



UDC 581.9+582.4

## ECOLOGICAL GROUPS OF DESERT PLANTS IN NUKUS CITY AREA, NORTHWESTERN KYZYLKUM

**Kaipov Kidirbay Pakhretdinovich**

*Doctor of Philosophy in Biological Sciences (PhD), Department of General Biology and Physiology, Karakalpak State University named after Berdakh, Republic of Karakalpakstan*

### ANNOTATION

*The article deals with the main ecological groups of desert plants in the area of the city of Nukus in the Northwestern Kyzylkum. The article presents the results of monitoring the current ecological state of natural biological objects, identified the species diversity of plants, classified and evaluated the tendency of plants to adapt to the environment according to environmental criteria.*

**KEY WORDS:** *ecological group, object, monitoring, species, classification.*

One of the important issues in monitoring of the current ecological status of natural biological objects around the city of Nukus in the North-West Kyzylkum, first of all, is to identify the diversity of plant species that form a major part of the desert ecosystem, classify and assess the tendency of plants to adapt to the environment through ecological criteria.

As a result of scientific research conducted in 2005-2018, there were identified 248 species of tall plants growing in the sandy deserts of Tashkudukkum near the city of Nukus in the Kyzylkum. Their diversity was studied during floristic, ecological and geobotanical expeditions, and the role of promising plant species in strengthening the mobile sands and barchans around various towns and villages of the Republic of Karakalpakstan was proved.

The observations in nature at different times of the year focused on the importance of 71 species of higher plant species dominating different desert biocenoses (or common ecosystems) in the biodiversity formation within the plant species distributed in the region. It was found that these species make up the bulk of the vegetation cover.

The herbarium samples collected during the expeditions were identified in the National Herbarium of Uzbekistan (TASH) of the Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan.

The ecological groups of the dominant species in the vegetation cover of the studied area were determined

depending on the mechanical composition of the soil, the amount of salt in the soil, the moisture content of the soil and the water requirements of the plants. The division of plant species into ecological groups was based on the classifications of P.A.Genkel [3], N.I.Akjigitova [1], I.N.Beydeman [2] and T.Rakhimova [4].

As a result of the analysis, 4 of the 71 plant species common in the Tashkudukkum area around Nukus in the North-West Kyzylkum depend on the mechanical composition of the soil, 5 on the salt content (salt resistance), 5 on the soil moisture level and 4 on the water requirements of the plants were divided into ecological groups (Table 1).

For many years, representatives of each ecological group have adapted to the abiotic environmental factors: soil, water, climate and negative atmospheric air - the extreme heat of the dry summer months and the extreme cold of the winter months in the sandy desert. During the study, it was once again confirmed that as a result of biomorphological variations, plant species in different ecological groups in the desert region change their position through the evolutionary natural laws of the vegetation cover. It has been proved that in different areas of the sandy desert the formation of landscapes with changes in the pedosphere layer goes in different directions.

**Table 1**

**The main ecological groups and economic importance of the dominant species of the flora of Tashkudukkum around the city of Nukus in the North-West Kyzylkum**

No. of types	Dominant species	The main ecological groups				Economic importance
		Depending on the mechanical composition of the soil	Depending on the amount of salt in the soil (salt resistance)	Depending on the moisture level of the soil	Depending on the water requirements of the plants	
1	2	3	4	5	6	7
1.	<i>Bassia hyssopifolia</i>	Halophyte	Eugalophyte	Eukserophyte	Ombrofit	Phytomeliorant, fodder
2.	<i>Kochia prostrata</i>	Halophyte	Eugalophyte	Eukserophyte	Trichophyte	Phytomeliorant, alkaloid
3.	<i>Kalidium capsicum</i>	Halophyte	Hypergalophyte	Poikyloxerophyte	Phreatophyte	Phytomeliorant, essential oil and alkaloid
4.	<i>Halostachys belangeriana</i>	Halophyte	Hypergalophyte	Hemixerophyte	Phreatophyte	Phytomeliorant, poisonous
5.	<i>Salicornia europaea</i>	Halophyte	Hypergalophyte	Eukserophyte	Trichophyte	Phytomeliorant
6.	<i>Horaninovia anoloma</i>	Psammofit	Hemigalophyte	Stypakerofit	Ombrofit	Sand-strengthening, alkaloid
7.	<i>Horaninovia ulicina</i>	Psammofit	Hemigalophyte	Stypakerofit	Ombrofit	Sand-strengthening, alkaloid
8.	<i>Salsola arbuscula</i>	Halophyte	Eugalophyte	Hemixerophyte	Phreatophyte	Phytomeliorant, tannic, dye, alkaloid
9.	<i>Salsola orientalis</i>	Halophyte	Eugalophyte	Eukserophyte	Trichophyte	Phytomeliorant, alkaloid, medicinal, fodder
10.	<i>Salsola paletziana</i>	Halophyte	Eugalophyte	Hemixerophyte	Phreatophyte	Phytomeliorant, medicinal, tannic, fodder
11.	<i>Salsola paulsenii</i>	Halophyte	Eugalophyte	Stypakerofit	Trichophyte	Phytomeliorant, fodder
12.	<i>Salsola richteri</i>	Halophyte	Eugalophyte	Hemixerophyte	Phreatophyte	Phytomeliorant, alkaloid, medicinal, fodder
13.	<i>Haloxylon aphyllum</i>	Halophyte	Eugalophyte	Hemixerophyte	Phreatophyte	Phytomeliorant, alkaloid, fodder
14.	<i>Haloxylon persicum</i>	Psammofit	Halogenoid	Eukserophyte	Trichophyte	Sand-strengthening, tannic, fodder
15.	<i>Halimocnemis karelinii</i>	Halophyte	Halogenoid	Stypakerofit	Ombrofit	Phytomeliorant, fodder
16.	<i>Gamanthus</i>	Halophyte	Halogenoid	Eukserophyte	Ombrofit	Phytomeliorant,



