Т. 8. №12. 2022
https://doi.org/10.33619/2414-2948/85

UDC 581.6; 574.45
AGRIS F40
https://doi.org/10.33619/2414-2948/85/15

ASSESSMENT AND RESERVE OF SOME FEED PHYTOCOENOSES

©Movsumova N., *ORCID: 0000-0002-1909-564X, Institute of Botany Azerbaijan National Academy of Sciences, Baku, Azerbaijan, movsumovanuri@yahoo.com*

ОЦЕНКА И РЕЗЕРВЫ НЕКОТОРЫХ КОРМОВЫХ ФИТОЦЕНОЗОВ

©Мовсумова Н. В., *ORCID: 0000-0002-1909-564X, Институт ботаники НАН Азербайджана, г. Баку, Азербайджан, movsumovanuri@yahoo.com*

Abstract. The studies were carried out on the floristic, geobotanical and resource assessment in Zardab and Ujar districts in 2020-2021 and 87 species belonging to 12 families were registered in the composition of coenosis. 12 species (*Poa bulbosa* L., *Poa pratensis* L., *Artemisia lerchiana* Weber, *Chenopodium album* L., *Bromus scoparius* L., *Alhagi maurorum* Medik., *Cynodon dactylon* (L.) Pers., *Climacoptera crassa* (M. Bieb.), *Stipa capillata* L., *Brassica napus* L., *Glycyrrhiza glabra* L., *Alyssum tortuosum* Willd. (= *Odontarrhena tortuosa* (Waldst. et Kit. ex Will.) C. A. Mey.)) distinguished for their long-term participation in the composition of the groupings were determined. The dynamics of productivity in coenoses were assessed by seasons and it was found that they changed in the range of 1.44-1.91 hwt/ha (in spring), 0.65-1.55 hwt/ha (in summer), 1.02-1.76 hwt/ha (in autumn). The dominance of forbs on botanical groupings was revealed.

Аннотация. Были проведены исследования по флористической, геоботанической и ресурсной оценке в Зардобском и Уджарском районах в 2020–2021 годах. В составе ценозов было зарегистрировано 87 видов, принадлежащих к 12 семействам. 12 видов (*Poa bulbosa* L., *Poa pratensis* L., *Artemisia lerchiana* Weber, *Chenopodium album* L., *Bromus scoparius* L., *Alhagi maurorum* Medik., *Cynodon dactylon* (L.) Pers., *Climacoptera crassa* (M. Bieb.), *Stipa capillata* L., *Brassica napus* L., *Glycyrrhiza glabra* L., *Alyssum tortuosum* Waldst. et Kit. ex Willd. (= *Odontarrhena tortuosa* (Waldst. et Kit. ex Willd.) C. A. Mey.)) — отличаются многолетним участием в составе группировок. Динамика продуктивности в ценозах оценивалась по сезонам года и было установлено, что она изменялась в диапазоне 1,44–1,91 ц/га (весной), 0,65–1,55 ц/га (летом), 1,02–1,76 ц/га (осенью). Выявлено доминирование разнотравья в ботанических группировках.

Keywords: animal husbandry, population structure, plant communities, pastures, feed crops, seasonal development.

Ключевые слова: животноводство, структура популяции, растительные сообщества, пастбища, кормовые культуры, сезонное развитие.

Animal husbandry is one of the areas of engagement of the local population living in the regions of the Republic. From ancient times, farmers engaged in animal husbandry, especially nomadic animal husbandry, regularly grazed livestock in summer and winter pastures, and drove animals to these pastures depending on the season.

Cattle grazing in natural pasture conditions has a positive effect on obtaining (for slaughter, dairy) high economic benefit in favor of low financial costs. Also, the rich content of the natural

Т. 8. №12. 2022
https://doi.org/10.33619/2414-2948/85

feed with protein, microelements and vitamins is the main condition for quality feeding of cattle. For this purpose, searches for the plants with high feed quality and widespread in the pastures, especially alternative feed plant resources are the focus of researchers [1, 3, 8, 10, 11, 13, 14, 16, 17].

This issue remains relevant not only to Azerbaijani scientists, but also to scientists all over the world [2, 9]. In general, the development of this area put forward the relevance of expanding research in this direction in terms of the implementing the tasks arising within the framework of State Programs. In order to successfully fulfill these tasks, first of all, pastures and hay fields shall be identified, their flora and vegetation be investigated, plants with high quality indicators be identified for creating a fodder base, and resource assessment be carried out.

