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CONTENTS

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AGROBIOTECHNOLOGY OF CULTIVATION *RICINUS COMMUNIS* L. IN THE CONDITIONS OF THE BUKHARA

Yarmuhammedov Jasur Mansurovich
Teacher, Bukhara State University
j.m.yarmuhammedov@buxdu.uz

Shodmonov Feruzjon Qamariddinovich
Associate Professor of Biological Sciences, Bukhara State University, doctor of philosophy,
f.k.shodmonov@buxdu.uz

Yuldoshov Laziz Tolibovich
Associate Professor of Biological Sciences, Bukhara State University, doctor of philosophy,
l.t.yuldoshov@buxdu.uz

Annotatsiya. Ushbu maqolada dorivor Kanakunjut (*Ricinus Communis L.*) ni Buxoro viloyati sharoitida yetishtirish agrobiotexnologiyasi ko‘rib chiqilgan. Shuningdek, kanakunjut o‘simligi urug‘larining unuvchanligi laboratoriya va dala sharoitida amalga oshirilgan. *Chlorella vulgaris* suspenziyasi bilan ishlov berilgan tajriba variantidagi urug‘lar unuvchanligi, nazoratga nisbatan 18-20% gacha yuqori bo’lishi aniqlangan. Shu bilan bir qatorda, *Ricinus Communis L.* o‘simligining urug‘i tarkibida, oqsil miqdori nazoratga nisbatan tajriba variantida 18 – 21% ga, moy miqdori esa 45-59 % ga yuqori bo‘lishi aniqlangan.

Kalit so‘zlar: *Kanakunjut, Ricinus Communis L., dorivor, sutlamadoshlar oilasi, manzarali o‘simlik, agrotexnika, alkaloidlar, sirka, izovalerian, saponin, nastoyka, lipaza fermenti, agrobiotexnologiya, Chlorella vulgaris.*

Аннотация. В данной статье рассматривается агробиотехнология выращивания лекарственной клещевины в условиях Бухарской области. Кроме того, было проведено проращивание семян клещевины в лабораторных и полевых условиях. Установлено, что всхожесть семян в опытном варианте, обработанном суспензией хлореллы обыкновенной, была на 18-20% выше, чем в контрольном. В качестве альтернативы было обнаружено, что в семенах клещевины содержание белка в опытном варианте на 18-21% выше по сравнению с контролем, а содержание жира на 45-59% выше.

Ключевые слова: *Клещевина обыкнове́нная, Ricinus Communis L., лекарственное, семейство молочайных, декоративное растение, агротехника, алкалоиды, уксус, изовалерианин, сапонин, настойка, фермент липаза, агробиотехнология, Chlorella vulgaris.*

Abstract. This article discusses the agrobiotechnology of growing medicinal castor oil plant in the conditions of the Bukhara region. In addition, the

germination of castor seeds was carried out in laboratory and field conditions. It was found that the germination of seeds in the experimental version treated with a suspension of *Chlorella vulgaris* was 18-20% higher than in the control version. Alternatively, it was found that in castor seeds, the protein content in the experimental version is 18-21% higher compared to the control version, and the fat content is 45-59% higher.

Keywords: *Castor oil plant, ricinus communis l., medicinal, euphorbiaceae family, ornamental plant, agrotechnics, alkaloids, vinegar, isovalerian, saponin, tincture, lipase enzyme, agrobiotechnology, Chlorella vulgaris.*

Introduction

There are 10-12 thousand species of medicinal plants on Earth. And there are more than 1000 species whose pharmacological and medicinal properties have been studied. There are more than 750 types of medicinal plants. 112 types of medicinal plants are used in pharmaceuticals. The active substance of medicinal plants includes alkaloids, various glycosides, saponins, flavonoids, coumarins and other mucous substances. These can be vitamins, essential oils, resins and other compounds.