	<i>gamocarpus</i>					fodder
17.	<i>Climacoptera lanata</i>	Halophyte	Hypergalophyte	Eukserophyte	Trichophyte	Phytomeliorant
18.	<i>Suaeda acuminata</i>	Halophyte	Hypergalophyte	Eukserophyte	Trichophyte	Phytomeliorant
19.	<i>Suaeda microphylla</i>	Halophyte	Eugalophyte	Hemixerophyte	Phreatophyte	Phytomeliorant, medicinal, fodder
20.	<i>Atraphaxis spinosa</i>	Гипсофит	Hemigalophyte	Eukserophyte	Trichophyte	Tannic, honey-like, fodder
21.	<i>Calligonum acanthopterum</i>	Psammofit	Halogenoid	Eukserophyte	Trichophyte	Sand-strengthening, tannic, fodder
22.	<i>Calligonum aphyllum</i>	Psammofit	Halogenoid	Eukserophyte	Trichophyte	Sand-strengthening, tannic, fodder
23.	<i>Calligonum aralense</i>	Psammofit	Halogenoid	Eukserophyte	Trichophyte	Sand-strengthening, tannic, fodder
24.	<i>Calligonum caput-medusae</i>	Psammofit	Halogenoid	Eukserophyte	Trichophyte	Sand-strengthening, tannic, fodder
25.	<i>Calligonum leucocladum</i>	Psammofit	Halogenoid	Eukserophyte	Trichophyte	Sand-strengthening, tannic, fodder
26.	<i>Limonium gmelini</i>	Halophyte	Crinogalophyte	Eukserophyte	Trichophyte	Phytomeliorant, dye, tannic, medicinal, fodder
27.	<i>Limonium otolepis</i>	Halophyte	Eugalophyte	Stypakerofit	Trichophyte	Phytomeliorant, dye, tannic, medicinal, fodder
28.	<i>Tamarix elongate</i>	Halophyte	Eugalophyte	Hemixerophyte	Phreatophyte	Phytomeliorant, medicinal, dye, tannic, essential oil, honey, fodder
29.	<i>Tamarix ramosissima</i>	Halophyte	Eugalophyte	Hemixerophyte	Phreatophyte	Phytomeliorant, medicinal, dye, tannic, essential oil, honey, fodder
30.	<i>Capparis spinosa</i>	Гипсофит	Hemigalophyte	Eukserophyte	Trichophyte	Tannic, honey-like, fodder
31.	<i>Descurainia sophia</i>	Halophyte	Halogenoid	Refugio-xerophyte	Ombrofit	Medicinal, fodder
32.	<i>Strigosella scorpioides</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Fodder
33.	<i>Strigosella turkestanica</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Fodder
34.	<i>Leptaleum filifolium</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Fodder
35.	<i>Lepidium perfoliatum</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Fodder
36.	<i>Chrozophora</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Fodder



