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BAUM'S GROVE - AS A PLACE OF REST

Annotation: *The Baum Grove Park area was built in 1894. An artificial Green valley located in the northern part of Almaty city between Seifullin and Suyunbai Avenues. The total area is 139.5 hectares. The gene plan is divided into landscaping zones. The connection between the landscaping areas is carried out by the Main Alley and pedestrian paths. The master plan includes playgrounds, a playground for sports, and a dog walking area. Small architectural forms are located in the area of the Great Almaty Canal. There is a parking area on the side of Suyunbai Avenue. The entrance to the park is through three entrance groups. The first is Ryskulov Avenue, the second is Suyunbai Avenue, the third is a residential area of the private sector. The reconstruction of Baum Grove helps to revitalize this area of the city for visiting citizens and guests. It also improves the appearance of the city not only for the better, but also increases the importance of restoring the Baum grove, since it gives this area landscaping, revitalization, but also improves the appearance of the city and has a positive effect on thermoregulation in the human body, that is, stabilizes blood pressure, improves physical condition and improves mood.*

Keywords: *urban areas, relief, hyperthermia, floristics, phytogenetics, inventory, economic measures, plantings, tree taxation, sanitary logging, individual trees, groups of trees, shoots, quarter, cartographic materials.*

The scope of methodological and programmatic research includes the following issues:

1. Survey of the territory of the Baum grove and assessment of their compliance with the purpose.
2. Investigation of the correspondence of forest plantations to relief elements, soils to the hydrological regime.
3. The range of tree species, the growth and condition of the species they consist of.
4. Study of the influence of trees on the general human condition

A special place in the system of urban planning measures aimed at solving issues of protection and improvement of the quality of the city's environment is occupied by plantings with complex health and environmental properties. One of them is to increase the comfort of the microclimate. Citywide and intra-block plantings are also an important and mandatory element of the city in terms of hygiene.

It should be noted at once that there are no scientific grounds for plantings as the only source of oxygen for the breathing of citizens. The oxygen content in the atmosphere has remained at 21% over the past 200 million years. During this time, a stable balance has been formed between the release and consumption of oxygen by plants and animals, its binding and participation in the global geochemical cycle.

49 species of trees grow on the territory of the Baum grove, of which 7 are coniferous and 42 are deciduous. 8 species of deciduous soft-leaved species, 16 deciduous and 18 fruit and ornamental. In the total composition of tree and shrub species, there are only 11 species of trees and 4 species of shrubs characteristic of this natural zone and the high-altitude zone. The remaining 38 species of trees and 11 shrubs are neighboring plants that are not typical for the foothills of the Northern Tien Shan. The number of species of tallgrass plants is about 118 species. There is also 1 species of ferns (spore ferns) registered in the grove, and 7 species of fungi and several species of mosses in the lower plants. The greatest floral and phytocenotic diversity is observed in floodplain ecosystems. In the main territory, the composition of the flora is poor, weeds are widespread. The state monument of nature "Baumskaya grove" has a good potential for the development of tourism on its territory. The following tourist activities are successfully developing here: - scientific and educational tourism. As part of the green spaces of groves with different histories of their origin and

development on the territory. The grove is home to many species of animals and birds. All this provides a good base for nature lovers and professionals studying individual groups of biodiversity.

The grove includes a well-developed network of alleys and paths going in different directions. Some of them have an asphalt surface, some are unpaved, but you can ride a bike. Cycling and training are held here.

The research was conducted in the Baum grove in Almaty from 2021 to 2023.

The purpose and objectives of the study: to study the microclimate of forest plantations used by people for recreation in the hot season. **The task of the study includes:** determining the continuity, seed composition, design of forest plantations, development of agricultural techniques for their creation, including basic tillage, assortment of tree species, age of planting material, timing of watering rates of young plantations, methods of work on their care.

Scientific discovery: for the first time, forest plantations used to protect people from direct sunlight in the hot season are being identified and studied.

Heat stroke is a type of hyperthermia. A special feature is the rapid development of hyperthermia, the rapid achievement of life-threatening values of body temperature (rectum) 42-43 °C. Heat stroke is a consequence of rapid exhaustion and disruption of adaptive thermoregulatory processes characteristic of the hyperthermia compensation period. Causes of heat stroke the most common causes of heat stroke are exposure to high-intensity heat and/or low efficiency of the body's adaptation mechanisms to high ambient temperatures [1].

