



## ASPECTS OF GROWTH AND DEVELOPMENT OF RUBIA TINCTORUM L. PLANT IN MEDIUM SALTY SOILS OF MIRZACHOL

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Article history:	Abstract:
<b>Received:</b> 28 <sup>th</sup> April 2021 <b>Accepted:</b> 14 <sup>th</sup> May 2021 <b>Published:</b> 10 <sup>th</sup> June 2021	The article provides information on the growth and development aspects of the <i>R. tinctorum</i> L. plant in the moderately saline soils of Mirzachol. In moderately saline Mirzachol soils, root germination (100%) and preservation (68.0%) were found to be high in the 1st growing year. After a one-month natural dormancy period, the laboratory germination rate of seeds was 3%. After a three-month dormancy period, seed germination increased to 6%. In our study, the effect of stratification on <i>R. tinctorum</i> seed germination was identified. The results show that stratification of <i>R. tinctorum</i> seeds has a positive effect on seed germination.

**Keywords:** *Rubia tinctorum*, medicinal plant, flowering, vegetation, rhizome, introduction, plantation, aspect.

Conservation and rational use of biodiversity of flora of Uzbekistan is one of the urgent tasks before us (Tukhtaev, Shakarbaev, 2013; Tadjibayev, 2015) [1]. This issue is related to the natural diversity of plants. Each family of plants has a special place in the local flora. One of them is the family Rubiaceae, which belongs to the group of plants belonging to the ecological life forms, living. It differs from the representatives of other families by its conditions and peculiarities. This family includes about 6,000 species. Most of them are medicinal plants that have a place in the ornamental and pharmaceutical industries.

They contain a number of biologically active substances, including anthracene products up to 5-6% of the rhizome (alizarin, ruberitric acid, galiozin, purpurin, xanthopurpurin, pseudopurpurin, rubiadin-glucoside, munistin, lucidin, iberitsin and others. Ruberitric acid is a glycoside that, when hydrolyzed, is broken down into alizarin aglyconium and primaverose (composed of xylose and glucose sugars, respectively) disaccharide (Tokhtaev, 2009; et al. 2014) [2]. native to the Mediterranean countries, Ukraine, Moldova, southern, southeastern part of the European part of Russia, the Caucasus (Dagestan, Armenia, Azerbaijan, Georgia) and Central Asia. Mainly along the streams, among the bushes, canals grows on the coast, in fields and gardens.

*Rubia tinctorum* L. (*Rubia tinctorum* L.) is one of the medicinal and dyeing plants used by humans since ancient times and was planted in the national industry as a medicinal, dyeing plant. .

They are often used in infusions, decoctions, extracts, drugs for the treatment and prevention of diseases. In medicine, the plant has antispasmodic and diuretic effects, as well as the softening of kidney stones (phosphates). Therefore, its drugs are used in diseases of the urinary tract stones, kidney stones and gallstones and gout. The root and rhizome are used in the textile industry as a dyeing raw material [3].

The aim of the study is to monitor the growth and development of the dye in moderately saline soils and to establish climate and plantations. To do this, it is important to plant the dye plant in the saline soils of the Syrdarya region, to monitor and analyze its bioecological characteristics during the growing season.

### OBJECT AND METHODS OF RESEARCH

The object of scientific research was *R.tinctorum* (Dyed Crayfish) to study the process of growth and development in moderately saline soils.

Seeds and rhizomes of the selected object were planted on the experimental field at Gallakor farm, Boyovut district, Syrdarya region. In our research on plant growth and development, the guidelines recommended by IV Belolipov and others (2015) and HK Karshibaev (2016) were widely used [4].

The seeds and rhizomes of the plant used as an introducer in the introduction were taken from the collection of medicinal plants of the Botanical Garden named after FN Rusanov of the Academy of Sciences of the Republic of Uzbekistan.

## THE RESULTS OBTAINED AND THEIR ANALYSIS

*R. tinctorum* is a perennial rhizome that belongs to the Rubiaceae family. Naturally, the stem grows sideways, lying down, or on the ground. Forms several stems, the stems are covered with small white hairs with four-sided, branched, coarse loops.

Experimental work was carried out in Boyovut district of Syrdarya region to determine the growth and development of the dye plant in moderately saline soils, resistance to pests and diseases, and compliance with the standards of the introductory requirements.

The peduncle is long brown, branched, thick, articulated, with many heads. The thickness of the rhizomes is 2-18 mm. The rhizome forms 8-12 joints a year. The leaves are ovoid, glossy, very short-banded, the thick veins at the bottom are covered with coarse loose hairs, the stems are arranged in 4-6 balls.

