DIVERSITY OF ECOLOGICAL CONDITIONS OF THE KYZYLKUM DESERT WITH PASTURE PHYTOMELIORATION

Ortikova Lola Soatovna - Doctor of Physical and Chemical Sciences (PhD).
Biology teacher
Esankulova Dilbar Saitovna- Biology teacher
Soliyeva Gulnoza Daniyarovna- Biology teacher
Ibragimov Ilkhom Erkinovich -trainee teacher. Department of Methodology for Teaching Biology. Jizzakh State Pedagogical Institute **UZBEKISTAN**

ABSTRACT

The Kyzylkum desert is a large and promising region of karakul breeding in Central Asia due to the need to carry out phytomeliorative measures on its pastures. Most of Kyzylkum is a flat plateau and low-lying clay plains. Plain plateaus are based on chalk rocks covered with a mantle of newest sand and gravel sediments. With regard to this region of karakul breeding with various soil and climatic conditions, hydrogeological and pasture-fodder conditions, the development of scientific and technological foundations for phytomelioration of pastures needs a differentiated approach, taking into account the specifics of specific environmental conditions. It is the zonal approach that provides for the prudent mobilization of natural resources of the environment and can be the key to successfully solving an important problem.

Keywords: Kyzylkum, pastures, karakul breeding, salinization, phytomelioration, desert, halophytes, ecology.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

Kyzylkum, more often known in the geographical and botanical literature as the Kyzylkum district, is a large karakul region in terms of its area and national economic significance. It occupies most of the flat territory of Uzbekistan and southern Kazakhstan with elevation marks of 100-300 (700) meters above sea level and is located between the Amu Darya and Syrdarya rivers, the lower and middle reaches of the Zarafshan (Fig. 1).

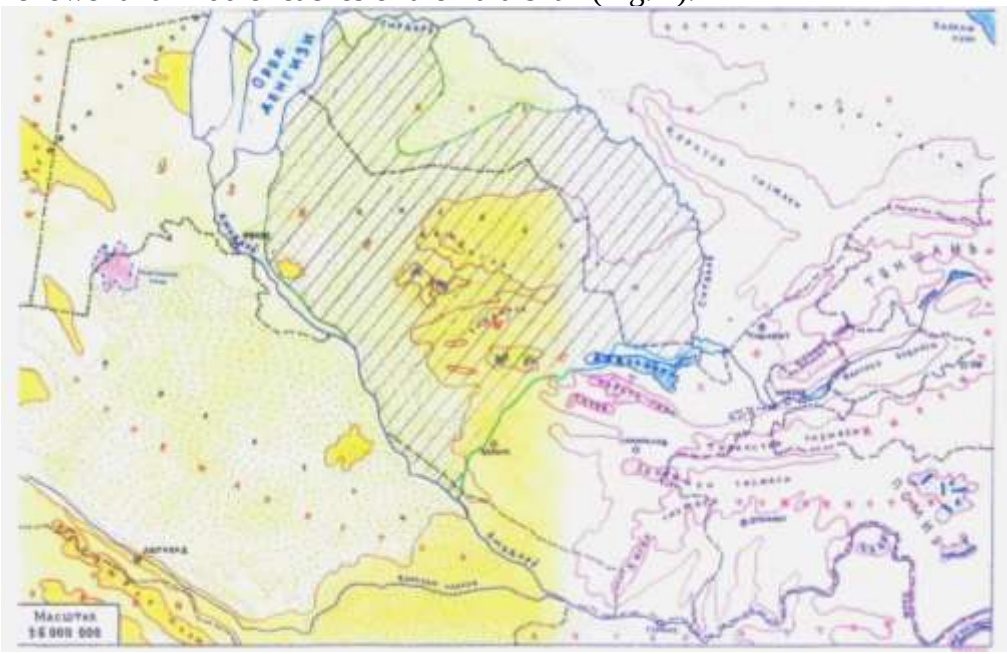

Fig. 1 Schematic map of Kyzylkum

Kyzylkum with the current level of development of productive forces in agricultural production is the largest pasture region of karakul breeding. It is dominated by pastures of a year-round use, accounting for almost 80% of the total area of the district.

