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Paletskiy Cherkezi (Salsola Paletzkiana Litv.) – A Prospective Plant for Increasing the Productivity of Cucumber Pastures

Rabbimov Feruz Abdulloyevich

Doctoral Student, Scientific Research Institute of Karakul Breeding and Desert Ecology

Rabbimov Abdullo Rabbimovich

Doctor of Agricultural Sciences (DSc), Scientific Research Institute of Karakul Breeding and Desert Ecology

Abstract: The article provides information on the nutritional properties and the environment-transforming role of Salsola paletzkiana Litv. in connection with phytomelioration of degraded pastures of Karnabchul.

Keywords: desert, grassland, vegetation cover degradation, productivity, soil moisture, phytoremediation, phytogenic area, phytometer species.

Karnabchol, located at the southwestern foothills of the Zirabulok Mountains, is a large desert area of 500,000 hectares, the vegetation of which is mainly composed of wormwood-ephemeral associations, and many black sheep are raised in this area. According to the latest classification (Lobova, 1960), cauliflower soils belong to the category of light gray soils or light brown soils. The soil is almost non-saline, sometimes there are massifs with a little salt (Shorsoy). However, in slightly deeper layers, salinity increases slightly, in the 80-133 cm layer, the amount of solid residue is 1.18-1.35%. The amount of gypsum in the soil is also quite high, and its amount varies from 0.29 to 12% in different layers. There is also a layer of gypsum deposits in the soil, the amount of gypsum in this layer reaches 36%. The amount of humus in the soil is very low, that is, its amount varies from 0.30 to 0.79% in the surface layers, while this amount decreases to 0.17% as it deepens. Gross nitrogen in the soil is 0.09%, and gross phosphorus is 0.10%. In some layers of the soil (44-626 cm), the amount of nitrate nitrogen is 28.5 mg/kg, and in the deeper, i.e. 789 cm depth, its amount is 4.6 mg/kg. Mobile phosphorus (R2O5) is only in the surface layers, its amount is 32.3 mg/kg. The amount of potassium that plants can absorb in the 0-25 cm layer of the soil is 239 mg/kg. In deeper layers, its amount decreases to 28 mg/kg. The water regime of cabbage soils, like that of all Central Asian deserts, includes two periods: mesothermal and xerothermic. In the mesothermal period, moisture accumulates in the soil. In cauliflower, this period includes December-April. In the xerothermic period, moisture is not collected in the soil at all, on the contrary, it is a period of consumption of existing moisture. In this case, soil moisture is consumed mainly through physical evaporation and transpiration by plants. Z. Sh. According to Shamsutdinov (1975), in the mesothermal period, 600 to 1250 tons of water per hectare can accumulate in the 0-120 cm layer of the soil of the wormwood-ephemeral pastures of Karnabchol in different years. By September, 300-400 tons of water was found in 1 hectare of the same layer. The climate of Karnabchol is a continental climate that changes dramatically. The long-term average temperature is 16oC, in June-July the temperature can rise to 40-45oC in the shade, and in January the temperature sometimes cools down to -20-30oC. An increase in air temperature above 0oC is observed in late January and early February. By the end of February, the air temperature starts to rise above 5 oC. Annual rainfall in Karbanchhol varies from 125 mm to 310 mm in different years. According to the Mubarak weather station, the annual average rainfall in the area is 167 mm. Based on the

