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Research Results on the State of Pastures in Southern Uzbekistan

Uktam Khujanazarov[1], Ibrohim T. Azimov[2], Madina A. Qalandarova[3], Bahromjon I. Nazarov[4], Risolat B. Norbobayeva[5]

[1]*Doctor of Biological Sciences, Head of the Department of Botany and Ecology, Tashkent State Pedagogical University named after Nizami, Tashkent, Uzbekistan.*

[2]*Doctor of Philosophy in Biological Sciences (Ph.D.) Associate Professor of the Department of Biology Teaching Methodology, Tashkent State Pedagogical University named after Nizami, Tashkent, Uzbekistan.*

[3,5]*Doctor of Philosophy in Biological Sciences (Ph.D.), Associate professor of the Department of Biology Teaching Methodology, Tashkent State Pedagogical University named after Nizami, Tashkent, Uzbekistan.*

[4]*Researcher of the Department of Biology Teaching Methodology, Tashkent State Pedagogical University named after Nizami, Tashkent, Uzbekistan.*

Abstract: This paper involves the development of land in the Kashkadarya basin, the development of the mining industry, and the expansion of the cattle breeding network and the transformation of the area's pastures. In this regard, the information given in the above literature sources on the structure and composition of pastures cannot reflect the modern state of pastures in the mountain and sub-mountain regions of the Kashkadarya basin. In this case, it is important to inventory the pastures of the area, to determine the topo-typological structure, and to develop effective measures for the protection of pasture species. As a result of human development, the influence of anthropogenic factors on nature is increasing. This has resulted in the extinction of species or populations. This has become more noticeable in recent years. Due to the economic and social activities of people, the increase of anthropogenic pressure, the destruction of the habitats of species, the loss of local populations, irregular grazing of livestock, and the improper use of useful properties of plants have irreversible consequences.

Keywords: *Pasture, Factors, Influence, Pressure, Formation, Landscape, Life Form, Flora, Endemic Species.*

Actuality: Kashkadarya region includes the Karshi depression in southern Uzbekistan, bordered in the north by the mountains of Koratepa, Zirabulok, and Ziyevuddin; in the east – by the foothills of the southwestern part of the Gisar ridge (Kashkadarya Region 1959). As a result of the study, we analyzed the plant species of mountain pastures and determined the current state of pastures in the Kashkadarya Basin (Dias & Barreiros 2018, Lebedev et al. 2018). One of the leading branches of agriculture is animal husbandry, and it is important to conduct a scientific, practical study, assessment of the material source of its development – natural food (source of hay) – pasture types (Galnaityte & Krisciukaitiene 2017). This work was arisen in the process of implementation and the requirements of economic development; subsequently, the requirements of the national economy, and is one of the urgent tasks of modern science and technology. The types of pastures – natural territorial complexes with similar climate, soil, productivity (fertility), the time of year, when cattle are grazed and types are determined by the edificatory types of plant families. There is a need to determine their ecological status: structure, composition,

productivity (fertility), and degree of damage (degradation, transformation), types of damage factors (damage), and other quantitative and qualitative indicators (Sukhova et al. 2018). The foothill pastures of the Kashkadarya Basin are one of the main bases for the development of animal husbandry, in recent years the productivity (fertility) of which is reduced under the influence of metrological factors (Khuzhanazarov 2012, Poškus et al. 2018) [10, 11]. In the world, much attention is being paid to modern floristic research, that is, to the composition of local flora, features of endemism, rare species, natural areas whose area is shrinking, and the patterns of formation of the composition of endemic flora, which is in crisis under the influence of anthropogenic factors [1]. In particular, endemic species have a changing composition formed in harmony with anthropogenic factors. The flora of South Uzbekistan (the flora of the mountain and sub-mountain pastures of the Kashkadarya Basin) is formed on the basis of the combination of natural and cultivated environmental phytocenoses. This, in turn, makes it possible to study changes in the structure of the flora of natural and human-made areas, and the laws of their formation. In recent years, the reduction of the area of natural landscapes, rare and endemic species and the transformation of species in South Uzbekistan is connected with the carrying out of various excavation works in the regions and the increase of socio-economic relations. From this point of view, determining the distribution of local rare and endemic species through a deep inventory of the composition of the flora is considered one of the urgent tasks. Inventorying the composition of the flora of South Uzbekistan, substantiating the unique characteristics of the flora, creating distribution maps of rare species developing protection measures, and evaluating the dynamic state of the process of anthropogenic factors affecting plants is of scientific and practical importance.

