

FAUNA AND PHENOECOLOGY OF ZOOPARAZITES

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Annotation

The article presents information on the fauna and phenoecology of zooparasites among animals in the ecotone and ecotopes of the Zarafshan oasis, as well as the distribution of ixodid ticks in zoobiocenoses and the diseases they cause, their movements, dominant species, and the scale of invasion.

Key words: Ecotone, ecotope, ecology, invaziya, ixod, ixodidoz, parazit, ticks, zoobiocenoses, fauna, phenoecology.

Introduction. Currently, parasitic and vector-borne diseases are widespread in most countries of the world and cause great economic damage to livestock. At present, the study of the fauna and phenoecology of zooparasites (*Arthropoda*), which are special carriers of these and other diseases, and the fight against them is of great scientific and practical importance. Zooparasites, along with blood-sucking ones, damage the skin of an animal and make 85% of the skin unsuitable for production, in addition, when they enter animals, the milk yield of each dairy cow decreases by 18-20%, body weight decreases by 12% and even leads to death. One of the important tasks is to identify species of zooparasites among large and small horned animals, study their distribution and improve measures to combat them.

On a global scale, in recent years, there has been an expansion of the range of zooparasites in large and small horned animals, as well as an activation of the epizootological process due to a decrease in the natural resistance of the organism of agricultural animals under the influence of adverse environmental factors. In particular, zooparasites belonging to the group of free-living arthropods (*Arthropoda*) are widespread in ecotones and ecotopes, which are also dangerous as carriers of transmissible infectious, viral transmissible parasitic diseases of the population and livestock. From this point of view, scientific research is being carried out in the world aimed at studying the fauna and pheno-ecology of blood-sucking parasites, that is, ticks, fighting them, improving methods for express diagnostics and preventing infection of animals with them, as well as the production of new acaricidal preparations.

Materials and research methods. The laboratory of arachnoentomology and acarology of the Scientific Research Institute of Veterinary Medicine, ecotopes of livestock and peasant farms in 4 districts of the Samarkand region, as well as large and small cattle in the care of the population were chosen as the object of study. Bioecological, phenological, parasitological, migratory, sanitary-hygienic, therapeutic, preventive, economic and other studies were carried out using modern biotechniques and methods adopted in veterinary medicine and medicine, special methodological manuals and determinants of species of breeding insects and other special literature.

Research results. The studies were carried out parasitologically on livestock farms, personal and personal livestock, in the forests and pastures of the Zarafshan River, in livestock farms and in personal subsidiary plots. As a result of research and observations, it was found that the seasonal movement of ectoparasites, in particular, ixodid ticks, is delayed by 20 days as a result of a decrease in temperature in the studied areas. In the ecotones and ecotopes of the Taylak, Urgut, Jambay, Payaryk districts of the Samarkand region, as zooparasites of cattle, the main pathogenic species are representatives of the generations of ticks *Hyalomma* (*H.anatolicum*, *H.plumbeum*, *H.scupense*, *H.detrutum*), *Rhipicephalus* (*Rh.bursa*, *Rh.turanicus*), *Haemaphysalis* (*H.sulcata*, *H.punctata*), genus *Dermacentor marginatus*. It has been established that the dominant species among ixodid ticks are *Hyalomma* and *Rhipicephalus* ticks.

Populations of *Trichodectidae* and *Ixodidae* were found mainly in the conditions of newly created small farms and personal subsidiary plots. During inspections and observations in 2018-2020. deviations in the seasonal phenology of zooparasites were not observed. During inspections and observations of livestock for ectoparasites in the mahallas "Tepakishlak", "Urtakishlak", "Fayziabad" and "Dustlik" of the Tailyak district, in the makhalla "Shitop" of the Urgut district and private (livestock in the care of the population) farms of the Jambay district, in mainly ticks *Hyalomma* (*H.anatolicum*, *H.plumbeum*, *H.detrutum*), *Rhipicephalus* (*Rh.bursa*, *Rh.turanicus*), *Dermacentor* (*D. marginatus*), ixodid ticks belonging to the genera *Ornithodoros* (*Alveonassus lahorensis*) from argas ticks.

