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PRELIMINARY STUDY OF *ECHINOCOCCUS* SPECIES DISTRIBUTION IN KAZAKHSTAN

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Cestodes are important endoparasitic organisms, some of which are responsible for serious zoonotic diseases. The most severe diseases are inflicted by the larval stages (metacestodes) of *Echinococcus multilocularis* and *E. granulosus*, which are the causative agents of alveolar (AE) and cystic echinococcosis (CE), respectively. Alveolar and cystic echinococcosis are emerging and reemerging in Europe, Africa, and Asia. The expansion of *Echinococcus spp.* tapeworms in wildlife and host reservoirs appear to be driving this emergence spread in larger areas.

The influence of human activities including the booming livestock pastoralism and changes in both land-use patterns and human behavior may have also influenced the epidemiology of AE and CE. It should be noted vast prevalence of echinococcosis diseases in neighborhood countries. Landscape and microclimatic conditions affect the location of endemic foci of *Echinococcus* in different zones in Central Asia resulting in a very patchy distribution. These features affect the type and structure of definitive and intermediate host populations and their interrelationships and hence transmission of the parasite. In the plains, the intensity of the distribution increases from the sandy desert with the lowest prevalence rates which much higher prevalence rates seen in animals in the steppe. In mountain areas, high infection rates are seen in the east of the region [1,2,3].

For, instance *Echinococcosis* is a serious reemerging zoonosis, and China is one of the most important endemic areas of AE and CE in the world. Human echinococcosis infection rates seemed to increase in China in recent years. It may be attributed to the use of better diagnostic techniques, more developed medical systems, and more extensive documentation in the past 20 years [4,5].

A similar situation is shown in Kyrgyzstan, *E. multilocularis* is responsible for the majority of human infections and is also found in the majority of dogs. Nevertheless, *E. granulosus* was also found in their studies [6].

Also, more than 500 cases of echinococcosis are registered annually in the Russian Federation. The Federal Service for Supervision of Consumer Rights Protection and Human Welfare reports that the epidemiological situation of

echinococcosis remains difficult in the Russian Federation. Based on a study aimed to identify the aetiological agents of the diseases and to investigate the distribution of each *Echinococcus* species in Russia, they were identified as *Echinococcus granulosus*, *E. canadensis*, and, *E. multilocularis* [7,8].

Although there was a studies of *Echinococcus spp.* distribution among livestock animals and wildlife hosts in Kazakhstan territory [5, 6, 7], there is still an acute question of more thorough and in-depth studies of this disease. A comparative table on the prevalence of echinococcosis species in the neighboring state is presented in Table 1.

Table -1. Types of Echinococcus species distributed in Kazakhstan and neighborhood countries

Country	Intermediate hosts			Final hosts		
	Cattle	Sheep	Human*	Wolf	Fox	Dog
<u>Kazakstan</u>	<i>E. granulosus</i>	<i>E. granulosus</i>	<i>E. granulosus</i>	<i>E. granulosus</i>	<i>E. multilocularis</i>	<i>E. granulosus</i>
Russia	<i>E. granulosus</i>	<i>E. granulosus</i>	<i>E. granulosus</i> <i>E. canadensis</i> <i>E. multilocularis</i>	<i>E. canadensis</i> <i>E. multilocularis</i>	<i>E. multilocularis</i>	<i>E. canadensis</i> <i>E. granulosus</i>
China	<i>E. granulosus</i>	<i>E. granulosus</i>		<i>E. granulosus</i>		<i>E. granulosus</i> <i>E. multilocularis</i>
Kyrgistan	<i>E. granulosus</i>	<i>E. granulosus</i>	<i>E. granulosus</i> <i>E. multilocularis</i>			<i>E. multilocularis</i> <i>E. equinus</i> <i>E. granulosus</i>
Mongolia	<i>E. granulosus</i>	<i>E. granulosus</i>				

* *impasse host*

As can be seen from Table 1, one can pay attention to the species diversity of echinococcosis infection common among the final and intermediate hosts. In particular, the same infection with the species *E. granulosus* between hosts is traced, which indicates a continuous cycle of this parasite.

According to our primary studies, a total of 17 samples were examined, we can conclude that among the final hosts (wild animals), two main types of echinococcosis are common *E. granulosus* and *E. multilocularis*, which had 1 genotype and 7 different haplotypes [8]. Highly prevalent in species is *E. granulosus*, and several cases of *E. multilocularis*.

At the moment, there is a growing need to study this disease in Kazakhstan, at all levels of the life cycle of helminth development. In turn, this includes studies of large and small animals, domestic and wild dogs. On this problem, we are conducting research in this area, to date, primary results have been obtained confirming the widespread occurrence of *Echinococcus spp.* among domestic animals.

In conclusion, the situation with echinococcosis in Kazakhstan is as bad as it is. Firstly, it is based on a poorly arranged monitoring system of helminths cycling in different levels of hosts. Additionally, there is a need to study the *Echinococcus* helminth species. The high genetic variability of this parasite in both intermediate

and definitive hosts should be noticed as a potential risk factor in pathogenesis. Secondly, according to our studies take the place of the silence of farmers, whose aim is to sell the meat product. Which leads to secondary infection with echinococcosis disease.

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