Many fodder plants are spread in natural pastures and hayfields. Since the feed value of these plants is different, their assimilation by cattle is also different. At present, since a large part of the pastures is given to the use of the local population for cultivation, and as a result of unregulated grass cutting and overloading, the inefficiently used soils have been degraded, eroded or salinized, and the structure and species composition of their phytocenoses have changed [14].

As a result, the species of economic importance in the grassland, especially *Poa*, *Agropyron*, *Astragalus*, *Trifolium*, *Kochia* and other species die without completing their ontogenetic period of development. The improvement of the fodder content of pastures is possible, first of all, by reducing loading. In this way, it is possible to increase productivity up to 20% [9].

The forage composition of pastures plays an important role in the year-round feeding of animals on farms. From this point of view, the study of forage quality in the grass cover of the pasture and resource assessment can play a fundamental role in determining the forage capacity and creating the fodder base. The conducted research aimed at studying the species composition of pastures, determining the leading coenoses, and assessing the seasonal dynamics of grass cover productivity.

Material and Methods

The studies were conducted in Zardab and Ujar districts in 2020-2021. The area is characterized by a semi-desert and dry desert climate with mild winters and hot, dry summers. In summer, the maximum temperature of air reaches 35–45°C. The average monthly air temperature is 3-7°C in the coldest month of the year (January), and 27°C in the hottest month (July-August) (The World Weather Information Service). The amount of annual precipitation is 250–335 mm. Gray-meadow, gray-brown soil type is characteristic in the area.

In order to study the vegetation, measurements were made in 6 isolated plots with a size of 5×5 m^2 in stationary conditions in the area, and geobotanical descriptions were given. The calculation of the productivity of the grass cover was performed by the mowing method in a marked area of 2.5 m^2 in 4 replicates [12, 18]. Depending on the season, the selection of fields was changed.

Classic and modern methodological tools were used during the identification and naming of species [4, 6]. Naming of plant groupings was done according to dominant species, abundance according to Drude's 5-point scale [5, 7].

Results and Their Discussion

During monitoring in the study area, first of all, the floristic composition of coenoses selected as pasture area was analyzed and 87 species belonging to 12 families were recorded in both districts (Figure 1). Of these, Fabaceae (by 18 species), Poaceae (by 15 species), Asteraceae (by 12 species) and Chenopodiaceae families (by 10 species) were represented by more species. In the pastures with observed seasonal dynamic changes, there are 12 species distinguished by the abundance

Т. 8. №12. 2022
https://doi.org/10.33619/2414-2948/85

(85%) and long-term presence in these groupings: *Poa bulbosa* L., *Poa pratensis* L., *Artemisia lerchiana* Weber, *Chenopodium album* L., *Bromus scoparius* L., *Alhagi pseudalhagi* (M. Bieb.) Desv. ex Wangerin, *Cynodon dactylon* (L.) Pers., *Climacoptera crassa* (M. Bieb.), *Stipa capillata* L., *Brassica napus* L., *Glycyrrhiza glabra* L., *Alyssum tortuosum* Willd. These species, as founders of coenoses, are mostly dominant and ensure the sustainability of pasture ecosystems. However, long-term grazing accelerates the processes of succession and fluctuation in coenoses and stimulates structural changes.

