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NEW UNCONVENTIONAL VEGETABLE CULTURE AND PROSPECTS OF ITS DEVELOPMENT

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ABSTRACT: The article provides information on the importance, use and nutritional value, origin, distribution and taxonomy, morphological characteristics and requirements for growing conditions of Japanese cabbage in scientific sources.

KEYWORDS: morphology, mibun, mizuna, profitability, decorative leaf, genotype, microelement, taxonomy.

INTRODUCTION: Food security depends on a range of socio-economic, demographic and environmental factors and is a key component of a country's development. The state food security policy is developed and implemented in four components of food security (food availability, purchasing power, their use and sustainability).

Humanity enjoys only one hundredth of the world's flora, which includes about 350,000 species plants. At the same time, UN FAO experts predict that by 2050 the world's population will reach 10 billion people. This would require an increase in food production by at least 50% if current consumption levels were maintained, although the United Nations estimates that 500 million people are already starving and 2 billion are undernourished.

With the growth of the population, the problem of high-quality nutrition is becoming more and more urgent. An important role in solving this problem is played by vegetables, which are not only highly productive and nutritious, but also have a special biochemical composition and are a very important source of vitamins, amino acids, mineral salts, carbohydrates and other valuable substances.

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Man has always needed, needs and will need food. The consumption of nutrients is necessary for the normal functioning of his body. Healthy eating means eating a variety of foods in a balanced and acceptable amount [2, 7].

THE MAIN FINDINGS AND RESULTS

Vegetables provide 88% of dietary energy and 80% of protein. In addition, each plant species has a unique combination of biologically valuable components, and only a variety of large species can satisfy the need for "healthy plant food" [2]. The "regulatory framework for agriculture" should not only exclude contamination with pesticides, nitrates, mycotoxins, etc., but also ensure their biological (and aesthetic) usefulness. Essential amino acids, vitamins, mineral salts, taste [4].

Nature has endowed the land with a variety of vegetation. The flora of the Earth includes about 5,000 plants suitable for human consumption. About 600 vegetable plants are grown in all countries of the world, of which in Russia, as well as in Uzbekistan - only 70-80, belong to 12 families [4]. At the same time, for Uzbekistan and other CIS countries, there are traditionally 6 types of vegetable products (white cabbage, carrots, beets, onions, cucumbers and tomatoes), which provide about 90% of all marketable vegetable products [1].

The attraction of unknown and little-known plant species from local or foreign flora and new cultivated plants for growing from other countries constantly replenishes the vegetable assortment of many peoples of the world [2, 3, 4].

One of these unconventional vegetables is Japanese cabbage, a valuable vegetable and ornamental crop. Japanese cabbage leaves are eaten for their aromatic taste (some specimens have a characteristic sweetish taste).

Benefits and nutritional value of Japanese cabbage. The amount of vitamin C is quite high, but it can be increased by slicing Peking cabbage pak choi [3]. The Mibun type is characterized by an increase in the content of chlorophylls A and B (3-carotene-6.0-6.4 mg / 100 g) [1, 7]. Both varieties are rich in group B, vitamin PP, ash elements (1.1–1.3%), including potassium, calcium, phosphorus, iron [5, 6].

A close relative of Japanese cabbage, Chinese cabbage is a source of longevity due to its existence. Lysine is an essential amino acid for the human body, has the ability to dissolve foreign proteins entering the human bloodstream, and is the main means of purifying the blood from harmful microbes and viruses, which increases the body's resistance to disease [6].

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However, there is no complete information on the biochemical composition of both varieties of Japanese cabbage, so it may be useful for further study. All this testifies to the importance of kale varieties and the prospects for their wider use in agriculture. [2, 4]

This is cabbage, which can be harvested at least twice in one growing season, which provides the population with fresh greens for a long time.