	<i>sabulosa</i>					
37.	<i>Euphorbia densa</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Fodder
38.	<i>Ammodendron conollyi</i>	Psammofit	Halogenoid	Eukserophyte	Trichophyte	Sand-strengthening, medicinal, dye, tannic, essential oil, honey, fodder
39.	<i>Smirnowia turkestanica</i>	Psammofit	Halogenoid	Eukserophyte	Trichophyte	Sand-strengthening, medicinal, fodder
40.	<i>Astragalus ammodendron</i>	Psammofit	Halogenoid	Eukserophyte	Trichophyte	Medicinal, fodder
41.	<i>Astragalus lehmannianus</i>	Psammofit	Halogenoid	Eukserophyte	Trichophyte	Medicinal, fodder
42.	<i>Astragalus villosissimus</i>	Gypsum	Hemigalophyte	Eukserophyte	Trichophyte	Sand-strengthening, medicinal, dye, alkaloid, fodder
43.	<i>Alhagi pseudalhagi</i>	Psammofit	Hemigalophyte	Hemixerophyte	Phreatophyte	Medicinal, dye, tannic, essential oil, greasy, honey, fodder
44.	<i>Melilotis albus</i>	Psammofit	Hemigalophyte	Hemixerophyte	Phreatophyte	Medicinal, dye, tannic, essential oil, fodder
45.	<i>Haplophyllum bungei</i>	Psammofit	Hemigalophyte	Hemixerophyte	Phreatophyte	Medicinal, dye, tannic, essential oil, fodder
46.	<i>Zygophyllum oxianum</i>	Psammofit	Hemigalophyte	Hemixerophyte	Phreatophyte	Medicinal, dye, tannic, essential oil, fodder
47.	<i>Peganum harmala</i>	Gypsum	Hemigalophyte	Hemixerophyte	Trichophyte	Medicinal, greasy, dye, alkaloid
48.	<i>Nitraria schoberi</i>	Halophyte	Crinogalophyte	Hemixerophyte	Trichophyte	Phytomeliorant, medicinal, alkaloid, dye
49.	<i>Psammogeton foetida</i>	Psammofit	Hemigalophyte	Hemixerophyte	Phreatophyte	Medicinal, dye, tannic, essential oil, fodder
50.	<i>Ferula karelinii</i>	Psammofit	Hemigalophyte	Hemixerophyte	Phreatophyte	Medicinal, dye, tannic, essential oil, fodder
51.	<i>Karelinia caspia</i>	Halophyte	Hemigalophyte	Poikyloxerophyte	Trichophyte	Phytomeliorant, alkaloid, dye, fodder
52.	<i>Artemisia diffusa</i>	Psammofit	Halogenoid	Poikyloxerophyte	Ombrofit	Sand-strengthening, medicinal, essential oil, coumarin, fodder
53.	<i>Artemisia scoparia</i>	Psammofit	Halogenoid	Poikyloxerophyte	Ombrofit	Sand-strengthening, medicinal, essential



						oil, coumarin, fodder
54.	<i>Artemisia terrae-albae</i>	Psammofit	Halogenoid	Poikylxerophyte	Ombrofit	Sand-strengthening, medicinal, essential oil, alkaloid, fodder
55.	<i>Cousinia dichotoma</i>	Psammofit	Halogenoid	Poikylxerophyte	Ombrofit	Sand-strengthening, medicinal, essential oil, alkaloid, fodder
56.	<i>Lycium ruthenicum</i>	Halophyte	Crinogalophyte	Hemixerophyte	Trichophyte	Phytomeliorant, medicinal, alkaloid, dye, fodder
57.	<i>Convolvulus divaricatus</i>	Gypsum	Hemigalophyte	Poikylxerophyte	Ombrofit	Medicinal, alkaloid, fodder
58.	<i>Convolvulus erinaceum</i>	Gypsum	Hemigalophyte	Poikylxerophyte	Ombrofit	Medicinal, alkaloid, fodder
59.	<i>Heliotropium arguzioides</i>	Psammofit	Halogenoid	Poikylxerophyte	Ombrofit	Sand-strengthening, medicinal, alkaloid, fodder
60.	<i>Arnebia decumbens</i>	Psammofit	Halogenoid	Poikylxerophyte	Ombrofit	Sand-strengthening, medicinal, alkaloid, fodder
61.	<i>Nonnea caspica</i>	Psammofit	Halogenoid	Poikylxerophyte	Ombrofit	Sand-strengthening, medicinal, alkaloid, fodder
62.	<i>Allium sabulosum</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Fodder
63.	<i>Carex pachystylis</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Sand-strengthening, fodder
64.	<i>Carex physodes</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Sand-strengthening, fodder
65.	<i>Stipagrostis karelinii</i>	Psammofit	Hemigalophyte	Refugio-xerophyte	Ombrofit	Sand-strengthening, fodder
66.	<i>Stipagrostis pennata</i>	Psammofit	Hemigalophyte	Refugio-xerophyte	Ombrofit	Sand-strengthening, medicinal, fodder
67.	<i>Poa bulbosa</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Sand-strengthening, fodder
68.	<i>Anisantha tectorum</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Sand-strengthening, fodder
69.	<i>Eremopyrum buonapartis</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Sand-strengthening, fodder
70.	<i>Eremopyrum orientale</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Sand-strengthening, fodder
71.	<i>Eremopyrum triticeum</i>	Psammofit	Halogenoid	Refugio-xerophyte	Ombrofit	Sand-strengthening, fodder



In summary, most of the plants distributed in the Tashkudukkum area are species adapted to grow in sandy and saline soils. These plants allow the selection of promising species in the development of degraded soils, phytomelioration and strengthening of mobile sands and barkhans.

## REFERENCES

1. Akzhigitova N.I. *Halophilic vegetation of Central Asia and its indicative properties*. Tashkent: Fan. 1982. pp. 10-192.
2. Beydeman I.N. *Handbook of water consumption by plants in the natural areas of the USSR*. Novosibirsk: Science. 1983, pp. 12-257.
3. Genkel P.A. *The physiology of heat and drought resistance of plants*. Moscow: Science. 1982. pp. 200-278.
4. Rakhimova T. *Ecology of plants of the Adyr zone of Uzbekistan. Part 2*. pp. 14-196.