1. Introduction

Scientists of N.T. Nechaeva (1958, 1962), L.P. Sinkovsky (1959), I.F. Momotov (1962), V.A. Burygin, L.E. Markova (1975), R.S. Wernick, T. Rakhimova (1982), O.Kh. Hasanov and T. Rakhimova (1996, 2000, 2003, 2006), Z.Sh. Shamsutdinov (2015), such as H.F. Shomurodov (2018) conducted research on the assessment of the state of pastures and their restoration in various natural regions of Central Asia. Information on the flora, phytocenotic structure, and ecology of the pastures of the mountainous and mountainous areas of the Kashkadarya basin was described in the works of V.A. Komarov (1891-1893), B.A. Fedchenko (1913), M.G. Popov (1925), S.N. Kudryashov (1941, 1950), E.P. Korovin (1934, 1956, 1962), K.Z. Zakirov (1955), I.I. Granitov, A.D. Pyataeva (1956, 1959), I.F. Momotov, A.D. Lee (1965), A.N. Babushkin (1964), E.M. Demurina (1975), S.M. Mustafaev (1966), U.Allanazarova (1969), A.Z. Genusov (1972), O.Kh. Khasanov (1972), N.I. Akzhigitova (1976), R.V. Kamelin (1979), E. Ashurov (1988), T. Norbobaeva (1990), T.V. Ovchinnikova (1995), F.Kh. Dzhangurazov (1965), B.E. Khojamkulov (1998), F. Khasanov (2013, 2014) and reflected in the research works of others. In recent years, the development of land in the Kashkadarya basin, the development of the mining industry, and the expansion of the cattle breeding network have caused the transformation of the area's pastures. In this regard, the information given in the above literature sources on the structure and composition of pastures cannot reflect the modern state of pastures in the mountain and sub-mountain regions of the Kashkadarya basin. In this case, it is important to inventory the pastures of the area, to determine the topo-typological structure, and to develop effective measures for the protection of pasture species. As a result of human development, the influence of anthropogenic factors on nature is increasing. This has resulted in the extinction of species or populations. This has become more noticeable in recent years. Due to the economic and social activities of people, the increase of anthropogenic pressure, the destruction of the

habitats of species, the loss of local populations, irregular grazing of livestock, and the improper use of useful properties of plants have irreversible consequences.

2. Material and Methods

The area of research is situated in the western spurs of the Hissar ridge located in the south of Guzar town and Dehkanabad village, on the left bank of the Kichik Uradarya River and in Tarkapchigay River basin. This territory has been defined as the Tarkapchigay phytogeographical region of the Western Hissar district of the Central Asian Mountain Province (Tojibaev et al. 2016). The territory belongs to the temperate climatic zone. The climate is dry, continental with long, hot and dry summer season; the winter season is short with mild frosts and little snow. The average annual temperature is 13–14˚C, the average temperature of January is 0 –2˚C, average temperature of the July is 26 –28˚C, the annual precipitation is 400 – 600 mm (Kashkadarya Region 1959, Williams & Konovalov 2008). Field research was performed during June of 2016 year by traditional phytosociological methods with description of plant associations, collection of herbarium specimens and photographing of surveyed plots (Mirkin et al. 2000). Demographic structure of populations was studied in accordance with T.A. Rabotnov (1950), A.A. Uranov (1975), L.A. Zhukova and E.V. Shestakova (1997). A.A. Uranov (1975) studied the age indexes. The ontogenetic structure of coenopopulations in the different ecological and phytocenotical conditions was determined by the transect method (Glotov 1998, Silbernagel 2018) [2,3].

