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**ORIGIN AND DEVELOPMENT STAGES OF THE NEWLY CREATED MANDARIN
VARIETY “MEDIANA”**

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Abstract: In recent years, one of the most important tasks for scientists has been the development and selection of new citrus varieties., including mandarins, that are resilient to adverse environmental conditions. It is equally essential to provide theoretical and practical expertise to dehqan farms, farmers, and entrepreneurs involved in the cultivation of these crops.

Keywords: Mediana, bud grafting (budding), analytical and synthetic breeding, nitrogen, phosphorus, potassium, yield (productivity), flowering.

Mandarin (*Citrus reticulata*) is a species of evergreen citrus tree belonging to the Rutaceae family.; a fruit crop. Wild species are unknown. The literature indicates that the mandarin (*Citrus reticulata*) plant originated mainly in China, and partly in Vietnam, Myanmar, and India. It has been cultivated in China since 2000-3000 BC. Later, it gradually spread to the tropical and subtropical regions of East Asian countries and then to countries around the world. Nowadays, it is also cultivated in other regions. Special open and closed greenhouses have been built for this purpose.

The main goal of our research work was to create a new variety of citrus mandarin that is adapted to local climatic conditions, high-yielding, with sweet-sour fruits and rich in vitamins. The study was based on the scientific and methodological works of the breeder and People's Academician Z. Fakhrutdinov, who had extensive experience in the development and cultivation of citrus varieties .

In the research work, plant species belonging to the citrus family and their valuable economic traits as parents were studied to create a new variety of mandarin, and the local varieties of lemon “F-1 Tashkent” were selected as the control variety and “Unshiu” as the grafting stock.

Origin of the newly developed mandarin variety “Mediana”.: The citrus fruit mandarin variety «Mediana» was created as a result of grafting and selection experiments based on synthetic and analytical selection methods, based on a line obtained from hybrid populations by grafting and backcrossing the lemon F-1 Tashkent local variety mandarin Unshiu, and artificially crossbreeding the flower through multiple selection on the background.

Creation of the mandarin variety “MEDIANA”:

A bud was obtained from the Unshiu mandarin variety



F-1 Tashkent lemon grafted



Protecting the mother flower on the branch that grew from the graft



F-1 Tashkent lemon was pollinated with a paternal flower



The resulting crop was studied as a new local variety



The new mandarin was named “MEDIANA”.

Table 1

A brief classification of the newly created Mediana and the mandarin “Unshiu” and lemon “F-1 Tashkent” varieties used as parents

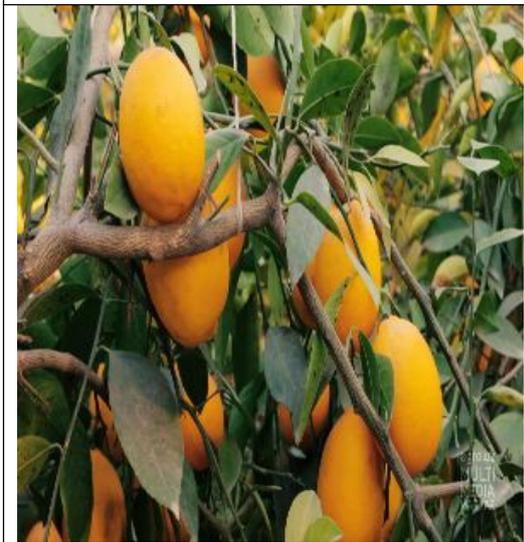


The Mediana variety of fresh mandarin is a mid-ripening variety. The plant is 2.50-2.75 m tall, the fruit is round in shape, and the first tier of fruit branches blooms. The fruit branches are located close to the main stem. The growth branches grow upright and quickly, the stem is dark green, and does not lie down. The leaves are thin, dark green in color. There are many side branches. The flower is small, and the flower has maternal and paternal anthers, and when the maternal flowers ripen, the paternal anthers also ripen at the same time and self-pollinate. The flowers are pollinated in 7-12 days and turn into a fruit. The fruit that turns into a fruit ripens in 7 months, that is, 210 days. One fruit weighs from 110 g to 185 g, the peel is thin, the fruit is round, the seeds are few, and the seeds are average. The «Mediana» mandarin variety is a perennial, small-growing tree. It lives for 60 years if grown from cuttings, and for over 100 years if grown from seeds or budded. The average yield is 45-60 kg per bush.



Unshiu variety of mandarin. Fruit: The shape of the fruit is slightly flattened (flattened sphere). The average weight is from 50 grams to 100 grams. Peel: The peel is light yellow or orange, rough and thin. The most important feature is that the peel is very easily separated from the flesh (sometimes a gap forms between the fruit and the peel). Flesh: Orange, juicy and very soft. Seedlessness: The main advantage of the Unshiu variety is that it contains almost no seeds. Taste: The taste is sweet, with a slightly pleasant sourness. It contains a high amount of sugar and vitamin C. Height: The tree is not very tall (short or dwarf), its branches and branches grow widely. This makes it suitable for growing at home (in pots). Yield: Early harvest. It usually ripens in late September and October (early ripening variety). The average yield is 40-50 kg per bush.