There are 2 types of descriptions of medicinal plants:

1. Depending on the composition of the active ingredients.
2. Depending on the pharmacological indications.

Medicinal and spicy plants are cultivated over large areas all over the world. At the same time, China (460 thousand hectares), India (300 thousand hectares), Hungary (34-40 thousand annually), Poland (30 thousand hectares), France (25 thousand hectares), Spain (19 thousand hectares), Germany (5.7 thousand hectares), Austria (4.3 thousand hectares) occupies a leading place. The species of medicinal plants of the family of Asteraceae and Lamiaceae grown in these fields provide supplies of high-quality raw materials for the pharmaceutical industry.

To a certain extent, this article will serve to implement the tasks defined by the decree of the President of the Republic of Uzbekistan dated November 26, 2020 No. PQ-4901 “On measures to expand the scale of scientific research on the cultivation and processing of medicinal plants, the establishment of their seed production” and other regulatory legal acts in this area [1].

This scientific research to a certain extent serves to implement the tasks set out in the resolutions of the President of the Republic of Uzbekistan dated May 20, 2022 № PP-251 “on measures to organize the widespread use of medicinal plants in cultivation and processing in culture and treatment” and other regulatory legal acts related to this area [2].

R.K. Singx, M.K. Gupta [4] and other scientists conducted a pharmacognostic study of the stem of the Ricinus communis plant. In this work, scientists are trying to generalize the pharmacognostic features of the Ricinus communis stem. Ash and extract values, chemical test, HPLC, histological color reactions, performed fluorescence analyses

Lin J.Y. and Lin S.Y. [5] conducted research on antitumor lectins isolated from Ricinus communis seeds.

Chigozie F. Uzoh; Joseph T. Nwabanne [6] noted that castor seed oil affects the type and concentration of the catalyst for the conversion of functional groups in the production of alkyd resin.

Botanical description: castor plant - *Ricinus Communis L.* is an annual herbaceous plant of the *Euphorbiaceae* family, reaching 2 m in height. The stem is branched. The leaf is large, glabrous, with 5-11 palmate lobes arranged in a row on a stem with a long stripe located in the center of the leaf plate. The leaf blades are oblong-ovate, with a serrated edge. The flowers are gathered in a brush. The flower is unisexual, the inflorescence is simple, the maternal flowers are located in the upper part of the calyx, and the paternal ones are in the lower part. The fruit is a three-seeded, triangular. As the capsula ripens, it cracks and the seeds are scattered [3].

Application: castor plant is used in medicine as a good laxative, in gynecology and eye diseases, for healing wounds, burn areas of the body, and the oil promotes hair growth. At low pressure, heating the oil to 240-300 °C, ricinoleic acid in the plant is cleaved to form ethanthol heptaldehyde and undecylenic acid. The resulting undecylenic acid has fungicidal (killing parasitic fungi) properties and is used to treat skin diseases – dermatoses, as well as psoriasis diseases [3].

Research Methodology

The plant castor ordinary (Ricinus communis L.) was taken as the object of the study. During the research, the agrobiotechnics of growing the castor plant in the conditions of the Bukhara region was studied. The research used laboratory and field experiments, phenological, morphological, biometric, environmental and statistical methods. Biometric measurements and analyses were performed in accordance with the generally accepted methods of Borisova, Beydeman [11], Panomarev, Zaytsev, [12] Yarash, Terexin and the requirements of state standards. The experiments were conducted at the scientific experimental site of the Faculty of Agronomy and Biotechnology of Bukhara State University.

Analysis and Results

Seed productivity: The seed productivity of a plant is a determining factor in the prospects of this species. To give a biological description of any species, it is necessary to determine its seed productivity. This indicates the possibility of using this species in nature and in conditions of acclimatization (introduction) [7].

The studied seed of the plant is egg-shaped, covered with a shiny hard flower skin of gray or light brown color, as well as reddish-brown spots, dots and stripes. There is a small white seedling at the tip of the seed. 1000 castor seeds weigh 800 g. The length of the seed of the largest is 16-21 mm, and the smallest is 6-8 mm.

