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THE INFLUENCE OF BIOCENOSIS ON THE FORMATION OF THE FAUNA OF ARGALI-MERINO SHEEP PARASITES IN THE NORTHERN TIEN SHAN

Suleimenov Maratbek Zhaksybekovich,
candidate of veterinary sciences, full professor,
Institute of Zoology, Almaty, Kazakhstan
E-mail: maratbek.suleimenov@zool.kz

Berkinbay Omarkhan,
doctor of veterinary sciences, full professor,
Institute of Zoology, Almaty, Kazakhstan
E-mail: berkinbay49@mail.ru

Omarov Bayzhan Baymukhambetovich,
candidate of veterinary sciences,
Institute of Zoology, Almaty, Kazakhstan
E-mail: baijan1957gmail.com

Zhanteliyeva Laura Orazakynovna,
PhD, Institute of Zoology, Almaty, Kazakhstan
E-mail: laura_18_87@mail.ru

Barbol Bekzhan Isenbayuly,
doctoral student, Institute of Zoology, Almaty, Kazakhstan
E-mail: bekzhan.barbol@gmail.com

Dzhusupbekova Nurgul Madalievna,
candidate of veterinary sciences,
Institute of Zoology, Almaty, Kazakhstan
E-mail: nurgul.dzhusupbekova@mail.ru

Uğur Uslu.
Division of Parasitology. Prof. Dr.
University of Selcuk, Medicine Faculty, Konya, Turkey
E-mail: uuslu@selcuk.edu.tr

Rao Zahid Abbas
PhD, Prof., Department of Parasitology,

University of Agriculture, Faisalabad, Pakistan
raouaf@hotmail.com

Abstract

In the Karkara-Kegen valley of the Almaty region of Kazakhstan, when breeding a new breed of sheep with the participation of different animal species, their fauna of parasites was formed from parasites present in this biocenosis or natural focus. In this region there were 75 species of parasites belonging to 5 types, 10 suborders, 21 families and 34 genera. During the formation of the breed for more than 20 years, argali-merino sheep had 28 species of parasites: one species of trematodes (*Dicrocoelium lanceatum*), 4 species of cestodes (*Taenia hydatigena, larvae; Echinococcus granulosus larvae; Moniezia expansa; M. benedeni*) and 23 species of nematodes (*Skrjabinema ovis, Chabertia ovina, Trichostrongylus axei, Trichostrongylus colubriformis, Ostertagiella circumcincta, O.occidentalis, O. trifida, O. trifurcata, Marshallagia marshalli, Nematodirus archari, N. dogieli, N. filicollis, N. oiratianus, N. spathiger, Nematodirella longissimespiculata, Dictyocaulus filaria, Protostrongylus davtiani, P. hobmaieri, P.raillieti, P. skrjabini, Cystocaulus nigrescens, Bicaulus schulzi, Trichocephalus skrjabini*). In the next 60 years, hybrids acquired another 35 species. Thus, a new breed of animals is included in the cycle of invasion in the biocenosis. Some parasites (not previously noted in this biocenosis) that are in the body of argali-merino sheep, getting into the external environment with feces, form new foci, involving other species of animals living in this biocenosis in the circulation.

Keywords: cestode; nematode; gadfly; fauna of parasites; Karkara-Kegen; valley; biocenosis.

Introduction

It is known that the formation of biocenoses, in addition to climatic changes and anthropogenic factors, is significantly influenced by the patterns of dynamics of a complex of biological components, among which parasites play an important role, participating, along with predators, in the regulation of the number of wild animals. In nature, the relationship between parasites and hosts is not always clearly traced, therefore, the study of such interactions, for example, the influence of helminths on the dynamics of wild ungulate populations, becomes not only a scientific, but also a practical task.

The fauna of eimeria of wild ungulates in the Northern Tien Shan was studied in 1958 by S.K.Svanbayev [1,2]. For the first time, he discovered two species of eimeria in wild boar (*Sus scrofa*): *Eimeria ibragimovae, E.almataensis* and one species of isospores – *Isospora suis*, in roe deer (*Capreolus pygargus*) – four species: *Eimeria capreoli, E.ponderosa, E. rotunda* and one species of isospores – *Isospora capreoli*, in maral (*Cervus elaphus*) - three species of eimeria: *Eimeria cervi, E.gallivalerioi, E.robusta*, argali (*Ovis ammon*) has four species: *Eimeria ammonis, E. surkovae, E. zejnijevi, E. rachmatullinae*, mountain

goat (*Capra hircus*) has four species: *Eimeria capra, E. babaevi, E. randilovi, E.nazijrovi*.