The studies were carried out in the conditions of secondary (anthropogenic ecotopes) and primary biocenoses (zoocenoses) in small livestock farms in the Taylak, Urgut and Jambay districts of the

Samarkand region, in personal subsidiary plots of the population. A total of 2600 cattle were used, over 328 sheep and over 352 goats. As a result, the following zooparasites and parasitic diseases caused by them were found in the ecotone and ecotopes (zoobiocenoses) (Table 1).

Found zooparasites and the parasitic diseases they cause

Table1

Types of animals	Common species of zooparasites	Names of diagnosed parasitic diseases
Cattle	<i>Hyalomma anatolicum</i>	hyalommosis
	<i>Hyalomma plumbeum</i>	hyalommosis
	<i>Hyalomma detritum</i>	hyalommosis
	<i>Rhipicephalus bursa</i>	ripicephalosis
	<i>Rhipicephalus turanicus</i>	ripicephalosis
	<i>Dermacentor marginatus</i>	dermacentrosis
	<i>Rhipicephalus sanguineus</i>	ripicephalosis
Sheep	<i>Bovicola bovis</i>	bovicolosis
	<i>Bovicola ovis</i>	bovicolosis
Goat	<i>Bovicola caprae</i>	bovicolosis

Movement of ticks *H.plumbeum*, *H.anatolicum*, *H.detritum*, *Rh.bursa*, *Rh. turanicus* spreading pathogens of human and animal transmissible diseases among cattle and small cattle, such as plague, Crimean Congo or Asian hemorrhagic fever, tularemia, tick-borne encephalitis, piroplasmidosis, in the conditions of Zarafshan oasis ecotones and ecotopes, began in early March. This year, in the conditions of private and small livestock farms, garden-ecotones of the Taylak, Urgut and Jambay regions, representatives of the generations of ticks *Dermacentor*, *Hyalomma*, *Rhipicephalus* appeared as dominant ectoparasites in the body of agricultural animals.

Research work on the seasonal movement of zooparasites was carried out in the ecotopes of the Samarkand region, that is, in cattle in private farms of Taylak, Urgut, Jambay and Payaryk regions. As a result, tick species belonging to the genera *Hyalomma* (*H.anatolicum*, *H.plumbeum*, *H.scupense*, *H.detritum*), *Rhipicephalus* (*Rh.bursa*, *Rh.turanicus*), *Haemaphysalis* (*H.sulcata*, *H.punctata*), *Dermacentor marginatus*) turned out to be widespread.

In the course of the study, 200 heads of cattle were examined in personal subsidiary farms of the "Bagizagan", "Tepakishlak", "Urtakishlak", "Fayziabad" mahallas of the Taylak district parasitologically for ticks. According to the results of the check, the degree of their invasion was 85 percent. It has been established that blood-sucking mites belonging to the genera *Dermacentor*, *Rhipicephalus* and *Hyalomma* are mainly widespread.

For ectoparasites, 35 heads of cattle from personal subsidiary farms of the mahallas "Shitop" and "Uramas" of the Urgut district were examined. It was found that 85.7% of them were

spontaneously infected with ixodid ticks. It was noted that species from the genus *Rhipicephalus* and *Dermacentor* dominate in this area.

When examining 50 heads of cattle in personal subsidiary farms of the mahallas "Guliston" and "Saroy" of the Jambay district, 40 heads of them (80.0%) were mainly representatives of the genera *Hyalomma*, *Rhipicephalus* and *Dermacentor* as the dominant species.

When checking 35 heads of cattle in private farms of the mahalla "Nakurt" of Payaryk district, it was revealed that all of them are infected with ticks. It has been established that the dominant species parasitizing these animals are representatives of the genera *Hyalomma* and *Haemaphysalis*. When examining cattle for ectoparasites, we studied the conditions of keeping, feeding, the quality of feed and the conditions for their storage in personal and private farms.

In the conditions of ecotones and ecotopes of the Samarkand region of the Taylak, Jambay, Urgut, Payaryk regions, representatives of the generations of ticks *Dermasentor*, *Hyalomma*, *Rhipicephalus* were observed as dominant ectoparasites in the body of agricultural animals. From the genus *Dermacentor*, species *D.marginatus*, *D.dagestanicus* were found. *H. anatolicum*, *H. plumbeum* from the genus *Hyalomma* were identified as the dominant species. When examining 200 heads of cattle in personal subsidiary farms of the mahallas "Bagizagan", "Tepakishlak", "Urtakishlak", "Fayziabad" of the Taylak district, blood-sucking mites of the genera *Dermacentor*, *Rhipicephalus*, *Hyalomma* were found in 170 (85%) cattle.