The height of the plant is 2.60-2.80 cm



Main characteristics of the F-1 "Tashkent" lemon variety. Origin: Created by Uzbek scientist Zayniddin Fakhriddinov in 1966. Tree: Medium height (up to 1.5-3 m), densely branched, dark green leaves. Flowering: Blooms twice a year (in spring and autumn). Fruit: Weight: 80-90 grams (relatively small). Peel: Thin, golden in color. Composition: Rich in vitamin C. Light and humidity: Very fond of light, requires high humidity, does not grow well in dry and sunless areas. Yield: One of the most productive varieties, hundreds of lemons can be obtained from one tree. The "Tashkent" variety is famous for its endurance and good yield, and is suitable for growing indoors and outdoors.

The purpose of selecting the parents selected for this hybrid variety is due to their high economic value and their sharp differences in vegetative processes, growth, flowering and fruiting periods, fruit quality, short time to harvest after planting, and high productivity (Table 1).

The experimental results were obtained through crossbreeding based on the synthetic selection method, and using this selection method, the Mediana mandarin variety was created in the following sequence:

- First stage: A bud was obtained from the Unshiu variety of mandarin.
- Second stage: The bud obtained in the first stage was grafted onto the F-1 Tashkent lemon using the bud grafting method.
- Third stage: The maternal flower on the branch growing from the graft was protected and pollinated with the paternal flower of the F-1 Tashkent lemon.

- Fourth stage: The resulting crop was studied as a new local variety.

The resulting three scientific innovations were named the mandarin “Mediana”.

In the first stage of the experiments, a 7-8 mm thick bud (bud eye) was obtained from a one-year-old, well-developed, healthy woody branch of the Unshiu variety created by Chinese scientists, free from diseases and other factors.

In the next stage of the work, a healthy shoot from the Unshiu variety, which was obtained above, was grafted in the form of a “T” onto the F1 Tashkent variety of lemon, which was completely good and perfectly ripe. The grafting was carried out in the following order. In the research work on grafting fruit trees, the summer method of bud grafting was used. Bud grafting was carried out in the conditions of Uzbekistan, when the bark of a fruit tree separates from the wood, that is, on August 12-15. The seedlings were watered a week before bud grafting. The side branches and leaves of the seedlings 15-20 cm above the root collar were removed. The bark on the stem, 2-3 cm from the root collar, on the north or north-west side of the top, was cut in the form of the letter “T” 2-2.5 cm long and separated from the wood, and a bud cut with its bark was placed between it. The grafted bud was tightly tied with a special material (leaving the bud open) with the top facing down. 12-15 days after grafting, the tied buds were released, and the buds that did not take root were grafted again. In early spring, before the buds awakened, the buds were released again, and the upper part of the graft was cut off at an angle.



Figure 1. Stages of grafting based on synthetic selection methods during the study.

In the third stage of the work, the unopened maternal flowers on the grafted branch were protected with special bags and pollinated the next morning with pollen from the paternal flower of the F-1 Tashkent lemon variety. And then they were again covered with special protective bags as protection.

In the fourth stage, the hybrid formed as a new local variety was studied in comparison with other samples and the standard Unshiu variety. This stage was carried out over the years through regular phenological observations and laboratory work in closed greenhouse conditions.

In all the above stages, 15 hybrids obtained as a result of hybridization by selecting mandarin varieties as mothers and lemon varieties as fathers, as well as the Mediana variety selected as a new variety, were studied in comparison with the standard Chinese selection Unshiu variety

(Table 2). The mandarin varieties Clementine, Unshiu, Chimera, Kovano Vase and Ponkan, and the lemon varieties Tashkent F1, Meyer and F-2 Jubilee were used in the comparison. As a result of hybridization, the following combinations were obtained: Clementine (tangerine) x Tashkent F1 (lemon), Clementine (tangerine) x Meyer (lemon), Clementine (tangerine) x F-2 Jubilee (lemon), Unshiu (tangerine) x Meyer (lemon), Unshiu (tangerine) x Tashkent F1 (lemon), Unshiu (tangerine) x F-2 Jubilee (lemon), Chimera

(tangerine) x F-2 Jubilee (lemon), Chimera (tangerine) x Meyer (lemon), Chimera (tangerine) x Tashkent F1 (lemon), Kovano Vase (tangerine) x Meyer (lemon), Kovano Vase (tangerine) x F-2 Jubilee (lemon), Kovano Vase (tangerine) x Tashkent F1 (lemon), Ponkan (tangerine) x Tashkent F1 (lemon), Ponkan (tangerine) x F-2 Jubilee (lemon), Ponkan (tangerine) x Meyer (lemon).