The helminth fauna of wild boar (*Sus scrofa*) in the Northern Tien Shan was studied in 1953-1954 by Y.N.Zakhryalov [3]. He registered the following helminths in the boar: *E.granulosus larvae; Taenia hydatigena, larvae; Ascarops strongylina; Physocephalus sexalatus; Metastrongylus elongatus; M. pudendotectus*. In this region, the helminth fauna of wild boars was studied by V.A.Shol in 1961 [4]. He discovered seven types of helminths: *D.lanceatum, Alveococcus multilocularis, E.granulosus, T.hydatigena, Metastrongylus elongatus, M. pudendotectus, Trichocephalus suis*.

According to helminthological studies by N.V.Badanin [5], the following types of helminths are parasitized in roe deer (Capreolus pygargus) from the Northern Tien Shan: *D.lanceatum, T.hydatigena (larvae), M.expansa, Trichostrongylus colubriformes, T.probolurus, T.vitrinus, Ostertagia circumcincta (=Ostertagiella circumcincta),Ostertagia trifurcata (=Ostertagiella trifurcata), Ostertagia marshalli (=Marshallagia marshalli), Ostertagia occidentalis (= Ostertagiella occidentalis), Nematodirus spathiger, Haemonchus contortus, Ch.ovina, Dictyocaulus hadweni (=D.eckerti), Parabronema skrjabini u Trichocephalus skrjabini*.

The helminth fauna of the maral (Cervus elaphus) from the Northern Tien Shan, according to S.N.Boev [6], I.B.Sokolova [7] and M.P.Lyubimov [8], are represented by 8 species: *D.lanceatum, M.benedeni, Dictyocaulus eckerti, Elaphostrongylus panticola, Oesophagostomun venulosum, Parabronema skrjabini, Setaria altaica.*

According to S.N.Boev, I.B.Sokolova and V.Ya.Panin, 28 species of helminths were identified in argali (Ovis ammon) in the Northern Tien Shan [9]: *Dicrocoelium lanceatum, Cysticercus tenuicollis, Moniezia alba, M.benedeni, S.ovis, Trichocephalus skrjabini, Chaberia ovina, Trichostrongylus colubriformis, T.probolurus, Marshallagia marshalli, M.mongolica, Ostertagiella circumcincta, O.occidentalis, O.orloffi, Ostertagia ostertagi, O.trifurcata, Nematodirus oiratianus, N.dogieli, N. archari, N.spathiger, Parabronema skrjabini, Dictyocaulus filaria, Protostrongylus davtaii, P.hobmaieri, P.skrjabini, P.raillieti, Systocaulus nigrescens, Spiculocaulus leuckarti.*

The helminth fauna of native sheep, goats and cattle in the Northern Tien Shan in 1960-1962 was studied by O.S.Karamendin and N.A.Gubaidulin [10]. They found the following helminths in this region: *D.lanceatum*[1,2], *E.granulosus*[1,2], *Cysticercus bovis*[1], *C.tenuicollis*[2], *Coenurus cerebralis*[2], *M.benedeni*[1,2], *Thysaniezia giardia*[1,2], *Protostrongylus davtiani*[2], *P.hobmaieri*[2], *P.raillieti*[2], *P.skrjabini*[2], *Cystocaulus ocreatus*[2], *Dictyocaulus filaria*[2], *D.viviparus*[1], *Haemonchus contortus*[1,2], *T.axei*[1,2], *T.capricola*[2], *T.colibriformis*[1,2], *T.vitrinus*[2], *Ostertagia ostertagi*[1], *Ostertagiella circumcincta*[2],

O.occidentalis[2], *O.orloffi*[1], *O.trifida*[2], *O.trifurcata*[2], *Marshallagia marshalli*[1,2], *M.mongolica*[1,2], *Skrjabinagia lyrate*[1], *Nematodirus archari*[2], *N.helvetianus*[1], *N.oiratianus*[1,2], *Cooperia oncophora*[1], *C.pectinata*[1], *C.zurnabada*[1], *Oesophagostomum columbianum*[1], *O.radiatum*[1], *O.venulosum*[1,2], *Bunostomum phlebotomum*[1], *B.trigonocephalum*[2], *Chabertia ovina*[1,2], *Trichocephalus ovis*[1,2], *T.skrjabini*[1,2], *S.ovis*[2], *Thelazia guloza*[1], *T.skrjabini*[1], *Setaria labiato-papillosa*[1]. (Note: "[1]" - helminths found in cattle; "[2]" - registered in sheep and goats).