Origin, distribution and taxonomy of Japanese cabbage. The variety of Asian cabbage as a cultivated plant originated in central China. It was formed in Korea and is widespread especially in Japan, which is the secondary center of these cultures [3, 4, 7]. East Asian cabbage has been cultivated for a long time. Thus, Japanese cabbage has been known as a green and vegetable crop in China and Japan since the 16th century. However, among the cabbage, it is still the least known. It is grown mainly in Japan, China and the Pacific coast of Korea. Interest in this crop is growing and varieties can be found in catalogs of seed companies around the world. It is grown in Australia, Belgium, the Netherlands, Canada, Poland, the USA and other countries. The growing interest in this culture is associated with its therapeutic, prophylactic and nutritional properties.

According to the accepted classification, deciduous plants: Chinese cabbage, Chinese cabbage, Japanese cabbage and leafy turnip belong to Brassica rapa L. Japanese cabbage - Brassica rapa. var. Nippos (Bzassica campestris var. Japonica) is one of the least studied cabbage species. Originally from Korea and Japan. [7]

However, there is no consensus on the taxonomic position of Japanese cabbage. Thus, G. Olsson [3, 7] characterized this as a diversity (var.) of B. campestris species. Tsen Et Lee [2, 3, 5] counted the Japanese variety of Chinese cabbage (var. Japonica) B. ssp. chinensis; Siebold [3, 7], then L.N. Bailey [257] isolated it as a separate species B. B. japonica Sieb. sin. B. nipposinika Bailey. However, modern botanists generally follow the classification of G. Olsson, according to which Japanese cabbage belongs to the Brassica family, the Brassicaceae (Burnett) family, the Brassicaceae Hayek family, the Brassicaceae Hayek subtribe [3, 5, 6, 7].

Morphological features and growing conditions of Japanese cabbage. Morphologically, Japanese cabbage differs from other varieties of East Asian cabbage. The plant produces annual or biennial large-leaved rosettes (from 8-15 to 30) due to the awakening of many apical buds. This feature allows Japanese cabbage to grow back after being cut. In Japan, a fresh crop can be harvested within 50 days of mowing. The rosette is very decorative, medium. Leaves

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develop from 5-8 equivalent buds, petiolate, medium, lyre-pinnate, three-lobed, narrow and medium-wide, green, less often dark green, glabrous, pointed [1, 7]. The multi-stemmed formation was probably caused by a mutation and revealed a sharp morphological difference between Japanese cabbage and related species. Japanese cabbage tends to form roots. Roots are conical, very large (length 8-12 cm, diameter 5-7 cm), white, thin, dense, tastes like rutabaga.

In the conditions of the Leningrad region, Japanese cabbage is usually resistant to growth retardation. With early spring planting, some plants grow back after 75-85 days and bloom in the first year of life.

There are two different forms of Japanese cabbage: long leaf mibun and mizunali. - Leaves are oddly leafy, this form is prone to root vegetables. Cabbage grows slightly slower than Peking and Peking cabbage, both types have a growing season of 90-100 days. In many morphological features, the shape of the scales is similar to salad mustard. Mizuna is very common in Japan, Mibuna is indigenous (Mibu is a region in Kyoto). The average weight of one Mibun plant outdoors is 0.6-0.9 kg, and the average weight is 0.8-1.5 kg. Productivity in greenhouses is 3-5 kg / m2 [4]. However, in the context of the Moscow region, there are no data on the yield and biochemical composition of two forms of cabbage, which have not been morphologically described and studied. Japanese cabbage is also an annual ornamental deciduous plant. The shapedly carved curly leaves of Japanese cabbage are painted in different colours at the end of July, have full decorative effect at the end of August and are stored until the onset of cold weather. It can be used to create curbs and decorate flower beds in gardens.

Requirements for the length of the day. Like other types of Japanese cabbage, East Asian cabbage species (especially Japanese) are long-lived plants. With a day length of 15-17 hours, the formation of generative organs is accelerated, and the formation of vegetative organs is inhibited and vice versa, when the length of the day is reduced to 15–13 h, the transition to reproductive development in plants is delayed [2, 3, 4, 6, 7]. However, in plants, the response to day length can vary depending on the genotype of the plant.

