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ОЛИЙ ВА ЎРТА МАХСУС ТАЪЛИМ ВАЗИРЛИГИ

ФАРҒОНА ДАВЛАТ УНИВЕРСИТЕТИ

FarDU. ILMIY XABARLAR-

1995 йилдан нашр этилади
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АМАРАНТ ТАРКИБИДАГИ ПИГМЕНТЛАР ВА УЛАРНИ ОЗИҚ-ОВҚАТ САНОАТИДА ҚЎЛЛАШ ИСТИҚБОЛЛАРИ

ПИГМЕНТЫ АМАРАНТА И ПЕРСПЕКТИВЫ ИХ ПРИМЕНЕНИЯ В ПИЩЕВОЙ ПРОМЫШЛЕННОСТИ

AMARANTH PIGMENTS AND PROSPECTS FOR THEIR APPLICATION IN THE FOOD INDUSTRY

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Аннотация

Мақолада амарант таркибига кирувчи пигмент бирикмалар тўғрисида маълумотлар келтирилган. Мақолада, шунингдек, беталаин пигментларни озиқ-овқат саноатида қўллашнинг аҳамияти тўғрисида ҳам маълумотлар берилган.

Аннотация

Статья содержит информацию о пигментных соединениях, входящих в состав амаранта. В статье также приводится информация о важности использования беталаиновых пигментов в пищевой промышленности.

Annotation

This article contains information about the pigment compounds that make up amaranth. The article also provides information about the importance of using betalain pigments in the food industry.

Таянч сўз ва иборалар: *амарант, пигментлар, беталаин, бетацианинлар, бетаксантинлар.*

Ключевые слова и выражения: *амарант, пигменты, беталаин, бетацианины, бетаксантины.*

Keywords and expressions: *amaranth, pigments, betalain, betacyanins, betaxanthins.*

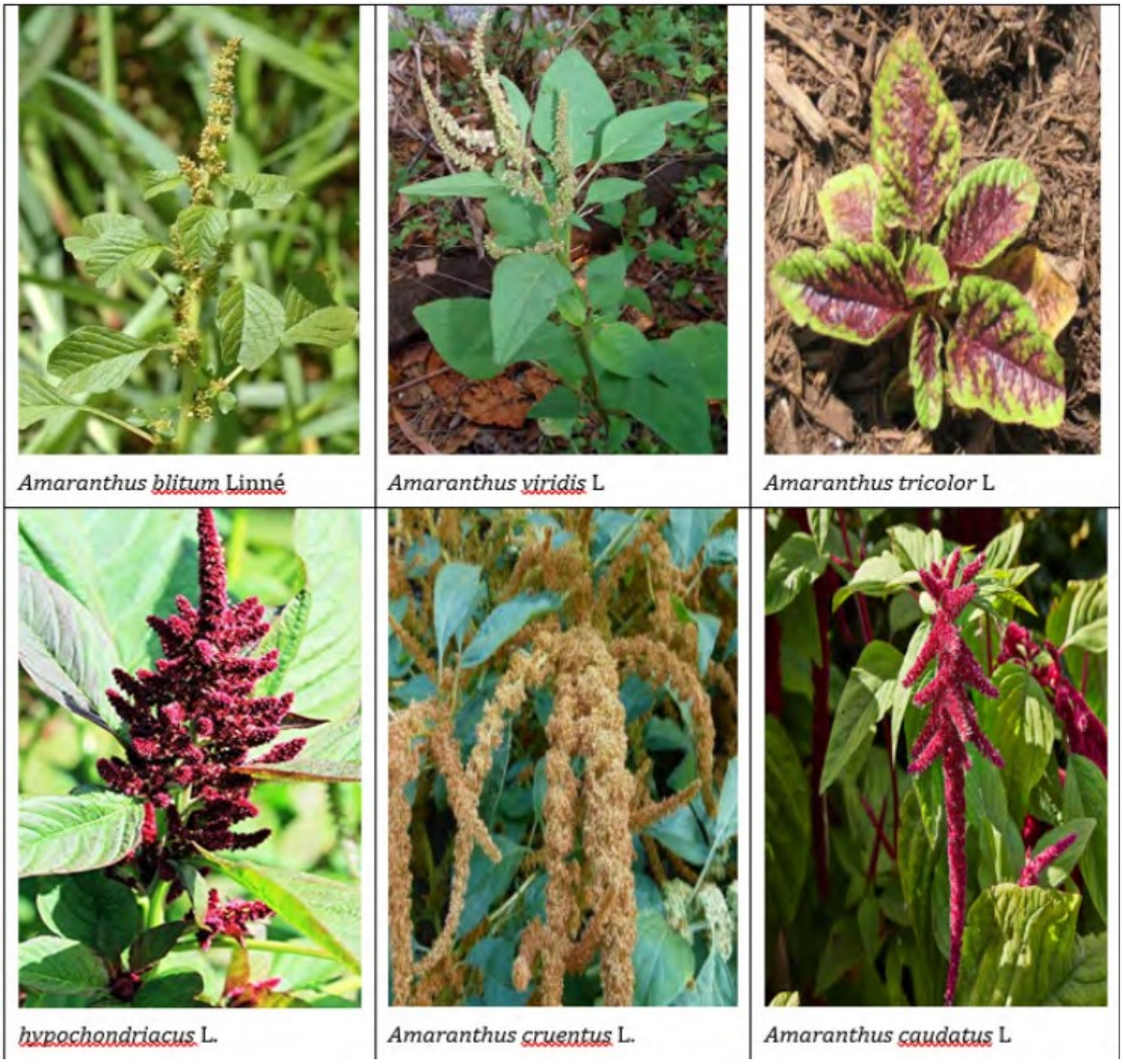
In recent years, there has been a growing trend in the food industry around the world to replace synthetic dyes with natural pigments that are safe and

