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Analysis of Artificial Plantations, Sanitation and Their Role in Creating the Urban Environment

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Annotation: A significant role in eliminating and reducing the degree of negative impacts on the city belongs to plants that perform not only a decorative, aesthetic, but also a protective and hygienic function. Woody plants purify, moisten and enrich the atmosphere of cities with oxygen, change the radiation and temperature regimes, and reduce the strength of wind and noise. Being under constant stress, plants turn on the adaptive mechanisms of biochemical, physiological, and morphological rearrangements. The article analyzes the problems of landscaping the city of Chirchik. The problems of the old fund of urban gardening are revealed. Presented are the modern most promising methods of planting greenery in the city.

Key words: landscaping, succulents, thiol compounds, landscaping models, stress, halophytes.

Introduction. It is no secret that green spaces are of great importance for the city, and are a living giant filter that purifies the air. If there is a lot of greenery in the city, people feel comfortable, in a good mood, they tend to go outside for a walk, relax in the park after a busy day. It is more pleasant to spend a hot day in the shade of green trees. The green color of the foliage, its quiet rustling in squares and parks, soft diffused light, pleasant coolness, low dustiness of the air, high oxygen content, a faint smell of phytoncides and other substances secreted by plants have a beneficial effect on the nervous system, relieve tension caused by rapid the rhythm of city life, improves health and improves human performance. And needless to say, parks, boulevards, squares and gardens are the beauty and comfort of a modern city, an oasis of health and tranquility for citizens. Centuries-old trees protect the soil and the surface of the walls of residential buildings from direct solar overheating, from an increase in air temperature, if they grow near 3-4 m from buildings. Inside the green massif, the air temperature is always on average 5-6°C lower. In the green zone, the ambient temperature due to humidity is felt much lower. Plants with large leaves, which reflect a significant part of the energy without absorbing, effectively reduce the temperature. In the central part of the city, the air temperature is usually 3-4 degrees higher, because it has a high building density, a large surface of streets and hard-surfaced areas. The city of Chirchik is of medium size, the air temperature in open places and in green areas has a slight difference. Within a radius of 50 to 100 m near a green massif, the air temperature is 4-5°C lower than in open places, where the sun warms up the open space well. Therefore, among the greenery, the air temperature, even at 35-40 degrees, is perceived by our body as comfortable (28-30 degrees).

The well-being of humans and animals in summer depends to a greater extent on air humidity than on temperature. In dry climates, plants and water bodies are the main regulators of air humidity. When heated, the surface of the leaves of trees and shrubs evaporates a large amount of water, while creating a pleasant coolness. Old giants from 10-20 m and above, with a spreading crown create the main comfort and microclimate of the city's environment. So, one well-developed oak, plane tree, acacia (40-50 years old) evaporates about 0.6-0.7 tons of water per day. If we take the relative humidity on the street equal to 30-32%, then in a residential area with landscaping, the humidity will be approximately 35%, on the boulevard - 38%, in the park - 40%.With an increase in humidity by 5-6%, animals and humans perceive it as a decrease in temperature by 4-5°C[11, 14].

In the city of Chirchik, there are many large, old trees that have a certain aesthetic and symbolic value, evoke a sense of respect, inspiration and admiration. They make up the main green, golden fund of the city of Chirchik.

To protect against the summer heat, large-leaved plants are planted in cities; horse chestnut, pedunculate oak, Norway maple (sycamore), various types of acacia, poplar, ash. Cool air from green spaces spreads to adjacent open spaces. Humidity increases by 5% in the zone, from the green massif at a distance of 500 m and

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further. Even not wide strips (10.5 m) tree and shrub strips at a distance of 600 m increase air humidity by 5% compared to an open area. [11]. Humid air among green spaces in hot weather is a favorable, mitigating factor.

In our time, great efforts are being made to preserve and renew the nature of the urban environment, since in cities where industry and a large amount of technology are developed, the surrounding nature is becoming poor, scarce and monotonous. It is necessary to equip and improve its condition, to ensure ecological balance - which is the main task of creating a future environment not only for present development, but also for the future city. The issue of urban greening becomes topical. Only glider, well-thought-out landscaping based on modern scientific research will help the city become better and healthier. Our main task was to analyze the green fund of the city of Chirchik, Tashkent region.

Material and method. Field studies were carried out in 2020-2022 in the city of Chirchik. The survey of the territory of the city of Chirchik was carried out with the aim of inventorying green spaces. The inventory of green spaces was carried out in order to use data in the development of the green economy of the city, restoration, improvement, reconstruction and operation of landscape and architectural objects in the city; determination of the total area occupied by green spaces, and its distribution by categories, trees, shrubs, flower beds, lawns, water bodies. Establishment of the number of trees and species, age of plants, condition. We set ourselves the goal of conducting an inventory of green spaces, territories of educational institutions, central highways of the city and recreational areas, as well as a phytopathological examination of green spaces in these areas [8].