The fauna of helminth in native sheep, argali-merino sheep and goats in the Northern Tien Shan in 1951-1953 was studied by H.S.Satubaldin [11]. He found 46 types of helminths in rough-haired sheep in this region: *O.circumcincta, O.occidentalis, O.trifurcata, O.orloffi, O.trifida, O.kegeni, M.marshalli, M.mongolica, Telodorsagia davtiani, T.colubriformis, T.axei, T.probolurus, T.capricola, N.oiratianus, N.spathiger, N.archari, N.helvetianus, N.filicollis, N.schulzi, N.longissimespiculata, D.filaria, P.railliei, P.hobmaieri, P.kochi, P.skrjabini, P.davtiani, Cystocaulus nigrescens, B.schulzi, Bunostomum trigonocephalum, Ch.ovina, P.skrjabini, S.ovis, T.skrjabini, M.expansa, M.benedeni, Thysaniezia giardia, Coenurus cerebralis (Multiceps multiceps larva), C.skrjabini, E.granulosus, C.tenuicollis, C.sp., D.lanceatum, Skrjabinotrema ovis, Fasciola hepatica, Eurytrema pancreaticum, H.contortus;* in argali-merino sheep – 28*: O.circumcincta, O.occidentalis, O. trifurcata, O. trifida, O. kegeni, M.marshalli, T.colubriformis, T.axei, N.oiratianus, N.spathiger, N.archari, N.dogeli, N.filicollis, N.longissimespiculata, D.filaria, P.railliei, P.hobmaieri, P.skrjabini, P.davtiani, C.nigrescens, B.schulzi, Ch.ovina, T.skrjabini, M.expansa, M.benedeni, E.granulosus, C.tenuicollis, Skrjabinotrema ovis*; in goats– 37: *O.circumcincta, O.occidentalis, O. trifurcata, O.orloffi, O.trifida, M.marshalli, M.mongolica, T.davtiani, T.colubriformis, T.probolurus, T.axei, T.capricola, N.oiratianus, N.spathiger, N.archari, N.dogeli, N.helvetianus, N.filicollis, N.andreevi, N.longissimespiculata, D.filaria, P.railliei, P.hobmaieri, P.kochi, P.skrjabini, P.davtiani, C.nigrescens, B.schulzi, Ch.ovina, S.ovis, T.skrjabini, M.expansa, C.cerebralis, C.tenuicollis, C.sp., D.lanceatum, Sk.ovis.*

One of the main branches of agriculture in Kazakhstan is traditional nomadic animal husbandry, which involves the use of common pastures with representatives of wild ungulate mammals. This technology has been developed for centuries. If the migration routes coincide, domestic and wild animals act as food competitors, while a mutual flow of invasion of various etiologies is possible in sufficiently large territories. In the natural conditions of the Northern Tien Shan, argali, wild boars, siberian roe deer and siberian mountain goats live on the grazing paths of farm animals. Therefore, when using common pasture lands and watering holes,

there is a wide interchange of parasites of domestic and wild animals, in which two kinds of phenomena are observed: flows of invasion between these groups of animals and the transfer of invasion in space.

The purpose of the research. The purpose of this study is to study the fauna of protozoa and helminths of wild and domestic ungulates living in the Karkara-Kegen valley of the Almaty region. To achieve this goal, the following tasks are set: to establish the species composition of the fauna of protozoa and helminths of wild and domestic animals living in this region.

Material and methods

The material was collected in 1986-1987 and 2021-2022 from 1330 argali-merino sheep in the Karkara-Kegen valley of the Almaty region.

The material was collected by the method of complete and incomplete helminthological autopsies and intravital studies (Fulleborn and Berkinbay methods).

Intravital parasitological studies of sheep were carried out according to the method of O.Berkinbay [12].

A study on sarcocysts in sheep was performed by muscle biopsy using a Popov needle.

Collected cestodes and trematodes were fixed in 700-alcohol, nematodes and acanthocephalus – in Barbagallo liquid.

The species belonging of helminths was determined by morphological features using definitional tables with verification of the correctness of the diagnosis of suborders and families, then by the genera table, for which classical determinants and monographs were used [13-20].

