American Journal of Interdisciplinary Research and Development
ISSN Online: 2771-8948
Website: www.ajird.journalspark.org
Volume 29, June - 2024

BIOECOLOGY OF THE MULBERRY (MORUS, NIGRA L) PLANT USED IN ROAD LANDSCAPING AND PREPARATION OF CUTTINGS IN THEIR VEGETATIVE PROPAGATION

Chorshanbiev Farxod Maxmatmurodovich
Doctor of philosophy (PhD) in agricultural Sciences, Tashkent State Agrarian Unuversity, Tashkent. farkhodch@gmail.com

Yuldashev Akmal Temirovich
Tashkent State Transport University, Senior Lecturer

Abstract
Bioecological characteristics of mulberry (Morus, nigra L) plant species were studied, vegetative reproduction was developed. The use of vegetatively propagated mulberry (Morus, nigra L) species in the landscaping of highways was studied. In the conditions of Uzbekistan, methods of applying mulberry (Morus, nigra L) to scenic greening of highways were developed.

Keywords: Mulberry (Morus, nigra L), decorativeness, resistance to diseases and pests, drought resistance, bioecological properties, vegetative reproduction, highways, landscape landscaping, methods of implementation in Uzbekistan.

Introduction

Globally, highway landscaping and landscape design are of great importance and interest in this field is constantly growing. For this reason, a lot of scientific and practical work is being carried out on the selection of types, varieties and forms of ornamental plants suitable for different climatic and soil conditions. The reason for this is that the flora first of all has a great impact on ecology and human health. It is known that the norm of green area in the city is 50 m2 per 1 population, cities with 40-60% green areas are exemplary, and cities with less than 10% vegetation are considered to have a negative ecological environment.

Special attention was paid to the identification of highly scenic, promising, plant species resistant to various external harmful factors and the development of efficient and optimal methods of rapid reproduction as the priority directions of greening of highways in the world. In this regard, new varieties and forms of decorative species were created, the possibilities of trees and shrubs in modern landscaping were evaluated, and new methods of vegetative propagation were created. It should be noted that representatives of Mulberry (Morus, nigra L) have a wide range of ornamental potential, development of fast and

effective methods of propagation by vegetative means, assessment of efficiency of use in landscaping is of important scientific and practical importance.

In order to continue the reforms implemented in all spheres, the development strategy of the Republic of Uzbekistan for the period of 2022-2026 known as "New Uzbekistan" was developed and a "road map" project was created for its implementation. This strategy includes seven priorities. On August 31, 2021, the opening ceremony of the "New Uzbekistan Park" dedicated to the 30th anniversary of the Republic of Uzbekistan was held. The general appearance of the 104-hectare park is in the form of five kings of trees, corresponding to the directions of the action strategy. Peaceful areas have been established here where people can relax in the presence of nature. There is an increasing demand for seedlings of ornamental tree species in large quantities in greening the cities and villages of our republic. This puts important tasks before the seedling growers, such as the reproduction of high-quality and inexpensive ornamental seedlings that meet standard requirements, and the development of rapid cultivation technology.

In this decision, it is decided to fundamentally improve the architectural and artistic quality of highways, greening and beautification works along the highways of our Republic - meeting the modern requirements of road safety and environmental protection issues. and the issues of fundamentally improving the quality of formation on a complex basis are envisaged. In connection with the execution of the decision, according to the order of the State Committee of Motorways dated September 12, 2017, the unitary enterprise "Oz yol kolamzorzamzar" and its territorial "Yol kolam" unitary enterprises in the regions were established done. Since the beginning of 2018, effective work has been carried out by these enterprises, which are not many since they were founded.

In the presidential decree, 288,000 ornamental, bushy, coniferous, tall and medium-sized tree saplings of various types were to be planted in the border areas along the public highways of the republic for 2018. During the first quarter of 2018, 505.1 km of greening and beautification works were carried out in the roadside areas adjacent to the border of the existing public highways in the Republic of Karakalpakstan and all regions, and about 230,000 saplings were planted.

