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STUDYING THE BENEFICIAL PROPERTIES OF BIOLOGICALLY ACTIVE SUBSTANCES OF AMARANTH ON A SCIENTIFIC BASIS

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Abstract
This paper explores the distinctive properties of amaranth, positioning it as a novel and economically impactful crop in the agricultural sector of Uzbekistan. Recognizing amaranth's unique attributes, this study delves into its cultural and economic significance, shedding light on the plant's potential to contribute significantly to the nation's agricultural growth. Furthermore, the paper underscores the heightened attention the Uzbekistan government is currently dedicating to the amaranth plant, emphasizing its pivotal role in addressing pressing agricultural challenges. As amaranth emerges as a focal point of national agricultural strategies, this research aims to provide insights into the transformative impact of this resilient and versatile crop on the economic and cultural fabric of Uzbekistan.
Keywords: amaranth, squalene, protein, vitamins, biologically active substances, food additive.

Introduction

Amaranth, a plant renowned for its unique properties, is gaining prominence globally and making bold inroads into Uzbekistan's agricultural sector, promising both cultural and economic effectiveness. Its exceptional nutritional profile, adaptability to diverse climates, and sustainable growth make it a noteworthy crop with implications reaching far beyond national borders. In addition to its local significance, amaranth has captured the attention of agricultural communities worldwide, emerging as a subject of global interest [1].

This paper aims to explore the distinctive characteristics of amaranth, shedding light on its potential transformative impact not only in Uzbekistan but also on the global stage. As societies around the world grapple with the challenges of sustainable agriculture and food security, amaranth's unique attributes position it as a promising solution. Furthermore, the growing recognition of amaranth as a resilient and versatile crop has sparked interest and research initiatives in various regions, contributing to a broader understanding of its agricultural significance [2,3,4].

In this context, it is crucial to examine how amaranth fits into the global agricultural landscape, considering its adaptability, nutritional value, and socio-economic implications. By doing so, this study aims to contribute to the broader conversation on amaranth, fostering a

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comprehensive understanding of its potential as a transformative crop with implications that extend beyond national boundaries [5,6,7].

The main part

It is not wrong to say that the presence of squalene in amaranth oil is one of the most important discoveries of our time. This substance, which is of special importance in medicine, was isolated for the first time in 1906 by the Japanese scientist Mitsumaro Sujimoto from the liver of a shark living at the bottom of the sea (lat. Squalus - shark). It turns out that squalene is essential for sharks to survive in hypoxia (an environment with very little oxygen) deep enough in the sea.

In 1931, Dr. Claure, a professor at the University of Zurich and a Nobel laureate, discovered that this biological compound consisting of natural unsaturated hydrocarbons lacks 12 hydrogen atoms for a stable state, so this unsaturated hydrocarbon tries to pull these atoms from any compound [8,9,10]. Due to the fact that water is the most abundant in the body, squalene reacts with water, absorbs hydrogens from it creates free oxygen, and ensures oxygen saturation of tissues and organs. As a result, it rejuvenates the cells of the body, eliminates free radicals, prevents the appearance and spread of oncological tumours, dramatically increases the stability of the immune system, and plays an important role in restoring human health. Among the many properties of squalene, it should be mentioned that it is a derivative of vitamin A, and in the synthesis of cholesterol it turns into its biochemical analogue 7-dehydrocholesterol, and this substance exhibits radioprotective properties under the influence of sunlight and forms vitamin D. does. In addition, vitamin A is better absorbed when dissolved in squalene. Since squalene is a natural component of the sebaceous glands of the human body, it has the ability to be easily absorbed by the body and accelerates the entry into the body of useful substances contained in cosmetics. For humans, squalene is necessary as an anticarcinogenic, antimicrobial fungicide, and it is oxygen deficiency that causes tissue damage, ageing of the body, and the appearance and development of tumours. It is squalene that is necessary as a solution to this problem (Figure 1) [11,12].

Squalene can be used for the prevention of onco- and cardiac diseases in the preparation of steroid hormonal preparations, in cosmetics. Squalene, necessary for the pharmaceutical industry, is imported from the liver of sharks and whales. These substances are present in large quantities in amaranth oil (amaranth-8%, olive oil-0.7%), and this oil has medicinal properties necessary for human health. When the presence of phytosterols and other substances became clear to science, attention to amaranth oil increased dramatically. Amaranth oil contains more unsaturated fatty acids than saturated fatty acids. Vitamin E in the form of tocopherols in the oil has an antioxidant effect and has the property of reducing the amount of cholesterol in the blood. The oil also contains rutin and vitamin R, and has antimicrobial and fungicidal properties [13,14,15].

Currently, amaranth oil is used in the biosynthesis of cholesterol, oncological and cardiovascular problems, ischemic diseases, cleansing the body of radionuclides, heavy metal salts, infectious diseases, herpes, psoriasis, vitiligo, neurodermatitis, eczema, atopic dermatitis, gastrointestinal ulcers, diabetes. It is widely used in diabetes, liver disease, genitourinary colds, atherosclerosis, anaemia, avitaminosis, stenocardia, and hypertension, and as a means of dramatically increasing immunity [15,16,17].

After checking the amaranth oil grown in our country by gas chromatography method, it was found that it is rich in Omega-3 and Omega-6 unsaturated fatty acids. This determines the

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prospects for the use of locally produced amaranth oil as a unique medicinal substance in medicine.

The high level of vitamin C and carotene in amaranth is an important factor in the health of animals and poultry.

Conclusions

Amaranth attracts the attention of agricultural workers, and practitioners-researchers due to its rich protein content, high productivity, many vitamins and mineral salts. It is considered a leading raw material not only for food and fodder but also as an invaluable medicinal plant.

Its trunk, leaves and grain husk are used as valuable fodder in livestock farming. The large number of useful unique elements and the record level of protein in the composition ensures rapid and healthy growth of lambs, calves and chicks, sharply increases the fattening process of animals, and increases the amount of cow's milk and the level of fat in it. Amaranth is well-ensiled together with corn, which solves the problem of fodder throughout the year. The high amount of sugar in corn pulp and protein in amaranth makes silage more nutritious.

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