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PHYTOSANITARY STATUS OF DENDROFLORA OF GANJA CITY AND SCIENTIFIC AND PRACTICAL DIRECTIONS OF ITS IMPROVEMENT

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ФИТОСАНИТАРНОЕ СОСТОЯНИЕ ДЕНДРОФЛОРЫ ГОРОДА ГЯНДЖИ И НАУЧНО-ПРАКТИЧЕСКИЕ НАПРАВЛЕНИЯ ЕЕ УЛУЧШЕНИЯ

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Abstract. The dendroflora of Ganja city includes the general composition of trees and shrubs naturally distributed in the city and used in greening. This flora has a significant impact on the ecological state of the city, its microclimate and the health of residents. The phytosanitary state of trees and shrubs used in greening reflects the health status of plants distributed in the area, their resistance to diseases, pests and environmental factors. From a phytosanitary point of view, exhaust gases and industrial waste cause a decrease in the quality of soil and air. This, in turn, creates stress in plants and reduces their resistance to diseases. In urban areas, tree species that are not suitable for the climate and soil are often damaged and stop developing. At this time, fungal, bacterial, viral diseases and pests develop, leading to the destruction of vegetation.

Аннотация. Дендрофлора города Гянджи включает в себя общий состав деревьев и кустарников, естественно распространенных в городе и используемых в озеленении. Эта флора оказывает существенное влияние на экологическое состояние города, его микроклимат и здоровье жителей. Фитосанитарное состояние деревьев и кустарников, используемых в озеленении, отражает состояние здоровья растений, распространенных на данной территории, их устойчивость к болезням, вредителям и факторам окружающей среды. С фитосанитарной точки зрения выхлопные газ и промышленные отходы вызывают снижение качества почвы и воздуха. Это, в свою очередь, создает стресс у растений и снижает их устойчивость к болезням. В городских районах часто повреждаются и прекращают развиваться неподходящие для климата и почвы виды деревьев. В это время развиваются грибковые, бактериальные, вирусные заболевания и вредители, что приводит к уничтожению растительности.

Keywords: dendroflora, phytosanitary, microbiota, pests, integrated control.

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Ключевые слова: дендрофлора, фитосанитария, микробиота, вредители, комплексная борьба.

Purpose of the study

The main purpose of the study was the phytosanitary condition of the dendroflora of Ganja city and the scientific and practical directions of its improvement. The study of the dendrological phytosanitary condition in the city area is to establish the scientific and practical directions and regularities of the application of plant protection products, thereby creating a basis for the creation of an ecologically healthy environment in the area. It should be noted that plants differ from other living beings in a number of qualities, which is the basis of scientific and practical interest in them. It would be logical to substantiate this idea by touching on some of these differences. Plants are practically the main and only source of organic matter on Earth, primarily oxygen. This is due to the fact that plants have chloroplasts capable of collecting solar energy, synthesize 20 essential amino acids necessary for the formation of proteins, including 9 that are not produced by humans (valine, tryptophan and phenylalanine, leucine, isoleucine, lysine, methionine and threonine), and have properties such as fixing nitrogen in the atmosphere, which living organisms and plants themselves cannot use, together with microorganisms [7, 8].

Although ecology has made great progress in understanding the dynamics and processes that regulate the trophic structure of ecosystems, systematic differences between ecosystems still remain, which leads to the emergence of controversial issues that can only be resolved through a comprehensive study of the plants in an ecosystem [9].

Against the background of climate variability occurring in nature, factors such as rainfall, dry summer, harsh winter, continental climate, in turn, affect the formation of the territory and vegetation. As a result of the arid climate and warming of the air here, the vegetation becomes simpler, and soils with a physical and mechanical structure are formed. In accordance with the primary nature of the soil and rocks, rough relief, weak plant populations, urbanization, rain, snowmelt flows cause erosion and flooding. Subsequently, the process of soil formation weakens and hinders the development of plants, thereby reducing soil fertility. Taking into account all that has been said, it can be concluded that the development of a number of recommendations related to the comprehensive study of the territory and the development and preparation of phyto-ameliorative measures in accordance with this is of great importance for the implementation of green growth in disturbed areas [10].

Research methodology

In 2023–2024, a number of scientific studies and research works were carried out by the Ganja City Nabatat Garden Institute of the Ministry of Science and Education of the Republic of Azerbaijan. Research works were carried out on plants in 17 parks and alleys in the city, which include a certain part of the dendroflora of Ganja city. As a result of monitoring, route observations, stationary phenological examinations and scientific research conducted in connection with the study of the sanitary condition of plants in the area, it was determined that the geographical location of the area and, at the same time, direct exposure to the influence of various ecological factors led to the formation of a unique complex mycobiota-ecosystem here [6].

Discussion of the work

Ganja, being the second largest city in Azerbaijan, has a relatively rich dendroflora and park system. The main green areas of the city consist of Nizami Park, Khan Baghi, Central Boulevard, Heydar Aliyev Park, trees and shrubs located along the city streets and avenues. Regular

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phytosanitary observation of trees in the city area was carried out, and in addition to visual assessment, various laboratory analyzes were used to accurately determine diseases and pests. In particular, damage is observed in plane trees, oaks, acacias and coniferous trees. On the other hand, soil density, soil impermeability and reduction of nutrients in the area cause trees to weaken. Also, periodic changes in soil by people, irrigation of plants with wastewater contaminated with household and industrial waste, failure to prune dry, damaged, diseased branches, as well as the introduction of new exotic plant species from different climatic zones of the world for scientific research purposes, etc. and as a result, all living things in the environment were exposed to the influence of various ecological factors, ultimately creating a complex ecosystem [1, 2].

