FIELD RESEARCH ON PASTURE VEGETATION IN SOUTH UZBEKISTAN (IN KASHKADARYA REGION PARTS)

Uktam Khujanazarov[1] Gulrukhsor Ergasheva [2] Gulbakhor Akbarova[3]

[1] Doctor of Biological Sciences, Head of the Department of Botany and Ecology, Tashkent State Pedagogical University named after Nizami, E-mail: khuzhanazarov74@mail.ru Tashkent, Uzbekistan.

[2] DSc, professor of the Department of Biology teaching methodology, Tashkent State Pedagogical University named after Nizami, Tashkent, Uzbekistan.

[3] PhD, associate professor of the Department of Biology Teaching Methodology, Tashkent State Pedagogical University named after Nizami, Tashkent, Uzbekistan.

[1] https://orcid.org/0000-0003-2452-2375

[2] https://orcid.org/0009-0007-6497-8365

[3] https://orcid.org/0000-0002-7688-1057

DOI: https://doi.org/10.63001/tbs.2024.v19.i02.S.I(1).pp62-66

KEYWORDS
Livestock, pasture, dominant, agrophytocenoses, phytomeliorants, weeds, communities, shrubs.
Received on:
25-07-2024
Accepted on:
09-11-2024

ABSTRACT

This paper involves the practical use of pastures in the Kashkadarya region. Therefore, the data on cartographic and monitoring fodder yield were given. To determine the fodder productivity of the foothill pastures during the year in the spring is carried out in the fieldwork through principled methodological schemes: drawing up a pasture card as a standard 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.

INTRODUCTION

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, and assessment of the material source of its development – natural food (source of hay) – pasture types (Galnaityte & Krisciukaitiene 2017). This work has 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 [7,8,9,10,11,12,13,14,15,16,17,18,19,20]. 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), degree of damage (degradation, transformation), types of damage factors (damage), and other quantitative and qualitative indicators (Sukhova et al. 2018) [39,40,41,42,43,44,45]. 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) has been reduced under the influence of metrological factors (Khuzhanazarov 2012, Poškus et al. 2018) [5, 6].

Pasture plants play an important role in the development of animal husbandry. Uzbek scientists carried out the scientific basis and methodology for increasing the productivity of natural forage grasses in the desert conditions of Central Asia through the study of the biology and ecology of natural pasture plants. Active research on pasture improvement in the mountainous and foothill areas of the Kashkadarya basin was carried out through the planting of valuable fodder crops [21,22,23,24,215,26,27,28,29,30,31,32,]. Recommendation had also developed to ensure the sustainability and protection of pastures. A list of dominant plants where are grown in Kashkadarya basin has been compiled and data on the scientific basis for the creation of high-yielding agrophytocenoses have been collected, focusing on the biological properties of phytomeliorants and soil factors [33,34,35,36,37,38]. However, the uniqueness and richness of the flora of the foothills of Kashkadarya basin, its forage, usefulness, medicinal value, rarity, aesthetics and economic significance are important [2].

The practical use of pastures is primarily focused on monitoring fodder yield, that is, cartographic data gives good results. To determine the fodder productivity of the foothill pastures during the year in the spring, it is carried out in the field work through principled methodological schemes: drawing up a pasture card as a standard 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 foothill pastures of the Kashkadarya basin serves as a standard for monitoring the ecological condition of fodder plants and when to graze livestock.

The results of the field research conducted on the inventory of pastures carried out in Chirakchi, Kitab, and Dehkanabad districts show that as a result of monitoring the dynamic state of pasture vegetation, it was found that the pasture areas have expanded over the past 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.

The following weeds were found to increase in all communities in the Adir 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.

Bushes of more edifying species in the pastures that appeared in many areas (fields, villages, wells, lands near the road) corresponded to the senile-senescence period and formed regressive conditions. Reproduction from seeds was almost never found in them.

Such plant communities formed more transformed areas and were shown on the map with conventional symbols.

In order to prevent and reduce the breeding process, it is necessary not to increase the number of livestock and to alternate use of pasture land. According to experts, 1 of livestock should be grazed on 4 ha during the year, while currently 4 of livestock are grazed on 1 ha.

METHODOLOGY.

