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FIELDS OF APPLICATION OF FOOD ADDITIVES CONTAINED IN THE MEDICINAL PLANT "AMARANTH"

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Abstract
Amaranth stands out as a focal point of interest among agricultural practitioners and researchers owing to its remarkable attributes. Renowned for its rich protein content, robust productivity, and diverse nutritional profile, amaranth emerges as a versatile resource with multifaceted applications. Beyond its conventional roles in food and fodder production, its stature as a medicinal plant of unparalleled worth further accentuates its significance. This review explores the utilization of various components of the amaranth plant, including its stem, leaves, and grain husk, as invaluable fodder sources in livestock farming. Notably, the infusion of amaranth into silage, particularly in conjunction with corn, emerges as a pivotal strategy for addressing year-round fodder requirements. The amalgamation of corn's high sugar content with amaranth's protein richness yields silage of heightened nutritive value, fostering accelerated growth and enhanced health parameters in livestock. By shedding light on the myriad benefits and potential applications of amaranth across agricultural and medicinal domains, this review aims to underscore its pivotal role in sustainable farming practices and human well-being.

Keywords: amaranth, animal husbandry, fodder, amaranth oil, squalene, protein, vitamins, biologically active substances, diseases.

Introduction

Amaranth, a resilient and versatile plant, has garnered significant attention in recent years among agricultural enthusiasts and researchers alike. Its emergence as a powerhouse of nutrition, boasting a wealth of protein, vitamins, and minerals, positions it as a cornerstone in the quest for sustainable food and fodder sources. Beyond its traditional agricultural roles, amaranth's medicinal properties have sparked curiosity and exploration, hinting at a wealth of untapped potential.

In this introduction, we embark on a journey to unravel the multifaceted significance of amaranth in both agricultural and medicinal contexts. We delve into its rich history, tracing its roots back to ancient civilizations where it was revered for its nutritional and healing properties. From its humble origins to its current prominence, amaranth has evolved into a symbol of resilience and adaptability in the face of changing agricultural landscapes and dietary preferences.

As we navigate through the intricate web of its agricultural applications, we explore the various parts of the amaranth plant—from its sturdy stem to its vibrant leaves and nutrient-dense grain husk—each offering a unique contribution to livestock farming and fodder production. Furthermore, we examine the symbiotic relationship between amaranth and other crops, particularly corn, in the production of silage, highlighting its role in ensuring year-round fodder security and livestock health.

Moreover, we venture into the realm of medicinal botany, uncovering the hidden treasures that lie within the leaves, seeds, and roots of the amaranth plant. From ancient remedies to modern pharmacological explorations, amaranth's therapeutic potential continues to captivate researchers and health enthusiasts alike, offering a glimmer of hope in the pursuit of natural remedies for various ailments.

As we embark on this exploration of amaranth's agricultural and medicinal significance, we invite readers to join us in unlocking the mysteries and marvels of this extraordinary plant. Through a holistic understanding of its attributes and applications, we aim to shed light on its transformative potential in shaping the future of agriculture, nutrition, and healthcare.

The Main Part

To date, 19 varieties of amaranth have been introduced in local conditions, and the varieties "Uzbekistan-M", "Andijan", "Marhamat", "Ulug'nor" based on the Kharkovsky-1, Helios, Ultra and Lera varieties of amaranth were created by natural selection. was created, it was recognized as a selection achievement, a patent was ordered under these names, and the relevant patents were issued. Possibilities of amaranth cultivation on degraded lands with high salinity and ultimately the dynamics of decreasing soil salinity are being tested in practice [10-13]. The fact that the decrease in the level of salinity of the earth creates enough opportunities for the cultivation of other technical plants also shows the economic efficiency of this plant [14].

Amaranth oil in the biosynthesis of cholesterol in medicine; cleaning the body from radionuclides, heavy metal salts; infectious diseases, herpes, psoriasis, vitiligo,

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neurodermatitis, eczema, atopic dermatitis, gastrointestinal ulcers, diabetes, liver disease, genitourinary colds, atherosclerosis, anemia, avitaminosis, angina pectoris, hypertension, oncological and cardiovascular diseases widely used in solving problems. It dramatically increases immunity, it is an unparalleled tool in the fight against anemia (Fig. 1).

Figure 1. Amaranth oil

The preliminary results of amaranth plant breeding in Andijan showed that the spikes were stronger than in European countries such as Ukraine. This gives hope that the productivity will be even higher in Uzbekistan.

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.

Squalene can be used for the prevention of onco- and cardiac diseases in the preparation of steroid hormonal preparations, in cosmetics. Squalene, which is needed for the pharmaceutical industry, is imported from the liver of sharks and whales, and these substances are present in large quantities in amaranth oil (in amaranth-8%, in 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 has more unsaturated fatty acids than saturated fatty acids. Vitamin E in the form of tocopherols in the oil has an antioxidant effect, has the property of reducing the amount of cholesterol in the blood. The oil also contains rutin and vitamin R, has antimicrobial and fungicidal properties (Fig. 2).

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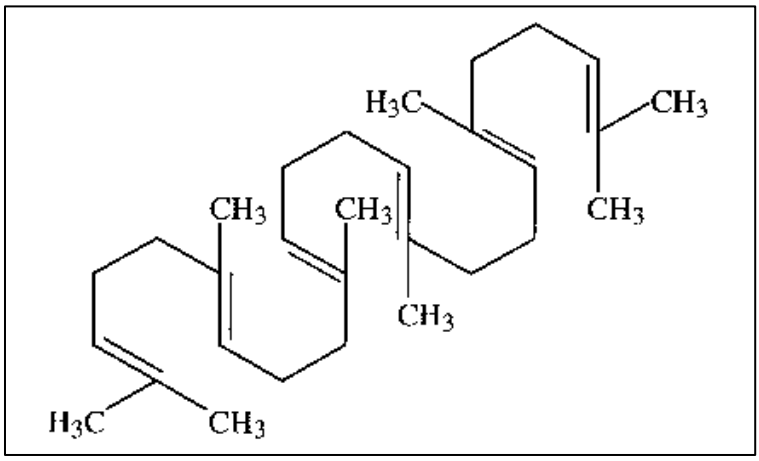

Figure 2. Squalene

It is known that flour and leaves made from amaranth grain are of high quality and have useful nutritional value, amaranth oil is rich in iron, phosphorus, potassium, group of vitamins B1, B2, E and D, phospholipids, phytosterols.

Preparation of balanced, easily digestible feed without imported additives, fully meeting current requirements, based on a mixture of amaranth, quinoa, eichhornia and other non-traditional plants granulated vegetable flour with bentonite mineral flour for livestock and poultry. technology development is underway.

In this regard, the following tasks are planned: development of technology for making "Amaranth+maize" silage with high protein content; Creating a method of obtaining high-protein fodder pellets in the combination of "amaranth+maize+eichhornia"; development of technology for preparation of granulated omukta - fodder by adding secondary product of amaranth seeds processing; creating a method of obtaining extruded fodder from amaranth and other plant grains; creation of methods of adding bentonite salt to feed; determination of fat content, total protein content, vitamin, amino acid, macro- and microelements, carbohydrates, polysaccharide content and nutritional value assessment of all selected fodder products.

In animal husbandry, amaranth's green mass and pulp are high-energy quality protein-vitamin feed, especially necessary for breeding cattle. In poultry farming, it is a nutritious, cervitamin feed, which has been found to have a significant effect on increasing the number of eggs. In addition, it is an invaluable raw material for cosmetology.

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