In particular, in Andijan region - 15.5 km, in Fergana region - 39 km, in Namangan region - 136 km, in Tashkent region - 8 km, in Syrdarya region - 141 km, in Jizzakh region - 13 km, in Samarkand region - 19 km, Karakalpog In the Republic of Estonia - 13 km, in the Kashkadarya region - 22 km, in the Surkhandarya region - 12 km, in the Navoi region - 18 km, in the Bukhara region - 48 km, in the Khorezm region - 22 km.

For these purposes, this year, the Republican Road Fund under the Cabinet of Ministers allocated 50 billion. It is planned to allocate 29.5 billion soums in the first quarter. Soum works have been completed. President of the Republic of Uzbekistan Sh.M. Mirziyoyev's decree of September 11, 2017 No. PQ-3262 "On measures to improve the architectural-landscape construction and improvement system of highways", the Cabinet of Ministers of the Republic of Uzbekistan "Taking into account the requirements of modern architecture and urban planning This research serves to a certain extent in the scientific implementation

of the tasks in the regulations of the settlement improvement works" dated March 9, 2009 No. 59 and other regulatory legal documents.

MATERIAL AND RESEARCH METHODS

The research is based on a systematic approach and generally recognized and proven methodologies used in scientific research of fruit crops. Research on introduction, morphology, bioecological characteristics, phenological observations, biology (growth and development) and shrubs were carried out using general scientific research methods: N.A. Aksenova; R.V. Vafin, V.P. Putenikhin; T.P. Dedenko, E.P. Khazova; S.V. Zalesov, E.P. Platonov and others; S.V. Kolmukidi, E.A. Kryukov; P.I. Lapin, S.V. Sidneva; M.A. Mingaeva G.E. Schultz; and others.

Long-term observations of its behavior in new natural conditions are necessary to assess the prospects of the introduced culture and its reasonable zoning. The result of such observations is an assessment of the most important ecological and biological characteristics of the plant and determination of the level of its adaptation to new conditions. Currently, many methods are used in introductory work. When preparing the report, the main available methods were analyzed, and directions of research in the field of implementation are reflected in the list of references used.

RESULTS OF RESEARCH

The peculiarity of trees and shrubs belonging to the Moraceae family is the presence of milky sap in their bodies. This family includes 65 species of tree plants, most of which are widespread in tropical and subtropical zones. Mulberry belongs to the genus Morus of the Moraceae family. In the CIS countries, including Uzbekistan, representatives of the following groups are widely cultivated and have important national economic value: they are mulberry, macklyura and ficus (fig) groups. Mulberry is found in regions from the temperate and subtropical regions of the Northern Hemisphere to the tropics of the Southern Hemisphere and can grow in a variety of climatic, topographical and soil conditions. They are widespread in all areas from the tropics to the subarctic and up to 1200m above sea level. In many mulberry-growing countries, particularly India and China, mulberry leaves are used to feed silkworms. Cultivation of mulberry is aimed at increasing leaf yield in these countries. However, in many European countries, including Turkey and Greece, mulberry is grown not for its leaves, but for its fruit. High-quality mulberries, mainly Morus alba, Morus nigra and Morus rubra, have favorable conditions for cultivation. In 2005, mulberry production in Turkey was 78,000 tons, and its cultivation in Turkey has been known for more than 400 years. 95% of mulberry trees grown in Turkey were M. alba, 3% M. rubra and 2% M. nigra.

In the CIS countries, including Uzbekistan, representatives of the following groups are widely cultivated and have important national economic value: they are mulberry, macklyura and ficus. Mulberry species are the main source of food for silkworms.

Morus alba (Morus alba L.) species is naturally widespread and cultivated in China, Japan, India and Central Asia, the Caucasus. Its height is up to 15 meters, and its body diameter is up to 80 cm. It has been determined that he lives up to 250 years. The bark of an adult tree trunk is thickly fissured and gray. New shoots are gray-green or reddish-gray and highly flexible. White mulberry blooms in April-May at the same time as the leaves appear. Fruits are sweet, edible, ripen in June-July.