The object of the study consists of plant communities (floristic and phytocenotic composition) in the foothills and mountains of Kashkadarya basin. In other words, Kashkadarya basin is a foothill and mountain pasture with I - weak, II - moderate, III - strong and IV - very strong levels of vegetation. The work reflects the route field research conducted from 2012 to 2019, as well as the materials of expeditions conducted with the researchers of the Institute of Botany. The geobotanical units of plant communities determine the content of natural pastures. For this reason, the classification, structure, composition, geobotanical studies of all-natural pasture vegetation cover is determined. Pasture type is the main unit of the pasture determined by the edificatory (dominant type) type of vegetation cover. This unit is the main pasture unit in the development of agricultural animal husbandry. All research in the study area is based on geobotanical manuals: “Field Botany” (1972); B.A. Bikov’s “Methodical development” (1957, 1978); V.B. Sochava’s “Geobotanical cartography” (1972); D.D. Vishivkin’s “Geobotanical cartography” (1977), G.N. Harin’s “Distance methods of studying plants” (1980). Productivity of pasture types was determined by “Guidelines for geobotanical researches of natural forage lands of Uzbekistan” (1980). Geobotanical description of plants according to the method of A.P. Shennikov (1964) was carried out on the structure of the surface phytomass, species composition, and productivity indicators in the degraded areas. Also, an approximate estimate of species abundance was conducted on the Drude scale (Drude, 1913). The condition of pasture digression was analyzed by the method of Chogniy (1977) [2].

The main sources of statistical analysis of the foothill pasture of the Kashkadarya basin are the “Flora of Uzbekistan” and “The determinant of plants in Central Asia”. The first edition of “Flora of Uzbekistan” in 6 volumes was published in 1941-1961. 3666 species of vascular plants, belonging to 1153 genera and 125 families were included in this revision. About 500 species of cultivated and introduced species were listed in this edition as well. Since 1969-1991 a large team of former Soviet Union, botanists published the “Conspectus Florae Asiae Mediae” with about 9000 species (in 10 volumes). The area of this revision includes five republics (Uzbekistan, Turkmenistan, Kazakhstan, Kyrgyzstan, and Tadzhikistan). Starting from 2012, Uzbek

botanists have been working on the new 2 edition of "Flora of Uzbekistan" planned e-flora on the Internet. Still, new species are found and described every year in this area. Nowadays there are about 4500 species naturally growing here. The first edition of the Red Data Book of Uzbekistan was published in 1984 with 124 species. In 2009, 4 th edition was published with 321 species of vascular plants. Amount of disappeared species increased from 4 to 18 [3].

RESULTS.

The structure (relief) of the land surface in the mountain is complex, and many factors affect to the distribution of shrubs and trees. Above sea level, mountain slopes, geology, erosion rate, mechanical composition of the soil, humidity, and temperature indicators form communities of different densities under the influence of the external environment. Therefore, in the studied area, trees and shrubs are more common as a unit, a complex. *Acer pubescens, Amygdalus bucharica, A.spinosissima, Berberis oblongo, Crataegus pontica, C.turkestanica, Cerasus erythrocarpa, Ephedra equisetina,* and *E.intermedia* are widespread in mountain ranges.

It is necessary to strengthen the protection measures of mountain pastures and to mark the current state of pastures every year. In this process, we should confirm the ecological education among the people who live near the mountain and foothills; to protect medicinal and endemic plant communities is essential, medicinal plants such as cadonopsis, zizifora, ferula, and others are material for the pharmacy industry. Among the leading families in the floristic spectrum that we studied in the mountains and foothills, we can count such plant families: Asteraceae - 92 species, Fabaceae - 71 species, Poaceae - 45, Lamiaceae - 35, Brassicaceae - 35, Rosaceae - 33, Apiaceae - 32, Liliaceae - 31, Boraginaceae – 25. They are not only leaders in plant communities but also play an important role in building associations, some of them are used as fodder reserves [4].

The following plant species were studied for the improvement of foothill pastures: 6 species of shrubs, 2 species of semi-shrubs, and 1 grass. From the bushes - *Haloxylon aphyllum*, *Haloxylon persicum*, *Salsola richteri* Karel. and *Salsola rigida* Pall., *A. turanica* from young bushes, astragalus (*Astragalus filicaulis*) from herbaceous plants. In natural conditions, these plants grow slowly, in culture, the vegetative period is shortened, the formation of underground organs is accelerated, and fruiting begins early.

Planting of phytomeliorants begins in early spring, the average daily temperature should be around 5°C. When the surface layer of the soil is at a temperature of 10-150C, it starts to sprout for 10 days. After sprouts appear, their underground organs also actively develop. In three months, the height of different types of phytomelionates in the above-ground part reaches 33-48 cm, and in the spring it reaches 84 cm. In this growth, the roots deepen to 130-180 cm. As the root system deepens, its tolerance to dry and hot temperatures increases.

