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THE CURRENT STATE OF FLORA AND PHYTOCOENOSIS ALONG THE KURA RIVER IN MINGACHEVIR CITY (AZERBAIJAN)

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СОВРЕМЕННОЕ СОСТОЯНИЕ ФЛОРЫ И ФИТОЦЕНОЗОВ ВДОЛЬ РЕКИ КУРЫ В ГОРОДЕ МИНГЯЧЕВИР (АЗЕРБАЙДЖАН)

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Abstract. During the geographical analysis of the flora in the area surrounding the city of Mingachevir, situated on the banks of the Kura River in Azerbaijan, a total of 158 species of angiosperms were recorded. These were found to be represented in 28 families and 79 genera. As a result of the analysis, a flora conspectus was prepared. During the conducted research, six types of vegetation were identified along the Kura River in Mingachevir city. These vegetation types include bozghir (dry steppe), semi-desert, halophyte desert, thicket-grass, wetland, and forest. The researchers found that these vegetation types are represented by eight formation classes, nine formation groups, and ten associations. The research included the species composition of the identified formations and carried out geobotanical descriptions. We also evaluated the economic importance of phytocoenosis by determining the main fodder plants and the modern state of the terrestrial flora and phytocoenosis.

Аннотация. При географическом анализе флоры в окрестностях города Мингячевир, расположенного на берегах реки Куры в Азербайджане, всего зарегистрировано 158 видов покрытосеменных растений. Было обнаружено, что они представлены в 28 семействах и 79 родах. В результате анализа был составлен конспект флоры. В ходе проведенных исследований вдоль реки Куры в городе Мингячевир выявлено шесть типов растительности. К этим типам растительности относятся степной, полупустынный, галофитный пустынный, травяной и лесной. Исследователи установили, что эти типы растительности представлены восемью классами формаций, девятью группами формаций и десятью ассоциациями. Исследователи изучили видовой состав выявленных формаций и провели геоботанические описания. Они также оценили хозяйственное значение фитоценозов, определив основные кормовые растения и современное состояние наземной флоры и фитоценозов.

Ключевые слова: степи, пустыни, заросли, болота, растительные сообщества.

Keywords: steppes, deserts, scrub, swamps, plant communities.

The city of Mingachevir is localized along the banks of the Kura River. It is bordered by the Yevlakh district on the east, south, and west, and the Mingachevir reservoir on the north [8, 13]. The area has lush vegetation and is a winter pasture [2, 18]. The richness of the area can be attributed to

the formation of the research area under the influence of various floristic provinces [6, 9].

It's necessary to note that the phytocenosis located in Mingachevir city Kurboyan were formed by anthropogenic factors. These factors include the geographical position of the research area, relief, hydrography, climate-soil cover and vegetation. As a result, air temperature and precipitation impact the species composition, structure, and bioecological characteristics of the phytocenosis found in the area. In the dry steppe, semi-desert, desert, thicket-meadow, wetland, and Tugai forest vegetation found here, fodder plants play an essential role in the development of livestock in the field of agriculture [5, 10-12].

Therefore, it's crucial to consider the restoration of the vegetation of the area and the economy found there, and the preservation and protection of valuable species, climate conditions, and soil fertility indicators, which are endemic, rare, and so on. It's relevant to determine the modern state of the flora and vegetation of the research area in terms of enhancing the fodder base of winter pastures and increasing their reserve balance. For this reason, the primary goal was to study the current state of the flora of Mingachevir city along the Kura River and the phytocenosis found there.

Material and methods of research

The goal of the research was to examine the current state of the flora and phytocenosis along Kura River in Mingachevir city between 2021 and 2023. During the study, the systematic structure, life forms, geographical and areal types, ecological groups, endemism of the flora, as well as the species listed in the Red Book of Azerbaijan were identified [1, 15-17] while examining the current state of the plants in the wild flora of the Kura area of Mingachevir city. In semi-stationary conditions, phytocenosis created by the plants found in the area during field studies were studied. Geobotanical methods such as Field Geobotany, Geobotany, Instructions for Large-scale Geobotanical Research of Natural Fodder Areas of the Republic of Azerbaijan were consulted to determine the types of vegetation, formations, and associations, as well as economically important species distributed there [3, 4, 7, 14].

The main fodder plants were identified, and the bioecological characteristics of some of them were studied while specifying the species composition of the formations found in the study area [1, 3, 9].

