munistin, lucidin, ibericin, etc.). In addition to anthracene products, organic acids in plant roots contain up to 15% of sugars, proteins, pectin substances, ascorbic acid, and citric, malic, and tartaric acids.

The root of Rubia tinctorum plant contains carbohydrates, phenolic acids and their derivatives, coumarin, anthraquinone, triterpenoids, flavonoids (quercetin, kaempferol, apigenin). The plant Rubia tinctorum has antispasmodic and diuretic effects in medicine and softens kidney stones (phosphates). Therefore, medicinal preparations are used for ureteral stones, kidney stones, gallstones and gout. [1-4] Natural dyes are environmentally friendly products. Fabrics dyed with them do not lose their quality for a long time. Currently, the need and demand for natural dyes is high. Especially in the textile and silk industries of our republic, the value of fabrics dyed with natural dyes is increasing, and people's interest in them is growing. Natural dyes have long been highly valued because they are of high quality and retain their original color over time. In addition to the use of the Rubia tinctorum plant in medicine, dyeing silkworms and cotton grown in our Republic with natural chemicals extracted from the royan plant as a natural dye for dyeing carpets, fabrics, and materials. will lead to an increase in jobs. Fig. 2.

Figure 2. Threads dyed with natural chemicals extracted from Rubia tinctorum plant. In the following years, the notions that mineral elements are necessary for plants began to emerge. One of the founders of this concept is agronomist A.T. Bolotov (1770). He put forward the idea that mineral particles in the soil are the main food for aquatic plants. A. T. Balotov also developed methods of applying fertilizers to the soil and showed that there are 53 types of fertilizers necessary for agriculture. Yu. Libix proposed the law of the minimum and the law of reversion. According to these laws, if the mineral elements necessary for plants in the soil do not reach the minimum, they will not be useful. In the law of return, it is explained that as many mineral substances as plants receive with their harvest, it is necessary to return as much instead. Otherwise, soil fertility and productivity will decrease year by year. Liebich's thoughts are generally correct. Productivity can be increased as a result of proper agrotechnical activities and timely provision of soil with mineral elements. The experiments conducted by I. Knop and Yu. Sachs in 1859 also disproved the "humus theory". According to them, plants can grow in water if only 7 elements are present: nitrogen, phosphorus, sulfur, potassium, calcium, magnesium and iron. Thus, they proved that it is possible to grow plants by vegetative methods (soil, water, sand) and confirmed the theory of mineral nutrition. The idea of root nutrition of plants was further developed by P.A. Kostichev, B.B. Dokuchaev, K.K. Gedroys, D.N. Pryanishnikov and other scientists. [4-9]. Plants have the ability to absorb all the elements shown in the

periodic table in small or large amounts from the natural environment. However, so far only 19 of these elements have been found to be of great importance for plants and cannot be replaced by other elements. These are carbon, hydrogen, oxygen, nitrogen, phosphorus, sulfur, potassium, calcium, magnesium, iron, manganese, copper, zinc, molybdenum, boron, chlorine, sodium, silicon and cobalt. 16 of them belong to the group of mineral elements. Because carbon, hydrogen and oxygen are received by the plant in the form of CO2, O2 and N2O. Plants receive water and all mineral elements from the soil through the roots. Mineral substances are found in soil solution, humus, organic and inorganic compounds, and adsorbed to soil colloids. The absorption of ions does not depend only on plants, but also on the concentration of this ion in the soil, its movement in the soil and soil reactions. Four elements make up 95% of the elements in plant bodies: carbon, hydrogen, oxygen and nitrogen. These elements are also called organogens. Because they form the basis of organic substances (proteins, fats, carbohydrates) in the plant body. Mineral elements are divided into three groups based on their amount in the body of plants: 1) macroelements; 2) microelements; 3) ultramicroelements. 1) Macroelements include all elements (N, P, K, Ca, Na, Mg) whose quantity in plants is 10-2 percent more. 2) Microelements include elements (Mn, B, Cu, Zn, Mo, etc.) whose amount in plants is 10-3 - 10-5 percent. 3) Ultramicroelements include elements that are very small (10-6 percent and less) and whose function has not been determined (Ce, Se, Ca, Ng, Ag, Au, etc.) in the plant [9]. ]. The lack of any microelement in plants causes it to be damaged by various bacterial, rotting and other diseases, that is, microelements increase the resistance of agricultural crops to various diseases. In particular, microelements increase the ability of plants to resist adverse effects of the external environment (cold, high temperature, soil salinity and drought). Therefore, it is necessary to know the importance of certain microelements in the normal nutrition of plants, their forms in the soil, and in which stages of development of plants, which types of plants absorb a lot. [49]. The amount of mineral elements contained in the root of Rubia tinctorum L. plant was measured by "X-ray fluorescent spectrometer Spectro Xepos 111, technical indicator: 120/230V, power 150W. It was discovered by the young researchers of the Institute of Bioorganic Chemistry named after Academician O.Sadikov of the Academy of Sciences of the Republic of Uzbekistan Aziza Saydullayevna Ishmuratova, Akmal Khushvakovich Islamov, Ibragimovich Ibodullokhon Abdimalikov. 56 elements and 9 of its compounds were determined in the root of Rubia tinctorum L., the root contained Aluminum oxide Al2O3 (2.174 %), Aluminum Al (6.714 %), Silicon oxide SiO2 (3.553 %), Silicon Si (15.58 %) ), Calcium oxide CaO (11.22 %), Calcium Ca (89.56 %), Potassium K (13.52 %), Phosphorus oxide P2O5 (7.284 %), Scandium Sc (64.01), Sulfur S (1.329 %) and its elements It was determined that the amount of compounds is more than others.

RESULTS AND DISCUSSION

The plant Rubia tinctorum L. was studied in Termiz district, Angor, Sherabad, Boysun districts of Surkhandarya region and in the plants of mountain and mountainous regions, the soil gardens, fields, fields, It was found that compared to the plants on the banks of the stream, the flowering and ripening of the fruits is delayed by 14-20 days compared to the plants in the high temperature area due to the low air temperature. When the Rubia tinctorum L. plant is planted in the experimental fields, it has high development characteristics, the flowering and fruiting process is delayed by 3-4 weeks from the naturally growing plants, the plant planted in the first year blooms later, the seed fertility is normal. z was found to be higher in biogums and peat than in soil.

CONCLUSION: cultivation of dye plants, study of their biology, agrotechnics, use of green biomass to feed livestock, development of dye extraction technology from rhizomes, production of environmentally friendly products It gives effective results in the production of new drug forms in the field of pharmaceuticals.

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