With the arrival of summer, underground growth slows down, and summer-autumn deep rooting is 0.50-0.92 cm/day. In the white saxavull, this indicator is -0.34 cm/day. At the end of the first year, the total root depth reaches 212-265 cm. Planting these crops in unfavorable weather conditions does not give good results. Grass plants planted in foothills cannot survive these periods. It is not recommended to plant seeds in early spring when the depth of soil moisture is below 60 cm. Germination is satisfactory if the soil has a depth of moisture in the range of 60-100 cm.

For planting, the soil should be plowed to a depth of 18-20 cm. The row width should be 10 m. Planting is carried out in early spring when the average temperature is 5°C. The norm for planting bushes and large grasses is 5-10 kg/ha and for young bushes -0.5 kg/ha. The seeds of bushes are planted at a depth of -1-2 cm, for young bushes they are planted at a depth of -0.5 cm.

Three-year agrophytocenoses provide significant fodder mass. The productivity of black saxaul is 10.5 t/ha, white saxaul - 6.4, black cherkez - 6.9, Richter cherkez - 11.7 t/ha. The productivity of agrophytocenoses is 1.5-3 times higher than that of natural pastures. In the future, the indicator will increase by 3-5 times [1; -227 c.].

CONCLUSION

Strengthening the legal basis of forest protection in the mountain and sub-mountain pastures of Kashkadarya, development of beneficial socio-economic forestry, and expansion of the share of the private sector in forestry are considered indicators that will be given special attention and implemented today, and require the development of a plan of measures in time. In addition, the development of ecological optimization measures on indicators such as preventing the reduction of mountain forests, regulating the livestock feeding system, and regulating irrigation and dry farming plays an important role in improving the efficiency of pasture restoration.

REFERENCES

- Nechaeva N.T., Prikhodko S.Ya. 1. Nechaeva N.T., Prikhodko S.Ya. Artificial winter pastures in the foothill deserts of Central Asia (Experience in creating artificial phytocenoses). – Ashgabat, 1966. – 227 p.
- Khujanazarov U.E., Islomov I.N. Monitoring Of Foothill And Mountain Pasture Plants Of Kashkadarya Basin. Journal of Critical Reviews ISSN- 2394-5125 Vol. 7, Issue 13, 2020. – Pp.740-743
- Khujanazarov U.E., Yu-Mi Lee, Sadinov J.S. A Transformation of Foothills of South Uzbekistan (In The Sample of Kashkadarya Basin). International Journal of Scientific and Research Publications, Volume 9, Issue 4, April 2019. ISSN 2250-3153 DOI: 10.29322/IJSRP.9.04.2019. p.8823 http://dx.doi.org/10.29322/IJSRP.9.04.2019.p.8823
- Khujanazarov U., Saidmuratov Sh., Abdurizayeva S. Ecological Position Of Mountain And Foothill Plant Communities In South Western Parts Of Zerafshan Mountain. Scientific-Discussion № 44, (2020), Section Of Biology And Environmental Sciences. – Pp.3-8.
- Khujanazarov, U., Shomurodov, H., Mirkhamidova, P., Alimova, R. Current state of Cenopopulations *Iris Magnifica* Vved and *Tulipa Fosteriana* W.Irving in Uzbekistan. E3S Web of Conferences, 2021, 244, 02027
- Khujanazarov, U.E., Shomuradov, H., Afonina, E.A. Modern condition of coenopopulation of *Eremurus robustus* Regel (Xanthorrhoeaceae) in Kashkadarya basin, Uzbekistan. Asia Life Sciences, 2019, (1), pp. 1–9.
- Uktam E. Khujanazarov, Habibullo Shomuradov and Elena A. Afonina. The modern condition of coenopopulation of Eremurus robustus Regel (Xanthorrhoeaceae) in Kashkadarya Basin, Uzbekistan (ASIA LIFE SCIENCES Supplement 21(1): 1-9, 2019 The Asian International Journal of Life Sciences).
- Khujanazarov U.E. The Level Of Study Of Mountain Pasture Plants In South Uzbekistan. 2022. Ann. For. Res. 65(1): Pp. 7098-7105, ISSN: 18448135, 20652445. ANNALS OF FOREST RESEARCH https://www.e-afr.org/
- Khujanazarov U.E., Azimov I.T., Nigmatullayev B. A., Eshjanov K.J. Analysis Of Mountain Pastures On Ecological Scale (In The Case Of Mountain Pastures Of Southern Uzbekistan). Journal of Pharmaceutical Negative Results,Volume 13, Special Issue 9, 2022. – Pp.6493-6497