3. Results

As part of the study in the Zeravshan mountain ranges (upper part of the Kashkadarya Basin), two coenotic populations of E. robustus were studied under different ecological and phytocenotic conditions (Figure 1). The first coenopopulation of the species is distinguished on the northwestern slopes of the Zeravshan mountain ranges (Takhta-Karacha Pass) along the bourn as part of the different herbaceous-wormwood-hawthorn community on typical serozem (Figure 2). The geographic coordinates of the coenopopulation are: N. 39.30125’E.066.89365’. The total projective cover of the grass stand is 70%. At the same time, the density of individuals of the studied species is low and barely reaches to 2%. The practical use of pastures is primarily focused on monitoring fodder yield, that is, cartographic data gives good results. Field work is carried out through principled methodical schemes to determine the fodder productivity of mountain pastures during the year in the spring. They are drawing up a pasture card as a benchmark describing the average productivity indicators of many years; carrying out surface field inspections for control in the most important grazing areas; annual inspections for the use of pastures as fodder and grazing of livestock. The map of upland pastures of the Kashkadarya basin serves as a standard for monitoring the ecological condition of fodder plants and when to feed livestock [5,6]. The results of the field research conducted on the inventory of pastures carried out in Chirakchi, Kitab, Dehkanabad districts show that because of monitoring the dynamic state of pasture plant cover, it was found that the pasture areas have expanded over the last 15 years. Pasture areas increased from 1321625 to 1408358 from 1998 to 2017. However, the cultivated pastures occupy the main place in Guzor and Dehkanabad districts. During one year, the area of open land increases by 10,000 hectares due to unplanned grazing of livestock. It was found that the following weeds are growing in all communities in the fields discovered in the adyr region: Acroptilon repens, Verbascum songoricum, Cichorium intybys, Artemisia scoparia, Turgenia latifolia, Vexibia pachycarpa, Rlantago lanceolata, Dodartia orientalis, Lactuca scariola, Convolvulus arvensis, Alhagi pseudalhagi, A. sporsifolia, Carthamnus