This huge desert area is diverse in geological and geomorphological terms: powerful sandy formations (ridges, hillocks, dunes); remnant mountain areas (Bukantau, Aristantau, Aktau, Kazakhtau, Kuldzhuktau, Dzhetymtau, Kokchatau, etc.); plains, pits-depressions (Ayakagitminskaya, Karakatinskaya, Mingbulakskaya, Beshbulakskaya, etc.).

In the geomorphology of the Kyzylkum, alluvial low plains also occur, and the relief of the Aral part was formed under the influence of the Aral Sea. The deposition of loose and fixed sands is characteristic along the eastern coast.

The non-sandy territory of Kyzylkum occupies more than 3.2 million hectares [7]. In the scientific literature, it is known as the Southwest Kyzylkum.

Sandy elevations typically alternate with sandy depressions, or between ridge plains. The length of the sandy formations ranges from several meters to several kilometers. The greatest height of the ridges often reaches 12-15 meters or more.

Depressions and plains between the ridge uplands are different in terms of occupied areas, and are often chaotically decorated.

The profile of desert-sandy soils and formations is poorly differentiated into genetic horizons with or without a barely noticeable crust on the surface. They have little humus (about 0.5%), which is more often formed at a certain (5-6 cm) depth [5].

Kyzylkum has features characteristic of the Turanian agro-climatic province [3,4].
According to the complex of natural characteristics, agrometeorologists [10] usually divide the Kyzylkum desert into three independent zones - northern, central and southern.

In terms of the annual amount of precipitation (Fig. 2), these zones differ somewhat: in the Central Kyzylkum, on average, 70-110 mm fall per year, while in the South, a few (77-137 mm) more [2,3,4].

According to this important climatic indicator, Kyzylkum belongs to the zone of insufficient moisture in its extreme expression or at the border of possible vegetation [14].

The distribution of precipitation throughout the year is uneven by seasons: winter is 24-40%, spring -43-59, summer -4-9 and autumn -8-14%