In January, February and March, 269 heads of livestock (cattle, sheep and goats) available in ecotones and ecotopes, Zarafshan oasis and private farms were examined. Ixodid ticks were not found in the organisms of these animals, but they are known to be infected with the parasites *Bovicola bovis*, *B. ovis* and *B. caprae*.

In April and May, ixodid ticks belonging to the genera *Hyalomma* (*H. anatolicum*, *H. plumbeum*, *H. scupense*, *H. detritum*), *Rhipicephalus* (*Rh. bursa*, *Rh. turanicus*) were found in the body of cattle. It was found that 15 heads (30.6%) of cattle were infected with *Bovicola bovis*. Infection of cattle with ticks occurred mainly in June-July of the summer season.

Parasitologically examined 35 heads of cattle from personal subsidiary plots of mahallas "Shitop" and "Uramas" of the Urgut district. It was found that 30 (85.7%) cattle were spontaneously infected with ticks. It was noted that representatives of the genera *Rhipicephalus* and *Dermacentor* dominated in this area.

When examining 50 heads of cattle, which are in the care of residents of the mahallas "Guliston" and "Saroy" of the Jambay district, 40 (80%) of them were dominated by the genera *Hyalomma*, *Rhipicephalus* and *Dermacentor*.

When checking 35 heads of cattle in private farms of the mahalla "Nakurt" of Payaryk district, it was revealed that all of them are infected with ticks. It has been established that these animals are mainly parasitized by mites of the genus *Hyalomma* and *Haemaphysalis*. When examining 40 heads of cattle in the Tolmos-R livestock farm in the same region, it was found that 30 of them (75%) were infected with ixodid ticks.

Under the conditions of ecotones and ecotopes of the Samarkand region, Taylak, Urgut, Jambay, Payaryk regions, it was noted that as zooparasites of cattle, the main pathogenic species are representatives of the generation of ixodid ticks *Hyalomma* (*H.anatolicum*, *H.plumbeum*, *H.scupense*, *H.detrutum*), *Rhipicephalus* (*Rh.Bursa*, *Rh.turanicus*), *Haemaphysalis* (*H.sulcata*, *H.punctata*) of the genus *Dermacentor marginatus* (Table 2).

Table 2

Distribution of zooparasites in ecotopes

Types of zooparasites	Types of animals	Seasonal distribution
1. <i>Hyalomma anatolicum</i>	Cattle	During the hot season
2. <i>H.detrutum</i>	Cattle	During the hot season
3. <i>H.scupense</i>	Cattle	Mainly from May to October
4. <i>H.plumbeum</i>	Cattle	Nymph in the warm season
5. <i>Dermacentor marginatus</i>	Cattle	During the hot season
6. <i>Rhipicephalus bursa</i>	Cattle	Any time of the year, winter
7. <i>Rh.turanicus</i>	Cattle	larva and nymph
8. <i>Haemaphysalis sulcata</i>	Cattle	During the hot season
9. <i>H.punctata</i>	Cattle	Summer months
10. <i>Bovicola bovis</i>	Cattle	Winter and spring months
11. <i>Bovicolaovis</i>	Sheep	Winter and spring months
12. <i>Bovicola caprae</i>	Goat	Winter and spring months
13. <i>Musca domestica</i>	Cattle	During the hot season
14. <i>Stomoxys calcitrans</i>	Cattle	During the hot season
15. <i>Lyperosia titillans</i>	Cattle	During the hot season

In the ecotones and ecotopes of the Taylak, Urgut, Jambay, Payaryk districts of the Samarkand region, tick species *Hyalomma* (*H.anatolicum*, *H.plumbeum*, *H.scupense*, *H.detrutum*), *Rhipicephalus* (*Rh.bursa*, *Rh.turanicus*), *Haemaphysalis* (*H.sulcata*, *H.punctata*) and representatives of the genera *Dermacentor marginatus* were identified as seasonal zooparasites parasitizing cattle (Fig. 1-6).