oxyacanthus. In the composition of degraded many pastures (farm, village, well, land near the road), the bushes of more edifice species (Acroptilon repens, Poa bulbosae, Aegilops cylindrica) coincided with the senile-senescence period and formed regressive conditions. Reproduction from seeds was almost never found in them [4]. We paid attention to the ecological-morphological features of plants on the determining the distribution of plants. It is mainly noted that ecomorphs (life forms according to their habitat) adapt to different ecotopes (space). The main leading factor (indicator) is moisture, the nature of which depends on: height stages, surface structure (relief), exposure and mountain slopes, soil type and its mechanical composition. Therefore, the main attitude of the species to moisture is taken into account in the ecological collection of plants [26,27,28,29,30,31,32,33,34,35,36,37]. However, some eurythermal plants are an exception. Because of the analysis of the flora in the studied area, it was defined that the most dominant ecological-morphological groups are xerophytic mesophytes. Agropyron trichophorum, Artemisia turanica, A. tenuisecta, Alhagi pseudalhagi, A.canescens, Psoralea druppaceae, Sentaura squarossa and others species are widespread among them. Mesophytes are mainly plant species that are more adapted to moderate humidity and average temperature, most of which are ephemeral and ephemeroides. They are mainly widespread on the hills and ones are the main fodder base in the spring. The most spread of these are: Carex pachystilis, Poa bulbosae, Vulpia heredity, Bromus oxydon, Taeniaterum critinum, Cryptospora falcate, Strigosella scorpioides, Romeria refracta and others. Some of the ecological groups are wide distributed on the banks of rivers, streams and ditches, and continue to grow in spring, summer and autumn such as Trifolium repens, Equisetum arvense, E. ramosissimum, Poa pratensis and others. Many of them are typical of the boreal flora, they are grown in all regions of the country and do not occupy a wide area. Hygromesophytes are moderately ecomorphic and ones are a complex of hygrophytes and mesophytes. This group is also more grown in humid areas, such as Phragmites australis, Carex stenophulloides, Cyperus rotundus and others. Halophytes grow in saline soils, and salinization is rare in the adyr and mountain height stages. Salsola scleranta, Girgensohnia oppositiflora, Halocharis hispida and others are found in saline soil communities in adyr pastures [9]. The development of industries and agriculture and the large scale use of natural areas are leading to a violation of the ecological balance. As a result, there is a risk of plant decline. This leads to decrease in the gene pool in the plant world. The extinction of any species leads to irreversible consequences, and therefore wild plants play a major role as a source in the establishment of cultivated plants in agriculture [12,13,14,15,16,17,18,19,20,21,22,23,24,25] According to the conducted scientific researches and the analysis of the data obtained from scientific sources, it was found that 371 species belonging to 60 families and 232 genera can be found in the area. Also, in terms of the number of species, the first place is Poaceae, the second place is Asteraceae, and the third place is Fabaceae. The large number of species of the leading families (Poaceae, Asteraceae, Fabaceae) and families (Astragalus, Gagea) corresponds to the flora of the mountain and sub-mountain regions of Central Asia (Table 1.1, Figures 1.1, 1.2).

Table 1.1 The leading families and genera of plants distributed in the mountain pastures of the Kashkadarya basin

No.	Families	Number of genera	%	Number of species	%	Genera	Number	%
1	Poaceae	39	26	63	25,61	Astragalus	21	31,34
2	Asteraceae	23	15,34	33	13,41	Gagea	8	11,94
3	Fabaceae	17	11,33	45	18,30	Hordeum	6	8,96
4	Boraginaceae	17	11,33	22	8,94	Bromus	6	8,96
5	Apiaceae	15	10	16	6,50	Artemisia	5	7,46
6	Caryophyllaceae	12	8	23	9,35	Aegilops	5	7,46
7	Lamiaceae	9	6	15	6,10	Convolvulus	4	5,97
8	Brassicaceae	8	5,34	9	3,66	Delphinium	4	5,97
9	Liliaceae	5	3,33	12	4,88	Polygonum	4	5,97
10	Rosaceae	5	3,33	8	3,25	Allium	4	5,97
Total		**150**	**100**	**246**	**100**	**Total**	**67**	**100**

A simplified version of I. G. Serebryakov's classification was used in the analysis of life forms of plants distributed in the mountain pastures of the Kashkadarya basin (Table 1.2)

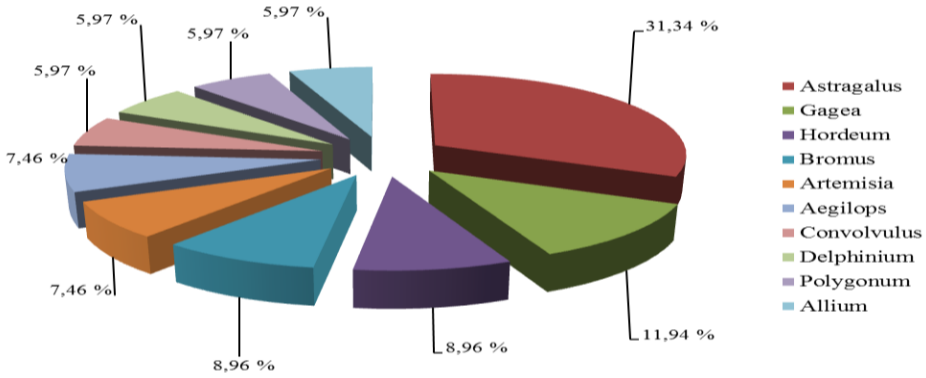

Figure 1.1. The number of leading families of plants distributed in the mountain pastures of the Kashkadarya basin.