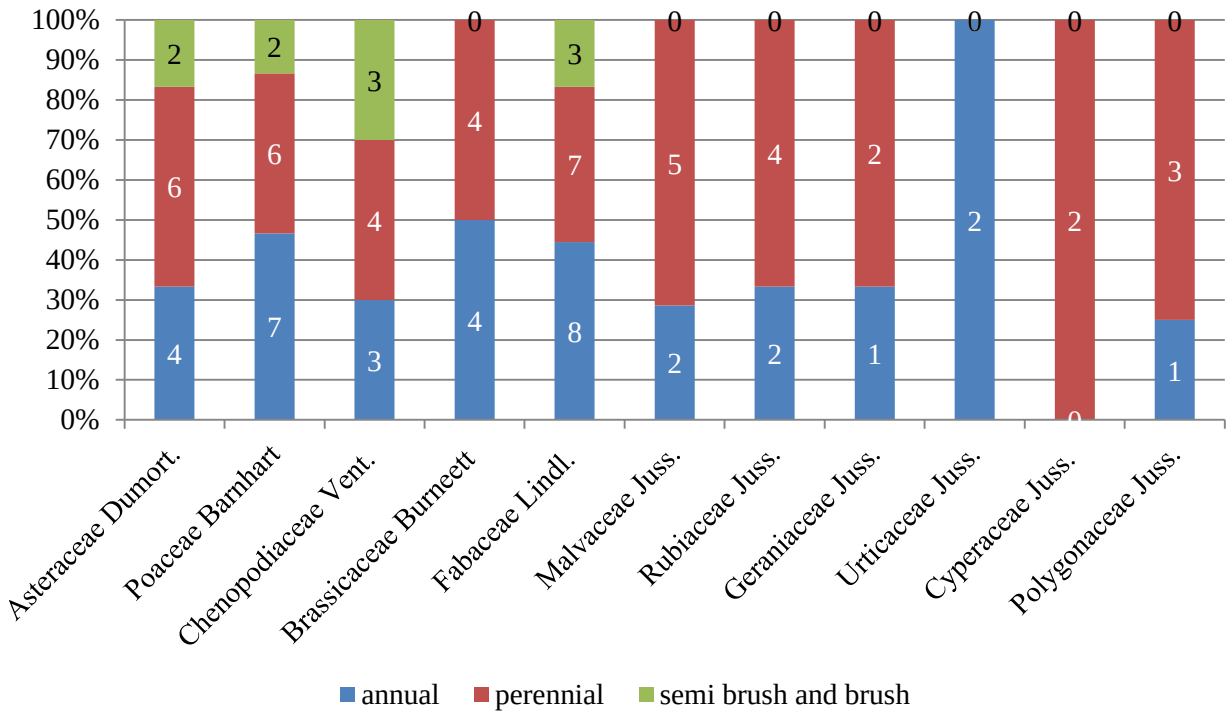

Figure 1. Distribution of dominant species in groupings by seasons

During the vegetation period, the effect of climatic factors on the variability, abundance and development of the species composition of coenoses is not small. Although overgrazing has been shown to be the main limiting factor, lack of soil moisture, high temperatures and high number of hot days also significantly affect the development and productivity of vegetation. In this respect, the composition of spring groupings in selected coenoses was productive with the presence of ephemerals (*Poa bulbosa* L., *Bromus japonicus* Thunb., *Lepidium perfoliatum* L., *Malvalthaea transcaucasica* (Sosn.) Iljin, *Galium verum* L., *Setaria pumila* (Poir.) Roem. et Schult., *Aegilops cylindrica* Host etc.) (Cop^3) (Table 1).

Table 1

DESCRIPTION OF GRASS-FORB-WORMWOOD GROUPING IN THE TERRITORY OF UJAR DISTRICT (28.IV.2020) (overall project cover 80%)

Species	*Abundance*	*Vitality*	*Tier and height, cm*	*Vegetation period*
Artemisia lerchiana	3	3	I (40)	1–2
Alhagi pseudalhagi	3	3	I (35)	1–2

Т. 8. №12. 2022
https://doi.org/10.33619/2414-2948/85

Species	*Abundance*	*Vitality*	*Tier and height, cm*	*Vegetation period*
Lactuca serriola	2	3	II (20)	3
Poa bulbosa	2	2	III (9)	4
Allium rubellum	1	2	II (16)	4
Papaver arenarium	2	1	III (6)	3–4
Achillea micrantha	1	2	II (13)	4
Hordeum leporinum	2	3	III (5–7)	4
Bromus scoparius	1	2	II (24)	4
Bromus japonicus	3	3	II (30)	4
Malvalthaea transcaucasica	2	3	III (8)	4
Stellaria media	2	3	III (9)	4

Note: In abundance assessment, it is an indicator of growth from 1 to 5, in vitality 3 is normal, below 3 is weak, above 3 is high vitality. Vegetation periods: 1. development of vegetative organs, 2. Budding, 3. Flowering, 4. Fruiting, 5. Drying

Although the increase of phytomass decreased to 0.61-1.75 c/ha in summer (Cop_1-Sol) (Table 2), the increase in forage mass in autumn in all variants was balanced due to the restart of vegetation in some species (*Atriplex tatarica* L., *Stipa capillata* L., *Medicago minima* L., *Astragalus arenarius* L., *Petrosimonia brachiata* (Pall.) Bunge, *Lolium rigidum* Gaudin, *Alhagi maurorum* Medik., *Artemisia* sp. and etc.) (Cop_3- Soc).