Today, natural and synthetic dyes are used in the food industry to color products. Dyes are added to foods that have lost their color as a result of processing or to increase the purchasing power of the product. Even colorless product is sometimes polished by coloring. For example, by coloring soft drinks, ice cream and confectionery, their appearance attracts buyers.

Despite the fact that natural pigments are an unstable compound compared to synthetic dyes and are expensive, their use attracts the attention of consumers. Betacyanin pigments have been one of the most widely used pigments in the food industry around the world for many years [2].

The amaranth plant is one of the representatives of the flora that has long been known to mankind. This plant is localized by the ancient Hindu, Mayan, Inca and Aztec tribes. From the XVIII century amaranth began to be grown in European countries as a grain plant.

There are currently 75 species belonging to the Amaranthus L family, which grow mainly in the hot and temperate climates of the globe (Picture 1). Amaranth is a plant widely used in the national economy, agriculture and other fields for grain, vegetable, fodder, decorative and technical purposes [3].



Picture 1. Some types of amaranth

The surface of many varieties of amaranth plant is rich in trace elements and organic matter. In particular, the protein content of amaranth leaves is up to 15%, most of which are irreplaceable proteins. Amaranth leaves also contain pectins, ascorbic acid, polyphenols, flavonoids, vitamins (A, C, E), betacyanin pigments, lipids, trace elements such as K, B, Fe, Ba, Ni [4].

The vegetative tissues of plants belonging to the family Amaranthaceae contain different colored betalain pigments, and these plant biomass are of interest as a potential alternative medium of betalains. Pigments in amaranth for use as natural food dyes show high efficacy.

Betalains are water-soluble nitrogen-retaining pigments. They are divided into two main groups according to their color, from red to reddish ink (betacyanins) and yellow (betaxanthins).

Betacyanins are divided into 4 groups according to their chemical structure: betanin type, amaranthin type, gomferenin type and bugenvillein type [5].

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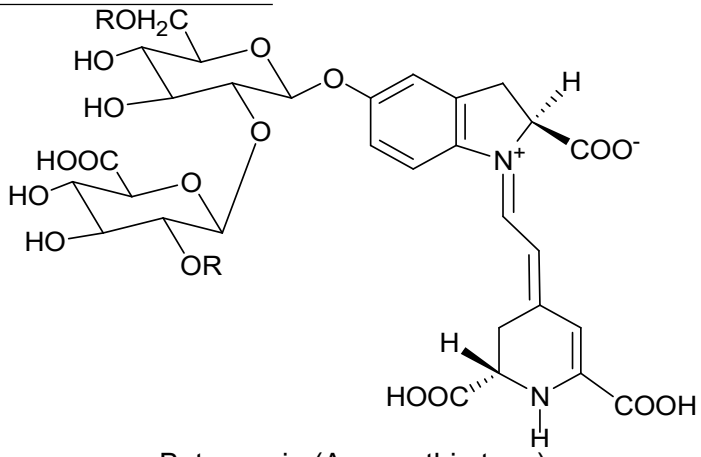
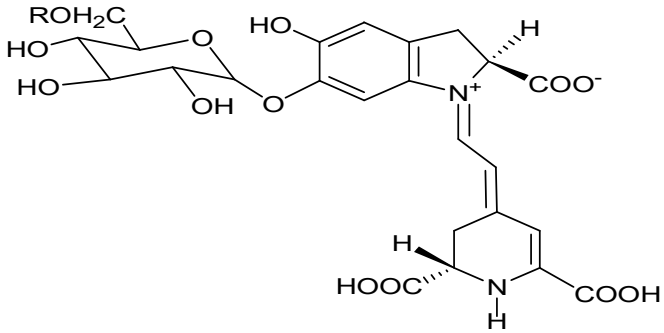
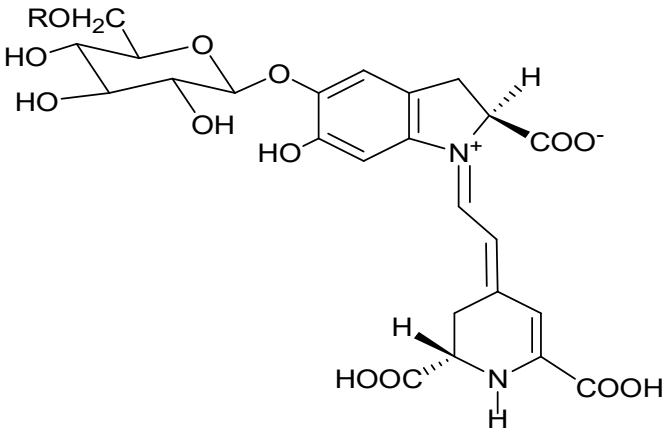