Figure 1. Mite of the genus *Rhipicephalus* **Figure 2.** Mite of the genus *Dermacentor*



Figure 3. The dorsal and ventral surfaces of the mite *Hyalomma*



Figure 4. The dorsal and ventral surfaces of the mite *Haemaphysalis*



Figure 5. The dorsal and ventral surfaces of the mite *Rh. turanicus*



Figure 6. Imago and larval forms of *Bovicola bovis*

It has been established that the seasonal behavior of zooparasites, depending on the temperature of the external environment, is the period of the peak of parasitism, which begins in early spring and summer. Infection of livestock with ixodid ticks depends on the temperature, and also depends on the cleanliness of the places where the livestock are kept. In the seasonal movement of ixodid ticks, this mainly occurs when cattle move to the fields at the beginning of warm days. Ixodid tick species were found in the bodies of cattle in late March and early April. In June and July there was a tendency of their increase. In the course of our scientific research, it was found that infection of cattle with ixodid ticks reaches a peak in summer, while representatives of the genus *Bovicola* spread mainly in the winter-spring period (Table 3).

Table 3

Seasonal phenogram of zooparasites in ecotopes and ecotones

Species of zooparasites discovered	By month (instance)								
	I-III	IV	V	VI	VII	VIII	IX	X	XI-XII
<i>H.anatolicum</i>	-	piece by piece	dozens	dozens	dozens	dozens	piece by piece	piece by piece	-
<i>H.plumbeum</i>	-	-	dozens	dozens	dozens	dozens	piece by piece	piece by piece	-
<i>H.detrutum</i>	-	piece by piece	piece by piece	dozens	dozens	dozens	-	-	-
<i>Rh.bursa</i>	-	piece by piece	dozens	dozens	dozens	dozens	piece by piece	piece by piece	-
<i>Rh.turanicus</i>	-	-	-	piece by piece	dozens	dozens	piece by piece	-	-
<i>H.sulcata</i>	-	-	piece by piece	piece by piece	piece by piece	piece by piece	piece by piece	-	-
<i>H.punctata</i>	-	-	piece by piece	dozens	dozens	piece by piece	piece by piece	-	-
<i>D.marginatus</i>	-	piece by piece	dozens	dozens	dozens	ўнлаб	piece by piece	piece by piece	-
<i>Bovicola bovis</i>	hundreds	hundreds	hundreds	dozens	dozens	dozens	dozens	dozens	hundreds

In the course of our research, in early April, in private and small livestock farms, ixodid ticks were found on the body of cattle, and by June-July, the level of parasitism of ixodid ticks was determined by dozens. It has been observed that their distribution is mainly affected by the conditions of their storage, where their waste is dumped, and the old and new building where the livestock is kept.

CONCLUSIONS

1. In the zoobiocenoses of the Samarkand region, it has been established that zooparasites of 15 species and the parasitic diseases caused by them are widespread among large and small horned animals.
2. In the ecotopes of zoobiocenoses of the “Zarafshan” ecolandscape, it was found that the level of infection of cattle with ixodid ticks in the summer months is 70.0%, and in ecotones - 75.0%, and the phenomenology of ixodidosis is delayed by 10-15 days due to cooler weather compared to subsequent years (2016-2018).
3. It has been established that in the existing cattle breeding in personal subsidiary plots of the Taylak, Urgut districts of the Samarkand region, *Hyalomma*, *Rhipicephalus*, Payaryk, Jambay districts, representatives of the genera *Dermacentor*, *Hyalomma*, *Rhipicephalus* of ixodid ticks predominate and representatives of the genus *Bovicola* dominate.
4. It was found that in the territories of the Samarkand region, 60.0% of cattle were infected with ticks of the genera *Hyalomma* (*H.anatolicum*, *H.scupense*, *H.detrutum*), *Rhipicephalus* (*Rh.bursa*, *Rh.turanicus*) and infected with representatives of the genus *Bovicola* (*B. bovis*, *B. ovis* and *B. caprae*).
5. It has been established that the movement of ticks *H.anatolicum*, *H.detrutum*, *Rh.bursa* and *Rh.turanicus* among cattle and small cattle in the ecotone and ecotopes of the Zarafshan oasis begins in the period from the last ten days of March to the first ten days of April, peaking in the summer months and not found during the winter months.

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