information given above, it can be said that the surface layer of the soil of Karnabchol is almost non-saline, it belongs to the category of soils with low fertility, the climate is arid, hot in summer, and severely cold in winter. The main plant cover of the meadows consists of wormwood-ephemeral associations, and the basis of ephemeral and ephemeroid species is ilok, kongyrbosh, yaltyrbosh, chitir, lalaqizgaldok and other species, and they form the basis of pasture feed in the spring and summer seasons. Wormwood is the main nutritious plant in the pasture in autumn and winter. However, in some massifs of the desert there are massifs of yantak and carrack of nutritive species with rough stems, and pastures of medicinal species of stinky carpet plants. The average productivity of pastures is 2.5-3.0 centners per hectare, in dry years this indicator may decrease by 2-3 times, and in wet years it may increase by 1.5-2.0 times. As a result of continuous and unsystematic use of pastures, almost half of Karnabchol pastures are now in crisis. The place of wormwood is rapidly being replaced by plants such as frankincense and sedge, which have no nutritional value. The shortage of fodder in the existing livestock farms is increasing year by year, and this is the reason for the low efficiency of the sector. Therefore, establishment of high-yield pasture agrophytocenoses through phytomelioration of pastures in Karnabchhol is one of the urgent problems of today. Plant species with high nutritional properties, well adapted to growth in the extreme conditions of the desert, are used to increase productivity of pastures through phytomelioration. Currently, a number of promising plant species for use in phytomelioration activities have been identified, and local varieties of some of them have also been created (Rabbimov, 2014, 2022). Potential phytomeliorants in terms of their life forms are perennial herbaceous species (Astragalus sp., Agrophyron sp., Onobrychus sp.), semi-shrubs (Kochia prostrata, Salsola orientalis, Ceratoides ewersmanniana, Halothamnus subaphyllus, Atriplex undulata, Camphorosma lessingi) and shrubs (Haloxylon aphyllum) consists of As you can see, among the assortment of phytomeliorants, only the black saxophone has been identified as a promising shrub. But there are also species belonging to Calligonum and Salsola families, which are well adapted to grow in desert conditions, and their importance in phytomelioration of desert pastures is relatively little studied. Especially Paletsky cherkez belonging to Salsola family - Salsola paletzkiana Litv. is a nutritious plant for livestock. Paletsky cherzeka is one of the common bushy plants in sandy deserts. Its nutritional properties are described as follows: hay contains 19.83-20.35% protein, 2.82-2.96% fat, 14.25-17.24% ash, 42.21-47.13% nitrogen-free extractives. and contains 15.62-17.43% fiber. 100 kg of Circassian hay contains 33-45 nutritional units depending on the seasons (Shamsutdinov, 1975).

Paletsky cherkeze was tested for the purposes of phytomelioration of pastures in the Badkhiz desert of Turkmenistan. The productivity of Circassian pastures was 5.6-12.9 centners per hectare in different years. In the deserts of Uzbekistan, the productivity of Circassian was 17.8-24.8 centners per hectare (Shamsutdinov, 1975). These data require the testing of Paletsky cherkez in the crisis soil-climate conditions of Karnabchol, the in-depth study of its growth, development, viability, productivity and other biological and ecological characteristics in the conditions of new growth, the development of agrotechnical bases of its cultivation. Another important aspect of testing Paletsky cherkez for the purpose of phytomelioration of pastures in the conditions of cauliflower is that shrub plants change the environment to a certain extent within the influence of their phytogenic areas, and this affects the growth and development of other types of plants in the phytocenosis to a certain extent. For example, the importance of the black saxophone in the desert is not only its nutritional value, but also its positive impact on the environment. It was found out from the researches that within the influence of its phytogenic area, the saxovull reduces the wind speed up to 3 times and significantly reduces the intensity of physical evaporation of moisture from the soil. As a result, it was found that other types of plants effectively use the soil moisture, which is always scarce in the desert, and collect a higher yield compared to the plants in the open environment. Saxaul's roots reach deep into the water, and its assimilative branches evaporate large amounts of water through transpiration. As a result, it ensures high relative humidity of the surrounding air. Also, within the influence of its phytogenic area, saxovul

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exerts a significant influence on the characteristics of air and soil temperatures, soil salinity regime (Ubaydullaev, 1983, 1984, 1986). Paletsky cherkez also affects the formation of microclimate and growth and development characteristics of other types of plants in the phytocenosis at certain levels within the influence of the shrub plant and its phytogenic area. Such effects are especially evident in the growth and development of ephemeral and ephemeroid species. When the soil moisture in the phytogenic area of Paletskyi Cherkessk was studied in comparison with the soil moisture in the open area, the following data were obtained: in the control option, moisture increases by a certain amount as it penetrates into the deeper layers of the soil, and in the phytogenic area, the amount of moisture to a depth of 40-50 cm is almost the same as in the control option, 50 From -60 cm depth to 80-90 cm depth, soil moisture was almost 2 times more than the control option in the phytogenic area, and from 90-100 cm depth, it was sharply decreased (Table 1). The decrease in humidity in this layer compared to the control can be explained by the widespread distribution of the root system of Paletsky Cherkesi in this layer. The fact that the soil of the phytogenic field is lower than that of the control shows that the ephemerals and ephemeroids use soil moisture intensively. Analyzing the data in the table, it can be said that the Paletsky cherzez is almost not affected by the moisture level of the surface layer of the soil, because its roots are located in the deeper layers of the soil. Therefore, the phytometer does not have a negative effect on the water supply of species (ephemeris and ephemeroids). This ensures that different life forms grow and develop together in the phytocenosis.