Table 1. *Morphological features of castor seeds.*

Plant name	Seed color	Dimensions, (mm)		Seed mass, gr.
		length	width	
Ricinus Communis L.	Gray or light brown	16-21	6-8	800

In 2024, experiments were conducted to determine the effectiveness of germination of seeds of the castor plant (*Ricinus Communis L.*) in various nutrient media.

The experiments were carried out in laboratory conditions. First, the seeds of the plant were sorted and placed in Petri dishes of 25 pieces. As a control option, the selected container was sprayed with plain water, and in the experimental version, a suspension of Chlorella vulgaris in an amount of 10 ml was sprayed on seeds and placed in a thermostat, providing a temperature of 240 °C [9].

Figure 1. Germination of kanakunjut seeds in laboratory conditions in experimental versions of plain water (a) control and suspension of Chlorella vulgaris (B) on day 1.

Seed germination was checked every 2 days for 10 days. During the experiment, the seed germination rate and the timing of shell cracking are shown in Table 2.

According to the results of the experiment, it was found that the actual yield coefficient of the seeds of the castor plant (*Ricinus Communis L.*) in the experimental version is relatively higher (up to 20%) than in the control one. The quality indicators of the seeds are good, no damage by phytogenic and zoogenic organisms was observed.

Table 2. *Seed germination rate and the timing of shell cracking.*

№	Day	Control (water), %	Experiment (Chlorella vulgaris), %
1	2	-	-
2	4	8	16
3	6	20	40
4	8	48	64
5	10	72	92

In addition to proteins, carbohydrates, fats, Chlorella vulgaris suspension contains macro- and microelements, vitamins and important physiologically active substances that positively affect seed germination [10]. This is due to the fact that these substances are more effective in the fight, having a positive effect on the germination of castor seeds in the experimental version.

Figure 2. Germination of castor seeds in laboratory conditions in experimental versions of plain water (a) control and suspension of Chlorella vulgaris (B) on 8th day.

The experiment was conducted both in the laboratory and in the field in order to study the intensity of growth and development of the castor plant (*Ricinus Communis L*).

The seeds of the castor plant contain 40-56% insoluble oil, 14-17% protein substances, 0.1-1% ricin and nicotine alkaloids, 18-19% clematis, the enzyme lipase, a strong toxic protein substance – ricin and other substances [8].

It is known from the literature that the seeds of the castor plant contain 14-17% protein, during our study it was found that when studying the composition of the seeds of this castor plant, the protein content is 18-21%, and the oil content is 45-59%.

When growing castor plants in the field, an average of 35 thousand bush plants are grown on 1 hectare, feeding them during the growing season with 90-100 kg of nitrogen, 70 kg of phosphorus and 50 kg of potassium mineral fertilizers [3].

