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Creation of Early, Fertile, Promising Varieties of Low-Growing Chinese Cabbage

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ABSTRACT

The article provides information about the creation of an early, productive, promising variety “Immunity” using the global gene pool of Chinese cabbage.

Today, the National Gene Pool of the Research Institute of Plant Genetic Resources stores 20 samples of Chinese cabbage introduced from around the world, and 13 varieties and samples from Taiwan, China and Russia have been selected for breeding. As a sample for our research, we used the "Sharq Gozali" variety (k-117), created in our republic and included in the state register in 2011.

KEYWORDS: seed, variety, sample, cabbage leaf blade, cabbage leaf strip, number of leaves, early, selection, yield, variety samples.

Introduction. The role of vegetable crops in ensuring food security in the world is unparalleled, and due to their richness in proteins, carbohydrates, starch, easily digestible oils, various vitamins, minerals and enzymes, they constitute 80-85 percent of humanity's daily food consumption.

In our republic in 2021, 315.42 thousand hectares of 45 different types of vegetables and vegetable crops were grown, 79.6% of this sown area was made up of the following 10 crops: potatoes (92.602 thousand), tomatoes (57.746 thousand), carrots (36.953 thousand), onions (34.931 thousand), cucumbers (23.993 thousand), cabbage (12.863 thousand), garlic (7.438 thousand), the share of polycultural crops of melons, watermelons, pumpkins accounts for (64.352 thousand), respectively. More than 30 vegetable crops are grown on the remaining 20% of the area. The main reason for this is that early ripening, high-yielding, vitamin-rich varieties of vegetables, not traditional for our country, suitable for local conditions, have not been created, and the cultivation technology has not been sufficiently studied.

In our republic, along with ensuring food security for the future generation, much attention is paid to healthy nutrition. A healthy diet includes not only the consumption of organic foods, but also the effective use of vegetables rich in vitamins, minerals and enzymes. In accordance with the decision of the Cabinet of Ministers of the Republic of Uzbekistan DP-4887 dated November 10, 2020 “On additional measures to ensure healthy nutrition of the population”, it is envisaged to

provide our population with a wide range of agricultural products and vegetable products in order to organize proper nutrition, and this research work in to a certain extent serves the implementation of the assigned tasks.

Research methods. Field experiments were carried out on the training field of the Center for Advanced Studies of the Agricultural Information and Consulting Center of the Tashkent State Agrarian University on the basis of "Methodology for state variety testing of agricultural crops" (Moscow, 1975), "Study and maintenance of the world collection of cabbage" (VIR, 1988), methodological manuals Azimova B.Zh., Azimova B.B. "Methodology for conducting experiments in vegetable growing, rice growing and potato growing" [1; 2; 3; 4; 5; 6; 8; 9; 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 20; 21; 22; 23.].

The geographical origin of the 13 collection specimens included in the study belongs to 4 countries of the world, including: Uzbekistan, China, Russia, Taiwan, and during 2014-2016, the soil and climatic conditions of our Republic were studied according to these basic economic characteristics.

Experiment results. Based on the results of studying the early ripening of collection samples of Chinese cabbage, 8 of the studied samples were identified as early ripening and samples K-109 "TB 00911" (Taiwan) were selected; k-110 "TB 00912" (Taiwan); k-111, "TB 00916" (Taiwan); k-41" LB01105" (Taiwan); k-42 "B01106" (Taiwan); K-120 "BP 05" (China); K-121 "BP 31" (China); k-133 "Vesnyanka" (Russia). The samples ripened 3-5 days earlier than the model variety "Sharq Gozali", k-131 "Goluba" (Russia); k-130 "Vitavir" (Russia); K-132, "Corolla" (Russia); k-134 "Kholodok F1" (Russia); K-135 "Beauty of the East" (Russia); It was found that the samples ripened 3-5 days later than the standard "Sharq Gozali" variety.