Table 2

Foreign and domestic samples selected for hybridization work

T.r.	Maternity samples	Paternity samples
1	Clementine (tangerine)	Tashkent F1 (lemon)
2	Unshiu (Mandarin)	Meyer (lemon)
3	Chimera (tangerine)	F-2 Jubilee (lemon)
4	Kovano Vase (tangerine)	
5	Ponkan (mandarin)	

The «Mediana» variety of mandarin is a mid-ripening variety. The Mediana mandarin is a citrus plant with a height of 2.60–2.76 m., medium-growing tree form, flowering and bearing fruit from the first tier of the fruit branch. Fruit branches are located close to the main stem. The growth branches grow quickly and upright, the stem is dark green, The stem is dark green and strong. The leaves are medium-sized, green. There are many lateral branches.

The planting period of the “Mediana” variety of mandarin can be planted in greenhouse conditions in four seasons of the year in a 2x2 chess pattern from 2500 young seedlings per hectare. Seedlings begin to bear fruit from the 2nd-3rd year. In order to obtain high yields from the variety, it is necessary to carry out agrotechnical measures in a timely manner, feed with organic, mineral and essential element fertilizers, shape, and treat against diseases.

Nitrogen, phosphorus, and potassium fertilizers are best applied at the recommended rates. Typical gray soils are applied at 250 kg/ha of nitrogen, 150 kg/ha of phosphorus, and 100 kg/ha of potassium.

The annual rate of phosphorus and potassium fertilizers should be determined based on the soil quality or agrochemical cartogram. It is recommended to apply nitrogen fertilizer in two periods: 15-20% of the annual rate before planting, 120 kg/ha before the first flowering,

80 kg/ha at the beginning of the flowering phase,



Figure 2: Appearance of the Mediana variety of mandarin.

Phosphorus fertilizer is applied before fruiting at 70% of the annual rate and 30% when oranges begin to bloom, potassium fertilizer is applied 7-12 days before flowering at 60% and during fruiting. “Mediana” tangerine should be fed with mineral fertilizers no later than July.

The flower is large, there are maternal and paternal pollen in the flower, when the maternal flowers ripen, the paternal pollen also ripens at the same time and is self-pollinated and partially external. The flowers are pollinated in 8-20 days and turn into a fruit. The fruit, which has become a symbol of the flower, ripens in 212-220 days. One fruit weighs from 130 g to 180 g, the peel is thin, the fruit is round, the seeds are 0-3, the seeds are large. The “Mediana” variety of mandarin is a perennial, medium-sized tree that can live for 40 years if grown from cuttings, or for over 70 years if grown from seed. The average yield is 40-58 kg per bush. After a certain period of flowering and ripening of the mandarin variety “Mediana”, the fruits begin to ripen intensively. The variety practically does not differ from other varieties in terms of the ripening process. It is possible to achieve high results if the variety is planted in a greenhouse in a 2x2 checkerboard pattern.

Young seedlings begin to bear fruit mainly from the 2nd year. They give their main crop after 4-5 years, are resistant to fungal diseases and can be propagated by growing from cuttings and seeds and grafting.

In conclusion, it can be said that the advantages of the citrus variety “Mediana” are as follows: this mandarin variety is fast-maturing, ripening in seven months, high-yielding, sweet, with an average yield of 130-180 grams, thin skin, rich in essential vitamins, its seedlings are resistant to diseases, and it is mainly preferred for its high-yielding and quality indicators.

REFERENCES USED

- 1.D.N. Nurmukhammedov and others. List of chemical and biological protection agents, defoliants and plant growth regulators approved for use against plant pests, diseases and weeds in the agriculture of the Republic of Uzbekistan. T. 2016 Page 52.
2. Fakhridinov Z. Obyknovennoe chudo. Tashkent - 1974.
3. Desyatichenko A.M. Perespektivnye sorta citrusovykh kultur dlya zashchishchennogo grunta Uzbekistana. Problemy razvitiya subtropicheskogo plodovodstva v Uzbekistane. Tashkent. Cocktail - 1985.
4. M.Z. Fakhruddinov, N.N. Oblomuradov, S.T. Zorayev "Citrus growing" study guide Tashkent-2025, p. 231-244.
5. M.Z. Fakhruddinov, N.N. Oblomuradov, S.T. Juraev "Citrus Crop Selection and Seedlings" textbook Tashkent -2025, 108-110 p.
6. M.Z. Fakhruddinov, A.A. Khurramov, Sh.M. Mirsoliyeva, D.S. Abdumutallimova "Formation of the vegetation period and plant height indicators of mandarin hybrids" Journal of Agribusiness, Science and Technologies 2026, February. No. 2, p. 748-751
7. S.T. Juraev, A.A. Khurramov, Kh.Kh. Jumaboyeva, G.A. Hojiakbarova "Fruit weight and productivity of hybrids obtained from crossing mandarin and lemon species" Journal of Agribusiness, Science and Technologies 2026, February. No. 2, pp. 769-772