Sunstroke is a type of hyperthermic condition. It has a number of differences from hyperthermia both by reason and by mechanisms of development. The cause of sunstroke is the direct effect of solar radiation energy on living organisms [1].

The functions of plantings in cities are different: purification of atmospheric air from chemical pollution, their positive effect on the urban climate and noise reduction. It is important to understand this in order to develop a competent, scientifically sound strategy for the development of a green space system in the city and work with existing green areas.

To perform ecological functions, plantings must have a specific design. Planting a thickened tree will do little to self-purify the atmosphere. Under their crowns, the air stagnates, becomes waterlogged, and favorable conditions are created in the air for the reproduction of pathogenic microorganisms. In addition, under the crowns, which allow only light and breathability, a full-fledged grass cover is formed, protecting the soil from compaction, drying and dust.[3]

Description of the research area. The research area covered the mountainous and semi-desert zones of the western part of Almaty.

It is known that favorable conditions for recreation of citizens are created in the shade of green spaces. In this regard, the shade of the following trees has been studied: *Ulmus minor* MILL, *Ulmus pumila* L., *Ácer platanoídes*, *Quercus* [1, 2].

In this regard, we investigated the dynamics of a decrease in the daily temperature of the soil surface under trees, one of the main components of the effectiveness of shade creation. For these purposes, a plantation with an area of 1 hectare was chosen, in which there were 200 specimens of various trees and shrubs, starting from 3.5-25 m, and the average size of the plantations, located mainly in biogroups, was 4x4 m.

The placement of control platforms, the installation of aboveground thermometers under the crowns of trees and in the open ground, the recording of thermometer readings was carried out in accordance with current recommendations.

The observations were carried out in five repetitions, and their results are presented in table1.

Table 1-The results of observations of the dynamics of soil surface temperature in the shade of green spaces and in the open ground.

Place of observation	Time of observation	Soil surface temperature by repetition, 0C					Average, temperature, °C	Tem. difference, °C
		I	II	III	IV	V		
In the shade of forest plantations in the Baum grove	11 o'clock	16.3	17.6	17.2	14.4	13.9	15,9	
	12 o'clock	17.2	11.3	18.3	15.4	14.4	15,3	
	13 o'clock	18.9	13.4	21.6	16.9	15.7	17,3	
	14 o'clock	20,1	15.1	23.4	17.8	17.3	18,7	

	Continuation of the 1st table							
		15 o'clock	11.2	18.9	25.9	20.9	21.4	19,7
	16 o'clock	20.2	15.2	22.3	21.3	25.0	20,8	
In the open area	11 o'clock	26.5	27.7	27.5	24.0	23.3	25,9	+10
	12 o'clock	27.5	31.2	28.0	25.5	24.0	27,2	+11,9
	13 o'clock	28.7	33.2	31.5	26.2	25.5	29,0	+11,7
	14 o'clock	30.2	35.3	33.7	27.0	27.6	30,8	+12,1
	15 o'clock	31.2	38.2	35.0	30.0	33.0	33,5	+13,8
	16 o'clock	30.4	35.5	33.6	30.0	33.0	32,5	+11,7

As shown in the table, an increase in the temperature of the soil surface and in both cases is observed before 4 p.m. At the same time, according to the weighted average of the five-fold repetition, in the afternoon, the temperature of the soil surface in the shade of the plantings increases slightly - from 11 hours 15.9 0C to 16 hours 20.8 0C. At the same time, the temperature difference is 4.9 0C, which leads to a change of 1.9 0C per 1 hour.

Unlike the temperature on the soil surface in the shade of plantings, the surface temperature of the soil of the open area is strongly heated from 11 to 25.9 0C at 15 to 33.5 0C. The temperature increase in 4 hours will be 7.6 0 C or 3.5 0C per 1 hour.

During the period of temperature increase, the most intense increase in the temperature of the open area is observed from 11 to 13 o'clock, respectively, to 3.90 and 6.40 C, then the temperature increase decreases to 3.2 and further to 0.80 C. In general, within the time under study, the soil surface in the shade of the plantings is 17.4 to the open area...23.60 s less. To assess the reliability of these differences, the obtained materials were subjected to a two-factor analysis of variance, shown in Table 2.