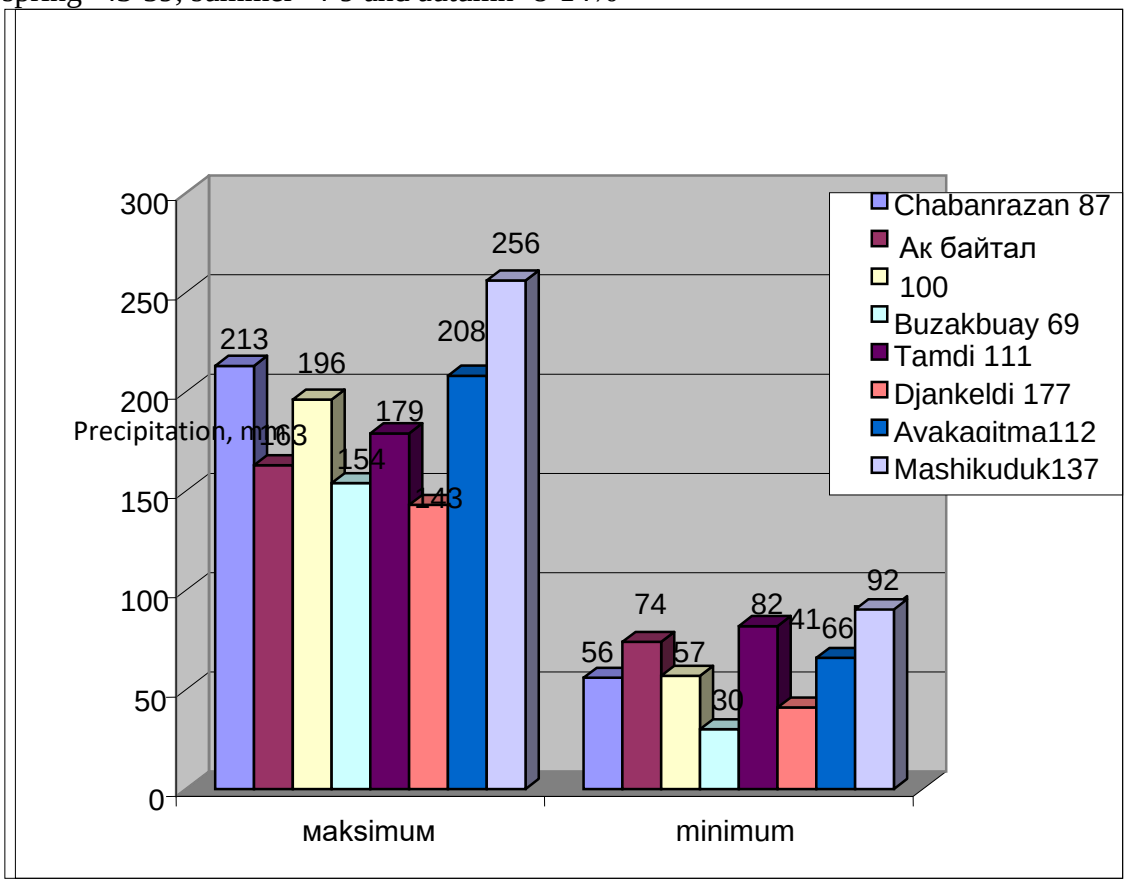

Fig. 2. The amount of annual precipitation of

The ratio of winter, spring, summer and autumn precipitation on average over 20 years of observations as a percentage of the annual amount is as follows: for Ayakagitma (south) 31: 54: 4: 12 and for Tamda (center) 33: 48: 4: 15.

Summer is almost rainless. The beginning of precipitation falls in October-November; reaches a maximum in March.

The amount of precipitation over the years ranges from 38.7 mm (1951) to 264.8 mm (1964). The average monthly temperature in January – February, the coldest months, fluctuates in the north (Buzaubay) 5.10 to 1.60 (Dzhangeldy) in the south. The absolute minimum (Kulkuduk) reaches - 26.90-31.90C.

The average monthly temperature of the hottest month (July) ranges from 29.50 (Tamdy) to 31.20 (Ayakagitma). The absolute maximum temperatures in summer reach 46.1-48.9, and the sum of effective temperatures is over 4600-55000 C [4].

Winds are one of the typical features of the climate and are extremely unfavorable for successful phyto-reclamation works. The average annual speed of the prevailing winds is 4-7 m / s. In winter and spring, the most frequent winds are northeastern, less often eastward [3,4].

In summer, the winds from the north increase The number of days per year with strong winds (15 m / sec and more) ranges from 11 (Tamdy) to 48 (Kulkuduk).

In some cases, the wind speed can reach 20-25 m / s, more often in spring.
The Kyzyl Kum desert is characterized by an abundance of light and solar radiation. The maximum arrival of radiation (21 kcal / cm^2) occurs in June, and the minimum (4-kcal / cm^2) - in December.

Heat consumption for evaporation is 6 kcal / cm^2. The sum of heat from direct solar radiation per cm^2 of the horizontal surface of Central Kyzylkum for a year is 106.2 or 11.8 kcal / cm^2 more than in Samarkand.

The variety of ecological conditions of the Kyzylkum desert left their mark on the vegetation cover, especially on its sandy massifs, which led to the development of psammophytes. The ecological regime and, accordingly, the plant conditions in the sandy desert are determined by the water-physical properties of sand, this kind of substrate [11].

In particular, we note some specific properties of sand and a sandy desert: in general, sand is a sedimentary rock consisting of grains of individual minerals and rock fragments ranging in size from 0.05 to 1 mm and having the property of flowability in a dry state.

Often sands are also called massifs of sandy deposits, understanding them as a kind of natural-territorial complexes with special vegetation and fauna on them.

The Kyzylkum sands consist of rounded grains of medium fraction quartz (40-70%), mica, feldspar, carbonates, etc.