- Khujanazarov U.E., Bakiyev D., Saidmuratov Sh.Kh. Bioecology of plants in the foothills of the Kashkadarya basin and the relevance of its study. Scientific And Theoretical Journal Of Tashkent State Pedagogical University, 2022. ISSN 2181-9580 issue 2, pages 184-195
- Khujanazarov U.E., Bakiyev D., Saidmuratov Sh. Bioecology Of Plants Of Mountain Zones Of The Kashadarya Basin. "Modern researches in biology: problems and solutions" collection of materials of the international scientific and practical conference, part 2. Termiz State university, 2022. – Pp. 215-219.
- Khujanazarov U.E. Flora of Uzbekistan. MO Signing Ceremony for ESD program development and Technology transfer, International conference, Korea Dankook University, 2022
- Khujanazarov U.E., Bakiyev D., Khaitmuratova Kh.U., Shoniyozova Sh.B., Shamsiyev G.A. State Of Study Of The Mountain Pastures Of Southern Uzbekistan. 1st international conference: Conservation of Eurasian biodiversity: contemporary problems, solutions and perspectives. Part II. 15-17 may, 2023, Andijan State University, Andijan, Uzbekistan. 2023. – Pp.40-42
- Khujanazarov U.E., Mirkhamidova P., Alimova R.A. To define the account of vitamin C in some medicinal plants growing in Kashkadarya basin mountain ranges. European Journal of molecular and Clinical Medicine. Vol.07, Issue 09,2020. – Pp. 1334-141
- Khujanazarov U.E., Mirkhamidova P., Mamatkulov D., Ziyamukhamedova S., Mukhamedova G.I. A determination of the amount of vitamin C in some medical plants growing in the southwestern Zarafshan Mountain ranges. European Science Review. Vienna. № 3-4, Mart-April, 2018. – Pp. 32-34.
- Khujanazarov U.E. Ecological condition of some endemic plants in the foothills. European Science Review. Vienna. № 3-4, Mart-April, 2018. – Pp. 32-34.
- Khujanazarov U.E. Factors Affecting The Status Of Mountain And Mountain Pastures Of Kashkadarya Basin. Natural Volatiles & Essential Oils, 2021; 8(4): 12006-12017.
- Khujanazarov U.E. Foothill flora of the Kashkadarya basin. Bulletin of Khorezm Ma'mun Academy, 2021. – No.7. – Pp. 93-98.
- Khujanazarov U.E. A statistical analyze of pasture plants of Kashka-darya basin foothills. European Science Review. Vienna. № 11–12, November–December. 2017: 27-29.
- Khujanazarov U.E., S.Ismailov, M.Komilov. Analytical approaches on monitoring of pastures and restoration of degraded areas. Problems of modern continuing education: Innovations and perspectives. International scientific conference. Tashkent state pedagogical university, April 27. 2018: 463.
- Khujanazarov U., Islomov I.H. Ecological conditions of Almond-tree (Amygdalus) formation of Chirakchi district in Kashkadarya region. Eastern European Scientific journal. Dusseldorf-Germany. № 2. 2016: 17-21.
- Khujanazarov U.E., Khonkhadjayeva N., Pulatova N.A., Sodiqova D.Kh., Sadinov J. Ecological situation of the type of Poeta bulbosae-cariceta pachystylis pastures. European Science Review. Vienna. № 1-2, January February. 2018: 32-34.
- Khujanazarov U., Islomov I. The red data book plant species of the Basin of Kashkadarya River. The seventh international conference on Eurasian scientific development. Vienna. 30 th November. 2015: 10-12.
- Khujanazarov U. About the protection of some rare and endemic plant species in the upper part of the Kashkadarya basin. – T.: News of the National University of Uzbekistan. № 3/2. 2015: 135-137.
- Khujanazarov U..E. Ecological condition of some endemic plants in the foothills of the Kashkadarya basin. – T.: News of the National University of Uzbekistan. №3 / 2. 2017: 210-213
- Khujanazarov U.E, Mirkhamidova P., Valikhanova A.K. 2017. Determination of flavonoids in medicinal plants in the Kashkadarya basin of the south-western Zarafshan ridge. Karshi State University News, No.4. – Pp.44-48.
