ANNOTATION

Dissertation work of Zhabykpayeva Aigul Gabyzkhanovna on the topic: «Study of ixodofauna in the Kostanay region and prevention of babesiosis in dogs» submitted for the degree of Doctor of Philosophy (PhD) in the educational program 8D09101-Veterinary Medicine

1. Relevance of the research topic. Ixodic ticks (*Ixodoidea ticks*) are blood-sucking arthropods, belong to the most widespread ectoparasites in the world and are reservoirs and carriers of many pathogens of dangerous viral, bacterial and protozoan diseases of humans and animals. The presence of a single mechanism of transmission of pathogens, common hosts and vectors determines the existence of combined natural foci of human and animal infections: encephalitis, borelliosis, granulocytic anaplosmosis, ehrlichiosis, nuttaliosis, babesiosis and teileriosis, causing significant damage to human and animal health and with considerable mortality.

It is difficult to overestimate the medical and veterinary significance of ixodes ticks, and, nevertheless, it is known that intensive study of the fauna of blood-sucking ticks in Kazakhstan was in Soviet times in the 50-80 years of the 20th century. In the future, studies of the fauna and taxonomy of ixodic mites were only episodic. Various sources provide some information about the faunal complexes of ixodes mites in the zones of the southern, western and eastern regions of Kazakhstan. To date, there is no modern data on the fauna of ixodes ticks in the northern region of the country, and the latest information on this topic can be found only in the literature of the 20th century (50-60 years).

In recent decades, the disturbance of the ecological balance, climatic changes, and intensive anthropogenic impact on faunal complexes have affected the number of ixodes ticks, their epidemiological activity and on the borders of the geographical areas of parasites.

The geographical location of the Kostanay region, bordering on well-known natural foci of blood parasitic infections located in the Russian Federation, as well as the variety of landscape and climatic conditions and wildlife create favorable conditions for the circulation of ixodes ticks infected with various pathogens.

Until now, many aspects of the epizootic manifestation of vector-borne diseases of carnivorous animals, in particular in dogs, have not yet been sufficiently studied and explained in various conditions. The most common and clinically significant disease in dogs is babesiosis, which causes irreparable harm to the animal's health. Every year, the problem of babesiosis becomes more acute, this is facilitated by the formation of biotopes of ixodic ticks in urban areas, as well as an increase in the number of dogs owned by private owners.

Despite the urgency of the problem and the presence of climatic, biological and epizootological prerequisites for the existence of infected ixodic ticks, insufficient attention is paid to the study of canine babesiosis. And, as a result, we have scant information regarding the prevalence, epidemiology, diagnosis and

treatment of vector-borne diseases of dogs, as well as diseases of zoonotic concern. An important aspect is the lack of information about the circulating strain of canine babesiosis in the territory of Kostanay region. Without proven facts of the endemic condition, there is no opportunity to improve the complex of therapeutic and preventive measures against babesiosis in dogs.

In this regard, modern clarification of the ixodofauna, specific vectors of canine babesiosis and epizootology of the disease in order to organize effective preventive and curative measures is relevant.

2. The purpose of the dissertation research: To study the species diversity of ixodes ticks in the territory of Kostanay region with the identification of vectors of babesiosis of dogs. To study the spread, features of the epizootic process of canine babesiosis and the improvement of protocols for the treatment and prevention of the disease.

3. The object of the study: ixodes ticks and dogs spontaneously infected with babesiosis.

4. Subject of the study: *Babesia canis*

5. Research objectives: 1. Monitoring and identification of the species diversity of ixodes ticks in the territory of Kostanay region (geographical distribution).

2. To identify the infection of ixodes ticks with the causative agent *Babesia spp*. with molecular genetic identification of babesias in ticks and in blood samples of sick dogs.

3. To analyze the epizootic situation of babesiosis of dogs in the territory of Kostanay region with the study of the features of epizootology: the dynamics of morbidity, seasonality, manifestations of the disease, the influence of pedigree, sexual and age factors on the occurrence of the disease.

4. To study the morphometric parameters of the babesias of dogs found in the Kostanay region and conduct clinical, hematological and biochemical studies of dogs with babesiosis.

5. To improve preventive measures and the protocol for the treatment of canine babesiosis and introduce it into the practice of veterinary clinics in Kostanay.

6. Scientific novelty.

New and up-to-date data on the species diversity, distribution and seasonality of parasitization of ixodic ticks in the territory of Kostanay region - the northern region of Kazakhstan are presented.

The species of the ixodic tick *D.reticulatus*, the main vector of canine babesiosis in the territory of the Kostanay region, has been identified.

For the first time, ticks living in the territory of Kostanay region were studied for the presence of babesias and the infection of ixodic ticks *Babesia canis* was determined using molecular genetic methods.

The epizootic situation and the dynamics of the incidence of canine babesiosis in the seasonal and age aspect in the conditions of the northern region of Kazakhstan have been studied.

A scientifically based effective therapeutic protocol with the use of Prednisolone and Dufalac drugs for babesiosis in dogs has been developed and tested and introduced into the practice of veterinary clinics in the city of Kostanay.

Scientifically based improved effective preventive measures are proposed to reduce the spread of the incidence of *Babesia canis*.

