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SEASONAL PHENOLOGY OF ECTOPARASITES IN THE ZOOBIOCENOSSES OF KARAKALPAKSTAN

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Annatation. This article examines the distribution and seasonal phenology of ectoparasites in farming households specialized in cattle and sheep breeding in the Nukus and Qorao‘zak districts of the Republic of Karakalpakstan. The study results describe the phenology of dominant ectoparasites affecting agricultural animals and the diseases they cause.

Key words: *Karakalpakstan, cattle breeding, sheep breeding, ixodid ticks, lice, Bovicola, zoophilic insects, dominant ectoparasites, seasonal phenology.*

Introduction. The global demand for livestock products, including meat, wool, and raw leather materials, is increasing year by year. Meeting this demand, creating new job opportunities, and increasing the volume of livestock products are critical tasks.

In certain regions of the Republic of Karakalpakstan, ectoparasites, particularly ixodid ticks and zoophilic insects, pose a significant threat to cattle and sheep in specialized farming households. Studying the distribution and seasonal dynamics of ectoparasites in these areas is of great importance for their control. In recent years, changes in the ownership structure of



livestock farming have led to an increase in the incidence of ectoparasites and related diseases among agricultural animals. Diseases such as hyalomma infestation, bovicola infestation, psoroptosis, sarcoptosis, oestrosis, and melophagosis cause stunted growth in calves and lambs, lagging behind their peers, and reduced productivity in terms of meat, milk, wool, cashmere, and reproductive performance.

Therefore, studying the phenology of ectoparasites living on the bodies of agricultural animals and the spread of parasitic diseases they cause remains a pressing issue.

Objective of the study. The aim of the study is to investigate the distribution and seasonal phenology of ectoparasites in cattle and sheep farming households in the conditions of Karakalpakstan.

Materials and methods. The tick species collected from cattle in certain districts of the Republic of Karakalpakstan were identified at the Arachnoentomology and Acarology Laboratory of the Nukus Branch of Samarkand State University of Veterinary Medicine, Animal Husbandry, and Biotechnology, and the Veterinary Research Institute. Identification was carried out using the "Atlas of Ixodid Ticks" (M. Kolos, 1968), identification keys by I.M. Ganiev and others (1959), as well as relevant literature and manuals. Collected ectoparasites were stored in test tubes, with each sample labeled. The labels included details such as the sample number, the name and location of the farming household or private household, the time of parasite collection, the type and age of the animal, and the body parts from which the ectoparasites were collected, recorded in black ink.

Study results. The research was conducted in cattle and sheep farming households and private households in the Nukus and Qorao‘zak districts of the Republic of Karakalpakstan, specifically in secondary (anthropogenic



ecotopes) and primary biocenoses (zoobiocenoses). A total of over 1,200 cattle and more than 2,400 sheep and goats were used in the study. In the studied areas, the seasonal movement (endemic migration) of ectoparasites in nature was observed to begin in the second decade of April with rising air temperatures. During the research, representatives of the genera *Hyalomma* (*H. anatolicum*, *H. plumbeum*, *H. scupense*, *H. detritum*), *Rhipicephalus* (*Rh. bursa*, *Rh. turanicus*), *Haemaphysalis* (*H. sulcata*, *H. punctata*), *Dermacentor marginatus*, and *Ixodes* (*I. ricinus*) were recorded as the primary zooparasites feeding on the bodies of cattle and sheep. Among these, species belonging to the genera *Hyalomma* and *Rhipicephalus* were found to be dominant.

During the study of the seasonal phenology of ectoparasites, investigations and observations were conducted in the “Dami-ata” farming household and “Samanbay” neighborhood in the Nukus district, as well as in the sheep-breeding specialized “Nur tilek Qarao‘zek” farming household and “Qo‘ybaq” neighborhood in the Qorao‘zak district, to assess the level of ectoparasite infestation in livestock. The results revealed that the dominant ectoparasites in these areas were *Hyalomma anatolicum*, *H. plumbeum*, *H. detritum*, *Rhipicephalus bursa*, *Rh. turanicus*, *Dermacentor marginatus*, and, among lice, species of the genus *Bovicola* (*Bovicola ovis*, *Bovicola bovis*) (Table 1, Figure 1).



Figure 1. Larval and imago forms of *Bovicola ovis*.

Table 1.

Ectoparasite Species Found in the Territories of Nukus and Qorao'zak Districts of the Republic of Karakalpakstan

№	Ectoparasite Species	Affected Animal Species	Seasons
1.	<i>Hyalomma anatolicum</i>	Cattle	Warm seasons, winter
2.	<i>Hyalomma detritum</i>		
3.	<i>Hyalomma plumbeum</i>	Cattle	Warm seasons, nymphs
4.	<i>Hyalomma.scupense</i>	Cattle	Warm seasons
5.	<i>Dermacentor marginatus</i>	Cattle	Warm seasons
6.	<i>Rhipicephalus bursa</i>	Cattle	All seasons, larvae and nymphs
7.	<i>Rhipicephalus turanicus</i>		
8.	<i>Haemaphysalis sulcata</i>	Cattle	Warm seasons
9.	<i>Haemaphysalis punctata</i>	Cattle	Warm seasons
10.	<i>Hyalomma anatolicum</i>	Sheep	Warm seasons



11.	<i>Bovicola ovis</i>	Sheep	All seasons
12.	<i>Bovicola bovis</i>	Cattle	All seasons

These ectoparasites were identified as seasonal zooparasites affecting the bodies of cattle and sheep. Their seasonal activity was found to be dependent on environmental temperatures, beginning in early spring and peaking in parasitic activity during the summer season (Table 1, Figure 2).

Ectoparasites on cattle were observed sporadically at the end of March and the beginning of April. Their reproduction intensified during June and July. The results of our scientific research indicate that ectoparasitic diseases in cattle peak during the summer season.





Figure 2. Dorsal and ventral views of ticks from the genus *Rhipicephalus*

Based on the analysis of our research on the seasonal dynamics of ectoparasite infestation in sheep and goats in the “Qon’iratbay-Mehri” farming household in the Nukus district, as well as in sheep from private households in the “Qo’ybaq” and “Samanbay” neighborhoods of the Qorao‘zak and Nukus districts, it was determined that the level of ectoparasite infestation in sheep is moderate in winter, reaches its maximum in spring, and is minimal in summer and autumn.

Conclusion.

1. In the conditions of the Republic of Karakalpakstan, 12 species of ectoparasites were identified as affecting agricultural animals: *Hyalomma anatolicum*, *H. plumbeum*, *H. scupense*, *H. detritum*, *Rhipicephalus bursa*, *Rh. turanicus*, *Haemaphysalis sulcata*, *H. punctata*, *Dermacentor marginatus*, *Ixodes ricinus*, *Bovicola bovis*, and *B. ovis*.

2. In Karakalpakstan’s livestock farming households, the seasonal phenology of ectoparasites, particularly ticks, begins in the second decade of April, with peak activity observed in June and July.



3. Ectoparasites causing entomosis diseases in agricultural animals, such as *Bovicola*, *Mallophaga*, and others, were found to be more prevalent in winter and spring months.

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