Results and discussion. The sanitary condition of 2160 trees (20 species) and 2030 shrubs (16 species) in the city of Chirchik was examined. It turned out that 75.8% of the trees were healthy, the foliage and needles were green, of normal size, the crown was dense, during the year of vegetation the trees gave normal growth. Pest or disease damage was rare. With external damage and a weakened life form 14.8%, mostly coniferous trees (pine, juniper), which indicates the need to improve the quality of the environment, as well as create competent additional landscaping. Our studies revealed that 78.3% of shrubs were healthy, 14.5% were weakened to varying degrees. A high number of shrubs without signs of disease indicates a competent selection of species composition, high-quality, timely care for shrubs.

Figure.1. Ratio of tree species by condition category

Trees of different species and age composition had different percentages of viability. So, 57.3% of Scots pine is in good condition, without signs of weakening, the trees were healthy, the needles are green, of normal size, the crown is dense, the trees gave a normal growth over the year. Pest or disease damage was rare. In the initial stage of weakening 30.3%. Weakened and damaged at different stages or dead 13.4%. Juniper 65.2% in good condition, no signs of weakening. Weakened 23.3%, growing mainly on both sides of highways. Damaged trees growing on both sides of the roads are subject to two main types of anthropogenic impact: chronic or gradually increasing pollution from exhaust gases

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Figure.2. Correlation by categories of condition of shrub species.

The chronic type includes the action of heavy metals and vehicle emissions. To the second - the sudden action of threshold concentrations of chemicals i.e. shock effect. Plants experience a gradually increasing effect of harmful substances in the atmosphere and soil. Oxides of sulfur and nitrogen, hydrogen sulfide in small concentrations can be absorbed by plants and converted into available forms (sulfate, nitrate). As a result of adaptation, plants increase the synthesis of thiol compounds and bind heavy metals into inert forms. [5, 10]. Improvement to a certain level of sulfur and nitrogen metabolism allows avoiding the toxic effects of heavy metals and, possibly, infection with various bacteria and pathogenic fungi. [13]. Plants in urban extreme conditions are able to rebuild metabolism and carry out adaptations. There is a formation of long-term specialized adaptation mechanisms responsible for increasing plant resistance to a given specific factor or complex of factors (general resistance) [15]. It is the long-term mechanisms of adaptation in plants that are of great interest for the selection of species resistant to the influence of abiotic factors to stresses. Accordingly, planting material must be selected from plants that have grown in the urban environment for a long time and have developed certain adaptation mechanisms. Adaptation mechanisms that occur in wild stress-resistant species provide good adaptation of plants to the salt factor, drought, atmospheric pollution: they are expressed in small-leaved elm, silver sucker, plane tree, ash, oak, walnut, arborvitae, sequoia, white locust, juniper , in cedar, chestnut, almond, as well as shrubs - lilac, hibiscus, boxwood, jasmine, etc. Among wild-growing salt-tolerant plants (halophytes), such an anatomical and morphological adaptation as the development of succulence (thickening of the leaf blade) is widespread [12]. By increasing the volume of the aquiferous parenchyma, salt-accumulating halophytes store water, which saves them from drought and helps to dilute the concentration of toxic ions in photosynthetic tissues. In halophytes, in the process of evolution, mechanisms such as the removal of excess salts from relatively inert tissues (vacuole, cell wall, cortex, etc.) were also selected [7]. Phytopathological surveys of some areas of the city showed that 53.5% of tree species and 44.7% of shrub species in the study areas are in good condition, with no signs of weakening or obvious disease. There are diseases of conifers - bacterial infection, vascular bacteriosis (Picea abies), spotting (Acer platanoides L). [6]. A disease of fungal origin affects the wood of pine species. The bark turns brown, cracks and begins to dry out and die. Long ulcers are formed, at the site of damage, fungal growths appear, the needles turn yellow and crumble [6, 9]. In the urban environment, there is an objective lack of green spaces. Lots of small open areas waiting for their landscaper. City services can not cope, the territory is too large. Schoolchildren, a large army of enthusiasts and volunteers can come to the rescue here. Involving schoolchildren in the landscaping of schools, kindergartens, and individual sections of the urban environment can be regarded as an excellent educational process. It is possible to allow schoolchildren, as a project teamwork, to develop their own action plan using modern pedagogical and digital technologies: such as creating a 3D design model for school gardening, or another site; formulation and development of an algorithm of actions for landscaping, taking

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into account health-saving methods - a work schedule, a planting plan; possibly other organizational activities related to landscaping. Thus, the responsibility for the assigned work of the younger generation will increase, and there will be an opportunity to realize their ambitions in the management and organization of the event. Worse than there will not be [1,2,3,4]. A small inventory of green spaces in the city of Chirchik showed that the plantings are in a satisfactory condition, but the main green fund is reaching an age in the near future, requiring replacement with young plantings.

Conclusion. The state of the urban green areas of the city of Chirchik looks depressing. It is necessary to develop recommendations for maintaining and improving the condition of parks and squares, adjacent territories of the entire city of Chirchik as a whole. First of all, we need to save what we have. These bizarre veteran trees, short and tall, with mutilated gnarled trunks, gray and hard, stand like giants not of this world. You will not find them in new urban developments, they are not found in modern parks either. Good care won't hurt them. They will delight the townspeople with their coolness for a long time to come. The identified environmental problems for the city of Chirchik are relevant. Chirchik is a city in which the issue of lack of green spaces is acute. Landscaping must be taken seriously, according to a well-thought-out program that meets the modern requirements of an ecological approach, for ten to twenty years ahead.

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