Table 2-Summary characteristics of a two-factor dispersion analysis of the temperature difference of the soil surface in the shade of a plantation in an open space

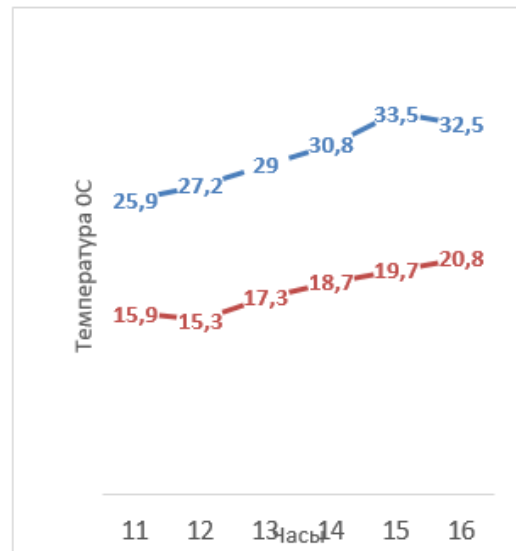
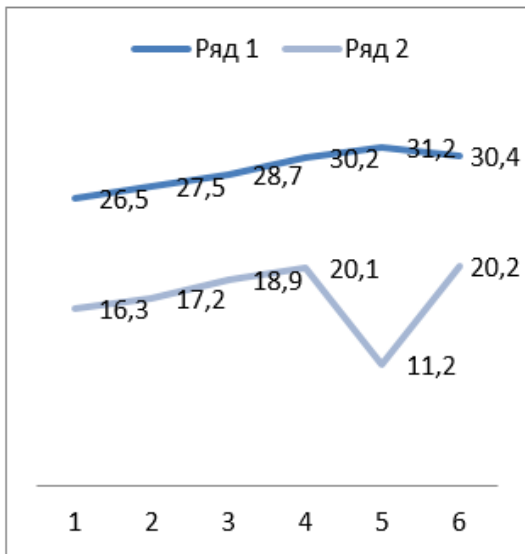
Variance	The square sum	The degree of emptiness	The middle square	F _φ	F ₀₅
General	8775,5	59	-	-	-
Territories (A)	7521,9	1	7521,9	1419,2	4,03
Part of the time (B)	881,2	5	176,2	33,2	2,40
Interaction (Ab)	116,7	5	58,3	11	2,40
Remainder (errors)	255,7	48	5,3	-	-

According to Table 2, relative differences in soil surface temperature are significant in all cases ($FF > F_{05}$) - between sites ($1419.2 > 4.03$), between observation periods ($33.2 > 2.40$) and their interaction ($11 > 2.40$). As can be seen from it, the temperature of the soil surface varies according to repetitions in the shade of the plantation 4.4...8.3 0 C and significantly exceeds the change in temperature values in the open area (1.1 ... 5.0 0C).

Graph 1 shows the dynamics of soil surface temperature in the daytime under the crowns of plantings and at a distance from them 30 times the height of trees, in open areas, i.e. outside the influence of plantings.

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It follows from table 1 that the indicators of soil surface temperature in forest plantations repeat the course of changes in soil surface temperature under a 100-year-old forest plantation. But only the surface temperature of the earth under young forest plantations and in the open ground is slightly higher than that of 100-year-old plantations and next to them. In 11 hours of local time, the soil surface temperature in the open area reaches 280C, the maximum soil surface temperature drops by 14 hours and is 390C, in 16 hours it decreases to 310C. Under the canopy of forest plantations, the soil surface temperature decreases slightly for 11 hours (to 350C) or slightly increases, as in forest plantations, from 250C or within 12 hours.



----- in the open area

----- Under the shadow

Figure 1-daily changes in soil surface temperature in an open area and under the canopy of young forest plantations.

However, in general, as in an open area with a 100-year-old forest plantation, in an open area with a young forest plantation, the soil surface temperature during the control period is significantly higher than optimal and increases by 10C. Under the canopy of young plantations, from 11 to 16 o'clock, the soil surface temperature ranges from 11-210 C, all do not grow much in the open ground and under young plantations, differences in soil surface temperature reach 25-34 C. Rapid warming of the soil at a depth of 5.10 and 15 cm in young forest plantations compared to 100 (graph1).