Table 2

DESCRIPTION OF FORB-WORMWOOD GROUPING IN THE TERRITORY OF UJAR DISTRICT (16.VI.2021) (OVERALL PROJECT COVER 45%)

Species	*Abundance*	*Vitality*	*Tier and height, cm*	*Vegetation period*
Artemisia lerchiana	3	3	I (40)	2–3
Salsola dendroides	2	3	I (35)	1–2
Petrosimonia brachiata	2	1	III (7)	1
Convolvulus arvensis	1	3	III (9)	1
Hordeum leporinum	1	2	II (16)	4
Bromus japonicus	2	1	III (6)	3–4
Atriplex tatarica	1	2	II (13)	1
Eremopyrum triticeum	2	3	III (5-7)	4
Asperula humifusa	2	3	II	3

Seasonal dynamic variability of productivity was calculated in Zardab district in 2020 in ephemeral-grass and forb grouping, in 2021 in grass-forb, forb-grass and forb grouping, in Ujar in 2020 in grass-forb-wormwood, wormwood-forb-grass and grass-wormwood, in 2021 in ephemeral-wormwood, forb-wormwood and wormwood-forb grouping. As a result, the highest productivity in the territory of both districts was recorded in the grass-forb-wormwood spring grouping in Ujar district in 2020, and the lowest in the forb-wormwood summer grouping in 2021 (Table 3).

Т. 8. №12. 2022
https://doi.org/10.33619/2414-2948/85

Fodder plants in the coenoses which seasonal dynamics were studied, were also distinguished by botanical groups. On average, changes were observed in the coenoses formed by the abundance of forbs (40%), correspondingly with the abundance of legumes (34%) and grasses (26%) depending on the season and climatic conditions. Although the forage quality of legumes and grasses in pastures and their assimilation by animals are high compared to forbs, there are also species of forbs that are the main founders of coenoses, which do not lag behind them in terms of feed value.

Of these, *Bassia prostrata* (L.) Back (= *Kochia prostrata* (L.) Schrad.) (protein 9.8%, cellulose 23.6%), *Leontodon hispidus* L. (protein 18.6%, cellulose 18.8%) and others can be shown [14].

Table 3

PRODUCTIVITY OF FODDER MASS OF PHYTOCENOSES IN PASTURE AREAS IN 2020-2021

Area	*Spring (April-May)*		*Summer (June-July)*		*Winter (October)*	
	Grouping	*Productivity (hwt/ha)*	*Grouping*	*Productivity (hwt/ha)*	*Grouping*	*Productivity (hwt/ha)*
Zardab d. (2020)	ephemeral-grass	1,16±0,1	forb	0,90±0,07	forb	2,75±0,15
Zardab d. (2021)	grass-forb	1,39±0,4	forb-grass	0,99±0,02	forb	1,14±0,08
Ujar d. (2020)	grass-forb-wormwood	2,01±0,17	wormwood-forb-grass	1,00±0,03	grass-wormwood	1,79±0,06
Ujar d. (2021)	ephemeral-wormwood	1,18±0,09	forb-wormwood	0,53±0,06	wormwood-forb	1,97±0,07

In general, in terms of ensuring the development of animal husbandry, especially local farms, studies shall be continued in order to assess and improve pasture areas, as well as to reveal future perspectives for the protection and use of valuable alternative fodder plants in the pastures.

Conclusion

In the composition of the coenoses noted in the pastures of both studied districts, 87 species belonging to 12 families were identified. Out of them, the representatives of the Poaceae, Fabaceae and Compositae (=Asteraceae) families dominated. The abundance of groupings (Soc-Cop_3) for spring and winter seasons is quite high (0.61-1.75 hwt/ha) compared to summer due to climate factor and soil moisture level. Productivity in spring coenoses was 1.16-2.01 hwt/ha, in summer 0.53-1.00 hwt/ha, and in autumn the productivity of winter pastures varied between 1.14-2.75 hwt/ha.