A new method for preparing a permanent preparation of ticks on a slide is proposed. Utility model Patent No. 4171.

7. Provisions for protection

The species diversity of ixodes mites in the territory of Kostanay region, depending on the landscape and climatic zones.

The species of ixodes tick *D.reticulatus* is the main vector of babesiosis of dogs in the territory of Kostanay region.

Babesia canis is the main etiological agent of canine babesiosis in Kostanay region.

The distribution and features of the epizootology of canine babesiosis in the Kostanay region.

Improved preventive measures and protocol for the treatment of canine babesiosis in veterinary clinics of Kostanay and Kostanay region.

8. The practical significance of the results obtained.

The results obtained expand and clarify information about the ixodofauna of the Kostanay region of Kazakhstan. The role of ixodic ticks in the spread of the pathogen *Babesia canis*. They make a significant contribution to solving the urgent problem of combating natural focal diseases. Determination of the dynamics of the incidence of canine babesiosis in the seasonal and age aspect were additional data revealing the features of the epizootology of invasion in the conditions of the northern region of Kazakhstan.

Effective treatment protocols using Prednisolone and Dufalac drugs have been tested and implemented in their practice in the conditions of veterinary clinics in the city of Kostanay for babesiosis of dogs. Preventive measures have been improved and recommended to prevent babesiosis of dogs. The acts of implementation in the veterinary clinics of Kostanay «VET ZABOTA», «Dogma», «Aibolit», and the clinic of Rudny «Vetlab».

The research results are used in the educational process of the parasitology course at the Department of Parasitology and Tropical Veterinary Medicine of the National University of Bioresources and Environmental Management of Ukraine, Kiev № 3 dated 14.03.2018.

The results of the work have been tested and presented in the form of:

- practical recommendations for the treatment and prevention of babesiosis in dogs – "Babesiosis of dogs. Distribution in the Kostanay region, diagnosis, treatment and prevention" (approved by the Scientific and Technical Council of the Kostanay Regional University named after A.Baitursynuly", Protocol №1 dated 13.09.2024).

- the textbook "Babesiosis of animals (epizootology, biology, diagnostics of a species determinant)" for students in the specialties of veterinary medicine and biology, to help teachers of higher and secondary specialized educational

institutions, veterinarians and specialists of diagnostic centers (approved by the Council of the Faculty of Veterinary Medicine and Animal Husbandry Technology, Kostanay State University named after A.Baitursynov, Protocol No. 3 dated 29.03.2018).

- patent for utility model №4171 «Method for preparing a permanent preparation from ticks on a slide».

They are listed in the GenBank database of the National Center for Biotechnology Information of the USA (NCBI) under the number MK070118.1. «Nucleotide sequences of Babesia canis isolated from mites of biotopes of Kostanay region (Babesia canis isolate Kaz-Dr93 small subunit ribosomal RNA gene, partial sequence)».

The results of the research can be used in lecture courses and laboratory classes in ecology, zoology, parasitology, in the performance of theses, master's, doctoral dissertations and scientific research.

9. Personal contribution of the doctoral student

A significant part of the research was carried out independently: collection, determination, analysis of the species composition of ixodic ticks, collection and analysis of the epizootic situation for babesiosis of dogs, clinical and hematological parameters for babesiosis were studied. Participation in the molecular genetic identification of babesias in ticks and blood of dogs. A treatment protocol and preventive measures against canine babesiosis have been developed and tested. The analysis, generalization of the results and the design of the manuscript were carried out.

The dissertation was carried out within the framework of the initiative topic registration card №0118RKI0035 on the topic: «Study of ixodofauna in ecosystems of Kostanay region and development of modern methods of prevention of babesiosis (pyroplasmosis) of dogs».

10. Approbation of the results of the dissertation.

- at the International Scientific and Practical Conference of the Institute of Veterinary Medicine "Problems of veterinary medicine, veterinary and sanitary expertise, biotechnology and animal science at the present stage of development of the agro-industrial complex of Russia". Chelyabinsk: South Ural State Agrarian University, - 2018 – pp.75-82

- at the III International Scientific and Practical Conference dedicated to the memory of Prof. Muslimova B.M.- Kostanay: A. Baitursynov KRU, 2020. - p. 68.

- at the International scientific and practical conference "Baitursynov Readings-2024", - Kostanay: Akhmet Baitursynuly KRU 2024 - pp. 177-180.

The results of dissertation research were reviewed at the meeting of the Academic Council (2018), the Scientific and Technical Council (2019), and the inter-cathedral meeting of the Akhmet Baytursynuly KRU (2024).

11. Publications.

The results of the dissertation research are reflected in 9 printed works: an article in the foreign rating journal of the Scopus database, percentile 52 - 1; in publications recommended by the KOKSNVO of the Ministry of Foreign Affairs of the Republic of Kazakhstan - 4 articles, in the materials of international

conferences - 3 articles. The patent for the utility model of the Republic of Kazakhstan No. 4171. Practical recommendations -1 and a textbook- 1 have been published.

12. The volume and structure of the dissertation. The dissertation work is presented on 130 pages of computer text, includes: introduction, literature review, own research, generalization of results, conclusion and a list of 187 sources used. The text of the work contains 39 figures, 24 tables, 1 formula and 12 appendices.