In 2016, research work was completed with 13 collection samples of Chinese cabbage, and sample K-41 LB01105 (Taiwan) was selected based on its complex characteristics. With a growth period of 38 days for this sample, it was found that the yield is 2.8 t/ha, and the amount of marketable products is up to 4.2% higher than that of the "Sharq Gozali" variety.

In 2014-2016, research was continued on sample K-41 LB01105 (Taiwan), selected for complex characteristics and planted in a hard-to-reach protected area; selection was carried out for the shape, color and other characteristics of cabbage leaves. Pure ridges with uniformity in basic economic characteristics were identified.

Table 1. Valuable economic traits of the "Immunity" variety, created on the basis of a collection sample of Chinese cabbage K-41, LB01105 (Taiwan) (2016)

Sample name	Growing period, days	Plant weight, g	Total yield, t/ha	Performance, %
"Sharq Gozali", st.	40	238	23,8	91,0
K-41 LB01105	38	266	26,6	95,2

The Chinese cabbage variety "Sharq Gozali" differed from the original VIR K-41 sample in terms of average yield weight, productivity, uniformity of shape and color of cabbage leaves (Table 6). This Taiwanese specimen, K-41 LB01105, was selected for selection and further research.

50 elite plants of the 2016 sample K-41 LB01105 Taiwan were selected, the rest were sent for consumption. Seeds of 50 selected healthy plants of the same height (28-29 cm) and number of leaves were collected separately in fabric bags and cleaned of plant debris by burning. Mother plant of Chinese cabbage (Fig. 8). In the spring of 2015, the seeds of 50 selected plants were sown separately in 50 experimental plots.

Figure 1. K-41 LB01105" Flower stem

During the growing season, the plots were mowed once, fertilized once, and watered twice between rows. In each section, 50 plants with a thickness of 50x20 cm were left. From these 50 experimental plots, 22 healthy stemmed plants with the same morphological characteristics, matured at the same time, were selected, and the seeds were collected in one bag when the seeds reached physiological maturity (the seeds were pooled).

In 2018-2019, a competitive variety trial of a new variety of Chinese cabbage, "Immunity," was carried out. The "Sharq Gozali" variety was studied in comparison with the model variety. On March 10, 20-day-old seedlings of new varieties of Chinese cabbage "Immunity" and the model "Shark Gozali" were planted in open ground. During phenological observations, it was established that the technical development of the newly created variety "Immunity" requires 38 days, and for the standard variety "Sharq Gozali" – 40 days. When the plant height of both varieties reached 25 cm, the first harvest was made on April 18 for the "Immunity" variety and on April 20 for the "Sharq Gozali" variety.

Table 2. Results of competitive variety testing of Beijing cabbage variety "Immunity" (2019-2020)

Sample name	Growing period, days	Plant weight, g	Total yield, t/ha	Performance, %
"Sharq Gozali", st.	40	210	21	91,0
"Immunity"	38	266	27,8	96,0

By this time, the average weight of one plant was 240 g for the "Immunity" variety, and 210 g for the "Sharq Gozali" variety. It was established that the "Immunity" variety was technically ripe 2 days earlier than the "Sharq Gozali" model variety (Table . 8). By this time, the average weight of one plant for the "Immunity" variety was 266 g, and for the "Shark Gozali" variety – 210 g. It was established that the "Immunity" variety was technically ripe 2 days earlier than the "Sharq Gozali" variety.

Conclusions. Based on the above experimental results, the following conclusions can be drawn.

1. As a result of studies of collection samples of Chinese cabbage of 8 varieties, the following samples were selected based on early ripening: K-109 "TB 00911" (Taiwan); K-110 "TB 00912" (Taiwan); K-111, "TB 00916" (Taiwan); K-41" LB01105" (Taiwan); K-42 "B01106"

(Taiwan); K-120 “BP 05” (China); K-121 “BP 31” (China); K-133 “Vesnyanka” (Russia) and it was found that the samples ripened 3-5 days earlier than the standard variety “Sharq Gozali”.

2. Research work continued with sample K-41 LB01105, selected for complex traits, and the “Immunity” variety was created based on analytical selection.

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