Figure 1. Morphological appearance of white mulberry (Morus nigra L.).

The leaves have the following forms: simple, ovate, with toothed edges. White mulberry blooms in April-May at the same time as the leaves appear. The flowers are small, the fruits are inconspicuous, sweet, edible and ripen in June-July. The seeds are small, round, light gray-yellow in color, about 2 mm in diameter. The amount of pure seed from raw fruit is from 2.5% to 4%. 1000 seeds weigh 1.5 g.

Figure 2. Morphological appearance of white, black and red mulberry fruits.

The success rate is 50-60%. White mulberry is well propagated by cuttings. White mulberry leaves mainly serve as a source of food for feeding cocoon worms, and are also used in forest reclamation. It yields annually, 20-50 kg of fruit can be harvested from one tree.

White mulberry is well propagated by cuttings. The white mulberry has been cultivated by the people of Central Asia and the Caucasus in the long past, especially its varieties, which are the product of folk selection under the names of pearl mulberry and balkhi mulberry, are widely planted by the people. Mulberry fruit is eaten dried and fresh, it contains sugar and vitamin C.

Black mulberry (Morus nigra L.) is grown mainly in Iran, Central Asia and the Caucasus. Its leaves are rarely used for silkworms. The tree is up to 15 meters tall, and its morphological features are almost indistinguishable from white mulberry. The fruits ripen in June-July, are dark red, dark inky in color, and have a sour-sweet taste. Its fruits are valued in comparison to white mulberries and are used as a coloring agent in the food industry and winemaking. Shotut, a product of the national selection of black mulberry, is widely planted by the population. Valuable varieties are mainly propagated by grafting.

Figure 3. Morphological appearance of red mulberry (Morus rubra L.).

The red mulberry (Morus rubra L.) species is a large tree up to 15 meters tall, introduced from North America, the trunk is brown-gray, and the leaves are less important for the feeding of cocoon worms. The fruits are large, ripen in June-July, are red, light red in color and have a sweet taste. In addition to Central Asia, it can be found in gardens and parks in the Crimea and the Caucasus, sometimes in Ukraine, Belarus, and the Baltic countries. Cold resistant. It has mature, dense wood. To protect seedlings from fusarium disease and fungi, seeds are washed with gronazan preparation (2 g per 1 kg of seeds) or sour manganese

potassium solution (2 g per 1 liter of water) before planting. In addition to disinfecting seeds, these preparations increase the ability of seeds to germinate.

In folk medicine, mulberry is used to treat many diseases. Mulberry juice diluted with boiled water is used as a gargle for sore throat, and infusion of bark and berries is effective for acute respiratory infections, bronchitis and bronchial asthma. Diuretic properties of decoction made from mulberry root and bark are used in hypertension, and decoction of leaves is used as an antipyretic agent in fever. People with heart disease and myocardial dystrophy are recommended to use mulberry in large quantities - 300 g 4 times a day for a month. In case of stress and insomnia, it is indicated to use a decoction of dried mulberries, as they contain a lot of B vitamins that affect protein and carbohydrate metabolism and support the functioning of the nervous system.

Figure 4. A decorative form of mulberry.

DISCUSSION OF THE RESULTS

Vegetative propagation is asexual propagation of tree and shrub species, examples of which are propagation by cuttings, propagation by grafting, and propagation by grafting. When reproducing seedlings by vegetative method, all the properties of the mother plant and its economic value signs are fully preserved. With this method, the work of growing seedlings is accelerated, and besides, it is not related to the yield of seeds.