It is advisable to plant the rhizome in the soil and climatic conditions of Mirzachol in the 3rd decade of February or the 1st decade of March. The rhizome can grow in one place for 4-5 years. It can be said that in the 3rd decade of February or the 1st decade of March it is required to plant up to 1000 kg of plant rhizomes per hectare.

From the 1st decade of June to the beginning of August, the plants have a flowering and fruiting period. The fruits ripen in August-September. The fruit is dark red. The second growing season begins on the 1st decade of March, and in the first days the growth and development of the plant begins rapidly [3].

Rhizomes and seeds are planted in soils with moderate humidity, they rot if the humidity is high, so the rhizomes are more resistant to dry soil. Large-sized rhizomes are planted at an average depth of 8-10 cm, depending on soil moisture, and small ones at a depth of 3-4 cm or 5-6 cm.

After 2-3 days, the first irrigation is carried out to ensure that the rhizomes are planted in the soil. The planting density of the plant is 10-12 rhizomes per 1 meter.

Row spacing is 50 cm, as in the second and third years the roots of the plant grow freely and cover the row spacing (above ground). Its height is 40-130 centimeters. The plant's rhizome grows continuously from 7 to 11 during each growing season.

The thickness of the stem in the first growing year is 14-20 mm, the length of the main stem is 14.2-1.51 cm, the number of leaves is 15-19.



Figure 1. View of the experimental field planted with crayfish in Gallakor SIU, Boyovut district, Syrdarya region.



Figure 2. Status during the winter break.

In the first vegetation year, in moderately saline soils, the growth of the plant is slow, but the first order branches (number 7-9 and length 42 cm) and the second order branches (number 5-6 and length 6-8 cm) ) and accelerates growth in the last stages of the growing season. In the first year, royan will continue its vegetation until mid-October. In the moderately saline soils of the study area, plant absorption rate and height growth were slightly lower during the 1st growing season.

If the plantation area needs to be changed, the plant's rhizomes are dug up and rested in moderately moist soil for a period of time before planting. The raw material obtained from the dyed rye is brown rhizome fragments. Dyed royan is a plant that loves heat and light. Due to its bioecological characteristics, the plant grows in conditions of high soil moisture. In summer, the growth rate slows down a bit [3].

According to the results of our research, the analyzed and identified environmental indicators, as well as the level of salinity of the species, seed germination, seedling germination and storage parameters, proposed by BYTukhtaev (2009) based on the principle of gradation of the introduction of mature plants in saline soils.

In the *R.tinctorum* plant introduced in saline soils, natural germination (seed stratification) and germination were observed during the first growing season (Table 1).

Table 1  
Preserved in the 1st growing year introduced in Mirzachol soils

Plant type	Reproductive organ	% account		
		Forgetfulness	Bruising	Conservatism
<i>R.tinctorum</i>	rhizome	100	100	68,0
<i>R.tinctorum</i>	seed	6	6	4

Yuqoridagi jadvaldan shuni xulosa qilish mumkinki O'rtacha sho'rlangan Mirzacho'l tuproqlarida 1-vegetatsiya yilida ildizpoyaning ko'karuvchanligi (100 %) va saqlanishi (68,0%) yuqori bo'ldi.

Like most other plant species, the seeds of *R. tinctorum* require a certain dormancy period after seed maturation. After a one-month natural dormancy period, the laboratory germination rate of seeds is 3%. After a three-month dormancy period, seed germination increased to 6%.

The survival rate of the plant during and after the growing season was 4%. This indicates that *R. tinctorum* has low memory.

The nutrient content of the soil increases due to the decomposition of a certain part of the rhizome under the soil. This aspect is one of the important factors in the development of saline soils in large areas (Karshibaev H.Q., Tukhtaev B.Y.) [5].

The seeds are small, round, flat, smooth, hard and black. The number of seeds in the fruit is 1-2. The fruit is juicy. The average weight of 100 seeds is 80 grams.



Figure 3. Fruits and seeds of dyed rye

In our study, the effect of stratification on *R. tinctorum* seed germination was identified. The results show that stratification of *R. tinctorum* seeds has a positive effect on seed germination.

When *R. tinctorum* seeds are stratified at low temperatures, they help to emerge from a state of deep endogenous dormancy as a result of biochemical processes that take place in the seed.

**CONCLUSION**

According to preliminary results of scientific research on the cultivation and cultivation of rhizomes in saline areas:

- High germination and preservation rates were observed when *Rubia tinctorum* rhizomes were planted in the 1st growing year.
- Studies show that planting the plant in moderately saline soils of Mirzachol gives positive results.

Therefore, it is possible to recommend the establishment of large-scale plantations of *R. tinctorum* as an introducible species.

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