The introduction of new harmful organisms into green areas as a result of the introduction of soils and plants brought to the area causes stress to plants, they are mechanically damaged, undergo morphological and physiological changes and are at risk of extinction. In addition to the mentioned anthropogenic and biotic factors, the climatic, edaphic, orographic factors prevailing in the area also played an important role in the development of living creatures and plants living here. Plants in the urban ecosystem develop under stress conditions under the influence of various anthropogenic and biotic factors. This is especially exacerbated by the effects of diseases caused by harmful insects and pathogenic microorganisms (fungi, bacteria, viruses, etc.). As a result of such effects, trees and shrubs are damaged, the photosynthesis process is disrupted, vegetative development is weakened, and the general phytosanitary condition worsens [3].

Due to the influence of ecological factors, the stability of biodiversity in the environment has often changed, and the stability of ecological balance has become difficult. Plants in urban areas are exposed to the unpleasant negative effects of numerous harmful insects and pathogens formed in the environment, they are damaged, become ill, and other negative situations arise. In many cases, a threat has arisen for the life of plants, ultimately leading to their destruction.

As a result, the entomological and pathological condition of plants in the area has worsened. In this area, which has such a complex ecological environment, it is extremely difficult and physically impossible to provide detailed scientific information about pests and pathogens of numerous perennial trees and shrubs in a short period of research. Scientific research in this direction is carried out in stages, the results are summarized, and finally a data bank on pests and pathogens of plants is created, which is extremely important and significant.

Ganja city is located at an altitude of approximately 400–450 meters above sea level. During the research years, pests of economically important plant species in the areas around Ganja city, located at a certain altitude above sea level, were studied and a number of bioecological characteristics of the main pests were determined. Among these pests, various polyphagous, oligophagous, monophagous phytophages and disease-causing pathogenic microorganisms were found [1].

During phytosanitary monitoring, many pests such as leafhoppers, leaf-eating butterflies, leaf-eating insects, leaf-eating beetles, various types of insects were found in the dendroflora of the area [3]. Among these microorganisms, species dangerous to plant life have been identified. There is a great need to prepare and implement a system of important measures to protect plants from the negative effects of these harmful organisms, organize their protection, and at the same time prevent and limit the spread of pests. At the same time, along with the protection of plants in these areas, the protection of the environment and human health also requires serious responsibility. All this indicates that scientific research in this direction is extremely important and necessary. In all cases, in order to ensure the sustainability and sustainability of the ecological balance and eliminate such undesirable situations, and to create a healthy phytosanitary situation in the environment, plant

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protection should be carried out on a scientific basis and based on the application of innovative technologies [4].

Considering the urgency of the problem, its solution should be approached seriously. For this, on the one hand, a correct analysis of the causes of the problem, that is, the components that aggravate the sanitary condition of plants, and on the other hand, the identification of innovative ways to eliminate these aggravating circumstances. For this, the following innovative principles should be observed:

1. Correct assessment of the phytosanitary situation within the ecosystem;

2. Implementation of measures to improve the sanitary condition of plants.

To solve the problem, it is advisable to conduct the following research at the initial stage.

— Conducting monitoring related to the analysis of the sanitary condition of plants in the area, determining the species composition of harmful organisms;

— Specifying the nature and degree of individual damage, bioecological characteristics (nutrition, reproduction, development stage and dynamics, damage periods, etc.) of harmful organisms;

— Determining the biocenotic relationships between plants-pests, pests-beneficial insects;

— Identifying the natural enemies of the pest;

— Studying the activity of entomophages, that is, the number of beneficial insects that prevent pests.

At the next stage of solving the problem, the following measures should be taken.

— First of all, quarantine measures should be strictly observed;

— Selective active preparations should be used against harmful organisms according to their individual characteristics;

— Application regulations, application times, and norms of the preparations used should be determined;

— Treatments should be based on the bioecological characteristics of the pest, and spraying should be carried out during the periods of damage by the pest;

— When implementing control measures, the type of control agents and the phenological development phases of plants should be taken into account;

— Biological control agents and the use of microbiological preparations should be preferred;

— Biotechnical control agents should be used.

The effectiveness of various innovative control measures and control tools against pests increases when these measures are applied against the background of high-quality and timely agrotechnical measures in accordance with the bioecological characteristics of pests [5, 6].

In general, as a result of numerous impacts through the human factor in various types of activity, great changes occur in nature, as well as in the ecological environment, where self-regulating systems are disrupted, and due to the lack of stability, all living organisms, including plants and people, face various disasters. In connection with all this, new views and concepts are being formed in the modern global world. People are trying to solve emerging natural problems, looking for new tools, methods and technologies.

Conclusion

The health of the dendroflora of Ganja city is extremely important for both the preservation of the ecological stability of the urban environment and the well-being of people. Thanks to scientifically based phytosanitary measures and proper urban planning, the development of healthy and sustainable green areas has been possible. As a result of these studies, the possibilities of applying appropriate phytosanitary measures, including plant protection products, have been

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identified. At the same time, this process creates conditions for the protection of the biodiversity of urban greenery, increasing the aesthetic and ecological value of the landscape, as well as the formation of a favorable ecological environment for human health. For this, a continuous monitoring system should be established and phytosanitary passporting should be applied to improve the phytosanitary condition of Ganja city. Plant protection measures should also be implemented on a scientific basis.

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