Discussion of results

Research was conducted in the Kura region of Mingachevir city to study the wild flora. The research found 158 species of plants belonging to 28 families and 79 genera and prepared a flora conspectus of plants found in the area. The study showed that in the formation of winter pastures in the Kura area of Mingachevir city, plants of fodder importance are more widespread in the local flora. The research found that the fodder plants are especially found in the species composition of *Salsolietum-Petrosimoniae*, *Artemisietum-Ephemerum*, *Kalidietum-Halostachysosum* formations. From this species *Kalidium caspicum* (L.) Ung.-Sternb., *Halostachys belangeriana* (Moq.) Botsch., *Artemisia lerchiana* Weber, 1775, *Bothriochloa ischaemum* (L.) Keng, *Bromus japonicus* Thunb., *Eremopyrum orientale* (L.) Jaub. et Spach, *Salsola nodulosa* (Moq.) Iljin, *Petrosimonia brachiata* (Pall.) Bunge, *Cynodon dactylon* (L.) Pers., *Phragmites australis* (Jav.) Trin. ex Steud., *Astragalus tribuloides* Del., *A. cruciatus* L., *A. brachyceras* Ledeb., *Vicia hybrida* L., *Vicia cinerea* M. Bieb., *Trigonella calliceras* Fisch., *T. spicata* L., etc. are distributed in area. During the conducted geobotanical research, according to relevant taxa in the territory of the city of Mingachevir, area phytocenosis or vegetation classification schemes were also determined. Among

the types of vegetation found in the research area — steppe (dry steppe) vegetation; semi-desert vegetation; halophyte desert vegetation; ticket and forest vegetation can be noted. *Polyuruseta-Artemisietum-Bothriochlosum* formation, identified in the dry steppe vegetation type found in the study area, was found in mountain gray-brown soils in winter pasture no. 9 Dashtoken of Yevlakh district. During the study, 23 types of higher flowering plants were found in the species composition of the formation group.

Bothriochloa ischaemum was dominant in this formation with an average height of grass cover of 15-30 cm, its abundance was estimated at 3-4 points. Among the subdominants, the abundance of *Artemisia lerchiana* can be noted with 2-3 points and *Paliurus spina-christi*, whose abundance was also evaluated with 2 points.

Bothriochloa ischaemum (L.) Keng, one of the economically important species found in the steppe vegetation of the research area, is one of the main valuable fodder plants of the winter pasture and is important in providing fodder for livestock in winter. After flowering, this species becomes coarse and less edible, but before flowering it has high forage quality and is readily eaten by animals.

The research also found *Artemisia lerchiana* Weber, 1775 to be an important species in the formation. This plant is subdominant as an edificator and is not completely eaten by animals in early spring and summer, but is eaten well in late autumn and winter. It is drought tolerant (xerophytic) and widespread in winter pastures. The plant, together with other ephemerals and ephemeroïds, is well eaten in the snow cover in winter, has a high fodder value, and also constitutes an insurance fodder reserve for pastures. It was found during the research that the dry steppe vegetation in the area is not being used efficiently, leading to a negative effect on the restoration of phytocenosis. The *Artemisietum-Ephemerolum* formation group, found in the semi-desert vegetation type in the Abdul winter pasture area no.73, Yevlakh district, was recorded in typical gray soils. The studied formation included 21 species. The abundance of *Artemisia lerchiana* Weber, 1775 was evaluated as an edifier and subdominant of phytocenosis with 2-3 points. Among the ephemerals, *Bromus japonicus*, *Eremopyrum orientale* etc. also dominate. The mentioned phytocoenosis also includes *Lolium rigidum*, *Hordeum leporinum*, *Medicago minima*, *Filago pyramidata*, *Erodium cicutarium*, etc. ephemerals.

Bromus japonicus Thunb. is a significant fodder species that forms clusters in semi-desert vegetation with wormwood and is well-eaten by small-horned animals until seed development. Research has shown that due to the inefficient use of semi-desert vegetation in the area, vegetation degradation is occurring. This has led to the rareness of the main fodder plants and an increase in harmful and poisonous plants (Sovish gangal, red onion, etc.) in the species composition of the phytocoenosis. Therefore, it is recommended to implement measures to improve the surface in order to destroy those plants. It is also advisable to use *Bromus japonicus* Thunb. in the creation of Cultural pastures.

The *Salsola* containing vegetation is categorized into two formation classes, two formation groups and an association. The plant species in this desert area include *Salsolietum-Petrosimiosum* and *Kalidietum-Halostachysosum*. One of the important plant species in this area is *Kalidium caspicum* (L.) Ung.-Sternb. which is commonly eaten by camels, sheep, and goats. However, it is recommended to carry out improvement measures in this phytocoenosis.