When propagating by cuttings, one-year branches are cut into several pieces and a bundle of 100 pieces is buried in wet soil or sand. The length of the cuttings is 20-30 cm, and the thickness is 0.5-2.0 cm. Until the time of planting, they are planted in sandy (8-10 cm) pits or trenches with 60-70% humidity. is stored. If the prepared pens are placed 0.6x0.20 m,

83 thousand per hectare of land, and 92 thousand per 0.7x0.15 m. Prepared cuttings are planted in a straight line in a parallel row vertically or slightly inclined, leaving 2-5 cm above the ground, leaving one or two buds. Immediately after planting, it is watered and cultivated after 2-3 days.

One of the most common methods of vegetative reproduction is grafting. Since mulberry (Morus, nigra L) is an introduced plant, rooting properties were studied based on 3 transplants from lignified and semi-lignified cuttings. Cuttings of two types of mulberry (Morus, nigra L). rosea Nichols- pink, f. violacea hort. - selected from purple forms. The cuttings were separated into 15-20 cm long pieces.

CONCLUSION

In Vietnam, Fomidol is produced from mulberry leaves, which are used to treat rheumatism and skin diseases. In addition to highways, the grafted form of mulberry is widely used in greening residential areas and landscape design.

References

1. Bakhtiyarullaevich, Ubaidullaev Farkhod, and Majidov Abdulaziz Norqobilovich. "Vegetative propagation of black mulberry (Morus, nigra L) recommended for landscaping roads and city streets." *Texas Journal of Agriculture and Biological Sciences* 12 (2023): 37-40.

2. Bakhtiyarullaevich, Ubaydullaev Farkhod, Xaitov Farhod Djuraevich, and Ubaydullayev Abbosjon Azimjon Ogli. "TOSHKENT SHAHAR MIRZO ULUG'BEK TUMANIIDAGI DAHALARNI KO'KALAMZORLASHTIRISHDA DARAXTLARNING SANITAR GIGIENIK VA XUSUSIYATLARI." *Conferencea* (2023): 149-153.

3. Ubaidullaev, F. B., A. N. Majidov, and S. K. Khudaybergenov. "AGROTECHNICS OF CULTIVATION AND USE OF MULBERRY SEEDLINGS FOR PICTURESQUE LANDSCAPING OF HIGHWAYS." *GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ) ISSN (E)*: 363-370.

4. Bakhtiyarullaevich, Ubaidullaev Farkhod, Majidov Abdulaziz Norqobilovich, and Khudaybergenov Sardor Kamaraddinovich. "Agrotechnics of cultivation and use of mulberry seedlings for picturesque landscaping of highways." *Galaxy International Interdisciplinary Research Journal* 11.1 (2023): 363-370.

5. Bakhtiyarullaevich, Ubaidullaev Farkhod, and Ubaydullayev Abbosjon Azimjon OGLi. "SANITARY-HYGIENIC PECULIARITIES OF GREENING OF STREETS AND AUTOMOBILE STATIONS AND NATIONAL POINTS." *Galaxy International Interdisciplinary Research Journal* 11.2 (2023): 53-58.

6. Убайдуллаев, Ф. Б. "Влияние стимуляторов на рост сеянцев конского каштана." *Актуальные проблемы современной науки* 3 (2018): 115-119.

7. Bakhtiyarullaevich, Ubaydullaev Farkhod, et al. "LANDSCAPE COMPOSİTİONS BASED ON EVERGREEN SHRUBS İN THE LANDSCAPİNG OF CİTY STREETS." *American Journal of Research in Humanities and Social Sciences* 10 (2023): 40-43.