Based on the high efficiency of forest plantations, the question of the shadow effectiveness of Baum grove plantations becomes relevant. This is the first time that research has been conducted. Their results of the study of plantations with high shade properties allow us to adjust the grafting technology of these trees. It should be noted that the effectiveness of shade plantations for the comfort of citizens depends, first of all, on the accumulation of moisture, which is obtained through a more rational choice of a system of agrotechnical measures. At the same time, special attention is paid to the main method of tillage. In studies in the arid zone, it is recommended to carry out tillage using the black steam system, including by plowing plantations.

The range of tree species was determined directly by studying existing forest plantations - according to established practices.

To clarify a particular type of wood found in forest plantations [5,6,7,8], appropriate reference books were used, and the methodology of V. V. Ogievsky and A. A. Hirov was used as a basis for studying forest plantations [89]. At the same time, it was established:

- 1) the origin of plantings (natural, crops);
- 2) Land category;
- 3) the main breed and its age;
- 4) related breeds and their age;
- 5) the composition of rocks, the scheme of movement;
- 6) seating arrangements;
- 7) Crown pairing;
- 8) general information on crops of planting material characteristics, method of creation (sowing, planting), availability, compliance with agrotechnical and forestry care;
- 9) barrel diameter, cm;

- 10) height, m;
- 11) diseases and pests;
- 12) the presence of self-seeding and seedlings;
- 13) measures necessary to improve the condition of plantings;

Let's explain that crown closures are rated in four categories-closed, open, closed, moderately closed, tightly closed.

Table 3-Journal of taxation- Baum's Grove - 60th quarter

Block	number allocation	Category of plantings	Type of plantings	Type or name age of forest crops	Height by year	Height by year	Diameter in cm	Condition	pests	diseases	Number of household	activities, pcs
60	1	1	The Grove	Morus	15	6	12	health (CSO-1)			Crown formation	1
60	2	1	The Grove	Úlmus glábra	25	6	16	health (CSO-1)			Crown formation	1
60	3	1	The Grove	Morus	15	6	12	health (CSO-1)			Crown formation	1
60	4	1	The Grove	Morus	25	8	30	health (CSO-1)				1
60	5	1	The Grove	Úlmus glábra	60	12	64	Dead trees (KSO-5)			sanitary cabins	1
60	6	1	The Grove	Úlmus glábra	60	3,5	52	Dead trees (KSO-5)			sanitary cabins	1
60	7	1	The Grove	Úlmus glábra	60	10	76	Dead trees (KSO-5)			sanitary cabins	1
60	8	1	The Grove	Sambúcus racemósa	10	2	10	health (CSO-1)				1
60	9	1	The Grove	Ácer negúndo	35	10	32	health (CSO-1)			Crown formation	1
60	10	1	The Grove	Úlmus glábra	50	12	56	health (CSO-1)				1
60	11	1	The Grove	Úlmus glábra	35	6	26	Dead trees (KSO-5)			sanitary cabins	1
60	12	1	The Grove	Úlmus glábra	35	10	34	health (CSO-1)				1

Studying the influence of humans on forest plantations

The development of this program issue is necessary to determine the specific impact of people on plantings, determine the degree of this impact, assess the attendance of citizens by groves and their impact on the growth and condition of trees.

One of the signs of active recreation of citizens is the anthropogenic impact on the occurrence of soil erosion. This is the denudation of the roots as a result of the fact that the trees are located close to the Ground due to a large number of recreations along separate trails.

Soil erosion can be expressed in points:

0 points-no erosion

1 point-erosion in the soil is marked up to 5 cm

2 points-erosion in the soil is marked up to 10 cm

3 points-erosion of the Earth's surface has been reduced to 20 cm, degradation, exposure of 50% of the roots near the trunks

4 points-erosion of the Earth's surface has been reduced to 30 cm, degradation, exposure of 70% of the roots near the trunks

5 points-erosion of the Earth's surface has decreased to 50 cm, wear, exposure of 70% of the roots near the trunks

Conclusion

Plantings not only purify the atmospheric air and reduce wind speed, but also regulate the temperature and humidity regime of the urban environment and the conditions of insolation of the territory, especially in summer, actively influencing its bioclimatic comfort. In hot weather, unfavorable microclimatic conditions may occur in the city, which worsen a person's thermal well-being due to the following factors:

a) in open areas, a person is exposed to direct sunlight, which can cause overheating phenomena;

b) the surfaces of walls of buildings, bridges, sidewalks and soil transmit a significant amount of reflected radiant energy, which worsens the radiation regime of open places in the city, the radiation of such heated surfaces is 30-40% of direct solar radiation;

c) the air temperature rises significantly near heated surfaces.

