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Biology, Ecology, Morphology And Epizootological Characteristics Of Sheep Moniesis

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ABSTRACT

The article compares the literature on the biology, ecology, some morphological features, epizootiological status of sheep moniesiosis pathogens, important diagnostic features that distinguish them from individual studies, data were analyzed.

KEYWORDS

Moniezia expansa, M.benedeni, M.autumnalia arthropods, oribatid canals, soil, humus, oncosphere, cysticercoid, strobila, scolex, cestode.

INTRODUCTION

Due to the fact that various infectious and invasive diseases hinder the development of animal husbandry and increase its efficiency, and helminthiasis plays a key role in them, many animals die, productivity decreases, young animals lag behind in growth and development, ewes become infertile, and other organisms there is a decrease in the ability to fight diseases, ie resistance, a decrease in meat production by 10-30% [10]. Among helminthiasis, intestinal cestodes of sheep play an important role in terms of prevalence, economic damage and low level of study. Due to the prevalence of helminths among animals, as well as the fact that they cause various diseases in farm animals and poultry, their study will undoubtedly solve not only problems in the field of veterinary medicine, but also a wide range of socio-economic issues. Scientific research on the effectiveness of helminthiasis control measures and ways to increase it has always attracted the attention of researchers.

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Monieziosis is a widespread cestodosis disease in many countries, including the CIS. The biology, ecology, distribution and other epizootiological features of sheep moniesiosis, the species composition of its pathogens have not been studied in Uzbekistan for more than 50 years. It should be noted that world science has identified 14 species of intestinal cestodes, the causative agent of moniesiosis in domestic and wild ruminants. Among them, Moniezia Blanchard, Moniezia expansa (Rudolphi, 1810), Moniezia benedeni (Moniez, 1879) and Moniezia autumnalia Kuznetsov, 1967 species of Moniezia were identified as parasites in Uzbekistan.

Young lambs and kids with moniesia are the most affected, followed by small horned animals aged 1-1.5 years. Moniesiosis caused by M.expansa and M.benede is rare in adult sheep. In recent years, our studies have shown that moniesiosis is common among sheep, resulting in deaths [10]. Therefore, it is important to conduct research on the biology, ecology and epizootiological status of moniesiosis pathogens.

THE PURPOSE OF THE STUDY

Analysis of the literature on the study of sheep moniesiosis in the context of Uzbekistan and the CIS, as well as the study of the biology, ecology and current epizootiological status of moniesiosis pathogens.

RESEARCH MATERIALS AND METHODS

In our research, the sources of scientific literature on the study of biology, ecology and distribution of sheep moniesio-pathogens were analyzed, and the results of our personal research in Uzbekistan were compared.

RESEARCH RESULTS AND THEIR ANALYSIS

Moniesiosis pathogens are biohelminths that develop in the presence of two hosts. Their intermediate hosts are oribatid (soil) canals, which are small-sized phytophagous and coprophagous, arthropods that feed on various humus in the soil, including animal manure. Ruminants, on the other hand, are their definitive masters.

The involvement of oribatids, or soil channels, of the Galumnidaeo family, in the larval development of Moniesia was discovered in 1937 by H.W. Stunkard. In 1938-1939, this researcher experimentally studied the development of cysticercoids, which are contagious to definitive hosts from the parasite's six-lobed oncospheres, by artificially infecting oribatid canals with M. expansa eggs. Such discoveries were confirmed in the same years by U.S. scientists W.H.Krull and others, who discovered that the Galumna emarginata (Banns, 1895) and G.nigra (Eming, 1913) oribatid canals were involved in the development of the parasite.

According to the literature, in the development of M.expansa it has been proved that oribatid canals belonging to families other than the Galumnidae family may be its intermediate host [7]. At the same time, he studied the development of M. Benedeni experimentally. Thus it was determined at that time that the oribatid canals belonging to the Schcloribates, Galumna, and Aborites genera were the intermediate hosts of M.expansa and M.benedeni. Oribatid canals also swallow parasitic eggs in the feces of animals infected with moniesi, along with various humus throughout life. In a mite's body, the oncosphere that comes out of the

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egg falls into its abdominal cavity and begins to develop in it, eventually becoming a cysticercoid that is contagious to the main host.

