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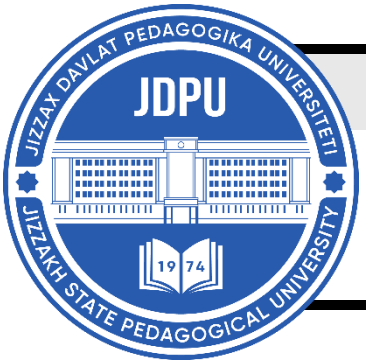

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SPECIES COMPOSITION OF BOVID HELMINTHS (BOVIDAE) OF KARAKALPAKSTAN

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ABOUT ARTICLE

Key words: species, bovid helminths (bovidae), biogeocenoses, transformation, natural environment, inhabitants, biodiversity, animal world, ecosystems, Karakalpakstan.

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Abstract: The article presents the results of a comprehensive study of the species composition of helminths of bovid animals (sheep, goats, cattle, saigas and goitered gazelles) in Karakalpakstan. The species composition of bovid helminths turned out to be infected by the helminth community. The infestation of animals was: in sheep - 100%, in goats - 75%, in cattle - 70%. Quite a high infection rate was also observed in wild representatives of bovids - saiga and goitered gazelle. 36 species of helminths belonging to the classes Cestoda (8 species), Trematoda (4 species), and Nematoda (24 species) were identified from infested animals. In the article it is stated that the prevalence of certain species suggests specific environmental and ecological conditions favorable to their life cycles. Additionally, the data reveal potential risk factors for bovid health, which can inform future veterinary interventions and control measures.

INTRODUCTION

The Republic of Karakalpakstan is located in the north-west of Uzbekistan and occupies the territory lying in the Lower Amu Darya at the junction of the greatest deserts - the Karakum and Kyzylkum deserts. The total area is 16174.0 thousand hectares, of which about 30% of the territory is pasture, more than 6% of the territory is covered with forest. Geographically, the territory of Karakalpakstan consists of the northwestern part of the Kyzylkum sands, the southeastern part of the Ustyurt plateau and the river delta. Amu Darya. The nature of Karakalpakstan differs from the nature of other regions of Uzbekistan. Most of the republic is occupied by desert, where precipitation amounts

to about 100 mm. precipitation per year. Karakalpakstan belongs to the eastern part of the Ustyurt plateau - a huge desert raised to a height of about 200 m above sea level. The nature of the Karakalpak part of the Kyzylkum desert, which covers the southeast of the republic, is unique. It is dotted with dry clayey, half-buried beds of ancient tributaries of the Amu Darya and Syr Darya.

The central part of the republic is occupied by a huge delta of its only water artery, the main source of life for the region - the Amu Darya River. In general, the territory of the Republic of Karakalpakstan is located in the central part of the Turan Lowland and is represented by three large regions - Northwestern Kyzylkum, Ustyurt and the lower reaches of the Amu Darya with unique natural complexes, adapted to them by a variety of fauna and flora [3].

The ongoing changes in biogeocenoses, transformation of the natural environment, have a significant impact on the biodiversity of the animal world, including the fauna of bovid helminths, integral components of various ecosystems of Karakalpakstan. Of particular interest in this regard is the study of the current species diversity of helminths of domestic and wild bovids (sheep, goats, cattle, saiga and gazelle), inhabitants of natural and transformed territories of Karakalpakstan [1; 2; 8].

The purpose of this work is a comprehensive study of the species composition of domestic and wild bovids (sheep, goats, cattle, saiga and gazelle) animals of Karakalpakstan, assessment of their role in the epizootology and epidemiology of parasitic diseases of farm animals and the development of effective methods for their prevention. The research on the species composition of bovid helminths (Bovidae) in Karakalpakstan is crucial for several reasons:

Biodiversity and Ecology: Understanding the diversity of helminth species within bovids in Karakalpakstan contributes to the broader knowledge of the region's ecological health and biodiversity. It helps in documenting and preserving the biological richness of the area.