Temperature requirements. The temperature factor is one of the most important factors, since the timing and possibilities of growing vegetables in the open field depend on it [2, 3]. Temperature indicators include heat demand, the amount of heat required during the growing season (sum of temperatures), and the plant's ability to withstand adverse (extreme)

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temperatures (cold resistance and heat resistance). Seeds can grow at a temperature of +2 ... 3 ° C, but in this case the process is very slow. The optimum temperature for growing East Asian cabbage seeds is +18 ... 20 ° C, while seedlings emerge in 3-4 days. At a temperature of +25 ... 28 ° C, seedlings emerge quickly, but they can elongate, grow slowly and die [2].

With the appearance of the first true leaves in the next 6-7 years, the temperature is optimal with the slightest fluctuations. At temperatures above 27 ° C, plants are said to be highly attacked by fungal and bacterial pathogens [1].

The best temperature during the Socket period is +18 ... 22 ° C. Low temperatures in the range of +4 ... 5 ° C for two to four weeks (depending on the genotype) and the next day at high temperatures are ideal for rapid growth plants.

The average temperature is + 12 ... 21 ° C with a short or average day length, which is favorable for the formation of the vegetative mass of the plant [2, 3, 4]. Mustard oil has been found to accumulate in crops at high temperatures and can affect taste [2].

Based on the above, it can be assumed that this is due to the cold resistance and simplicity. Japanese cabbage is successfully grown in the Tashkent region (indoor and outdoor). The cold resistance of seedlings depends on the degree of hardening and growing conditions. Frozen seedlings in pots with 5-8 leaves can withstand temperatures up to -5 ... 7 ° C, and unfrozen seedlings are severely damaged by frosts up to -2 ... 3 ° C [2].

Requirements for the water regime. Japanese cabbage belongs to the group of the most demanding vegetable crops in terms of its morphological characteristics: its root system is not very strong, and large leaves have a large evaporation surface. Especially hygrophilous Asian species, incl. and Japanese cabbage. The highest yield of these varieties of Japanese cabbage is achieved when soil moisture is in the range of 60-85% of the total moisture. A good supply of moisture not only increases the yield of these crops, but also accelerates their ripening under favorable temperature conditions [7].

Irrigation is recommended. Japanese cabbage is rare, but abundant. Watering at the root (along the groove) is desirable, because the leaves of this culture do not have a wax coating like white, and they are very thin.

Plant water resistance. In many areas, plant growth and development are subject to biotic and abiotic stresses, including. lack of water, increased soil salinity, high or low temperatures, etc. [5]. In the works of Wang and his colleagues [3], it is argued that the loss of crop yield under

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the influence of abiotic factors can be up to 30% in the next 25 years and up to 50% by 2050. Plant resistance to environmental stresses, including water shortage, is one of the tasks of many areas of crop production - genetics, physiology, biochemistry and breeding. Under conditions of water deficit, significant changes occur in plant metabolism, both in the concentration of individual compounds and in the degree of participation in the metabolism of individual enzyme systems. According to the literature, stress can lead to an increase in the content of soluble substances with osmotic potential. There are two ways to increase the viability of plants under conditions of high osmotic pressure (lack of water in the soil): by physiological adaptation of plants to this stress, or by changing the genotype of the population during the selection process.

Requirements for soil and fertilizers. Japanese cabbage grows well on fertile, moderately sandy, rather moist soils and effectively responds to the introduction of organic and mineral fertilizers into the soil [2].

In addition to the main elements, for the normal growth of Japanese cabbage, microelements are needed: boron, molybdenum, copper, magnesium and others [5, 7]. E.P. Shirokov [2] some trace elements not only increase the yield of the extract, but also accelerate its ripening, improve its chemical composition. I.A.Babichev [5] points out that fertilizers have a great influence on the correct combination of nutrients when they are correlated with the needs of the plant at different stages of growth and development. Nutrient requirements differ depending on the age of Japanese cabbage. Thus, during the growing season, he needs a balanced diet that is readily available with all the essential nutrients. After planting seedlings in the ground, to restore the root system and build an assimilation apparatus, the plant needs more nitrogen, and with the rapid growth of the leaf mass, more phosphorus and potassium [96].

CONCLUSION. In the Tashkent region, the reaction of plants to the temperature regime can be different. This situation requires a careful study of the vegetable crop.

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