The main hosts of Moniesia are damaged as a result of consuming such cysticercoid canals along with grass and soil. Parasites grow rapidly in the intestines of animals, and it averages 8 cm per day. M.expansa matures in the intestines of lambs in 38-40 days, and M.benedeni in 42-49 days. In calves, their development can take 2-3 days.

In Russia, it was found that invasive larval cysticercoids of both species reach the oribatid canals at 16-20 0C for 90 days in summer and autumn, and at 95-114 days in winter at the same temperature [4].

In Uzbekistan, at the same temperature (23 0C) cysticercoids of moniesia become invasive in soil canals in 85-98 days, and when such canals are consumed by lambs, M.expansa matures in 39 days and M.benedeni in 54 days. 9 rounds for the task and 10 rounds for M. Benedeni [6].

Some researchers have shown that in Uzbekistan, 12 species of oribatid canals serve as intermediate hosts for both species of moniesia (M.expansa, M.benedeni) and another species of mite for M.benedeni [1]. According to him, M.benedeni matures in the body of a lamb in 54 days, while in M.expansa it is 39 days. In sheep, M. expansa lives 87 days and M. benedeni 117 days.

According to the literature, oribatid canals fall from the plant body to the soil when the air temperature in Belarus drops to 10 0, and at temperatures above 10 0 the canals rise back to the plant body. At 12-14% humidity, the canals stop moving, in the morning dew, on cloudy days they can be found in the plant body. Such spiders are described as transitioning to an anabiotic state at a depth of 0.5 cm in the soil in winter. Also, during drought, a layer of soil rich in organic matter absorbs steam-like moisture hygroscopically and as a result they do not move towards the deeper layer of the soil.

In the conditions of Samarkand region, 223 samples with a thickness of 2-5 cm in an area of 10 x 10 cm of soil were studied in the Tulgren apparatus, in which a total of 4535 copies of oribatid canals were found. According to him, the density of oribatid canals in Narpay district of the province is lowest in January, then it rises and rises until April, then decreases, rises from July and peaks in September [9]. In the irrigated zone, these spiders were not only found in December, but were highest in April and September. In the foothills, these canals are less common than in the irrigated zone, where they appear in March, the number of canals decreases in April-May, does not occur in June-July, appears in August, increases in September, and then decreases. Data such as the absence of oribatid canals in certain months of the year or the decrease in their number during the months with the highest humidity in the foothills (April-May) do not currently seem to be relevant to the ecology of these spiders.

In the semi-desert zone of Uzbekistan, oribatid canals are most common from autumn to mid-spring [6]. During the hot and dry periods of summer, they were observed to migrate to a depth of 110 cm in the soil.

Intermediate hosts of intestinal cestodes - the study of the ecology of oribatid canals - have found that they are widespread in all zones, that they are very common in the desert-

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pasture zone, and even in the dry parts. In the study of vertical migration of these spiders, oribatid canals were observed to penetrate them into the soil up to 35 cm in humid conditions [1; 2]. This type of migration was considered to be characteristic of soil canals in Central Asian countries. In cold conditions, it was observed that the main part of the canals meet at a depth of 5-10 cm and is in an active state.

In the conditions of Uzbekistan, the intermediate hosts of moniesia - oribatid canals, develop and multiply intensively when the soil contains 1.0% or more humus. In soils with 0.7% to 1.0% humus, they multiply slowly, while in soils with a humus content of 0.5%, oribatid canals die quickly. It is known in science that the amount of humus in the soil does not exceed 0.6% in the soils of the desert-pasture zone in relation to irrigated and plain, foothills and mountainous areas. Studies have shown that sheep moniesiosis is highest in the desert-pasture zone (43.2%), almost twice as low in the foothills (21.1%), and much lower (8.9%) in the irrigated zone [8;]. According to this author, oribatid canals occur at a depth of 5-10 cm of soil in the irrigated zone, 10-15 cm in the foothills, 20-25 cm in the desert-pasture zone. These canals are common in the winter and spring months in all zones, according to the author, but they are found in each zone each month of the year. Thus, oribatid canals are widespread in nature, so moniesiosis occurs in all climatic-geographical zones, it can be included in the list of diseases without borders.

Outbreaks appear to be exacerbated during grazing and, in rare cases, due to the immediate exposure of domestic animals to alfalfa or other green plants harvested in humid weather.