The participation of physical sand (size of fractions 0.25-0.05 mm) on various - not overgrown, hilly-ridge, ancient alluvial sands is 76.2-63.6%.

Due to the favorable mechanical composition, the sands have high water permeability. Atmospheric precipitation, as a rule, is perfectly absorbed by them, i.e. there is a better accumulation of moisture in the soil.

In lowlands, where, as a rule, the erosion process is more stable, there is a better infiltration of atmospheric precipitation, and due to this, a more favorable water regime is observed. It is this circumstance that should be taken into account when choosing the environmental conditions for carrying out phytomelioration works.

Winds on separate massifs produce tremendous destructive and constructive (in the sense of the formation of relief) work simultaneously, blowing in one place and depositing in another, significant masses of sand.

The thermal regime of the sands studied on the example of the Kyzylkum desert is not the same in the depth of the profile and the seasons of the year [13]. Quartz, of which, for example, Kyzylkum sands mainly consist, has a high thermal conductivity, however, the lowest heat capacity [14].

According to our observations, the surface of the sands produced in various regions of Kyzylkum in the midday hours in spring heats up to 42-49, and in summer - to 60 ° C.

For completeness of understanding of the natural features of Kyzylkum, we present a brief comparative description of it with other desert regions of Uzbekistan (Fig. 3).

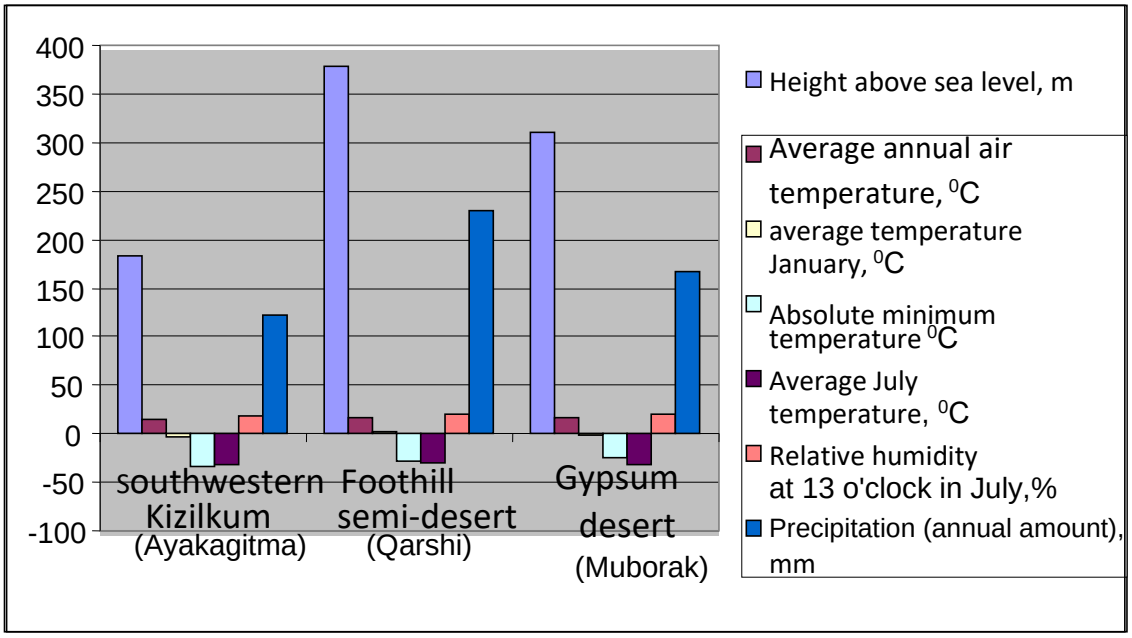

Fig. 3 Comparative climatic characteristics of different regions of karakul breeding

The foothill semi-deserts (adyrs) are characterized by a relatively large amount of atmospheric precipitation, which is two times higher than in the Kyzylkum desert. The typical type of vegetation is ephemeral-ephemeral; and the economically expedient season of their use is spring-summer.