Animal Health and Productivity: Helminth infections can significantly affect the health and productivity of bovid populations. By identifying the specific helminth species present, effective control measures can be developed, leading to healthier livestock and improved agricultural outcomes.

Veterinary and Public Health: Some helminths can be zoonotic, meaning they can be transmitted from animals to humans. Researching their species composition helps in assessing potential public health risks and in developing strategies to mitigate these risks.

Economic Impact: Livestock is a vital component of the economy in many regions, including Karakalpakstan. Helminth infestations can lead to economic losses due to decreased productivity and increased veterinary costs. Understanding the helminth species composition can guide better management practices, thereby reducing economic losses.

Scientific Knowledge and Research: This research adds valuable data to the scientific community, fostering further studies in parasitology, veterinary science, and related fields. It can also serve as a basis for comparative studies in other regions, enhancing our global understanding of helminth

biodiversity.

Conservation Efforts: Knowing the helminth species that affect wild bovids can aid in conservation efforts by informing strategies to protect endangered species and maintain balanced ecosystems.

RESEARCH MATERIALS

The main material was qualitative and quantitative collections of helminths from domestic (sheep, goats, cattle), bovids bred in livestock farms in Karakalpakstan and wild animals (saiga, goitered gazelle) living in natural areas. Helminths were collected in 2020-2023. dissection of animals using known methods [5;7]. 37 individuals of Karakul breed sheep, 35 goats of local breed, 19 cattle of different breeds were examined at the slaughter points of Kegeyli, Bozatau, Takhtakupir, Kungrad, Muynak, Amudarya, Turtkul districts. Autopsies of individual organs of slaughter animals were also carried out: 116 of cattle, 250 of sheep and goats. Study of wild bovids (saiga - 11 individuals and goitered gazelle - 13 individuals) in the ecosystems of the Republic of Karakalpakstan. Material was collected from animals killed and seized from poachers (Fig. 1).

The collected helminths were preserved according to the generally accepted method: cestodes and trematodes - in 70% alcohol; nematodes in Barbagallo liquid. To identify helminths, we used well-known guides and monographs [5; 6; 9].

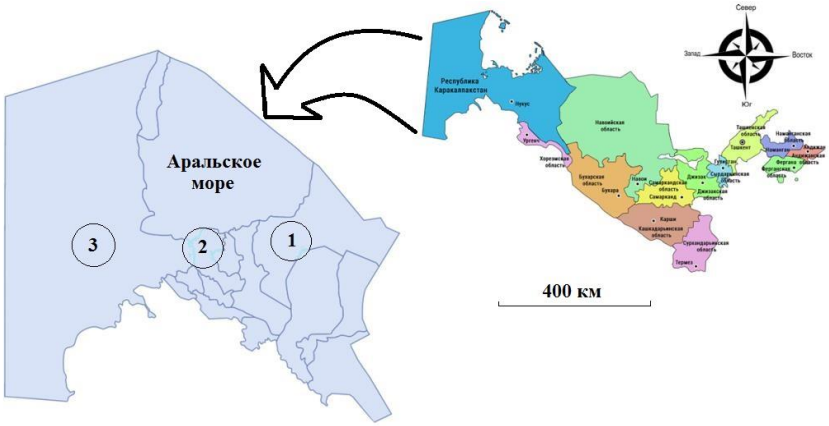

Figure. 1. Places for collecting material from biocenoses of Karakalpakstan: 1 – Northwestern Kyzylkum; 2 – Lower reaches of the Amu Darya; 3 – Ustyurt Plateau.

DISCUSSION

The results of the studies showed that the bovids (sheep, goats, cattle, saigas and goitered gazelles) of Karakalpakstan were infected with a community of helminths. The infestation of animals was: in sheep - 100%, in goats - 75%, in cattle - 70%. Quite a high infection rate was also observed in wild representatives of bovids - saiga and goitered gazelle. 36 species of helminths belonging to the classes Cestoda (8 species), Trematoda (4 species), Nematoda (24 species) were identified from infested animals (Fig. 2).