The intermediate hosts of the Moniesia - oribatid canals - are widespread in all climatic and geographical regions of Uzbekistan - in the irrigated plains, foothills and desert-pasture biocenoses. Accordingly, the disease covered all areas where animals are kept. Monieziosis also occurs among ruminants that are kept permanently or temporarily on personal helper and farmland plots.

Monieziosis is not observed to be a seasonal disease because it can be encountered throughout the year. It is well known that oribatid canals become very active during periods of high humidity and soil temperature. Accordingly, canals infested with moniesia cysticercoids are most consumed by animals during these periods when they are fed in field conditions. Therefore, moniesiosis peaks in spring and autumn. In the summer, soil canals fall into the animal's body due to the consumption of plants by the bottom in the conditions of irrigated biocenoses, which is also observed during the slightly warmer winters. According to our research, when the ground is covered with snow, under the influence of the sun it can be observed moniesiosis even in places where it melts at 10-12 0S (where the green plant is deciduous). The end of autumn, the beginning of winter is marked by warm weather and high humidity, while in all zones, especially in the foothills and desert regions, the pastures are covered with green grasses with thin roots. At this time, the soil, partially mixed with the roots of grasses, falls in large numbers on the organism of animals, and the incidence of moniesiosis increases. During the harsh winter, moniesiosis ceases when the topsoil freezes thickly. During the summer, one-month-old green plants in the desert region dry out, but the moisture around their living roots retains some of the moisture. The roots

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of such plants enter the animal organism in a soil mixture, and in the soil structure and in the root of the plant there are oribatid canals, among which there are those infected with moniesiosis pathogens.

Due to the fact that moniesiosis does not belong to the group of seasonal diseases, the infestation of animals with moniesia increases in spring and autumn, when there is sufficient precipitation. Outbreaks appear to be exacerbated during the harsh winters. If the winter is warm, the invasion will continue. When animals are kept close to narrow pastures, the incidence of moniesiosis increases. In the summer, moniesiosis of animals in desert-pasture conditions occurs as a result of consumption of soil mixture with the roots of dried annual plants. This situation is also observed in the meadows around the irrigation canals and outlets.

The species composition of sheep moniesiosis pathogens in Uzbekistan was first studied in the Samarkand region in 1946-1948 by Professor NV Badanin (1949), and it was determined that it was caused by cestodes M.expansa and M.benedeni. After that, R.H.Khayitov found 3981 copies of cestodes in the small intestine of 1220 heads (9.93%) of 12849 heads of sheep examined by helminthological cracking in 1951-1953 in Samarkand region. The average invasive intensity of these parasites was 3.3 copies per infected sheep. Of all the sheep examined, 2.1 percent were found to be infected with M.expansa, 3.1 percent with M.benedeni, 5.2 percent with tyzaniesia, and 0.3 percent with avitellina. More than half of all cestodes studied were tizaniesia, 23.5% were M.benedeni, 19.0% were M.expansa, and about 2% were avitellina. Thus, in terms of invasiveness and invasive intensity, T. giardi was first, M. benedeni was second, M. expansa was third, and avitellina was fourth.

According to research conducted in Uzbekistan, the incidence of sheep moniesiosis (M.expansa and M.benedeni) is 1.7% in Tashkent region, 15.6% in Samarkand region, 8.6% in Navoi region, 17.1% in Bukhara region. In Surkhandarya region it is 23.5%. In terms of different categories of farms, the incidence of sheep moniesiosis is highest in breeding farms (25.3%), moderate in dehkan farms (14.2%), commodity (rent and company) and minimum in private subsidiary farms in the desert and semi-desert region. (7.2 and 7.1 percent, respectively) [3].

In our studies in Uzbekistan in 2012-2020, morphologically different monies were found among cestodes collected from sheep intestines. We will dwell on them in part.

Adult cestode with strobiles up to 70 cm. The owner is a 12-month-old Ovis aries. Scholexia is as wide as other monies in relation to the short neck, but the proglottids formed from the neck grow faster in width. For example, proglotids 15 cm from the scolex are 3.8 mm wide by 0.6 mm long and 35 cm long by 6.2 and 0.9 mm, respectively. When the strobiles reach 40 cm, the proglottids shrink slightly in width and grow slightly in height. Then again they grow more in width than in height. Thus, the latest proglotids are 7–7.5 mm wide and 1.1 mm long. The uterus of the last proglottids matured was 4-sided and numerous with noxious apparatus eggs. The fact that this cestode belongs to the genus Moniezia and is distinguished from M.expanza, M.benedeni, M.alba, M.autumnalia by its morphologically short strobile, uneven development of proglottids, and biologically rapid maturation indicates that it is a new pathogen of moniesiosis.