Table 1.Salsola paletzkiana Litv. soil moisture of the phytogenic area, % (June, 2022)

The depth of the soil layer, cm	In the phytogenic area	In control
0-10	2,0	2,49
10-20	2,43	3,69
20-30	3,70	4,61
30-40	4,41	4,99
50-60	7,26	4,77
60-70	7,81	5,75
70-80	12,48	7,21
80-90	10,12	7,86
90-100	4,41	6,79
100-110	2,09	7,01

The results of the study of the distribution density of ephemeral and ephemeroid species in the phytogenic field and the open field showed that the number of phytometer plants was significantly higher in the phytogenic field compared to the control (Table 2). In the 0.5 m2 area of the phytogenic area, the number of papavers (Papaver pavonium) - 44.2 pieces, and in the control - 7.2 pieces, the number of the goldenrod (Poa bulbosa) in the phytogenic field - 20.2 pieces, in the control - 18.6 pieces, (Bromus tectorum) was 14.5 units in the phytogenic area, and 3.2 units in the control area. It can be explained that such a distribution density of phytometric species is definitely related to the creation of relatively favorable conditions for plants that occur in the phytogenic area of Paletsky Cherkessk.

Table 2. Salsola paletzkiana Litv. The number of phytometer types of bushes in the field of phytogeny, pieces / 0.5 m2

Options	Papaver pavonium	Poa bulbosa	Bromus tectorum
Phytogenic area	44,2±4,17	20,2±2,0	14,5±1,7
Control	7,2±1,1	18,6±1,6	3,2±0,9

It was observed that the above idea is also evident in the height growth indicators of the phytometer species in the phytogenic area and the control variants (Table 3).

Table 3. Salsola paletzkiana Litv. growth of phytometer species in phytogenous area, cm

Options	Papaver pavonium	Poa bulbosa	Bromus tectorum
Phytogenic area	42,0±0,28	24,0±0,15	28,6±2,1
Control	23,1±1,9	19,8±1,7	16,3±1,9

The high number of plants and rapid growth of phytometer species in Paletsky cherkez phytogenic area compared to the control ensures their accumulation of high phytomass yield (Table 4). The yield of dry phytomass of ephemera and ephemeroids distributed in the phytogenic field was 13.5 centners per hectare, while in the control variant this figure was 5.2 centners. Ephemeral and ephemeroid species are the most valuable plants in terms of nutrition. Therefore, their productivity is one of the decisive factors in providing livestock with pasture food.

Table 4. Salsola paletzkiana Litv. productivity of phytometer species in phytogenic area, centner/ha

Options	Dry mass yield, centner/ha
Phytogenic area	13,5±1,3
In control	5,2±1,7

Conclusions:

1. Paletsky cherze is a promising plant for phytoremediation and productivity improvement of desert pastures in crisis, and can ensure pasture productivity of 18-25 centner/ha in different years.
2. Hay and seeds of Paletsky cherkez are nutritious feed for livestock, its feed contains 19.83-20.35% protein, 2.82-2.96% fat, 14.25-17.24% ash, 42, Contains 21-47.13% nitrogen-free extractives and 15.62-17.43% fiber. 100 kg of Circassian hay contains 33-45 nutritional units, depending on the seasons.
3. Paletsky cherkeze creates a unique phytogenic area in the desert like a saxophone, has a positive effect on the good growth and development of ephemeral and ephemeroid species and creates conditions for their high harvest.

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