References:

1. Ahmadova, S. Z. (2017). Bioecological condition of Azerbaijan's Jeyranchol winter pasture at the beginning of the 21st century. In *Actual problems of modern natural sciences. International scientific conference dedicated to the 94th anniversary of the birth of national leader H. Aliyev,* Ganja, 212-213. (in Azerbaijani).

2. Ali, H., Gul, B., Adnan, M. Y., Ahmed, M. Z., Ansari, R., & Khan, M. A. (2016). Potential of halophytes as cattle fodder: a case-study in Pakistan. *Pakistan Journal of Agricultural Sciences*, *53*(3). https://doi.org/10.21162/PAKJAS/16.2580

3. Aliyev, R. A. (1966). Winter pastures of Azerbaijan. Baku. (in Azerbaijani).

4. Askerov, A. M. (2016). Plant world of Azerbaijan (Higher plants-Embryophyta). Baku. (in Azerbaijani).

5. Lavrenko, E. M., & Korchagina, A. A. (1964). Polevaya geobotanika. Moscow. (in Russian).

6. Flora Azerbaidzhana (1950-1961). Baku, I-VIII. (in Russian).

7. Guidelines for large-scale geobotanical research of natural fodder areas of the Republic of Azerbaijan (2002). Group of co-authors, Baku. (in Azerbaijani).

8. Gurbanov, E. M., & Aslanova, S. Sh. (2012). Phytocenological characteristics of vegetation in the summer pastures of Astara region. In *Scientific works of the Institute of Botany of ANAS, Baku, 32*, 185-189. (in Azerbaijani).

9. Hirich, A., Choukr-Allah, R., & Ragab, R. (Eds.). (2020). *Emerging Research in Alternative Crops*. Springer International Publishing. https://doi.org/10.1007/978-3-319-90472-6

10. Ibadullayeva, S. J., & Isgandarova, A. I. (2013). About the Genus of Mallow (*Malva* L.) Common in the Flora of Azerbaijan. *ANAS News, Biology Series, 3,* 127-129. (in Azerbaijani).

11. Ibadullayeva, S. J., Movsumova, N. V., & Akhundova, S. T. (2018). Determination of quality indicators of basic feed crops belonging to a variety of herbs in summer pastures. *Novosti biologii i meditsiny NANA*.

12. Godlevskaya, T. R., Larin, I. V., Bogdanov, V. M., & Kretova, A. P. (1964). Praktikum po lugovodstvu i pastbishchnomu khozyaistvu. Leningrad. (in Russian).

13. Mammadli, T. B., & Ibadullayeva, S. J. (2011). The modern state of the vegetation of the summer and winter pastures of Gunnut - Gapijig region. Baku, 83-91 (in Azerbaijani)

14. Movsumova, N. V. (2021) Alternative food plant resources and their future perspectives in livestock development. *SEAB,* 259.

15. Movsumova, N. V. (2019) The modern state of some coenoses used as pastures and hayfield in the central lowlands of Azerbaijan. *Azerbaijan Agricultural Science Journal, 3*, 102-105. (in Azerbaijani).

16. Movsumova, N. V., Ibadullayeva, S., & Shiraliyeva, G. (2019). Forage resources of winter pastures of the Acinohur territory of Azerbaijan. In *Innovation in use of Agrobiodiversity for sustainable agriculture development, Tashkent,* 76-79.

17. Nabiyeva, F., Ibrahimov, A., & Ibadullaeva, S. J. (2011). Forage resources of winter pastures. Agrarian science, 10-12. (in Russian).

18. Taishin, V. A., Botonova, A. S. (2006). Methodological aspects in the economic assessment of pasture resources//Modern problems of science and education. 5: 86-87 (in Russian).

19. Hajiyev, V. C., Hatamov, V. V., & Gurbanov, E. M. (1995) Geobotanical research methodology of natural fodder areas. Baku, 52. (in Azerbaijani).