- Khujanazarov U.E. Grassland vegetation cover transformation of southwestern Zarafshan Mountains: a monograph. – Tashkent: Zuhra Baraka Business L.L.C., 2017. – 200 p.
- Khujanazarov U. Prospective ways of rational use of plants in the upper part of the Kashkadarya basin // News of the National University of Uzbekistan. – Tashkent, 2011. – Special issue. – Pp. 204-207.
- Khujanazarov U.E. The diversity of plant species of the upper part of the Kashkadarya basin and their protection // News of the National University of Uzbekistan. – Tashkent, 2011. – Special issue. – Pp. 85-87.
- Khujanazarov U. The current state of the pastures of the upper part of the Kashkadarya basin // Bulletin of the agricultural science of Uzbekistan. – Tashkent, 2012. – No. 1-2. – Pp. 111-115.
- Khujanazarov U.E., Karimova N.Sh. Ecological status of some medicinal plants of the southwestern Zarafshan Range // Reports of the National University of Uzbekistan. – Tashkent, 2016. – No. 3/1. – Pp. 105-109.
- . Khujanazarov U.E. Ecological status of some endemic plants of the foothills of the Kashkadarya basin // Reports of the National University of Uzbekistan. – Tashkent, 2017. – No. 3/2. – Pp. 210-213.
- Khujanazarov U.E., Dadaeva G.S. Ecological principles of rational use of Kashkadarya foothill pastures // Bulletin of Gulistan State University. – Gulistan, 2019. – No. 3. – Pp. 14-19..
- Khujanazarov U.E., Shomuradov H., Sadinov J.S., Xidirova M.A. Modern Condition of Coenopopulation of Tulipa fosterianaW.Irvingin Southern Part of Uzbekistan // American Journal of Plant Sciences, 2020. –№11. –Pp. 832-837.
- Khujanazarov U.E. Foothill flora of the Kashkadarya basin. Bulletin of Khorezm Ma'mun Academy, 2021. – No.7. – Pp. 93-98.
- Khujanazarov U., Bobonazarov G., Ishmo'minov B. The current state of the population of rare, endemic plants in the upper part of the Kashkadarya basin // TDPU scientific information. – No. 3 (8). – Pp. 20-24.
- Khujanazarov U.E. Modern state of the population of rare endemic plants of Kashkadarya basin mountain ranges // Advances in Agricultural and Biological Sciences. – Science and beyond publishing UK, 2018. Volume 4, Issue 5. – Pp.5-8.
- Khujanazarov U.E., Bakiyev D.E. Ecological principles of restoration of degraded pastures in Kashkadarya basin // Theoretical and applied science. –Philadelphia, USA, 2019. – Pp. 161-164.
- Smirnova, O.V., L.B. Zagolgova, I.M. Ermakova, L.I. Vorontsova, L.E. Gattsuk, V.N. Egorova, L.A. Zhukova, E.I. Kurchenko, A.R. Matveev, T.D. Mikhailov, E.A. Prosvirnina, N.A. Toropova, L.D. Falikov, N.I. Shorina, and A.A. Uranov. 1976. Coenopopulations of Plants (Basic Concepts and Structure). Nauka, Moscow, Russian Federation, 217 p.

- Strydom, A. 2017. The effect of virtual learning environments in an ESL classroom: A case study. International Journal of Innovation, Creativity and Change 3(2): 49-59.
- Sukhova, M.G., O.V. Zhuravleva, Y.I. Vinokurov, E.O. Chernova, M.I. Kaizer. 2018. Recreation and bioclimatic specifics of landscapes of the central and south-eastern altai. Periodico Tche Quimica 15(1): 537-547.
- Tojibaev, K.Sh., N.Yu. Beshko, and V.A. Popov. 2016. Botanical-geographical regionalization of Uzbekistan. Russian Journal of Botany 101: 1105-1132.
- Uranov, A.A. 1975. Age specter phytocenopopulation as function of time and energetic wave processes. scientific lecture of higher schools. Biological Sciences 2: 7-34.
- Williams, M.W. and V.G. Konovalov. 2008. Central Asia Temperature and Precipitation Data. USA National Snow and Ice Data Center, Boulder, Colorado, USA, 298 p.
- Zhukova, L.A. and E.V. Shestakova. 1997. Ontogenetic Atlas of Medical Plants. Mari State University, Yoshkar-Ola, 240 p.