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Strobilasi 110 cm ga teng tsestod. The owner is 11-month-old Ovis aries. The longitudinal part of it, the initially formed proglottids in it also grew rapidly in width. For example, proglotids at a distance of 10 cm from the neck are 6 mm wide and at a distance of 20 cm are 9.0 mm. However, in M.expanza the width of proglottids at this distance does not exceed 3.0 mm. Proglotides at a distance of 50 cm from the scolex were 10 mm wide, 11 mm at 80 cm, and 12 mm at 100 cm. This was followed by a reduction in the width of the most recent proglottids, which was 10 mm. The height of the proglottids did not exceed 0.7-0.8 mm. In the uterus of this cestode, the formation of eggs was observed. Thus, this cestode also differs sharply from other species of moniesia in that it grows biologically rapidly and matures.

Strobilas are adult cestodes, 120 cm long. The owner is a 5-month-old Ovis aries. Its neck is very short, fast-growing, the proglottids develop in one plane, the last proglottids are parasites with a width of 14 mm and a height of 1.2 mm. In her uterus were placed triangular eggs resembling M.expanza. This species of cestode also differs sharply from other cestodes belonging to the Moniezia family by its biologically rapid growth and maturation.

The length of the strobilas is 195 cm. The owner is Ovis aries. The neck is very short, similar to that of moniesia, the first proglotids grow rapidly in width, then shorten, and grow in height, thus forming a chain shape. In cestodes with such proglotids, cocoons usually appear, not eggs, but eggs matured in the last proglotids of this cestode.

Such a list of moniesiosis pathogens can be continued further, as there are currently 14 species of moniesia in science. 10 species of them have been found to parasitize wild wild ungulates. These include Moniezia species (Koch, 1942) found in Germany, Moniezia species (Cameron, 1943) found in Canada, Moniezia rangiferina Kolmakov, found in Russia, 1938, Moniezia baeri Skrjabin, 1931, Moniezia taimerica Semenova, 1966 and others, listed in Kyrgyzstan. species (Massino et Almidova, 1949). But the morphology of most of them is not covered in the literature that belongs to us. There is only some information about the 3 rounds between them. For example, the strobile of M. rangiferina is 5-10 m long, 12-18 mm wide, the interstitial glands are ring-shaped, they are located at the edges of the joints 12-28 times. The uterus is round in shape, the eggs have a noxious apparatus. This cestode is very close to M.expanza.

According to the results of our research, the infestation of sheep with moniesiosis pathogens M.expansa and M.benedenilar in Uzbekistan begins in early spring due to the winter invasion of soil canals last year, which is followed by this year's invasion. Infection with moniesia decreases slightly in summer, but it is observed at different levels in different climatic-geographical zones, increased humidity in autumn leads to re-invasion, and in most years (except long-term frosty winter) moniesia infestation is repeated in some months or days of winter. It is also important to note that in each zone there are separate and common areas (foci) of M. expansa and M. benedeni. It was noted that in the foothills of Samarkand region, both species of sheep are parasitic, with a slight predominance of M. expansa, and in the desert-pasture region, a strong moniesiosis epizootic is dominated by M. Benedeni. In mixed moniesiosis, the predominance of one or another type of cestode depends on the degree of damage to them, the number of sheep, the size, quality

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and other environmental factors of pastures and meadows.

From the above data, it can be seen that there are different, even contradictory, data in the literature on the ecology of oribatid canals in the MHD region. The most important of these is the positive effect of humidity and temperature on the activity of these spiders. Oribatid canals play an important role in soil erosion and increase its fertility.

CONCLUSION

In our study, moniesiosis was one of the most common cestodes in sheep, and scientific data on the development of its pathogens, the bioecology of intermediate hosts were analyzed. Moniesia can be found in every season of the year. In the territory of Uzbekistan, except for M.expanz, M.benedeni, the rapid maturation of O.aries in sheep indicates the presence of species of moniesiosis pathogens, characterized by shortness of strobilas and some other morphological features. However, the literature notes that the degree of invasiveness and invasive intensity of moniesia varies according to the age of the sheep and also in different climatic-geographical zones.

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