Список литературы:

1. Əhmədova S. Z. Azərbaycanın Ceyrançöl qış otlağının XXI əsrin əvvəllərində bioekoloji durumu // Müasir təbiət elmlərinin aktual problemləri.Ümumilli lider H.Əliyevin anadan olmasının 94-cü ildönümünə həsr olunmuş beynəlxalq elmi konfrans. Gəncə: 2017. Səh. 212-213]

2. Ali H. et al. Potential of halophytes as cattle fodder: a case-study in Pakistan // Pakistan Journal of Agricultural Sciences. 2016. V. 53. №3. https://doi.org/10.21162/PAKJAS/16.2580

3. Əliyev R. Ə. Azərbaycanın qış otlaqları. Bakı: Azərnəşr, 1966. 45 s.

4. Əsgərov A. M. Azərbaycanın bitki aləmi (Ali bitkilər-Embryophyta). Bakı: TEAS Press, 2016. 444 s.

5. Лавренко Е. М., Корчагина А. А. Полевая геоботаника. М: Наука, 1964. Т. 3. 442 с.

6. Флора Азербайджана. Баку: АН Азерб. ССР, 1950-1961. Т. I-VIII.

7. Azərbaycan Respublikasının təbii yem sahələrinin irimiqyaslı geobotaniki tədqiqatına dair təlimat // Həmmüəlliflər qrupu. Bakı, 2002. 142 s.

8. Qurbanov E. M., Aslanova S. Ş. Astara rayonunun yay otlaqları ərazisində bitki örtüyünün fitosenoloji xüsusiyyətləri // AMEA Botanika İnstitutunun Elmi əsərləri. Bakı: Elm, 2012. Səh. 185-189.

9. Hirich A., Choukr-Allah R., Ragab R. (ed.). Emerging Research in Alternative Crops. – Springer International Publishing, 2020. https://doi.org/10.1007/978-3-319-90472-6

10. İbadullayeva, S.C., Isgəndərova, A.İ. Azərbaycan Florasında Yayılan Əməköməci (Malva L.) Cinsi Haqqında // AMEA Xəbərlər, Biologiya seriyası. 2013. №3. Səh. 127-129.

11. Ibadullayeva S. J., Movsumova N. V., Akhundova S. T. Determination of quality indicators of basic feed crops belonging to a variety of herbs in summer pastures // Novosti biologii i meditsiny NANA. 2018.

12. Годлевская Т. Р., Ларин И. В., Богданов В. М., Кретова А. П. Практикум по луговодству и пастбищному хозяйству. Л.: Колос, 1964. 239 с.

13. Məmmədli T. B., İbadullayeva S. C. Günnüt – Qapıcıq rayonunun yay və qış otlaqlarının bitki örtüyünün müasir vəziyyəti. Bakı, 2011. Səh. 83-91.

14. Movsumova N. V. Alternative food plant resources and their future perspectives in livestock development. SEAB, 2021. P. 259.

15. Mövsümova, N.V. Azərbaycanın mərkəzi aran ərazilərində otlaq və biçənək kimi istifadə olunan bəzi senozların müasir vəziyyəti // Azərbaycan Aqrar Elm jurnalı. 2019. №3. Səh. 102-105.

16. Movsumova N. V., Shiraliyeva G. Sh., Ibadullayeva S. J. Forage resources of winter pastures of the acinohur territory of Azerbaijan // Innovation in use of Agrobiodiversity for sustainable agriculture development. Tashkent, 2019. P. 76-79.

17. Набиева Ф. Х., Ибрагимов А. Ш., Ибадуллаева С. Д. Кормовые ресурсы зимних пастбищ // Аграрная наука. 2011. №9. С. 10-13.

18. Тайшин В. А., Ботонова А. С. Методические аспекты в хозяйственной оценке пастибищных ресурсов // Современные проблемы науки и образования. 2006. №5. С. 86-87.

19. Hacıyev V. C., Hətəmov V. V., Qurbanov E. M. Təbii yem sahələrinin geobotaniki tədqiqat metodikası. Bakı: BDU, 1995. 52 s.

Работа поступила
в редакцию 12.11.2022 г.

Принята к публикации
19.11.2022 г.

Ссылка для цитирования:

Movsumova N. Assessment and Reserve of Some Feed Phytocoenoses // Бюллетень науки и практики. 2022. Т. 8. №12. С. 119-125. https://doi.org/10.33619/2414-2948/85/15

Cite as (APA):

Movsumova, N. (2022). Assessment and Reserve of Some Feed Phytocoenoses. *Bulletin of Science and Practice, 8*(12), 119-125. https://doi.org/10.33619/2414-2948/85/15