The wormwood-ephemeral desert Karnabchul occupies an intermediate position in terms of annual precipitation and other climate parameters.

The temperature conditions of the Kyzylkum desert are also somewhat harsh, where the absolute minima are 4 and 9.9 ° lower than other comparable regions of karakul breeding. In terms of the absolute maximum temperature, Kyzylkum is also 2-3 ° higher than other natural areas of the desert compared to it.

The distinctive ecological environment of the sandy part of the desert naturally leaves a certain mark on the formation of the vegetation cover, its composition and structure. Thus, the total number of plant species in different regions of the sandy desert of Central Asia is different; in Muyunkum - it is 215 species [14], for the Ural-Emben sands - 275; Kazakh sandy deserts - 718 [14].

M.G. Popov [24] notes that sandy deserts open before us “an amazing, incomparable landscape, full of grandeur and beauty. In front of the naturalist, they also discover the original biological environment and the corresponding world of organisms, adaptations unknown in other landscapes ". These epithets about the sandy deserts of the famous botanist - geographer, first of all, with good reason, relate specifically to the Kyzylkum desert ...

Shrubs and trees play a dominant role in the vegetation cover of the Kyzyl Kum sandy desert. These include saxauls (white, black), sand acacia, species of the genus Juzgun, ephedra, astragalus [12].

If in the flora of the sandy deserts of Central Asia there are 320-718 species, then the share of the sandy part of the Kyzylkum, there are 320 species of flowering plants belonging to 31 families and 134 genera [6,15].

The number of plant species in the most abundant species of the sandy desert flora families is presented as follows: Fabaceae - 43 species or 13.4%; Asteraceae - 39 (12.1%), Chenopodiaceae - 38 (11.2%), Polygonaceae - 35 (10.9%), Poaceae - 25 (7.8%), Brassicaceae - 23 (7.1%), Liliaceae - 18 (5.6%), Baraginaceae - 13 (4.1%), etc.

Of the 320 species, 174 species are psammophytes, other species are also found in gypsum (40 species), saline deserts, as well as in the foothills, the lower belt of mountains (60 species).

Of these, 171 species are endemic to Central Asia. According to life forms, endemics are distributed as follows: trees and shrubs 42 species, half-shrubs -20, summer grasses 51 and annuals 50 species [8].

According to the composition of life forms of plants, the psammophilic flora is composed as follows: desert trees of 8 species; desert bushes 56 and 49; dwarf shrubs and shrubs 21 and 11; perennial grasses 84 and 55; annual grasses 139 and 51; biennial grasses 8 and 4; mosses - 1 [14]

The sandy desert, in comparison with other ecological types of deserts, is fully represented by multi-tier associations, which are characterized by the presence of large shrubs in the upper tier (white saxaul, Cherkez), in the second and third tiers - shrubs and semi-shrubs (kandym, mausoleum, wormwood), in the fourth - long-growing herbs - selines and in the fifth - herbaceous vegetation (ephemera, ephemeroids, hodgepodge).

The ecological conditions within the peaks, slopes, and also inter-ridge plains differ markedly and are expressed in the species composition of plants, their number.

One of the main tasks of phytomelioration of the region's pastures is to identify potential ecological reserves, first of all, such soil varieties, which, due to their water-physical properties (good water permeability, high moisture capacity and low evaporation), would contribute to the maximum possible accumulation, conservation and economy.

On the basis of solving a number of important environmental and biological issues, it is also necessary to develop effective methods and a set of agrotechnical techniques that ensure the conditions for the formation of forage lands in relation to harsh natural conditions.

In a word, the problem of improving the Kyzylkum pastures as a specific natural region consists of solving three interconnected key issues:

- identification of the ecological potential of the environment on the basis of thorough research, analysis of natural conditions;
- detailed study of bioecological properties and characteristics of the tested plants;
- development of a specific technology for the creation and use of pasture agrophytocenoses. [15]

In particular, a non-flush type is characteristic of a sandy desert, which schematically consists of three moistening horizons: permacid, impermacid and impermacid-capillary [13].