8. Убайдуллаев, Фарход Бахтияруллаевич, and Фарҳод Джураевич Хаитов. "TYPES OF ORNAMENTAL PLANTS RECOMMENDED FOR BALANCE AND LANDSCAPING OF PARKING AREAS ON HIGHWAYS AND WALKS IN CITY STREETS FOR TASHKENT OASIS." *Science and Innovation* 1.4 (2022): 95-100.
9. Khatamovich, Yuldashov Yakubjon, Ubaydullaev Farkhod Bakhtiyarullaevich, and Khatamov Bakhramjon Yakubjanovich. "FEATURES OF PRODUCTIVITY, RIPENING AND GERMINATION OF JUNIPER SEEDS." *American Journal of Pedagogical and Educational Research* 10 (2023): 85-92.
10. Bakhtiyarullaevich, Ubaydullaev Farkhod, Ubaydullayev Abbosjon Azimjon Ogli, and Aripov Xojiakmal Xojiakbarovich. "CHARACTERISTICS OF DECORATIVE AND POISONOUS GASRESISTANT TREES FOR THE STREETS OF TASHKENT." *Open Access Repository* 4.02 (2023): 85-94.
11. Убайдуллаев, Фарход Бахтияруллаевич, et al. "АВТОМОБИЛЬ ЙЎЛЛАРИ ВА ШАҲАР КЎЧАЛАРИДАГИ САЙИЛГОҲ ҲУДУДИНИНГ ТОШКЕНТ ВОҲАСИ УЧУН БАЛАНСИ ВА ЯШИЛ ЭКИНЗОРЛАРИГА ТАВСИЯ ЭТИЛАЁТГАН МАНЗАРАЛИ ЎСИМЛИК ТУРЛАРИ." *UIF-2022* 8: 95-100.
12. Ubaydullaev, Farxod, et al. "Irrigation regime Influence on the growth and seedlings development of common fake chestnut (Aesculus hippocastanum L.) and Japanese safflower (Sophora japonica L.) in the highways landscaping." *E3S Web of Conferences*. Vol. 264. EDP Sciences, 2021.
13. Ubaydullayev, F., and Sh Gaffarov. "Selection of prosperous varieties of rosehips (rosa L.) And their seed productivity in Tashkent oasis, Uzbekistan." *E3S Web of Conferences*. Vol. 258. EDP Sciences, 2021.
14. Ubaydullaev, Farxod, Bakhramjon Khatamov, and Abdulaziz Majidov. "AVTOMOBIL YO'LLARINI KO'KALAMZORLASHTIRISHDA TUT (MORUS, NIGRA L) KO'CHATLARINI PARVARISHLASHDA MINERAL O'G'ITLARNI QO'LLASH VA SUG'ORISH ME'YORLARI." *Евразийский журнал академических исследований* 3.4 (2023): 75-81.
15. Baxtiyarullaevich, Ubaydullaev Farxod. "CHINORBARGLI ZARANG (Acer platanoides L.) va SEMENOV ZARANGI (Acer semenovii Rgl. Et Herd.) TURLARINING BIOEKOLOGIK XUSUSIYATLARI, MANZARAVIYLIGIi VA KO ‘CHATLARINI YETISHTIRISH TEXNOLOGIYASI." *Science Promotion* 1.1 (2023): 36-39.
16. Baxtiyarullaevich, Ubaydullaev Farxod, and Rafiqov Rustamjon Azamjon-o'g'li. "Toshkent shahri Uchtepa tumani mahalliy ahamiyatdagi “Farxod” ko‘chasida harakat xavfsizligini oshirish." *Science Promotion* 1.1 (2023): 28-31.
17. Baxtiyarullaevich, Ubaydullaev Farxod, and Abduraximov Muhammadali Muhammadibroxim o‘g‘li. "Pensilvaniya shumtoli (Fraxinus pennsylvanica Marsh.) tur va shakllarining bioekologik xususiyatlari, manzaraviyligi va ko ‘chatlarini yetishtirish." *Science Promotion* 1.1 (2023): 32-35.
18. Bakhtiyarullaevich, Ubaydullayev Farkhod, and Gulamkhodjaeva Shakhnoza Fakhritdinovna. "EFFECT OF IRRIGATION ON GROWING TWO-YEAR-OLD MULBERRY