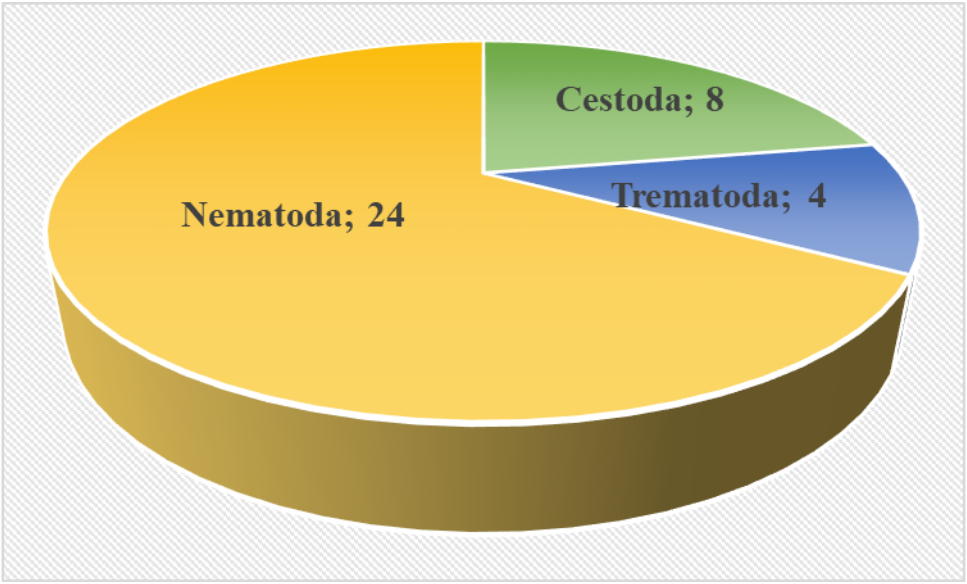

Figure.2. **Infection rate of helminths in bovids Bovidae in Karakalpakstan**

The species composition of helminths in the studied animal species is not clear. Thus, the largest number of species was recorded in the sheep population - 28 species; the second position in these indicators is occupied by cattle - 26 species; the following places are occupied by domestic goats - 21 species, goitered gazelles - 21 and saigas - 17 species (Table 1).

Table 1.

Species composition of bovid helminths Bovidae in Karakalpakstan

№	Type	Sheep	Goat	Cattle	Saiga antelope	Jeyran
1	*Moniezia expansa*	+	-	+	+	+
2	*Moniezia benedeni*	+	+	+	-	-
3	*Avitellina centripunctata*	+	-	-	+	+
4	*Thysaniezia giardi*	+	+	-	-	-
5	*Taenia hydatigena*, larvae	+	+	+	+	+
6	*Echinococcus granulosus*, larvae	+	+	+	+	+
7	*Multiceps multiceps*, larvae	+	-	-	-	-
8	*Taeniarhynchus saginatus*, larvae	-	-	+	-	-
9	*Fasciola gigantica*	+	+	+	+	+
10	*Calicophoron calicophorum*	+	-	+	-	-
11	*Gastrothylax crumenifer*	-	-	+	-	-
12	*Schistosoma turkestanicum*	+	+	+	+	+
13	*Trichocephalus ovis*	+	-	+	+	+
14	*Trichocephalus skrjabini*	+	+	+	+	+
15	*Chabertia ovina*	+	+	+	-	-
16	*Dictyocaulus filaria*	+	+	-	-	-
17	*Dictyocaulus viviparus*	-	-	+	-	-
18	*Dictyocaulus eckerti*	-	-	-	-	+
19	*Trichostrongylus axei*	+	+	+	+	+
20	*Trichostrongylus vitrinus*	+	-	+	-	-