Consequently, a citizen located in an open, non-planted area, on a sidewalk or in a block near buildings, is exposed not only to direct solar radiation, but also to additional radiation from highly heated surfaces and exposure to high air temperatures.

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РОЩА БАУМА - КАК МЕСТО ОТДЫХА

Аннотация: Парковая зона "Роща Баума" была построена в 1894 году. Искусственная зеленая долина, расположенная в северной части города Алматы между проспектами Сейфуллина и Суюнбая. Общая площадь составляет 139,5 гектаров. Генплан разделен на зоны озеленения. Связь между зонами озеленения осуществляется с помощью Главной аллеи и пешеходных дорожек. Генплан включает в себя детские площадки, площадку для занятий спортом и зону выгула собак. Малые архитектурные формы расположены в районе Большого Алматинского канала. Со стороны проспекта Суюнбая есть парковка. Вход в парк осуществляется через три входные группы. Первая - проспект

Рыскулова, вторая - проспект Суюнбая, третья - жилой массив частного сектора. Реконструкция Баум-Гроув помогает оживить этот район города для приезжих горожан и гостей города. Это также улучшает внешний вид города не только в лучшую сторону, но и повышает важность восстановления Баумовой рощи, поскольку придает этой местности озеленение, оживление, а также улучшает внешний вид города и положительно влияет на терморегуляцию в организме человека, то есть стабилизирует кровяное давление, улучшает физическое состояние и поднимает настроение.

Ключевые слова: городские территории, рельеф, гипертермия, флористика, фитогенетика, инвентаризация, хозяйственные мероприятия, насаждения, таксация деревьев, санитарные рубки, отдельные деревья, группы деревьев, побеги, квартал, картографические материалы.

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БАУМ ТОҒАЙЫ - ДЕМАЛЫС ОРНЫ РЕТІНДЕ

Аннотация: Баум тоғайы саябақ аймағы 1894 жылы салынған. Алматы қаласының солтүстік бөлігінде Сейфуллин мен Сүйінбай даңғылдарының арасында орналасқан жасанды жасыл алқап. Жалпы ауданы 139,5 га. ген жоспар көгалдандыру аймақтарына бөлінген. Көгалдандыру аймақтары арасындағы байланыс негізгі аллеямен және серуендеу жолдарымен жүзеге асырылады. Бас жоспарда ойын алаңдары, спортқа арналған алаң, иттерді серуендетуге арналған алаң жобаланған. Үлкен Алматы каналының аймағында шағын сәулет нысандары орналасқан. Сүйінбай даңғылының жағында тұрақ аймағы орналасқан. Саябаққа кіру үш кіру тобы арқылы жүзеге асырылады. Біріншісі-Рысқұлов, екіншісі-Сүйінбай даңғылы, үшіншісі-жеке сектордың тұрғын аймағы. Баум тоғайын қайта құру қала тұрғындары мен қонақтарына бару үшін қаланың осы аумағын жандандыруға көмектеседі. Сондай-ақ, бұл қаланың келбетін тек жақсы жаққа жақсартады, соныменқатар Баум тоғайын қалпына келтірудің маңыздылығын арттырады, өйткені ол осы аумақты көгалдандыру, жандандыру ретінде береді, бірақ сонымен бірге қаланың келбетін жақсартады және адам ағзасындағы терморегуляцияға оң әсер етеді, яғни қан қысымын тұрақтандырады, физикалық жағдайды жақсартады және көңіл-күйді көтереді.

Кілт сөздер: урбанизациялық аумақтар, рельеф, гипертермия, флористика, фитоценетика, инвентаризация, шаруашылық шаралар, алқаағаштар, ағаш таксациясы, санитарлық кесу, жеке ағаштар, топ ағаштар, өскіндер, квартал, картографиялық материалдар.

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