Our many years of continuous research experience on the phytomelioration of pastures in this region of various ecological regimes, covering a complex of aspects, gave positive results [14-15]

CONCLUSIONS

1. The Kyzylkum Desert is a kind of pasture region for karakul breeding, it differs from other arid lands of the republic in more severe natural conditions; low (100-130mm) amount of precipitation, sharp differences in air temperatures by seasons and during the day; high insolation and a significant amount of effective temperatures in summer, the complexity and variegation of the soil cover; variety of vegetation.

2.Among the wide variety of ecological conditions, two types of deserts stand out here - sandy, original and relatively favorable, and gypsum - with its characteristic ecological regime and tough.

3. Natural types of Kyzylkum pastures are characterized by low yield of forage mass, sharp fluctuations in years and seasons of the year, negative dynamics of the nutritional value of forage throughout the year (from spring to winter).

4. With regard to this region of karakul breeding with various soil and climatic conditions, hydrogeological and pasture-fodder conditions, the development of scientific and technological foundations for phytomelioration of pastures needs a differentiated approach, taking into account the specifics of specific environmental conditions. It is the zonal approach that provides for the prudent mobilization of natural resources of the environment and can be the key to successfully solving an important problem.

5. In the extreme conditions of the Kyzyl Kum desert, first of all, the effectiveness of phytomeliorative measures is determined by the scientifically grounded selection of phytomeliorants, the use of a differentiated technology for creating pasture agrophytocenoses. etc.

REFERENCES

1.Abulkasymov A.A., Abbasov S.B. Landscape and ecological studies of the Central Kyzyl Kum. Samarkand, Sam GU, 2001, 153 p.

2. Babushkin L.N. Agroclimatic description of Central Asia. // Scientific works of Tash GU, issue 236, Tashkent, 1964, p. 5-47

3. Babushkin L.N., Kogai N.A., Zakirov Sh.S. Agroclimatic conditions of agriculture in Uzbekistan. Ed. "Mekhnat", Tashkent, 1985, 160 p.

4. Balashova E.N., Sabinina I.G., Semenova O.A. Climatic description of Kyzyl Kum. // Collection of works of the Tashkent Hydrometeorological Observatory, vol. 1, Tashkent, 1961, p. 5-42

5. Butskov N.A., Nasyrov Ya.M. Soils of the Southwestern Kyzylkum Mountains, Tashkent, 1961, 200 p.

6.Gaevskaya L.S. Karakul pastures of Central Asia. Tashkent, "Fan", 1971, 332 p.

7. Granitov I.I. Vegetation map of Southwestern Kyzylkum. Ed. SAGU, Tashkent, 1950, 87 p.

8. Granitov I.I. Vegetation cover of Southwest Kyzyl Kum, volume 1, Ed. "Science", Tashkent, 1964, 335 p.

9. Gael A.G. On uneven-aged soils on the sands of arid regions of the USSR // Problems of Desert Development, 1, 1988, pp. 3-10

10. Gringoff I.S., Reizvikh O.N. Agroclimatic features of Kyzyl Kum and productivity of desert pastures. // Proceedings of SARNIGMI, vol. 40 (121), Tashkent, 1977

11. Gunin P.D., Dedkov V.P. Ecological regimes of desert biogeocenoses. Ed. "Science", M., 1978, 228 p.

12. Zakhidov T.Z. Biocenoses of the Kyzyl Kum Desert. Publishing house, "Fan", Tashkent, 1971, 304 p.

13. Kimberg I.V. Soils of the Desert Zone of the Uzbek SSR, Tashkent, "Fan", 1974, 298 p.

14. Makhmudov M.M. Phytomelioration of Kyzylkum pastures. // Agriculture of Uzbekistan, 1991, 3, p. 23-24

15. Makhmudov M.M. Agrobiological basis and technology for improving Kyzylkum pastures. Author's abstract of doctoral dissertation, Tashkent, 1998,50 p.