Betacyanin (Amaranthin type)

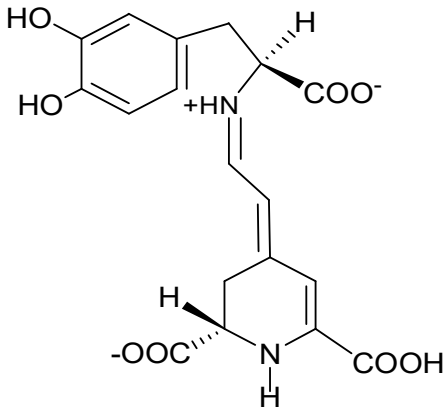


Betacyanin (Gomferenin type)

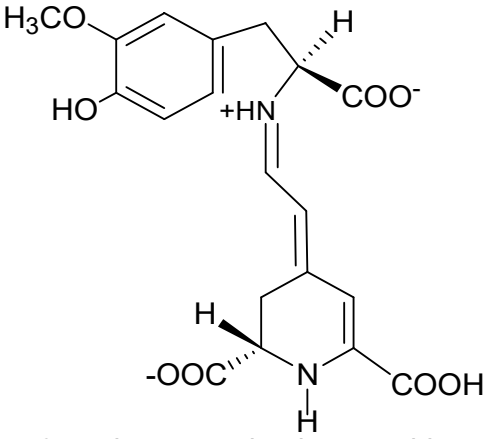


Betacyanin (Betanin type)

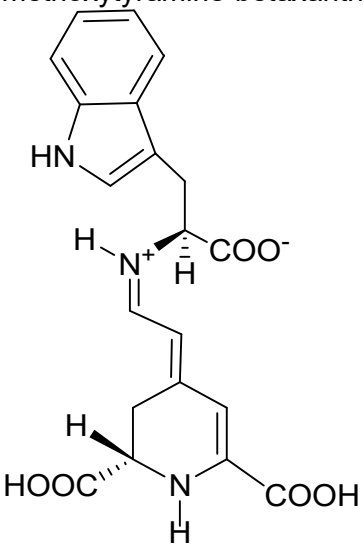
Amaranth also contains betaxanthin pigments such as dopamine betaxanthin (Miraxantine V), 3-methoxytyramine-betaxanthin and (S) -Triptophanbetaxanthin [6].



Miraxantine V



3-methoxytyramine-betaxanthin



(S) -Triptophanbetaxanthin

To date, about 50 red betacyanin and about 20 yellow betaxanthin pigments of betalains have been identified in nature.

Betalains are compounds that not only color the plant, but also have high physiological activity, one of which is their antioxidant properties. In recent years, these compounds are widely used in the food industry and pharmaceutical industry as biologically active compounds [7].

Betalains belong to dozens of species of the family Amaranthaceae, such as Amaranthus, Celosia, Gomphrena, Iresine [8]. The following table provides information on betalains, which are part of the amaranth plant (Table 1).

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Table 1

Betalains which are part of amaranth

Betacyanins	
Amaranthin type	Amaranthin
	Isoamaranthin
	Celocyanin I
	IsocelocyaninI
	CelocyaninII
	IsocelocyaninII
	Irezinin I
	Irezinin II
Betanin type	Betanin
	Isobetanin
Gomferenin type	Gomferenin I
	Isogomferenin I
	Gomferenin II
	Isogomferenin II
	Gomferenin III
	Isogomferenin III
Betaxanthins	Miraxantine V
	3--methoxytyramine-betaxanthin
	(S) -Triptophanbetaxanthin

From the above data, it can be seen that the diversity of pigments in amaranth composition further increases its nutritional value. From many studies conducted by scientists around the world, it is known that amaranth is a natural alternative source of betalains.

Today, in different regions of the country, certain scientific and practical results are being achieved in the adaptation of Amaranthus plants to local climatic conditions, the creation of new varieties, their processing. Varieties of amaranth localized in the climatic conditions of Uzbekistan, such as Kharkiv, Lera, Andijan and Gelios, are the result of research conducted by Uzbek scientists in this area.

By studying the amount of pigments contained in these cultivated and introduced amaranth varieties, the use of this plant in coloring products in the food industry has its own prospects. Also, the creation of cheap, harmless and quality new types of food additives from amaranth is one of the urgent tasks awaiting the solution today.

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