# AREA OF AMARANTH APPLICATION BY CHEMICAL COMPOSITION

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**Abstract.** The following scientific report reviewed the materials on the history of the development of using Amaranthus, chemical composition, using of representatives of the genus Amaranthus [Amaranthaceous] in the medicine and food industry. The presence of valuable biological active substances in the amaranthus determines the prospects of its use in the production of special and general food products, as well as raw materials for the production of biological active additives.

**Key words:** amaranthus, biological active substances, amaranth oil, pectin, amino acids, squalene, antioxidant activity.

In connection with the problem of providing humanity with food, all over the world there is a search for ways to increase plant productivity and identify new crops that can be both a source of high-quality food and raw materials for the creation of new medicines. The most promising among other plants is amaranth.

Genus Amaranthus L. - amaranth [fam. Amaranth] has about 75 species growing in warm and temperate zones of the globe [1]. Amaranth is a valuable multi-purpose crop: grain, vegetable, fodder, ornamental and industrial. The center of origin of amaranth is South America, where a large number of its species, varieties and forms grow. Many representatives of the genus live in North America, India and China, but these are secondary centers of distribution of amaranth [2]. In pre-Columbian times, the grain amaranth was one of the main food crops of the New World, almost as important as corn and beans. Amaranth is an ancient crop with a thousand-year history, known since the times of the ancient Incas, Aztecs and Mayans. It was called "Aztec wheat" or "Inca bread". In addition to its consumption as food, the Aztecs and Incas used

amaranth as a source of purple dye in pagan rites. With the arrival of the Spanish conquistadors and the introduction of Christianity, pagan rituals began to be supplanted, including by their related amaranth. Corn and beans remained the main food crops, and amaranth was practically forgotten. Thus, the Spanish conquerors put an end to the use of amaranth as a staple food crop of the New Age, which significantly slowed its spread into world agriculture as a highly nutritious product.

A significant contribution to the revival of amaranth was made by Robert Rodale, who created the Amaranth Institute in the USA and contributed to the introduction of this culture in many countries of the world [3].

According to a number of researchers [4-6], amaranth is a unique crop with multifaceted applications. Suitable for cultivation as a fodder, grain, vegetable, medicinal and ornamental plant. It has high productivity, drought and salt resistance, high protein content and other biologically active substances.

In Europe, amaranth began to be grown as an ornamental plant only at the beginning of the 18th century. They began to grow it for grain. In Asia, amaranth became popular as a grain crop among the hill tribes of India, Pakistan, Nepal and China. Broad-leaved forms are used by the population of these countries as vegetable plants for preparing salads rich in carotene, vitamin C, calcium, iron and other microelements [2]. In the 30s of the last century N.I. Vavilov [7] strongly recommended the introduction of amaranth into the Russian national economy. As a result of the tests, high yield, drought resistance, rapid growth, high nutritional value of grain and green mass and other advantages of amaranth were noted.

The possibility and feasibility of using amaranth in the production of confectionery dietary products, as well as in baby food, has also been established [8].

It has been established that 63 g of amaranth green mass is equivalent in protein to 10 g of soybean grain. Under production conditions, it has been

shown that in Russia, even at 60° northern latitude, it is possible to obtain up to 300 centners of amaranth green mass per hectare, and in the middle zone - up to 1000 centners, while soybeans, like those mentioned above, are not cultivated at all under these conditions. The green mass of amaranth is an excellent feed for pigs and birds, as well as for cattle [8-9].

In many countries of Latin America, Asia and Africa, amaranth is used as a vegetable crop. Considering the nutritional value and high content of vitamins in amaranth leaves, you can prepare salads, soups, and side dishes from them. They are also dried and pickled for consumption in winter. Protein concentrates, pectin, and amaranthine dye are obtained from the leaves [9–10].

At the same time, it is known that amaranth leaves emit oxalic acid in significant quantities, the accumulation of which in the human body is undesirable. Therefore, in addition to scientific interest, elucidating the regulation of oxalic acid metabolism attracts the attention of specialists involved in nutrition and toxicology.

A characteristic feature of amaranth lipids is the high content of squalene [5–7], phospholipids and other substances with high biological activity. A technology has been developed for obtaining oil from amaranth seeds by cold pressing, which ensures the yield of high-quality oil with a maximum content of physiologically active compounds [11-13].

The presence of valuable biologically active substances in the seeds and vegetative organs of plants of various types of amaranth, high content of protein, pectin, squalene, dietary fiber, vitamins [A, group B, C, E], macro- and microelements. determines the prospects for its widespread use in the production of bakery, confectionery and dairy products, as well as raw materials for the production of dietary supplements.

Thus, amaranth is a grain, fodder, vegetable, industrial, green manure and ornamental crop and all its organs (grain, leaves, stems, roots) can be used by humans.

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