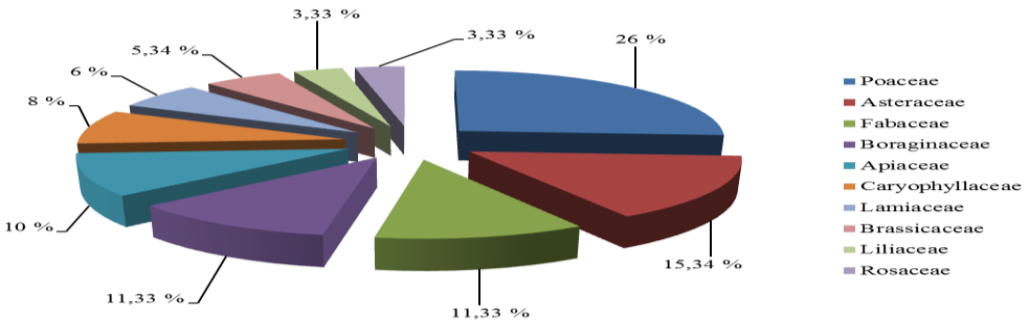

Figure 1.2. The number of leading genera of plants distributed in the mountain pastures of the Kashkadarya basin

Table 1.2 Life forms of plants distributed in the highland pastures of the Kashkadarya basin

No.	Life forms	Number of species	By %
1	Trees	7	1,89
2	Bush	14	3,77
3	Semi-shrubs	7	1,89
4	Shrub	2	0,54
5	Semi-bushes	5	1,35
6	Many years	176	47,44
7	Biennials	13	3,50
8	Annuals	142	38,27
9	1 year or 2 years	5	1,35
	Total	**371**	**100**

Of the 371 existing plant species: trees - 7, shrubs - 14, semi-shrubs - 7, shrubs - 2, semi-shrubs - 5, 1-2 annuals - 5, perennials - 176, biennials - 13, annuals - 142. The tree life forms mainly belong to the Salicaceae and Rosaceae family and form tukai and adir trees. The large number of perennial and annual grasses in the vegetation cover (318) is characteristic of the mountainous regions of Central Asia. This indicates that they are similar to the flora of the eastern part of the Mediterranean. The flora of the basin is the elemental flora characteristic of the Afghan-Turkistan province, and its florogenesis has developed on the basis of autochthonous and allochthonous (local) trends [7]. The presence of endemic and rare species in the flora of the upland areas of the Kashkadarya basin indicates that they have a unique history of development and that some species are at risk of diminishing and disappearing under the influence of anthropogenic factors. Biomorphological collection (spectrum) of the flora of the studied area allows to evaluate their position in terms of quantity and quality. In this case, the classification of I.G Serebryakov (1962) (according to appearance (habitus) and type of vein) was taken as a basis [8]. Comparative indicators of the geomorphological structure of the flora of the region indicate

that its climatic conditions are dry and continental. This shows its closeness to the typical ancient Mediterranean flora. It is known that the ecological composition of the flora mainly depends on the external environment and soil type. The more complex the environment, the more diverse the life forms of plants. Analyzing the vital form (form) of plants leads to connecting the problem (genesis) of its historical development. In addition, the study of the ecological composition of plants reveals one aspect of its historical development.

4. Conclusion

In conclusion, it can be said that it is the patriotic duty of every citizen to preserve the range of rare and endemic species with their historical evolution in natural ecosystems and to maintain their population density at an average level. Because, in nature, the decrease in the number of a species and ultimately the increase in the level of extinction leads to the reduction of its gene pool. This is an irreparable mistake for the next generation.

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