The species composition and structure of the *Tamarixeta-Alhagietum-Cynodonosum* formation in the thicket-meadow vegetation type of the research area was recorded in the gray-meadow soils in the valley near the edge of the Mingachevir reservoir in Yevlakh district territory. 22 species were found in the species composition of this studied formation. In contrast to dry

steppe, semi-desert and desert vegetation, mesophytes are dominant in this phytocoenosis.

The abundance of *Cynodon dactylon*, the dominant phytocoenosis, was evaluated as 4-5 points, the abundance of *Alhagi pseudalhagi* as 2-3 points, and the abundance of *Tamarix ramosissima* as 2 points. These species, which are found in grassland vegetation, have good fodder quality. The species composition and structure of the *Tamarixetum-Phragmitosum* formation determined in the wetland vegetation type of the area was recorded on the border of winter pastures no. 77 in swamp-meadow lands between the Mingachevir reservoir and the Kura River, Yevlakh district.

During the study in the Yevlakh district of Azerbaijan, 11 species were found in the wetland vegetation around the Mingachevir reservoir. The dominant species found in this area is *Phragmites australis*, with an average height of 60-120 cm. Its abundance was estimated to be between 4-5 points. The subdominant species found in this region is *Tamarix ramosissima*, with an estimated abundance of 2-3 points. It should be noted that wetland vegetation is found in a wide area around the Mingachevir reservoir. This vegetation includes *Phragmites australis* which spreads on the edge of the reservoir. *Phragmites australis* is also found in wetland vegetation in the studied area and is eagerly eaten by large horned cattle (buffaloes) and sheep. In the forest vegetation type of the area, the species composition and structure of the *Tamarixeta* formation is identified in the Tugay forest phytocoenosis (Kurgiraghi zone) on the banks of the Duzen river in Yevlakh. The territory of the district is registered in the Kura riverbank — Yuhary Garkhon administrative territorial circle, meadow-forest-Tugai lands. This formation is made up of associations of *Tamarixeta ramosissima* and *Tamarixeta hohenackari*. There were 12 species identified in the composition of the phytocoenosis. The phytocoenosis was dominated by *Tamarix ramosissima*, with an abundance rating of 4-5 points and an average density of 0.8-0.9%. The average height of this dominant species was 3-8 meters.

During the study, the *Populeta* formation group was identified in the Tugai forest, towards the Yuhary Garkhun village located on the banks of the Kur river. This area is home to the *Populeta alba* association, which is made up of the endemic plant of the Caucasus known as *Populus alba* [15-17]. The white poplar is found in the first layer of the phytocoenosis, with an abundance rating of 3-4 points and a density of 6-7%. Other plants such as *Tamarix ramosissima*, *Crataegus pentagyna*, and more occur as shrubs. It should be noted that in the Yevlakh district along the Kura River, a dry and cut poplar phytocoenosis was observed in the plain riverside Tugai forest. However, artificial poplar forests can be restored in drying areas.

Results

Research conducted in the winter pastures along Kura River in Mingachevir city has shown that plants of fodder importance are widespread in the species composition of phytocoenosis. The main fodder plants found in steppe, semi-desert, desert, thicket-meadow, and wetland vegetation types are essential for feeding large and small horned animals. Thus, 11 species of main fodder plants characteristic of dominant and subdominant species were recorded in the natural vegetation of the area. Among these, more important forage plants include *Artemisia lerchiana*, *Bromus japonicus*, *Eremopyrum orientale* etc. an example can be given. However, it was observed that dry steppe vegetation in the Kurboyu area of Mingachevir city is used inefficiently, and as a result, fodder plants cannot complete their vegetation to the end, leading to a negative impact on the restoration of phytocoenosis. Similarly, because the semi-desert vegetation of the area is not used effectively, vegetation degradation occurs, causing the main fodder plants to become rare. To address this issue, it is necessary to carry out fundamental improvement measures in the phytocoenosis found in the identified types of vegetation.

The flora and vegetation along the Kura river of Mingachevir city were studied, and it was concluded that the preservation of recorded vegetation types, including valuable fodder plants, is relevant in terms of enriching the fodder balance of winter pastures in the future. In addition to valuable fodder plants, rare and endemic species included in the Red Book were also discovered in the phytocoenosis determined as a result of the research. Therefore, the study of the modern state of the flora of Mingachevir city along the Kura River and the phytocoenosis found there lays the foundation for conducting geobotanical or phytocoenological studies for the preservation of biological diversity.

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