21	*Haemonchus contortus*	+	+	+	-	-
22	*Marshallagia marshalli*	+	+	+	+	+
23	*Marshallagia mongolica*	+	-	+	+	-
24	*Nematodirella longissimespiculata*	-	-	-	-	+
25	*Nematodirella cameli*	-	-	-	-	+
26	*Nematodirus helvetianus*	+	+	+	+	+
27	*Nematodirus oiratianus*	+	+	+	+	+
28	*Nematodirus gazellae*	-	-	-	-	+
29	*Ostertagia ostertagi*	+	+	+	-	-
30	*Teladorsagia circumcincta*	+	+	+	-	-
31	*Skrjabinema ovis*	+	-	+	-	-
32	*Skrjabinema caprae*	-	+	-	+	+
33	*Gongylonema pulchrum*	+	+	+	+	+
34	*Parabronema skrjabini*	+	+	+	-	+
35	*Setaria labiatopapillosa*	+	+	+	+	+
36	*Skrjabinodera saiga*	+	+	-	+	+
		28	**21**	**26**	**17**	**21**

The following types of helminths turned out to be common to the studied bovids: *Taenia hydatigena* (larvae), *Echinococcus granulosus* (larvae), *Fasciola gigantica, Schistosoma turkestanicum, Trichocephalus skrjabini, Trichostrongylus axei, Marshallagia marshalli, Nematodirus helvetianus, N. oiratianus, Gongylonema pulchrum* и *Setaria labiatopapillosa.* Some types of helminths were found in 3-4 species of bovids studied: *Moniezia expansa, M. benedeni, Avitellina centripunctata, Trichocephalus ovis, Chabertia ovina, Haemonchus contortus, Marshallagia mongolica, Teladorsagia circumcincta, Skrjabinema caprae, Parabronema skrjabini* и *Skrjabinodera saiga.*

Of the total number of species (36) helminths, 4 species – *Taenia hydatigena, Echinococcus granulosus, Multiceps multiceps* и *Taeniarhynchus saginatus* found in bovids in the larval stage. The species diversity of bovid helminths in Karakalpakstan is very similar, due to the ecological characteristics of the study areas and the similarity of ecological-trophic relationships of animals.

CONCLUSION

In our material, the species composition of bovid helminths is represented by 36 species, which complements the helminth communities of the study region with 7 species of parasites. At the same time, we note that in the studied animals of Karakalpakstan, Dicrocoelium dendriticum, Hasstillesia ovis, species of the family Protostrongylidae - common parasites of bovids - were not detected, which emphasizes the uniqueness of the helminth fauna of Karakalpakstan, due to the natural and ecological characteristics of the region. Parasites of the genera are widely represented here *Avitellina, Gastrothylax, Fasciola, Schistosoma, Nematodirella, Parabronema* и *Skrjabinodera,* that are not available in other regions of Uzbekistan. Thus, the presented materials indicate the possibility of exchange of helminths between the studied animals. All these circumstances must be taken into account when developing and carrying out antihelminthic measures in the conditions of the natural

and ecological features of the Republic of Karakalpakstan.

The research on the species composition of bovid helminths (Bovidae) in Karakalpakstan has provided valuable insights into the diversity and prevalence of helminth species affecting these animals. Our study identified a significant variety of helminth species, indicating a complex parasitic fauna within the bovid populations in this region. This diversity highlights the ecological interactions between bovids and their parasites and underscores the need for comprehensive parasitological management to ensure the health and productivity of these animals. Key findings include the identification of several helminth species previously unreported in Karakalpakstan, contributing to the broader understanding of the geographic distribution of these parasites. Overall, this research emphasizes the importance of ongoing surveillance and study of helminth infections in bovids to mitigate their impact on livestock health and agricultural productivity in Karakalpakstan. The findings serve as a foundation for developing targeted strategies to control and prevent helminthiasis in bovids, ultimately contributing to the sustainability of local livestock farming practices.

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