SEEDLINGS USED IN HIGHWAY LANDSCAPING." *British Journal of Global Ecology and Sustainable Development* 25 (2024): 33-38.
19. Bakhtiyarullaevich, Ubaydullayev Farkhod, and Khomidova Nargiza Isaqulovna. "THE STANDARD OF DIFFERENT WATERING REGIMES OF MULBERRY SEEDLINGS EFFECT ON SEEDLING EMERGENCE." *American Journal of Interdisciplinary Research and Development* 25 (2024): 220-225.
20. Baxtiyarullaevich, Ubaydullaev Farxod, and Rafiqov Rustamjon Azamjon-o'g'li. "Toshkent shahridagi M39 yo'lidan M39b" Toshkent xalqa yo'li" shahobcha avtomobil yo'lining 12-22 km bo'lagini ko'kalamzorlashtirishda bir yillik va ko'p yillik gullardan klumbalar barpo etish." *Science Promotion* 1.1 (2023): 40-44.
21. Bakhtiyarullaevich, Ubaydullaev Farkhod, Khomidov Jalaldin Oktamkhoja ogli, and Abdurakhimov Muhammadali Muhammadibrokhim ogli. "BIO-ECOLOGICAL CHARACTERISTICS, ORNAMENTAL FEATURES AND TECHNOLOGY OF GROWING SEEDLINGS OF MAPLE (ACER PLATANOIDES L.), MAPLE (ACER SEMENOVII RGL. ET HERD.) AND PENNSYLVANIA ASH (FRAXINUS PENNSYLVANICA MARSH)." *American Journal of Pedagogical and Educational Research* 15 (2023): 173-186.
22. Kuchkarovich, Kasimkhodjaev Bokhodir, Ubaydullaev Farkhod Bakhtiyarullaevich, and Nishonov Umid Toir ogli. "THE USE OF GABIONS IN THE LANDSCAPE DESIGN OF HIGHWAYS AND CITY STREETS." *American Journal of Technology and Applied Sciences* 11 (2023): 11-17.
23. Isan ogli, Alisher Kholikov, Kasimkhodjaev Bokhodir Kuchkarovich, and Ubaydullaev Farkhod Bakhtiyarullaevich. "DETERMINING THE INFLUENCE OF CHANGES IN THE QUANTITY, SPEED AND COMPOSITION OF VEHICLES AND HIGHWAYS IN THE CITY AND THE DISTRIBUTION OF TRANSPORT." *American Journal of Pedagogical and Educational Research* 10 (2023): 167-174.
24. Убайдуллаев, Фарход Бахтияруллаевич, et al. "АВТОМОБИЛЬ ЙЎЛЛАРИ ВА ШАҲАР КЎЧАЛАРИДАГИ САЙИЛГОҲ ҲУДУДИНИНГ ТОШКЕНТ ВОҲАСИ УЧУН БАЛАНСИ ВА ЯШИЛ ЭКИНЗОРЛАРИГА ТАВСИЯ ЭТИЛАЁТГАН МАНЗАРАЛИ ЎСИМЛИК ТУРЛАРИ." *UIF-2022* 8: 95-100.
25. Bakhtiyarullaevich, Ubaidullaev Farkhod, and Majidov Abdulaziz Norqobilovich. "Vegetative propagation of black mulberry (Morus, nigra L) recommended for landscaping roads and city streets." *Texas Journal of Agriculture and Biological Sciences* 12 (2023): 37-40.
26. Bakhtiyarullaevich, Ubaydullayev Farkhod. "EFFECT OF IRRIGATION ON ONE-YEAR GROWTH OF MULBERRY SEEDLINGS USED IN HIGHWAY LANDSCAPING." *American Journal of Interdisciplinary Research and Development* 25 (2024): 214-219.
27. Bakhtiyarullaevich, Ubaydullaev Farkhod, and Aripov Xojiakmal Xojiakbarovich. "STUDY OF THE STRUCTURAL COMPOSITION OF GABIONS IN LANDSCAPE DECORATION OF AUTOMOBILE ROADS AND CITY STREETS." *British Journal of Global Ecology and Sustainable Development* 25 (2024): 70-80.