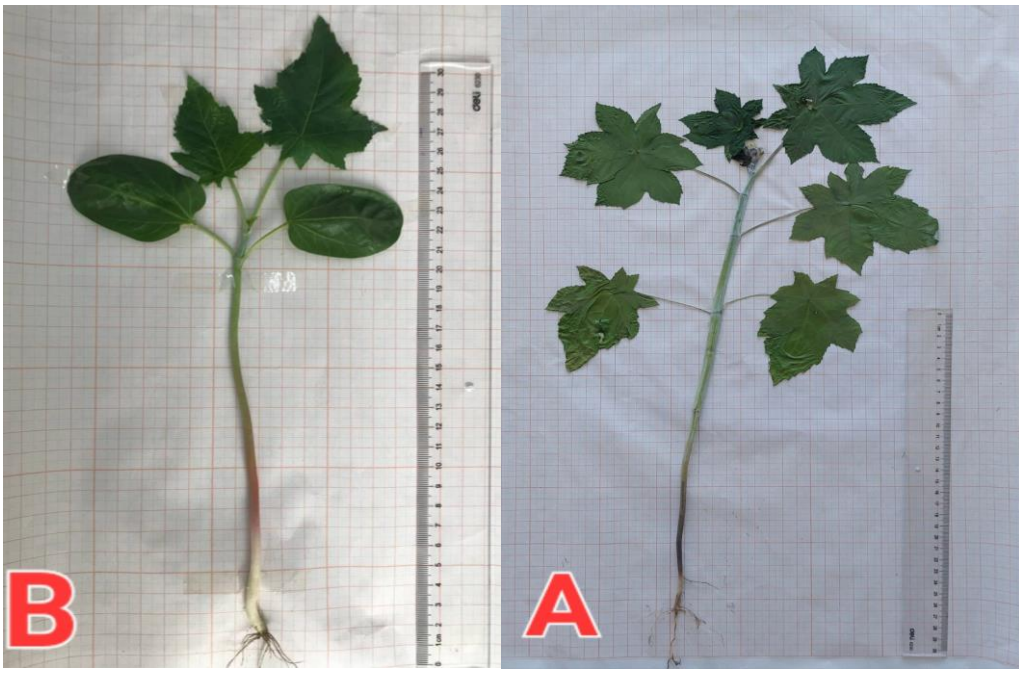

Figure 3. In the field, the castor plant was grown and cultivated in a suspension of Chlorella vulgaris (a) plain water (B) in control experimental variants.

In the field, castor seeds were sown by a control method on 1 m^2 of area and an experimental version on 1 m^2. It is established that the soil temperature in the conditions of the Bukhara region is 12-14°C. After seed germination, the control variant was fed in the traditional way at the virginyl, herbal, juvenile, immature, mature virginyl stages of vegetation. The plants of the experimental variant were fed with an additional suspension of Chlorella vulgaris. The result was very different from the control version in the number of pods and seeds of plants grown in the experimental version, as well as in size, speed of maturation and maturation, as well as a higher protein and fat content in the seeds.

Conclusions

Thus, the castor plant was studied in the conditions of the Bukhara region. Experiments conducted in laboratory and field conditions have shown that the germination of seeds treated with Chlorella vulgaris suspension, the rate of growth and development of the plant, the stages of vegetation of virginil, grass, juvenile, immaturity, mature virginil, the number and size of seeds and seeds, the rate of maturation and maturation, controlled by a high content of physiologically active substances in seeds. it was different from its variants. In particular, it was found that the germination of the seeds of the Ricinus Communis plant is up to 20% higher than the control one, the protein content in the seeds is 18-21%, and the oil is 45-59% higher.

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HYDROCHEMICAL COMPOSITION OF PONDS IN BAHA ‘AL-DIN NAQSHBAND SHRINE, BIOTECHNOLOGY OF DETERMINATION AND PROPAGATION OF PHYTOPLAKTONS

Sharopova Shakhnoza Rakhmatilloyevna
Associate Professor (PhD), Department of Biotechnology and Food Safety
s.r.sharopova@buxdu.uz

Nurillayeva Gulzoda Ulug’bek qizi
Master student of Bukhara State University

Annotatsiya. Ushbu maqolada Bahouddin Naqshband ziyoratgohida joylashgan hovuzlardagi fitoplanktonlar aniqlash va ularning gidrokimyoviy tarkibini o‘rganish to‘g‘risida ma’lumotlar keltirilgan.

Kalit so‘zlar: *hovuzlar, fitoplankton, probirka, shtativ, eritmalar, distillangan suv, tekshiriluvchi suv, indikator.*

Аннотация. В данной статье представлены сведения по идентификации фитопланктона в прудах, расположенных на территории святилища Бахауддина Накшбанда, и изучению их гидрохимического состава.

Ключевые слова: *пруды, фитопланктон, пробирка, штатив, растворы, дистиллированная вода, тестируемая вода, индикатор.*

Abstract. This article presents information on the identification of phytoplankton in the ponds located in the shrine of Baha ‘al-Din Naqshband (Bahauddin Naqshband) and the study of their hydrochemical composition.

Keywords: *ponds, phytoplankton, test tube, tripod, solutions, distilled water, tested water, indicator.*

Introduction

The Baha ‘al-Din Naqshband monument complex is located 10 km north-east of Bukhara and has been formed for many centuries. This complex was created after the