Results

The Kazakh argali is the first breed in the world history of sheep breeding, obtained by crossing (hybridization) of fine-fleeced sheep (Novokavkaz merino) with wild argali sheep living in the Tien Shan Mountains and other high-altitude areas. Hybrids here were kept on pastures without fertilizing throughout the year. At the same time, in accordance with the purpose of the animals of the degenerated breed, pastures located at an altitude of 2.0-3.5 thousand meters above sea level were used for them.

Below is a list of parasites compiled according to their own and literary data (Table).

Table shows that the argali-merino sheep appeared in a new biocenosis for them when there were already marals, roe deer, argali, wild boars, native rough-haired sheep, goats, cattle, in which protozoa, trematodes, cestodes, nematodes were registered. That is, a certain focus of a number of parasites already existed.

Table - Parasites registered in ungulates in the Karkara-Kegen valley

Parasites	Kinds of animals							
	Ss	Ce	Cs	Op	Bt	Ch	Fo	Am
1	2	3	4	5	6	7	8	9

Phylum Apicomplexa Levine, 1970
Classis Sporozoasida Leuckard, 1879
Subclassis Coccidiasina Leuckard, 1879
Ordo Eucoccidirida Leger, Duboscq, 1910
Subordo Eimeriorina, Leger, 1911
Familia Cryptosporidiidae Leger, 1911
Genus Cryptosporidium Tyzzer, 1907

Continuation of table

1	2	3	4	5	6	7	8	9
1.Cryptosporidium sp.	-	-	-	-	-	-	-	Od
Familia Eimeriidae Minchin, 1903								
Subfamilia Eimeriinae Minchin, 1903								
Genus Eimeria Schneider, 1875								
2.E.ahsata Honess, 1942	-	-	-	-	-	-	-	Od
3.E.almataensis Musajev, 1970	Ld	-	-	-	-	-	-	-
4.E.capreoli Galli-Valerio, 1927	-	-	Ld	-	-	-	-	-
5.E.cervi Galli-Valerio, 1927	-	Ld	-	-	-	-	-	-
6.E.crandallis Honess, 1942	-	-	-	-	-	-	-	Od
7.E.faurei (Moussu, Marotel, 1902) Martin, 1909	-	-	-	-	-	-	-	Od
8.E.gallivalerioi Rastegaieff, 1930	-	Ld	-	-	-	-	-	-
9.E.granulosus Christensen, 1938	-	-	-	-	-	-	-	Od
10.E.ibragimovae Musajev, 1970	Ld	-	-	-	-	-	-	-
11.E.intricata Spiegl, 1925	-	-	-	-	-	-	-	Od
12.E.ovina Levine, Ivens, 1970	-	-	-	-	-	-	-	Od
13.E.ovinoidalis Levine, 1961	-	-	-	-	-	-	-	Od
14.E.parva Kotlan, Mocsy, Vaida, 1929	-	-	-	-	-	-	-	Od
15.E.ponderosa Wetzel, 1942	-	-	Ld	-	-	-	-	-
16.E.robusta Supperer, Kutzer, 1961	-	Ld	-	-	-	-	-	-
17.E.rotunda Pellerdy, 1955	-	-	Ld	-	-	-	-	-
18.E.wassilewskyi Rastegaieff, 1930	-	Ld	-	-	-	-	-	-
Genus Isospora Schneider, 1881								
19.I.capreoli Svanbaev, 1958	-	-	Ld	-	-	-	-	-
20.I.suis Biester, Murray,	Ld	-	-	-	-	-	-	-

1934								
Familia Sarcocystidae Poche, 1913								
Subfamilia Sarcocystinae Poche, 1913								
Genus Sarcocystis Lankester, 1882								
21.S.ovicanis Heydorn e.a., 1975	-	-	-	-	-	-	-	Od

Continuation of table

1	2	3	4	5	6	7	8	9
Phylum Plathelminthes Schneider, 1873								
Classis Trematoda Rudolphi, 1908								
Subordo Fasciolata, Skrjabin, Schulz, 1937								
Familia Fasciolidae Railliet, 1895								
Genus Fasciola Linnaeus, 1758								
22.F.hepatica Linnaeus, 1758	-	-	-	Ld	Ld	-	Ld	Od
Familia Dicrocoeliidae Odhner, 1911								
Genus Eurytrema Looss, 1907								
23.E.pancreaticum (Janson, 1889)	-	-	-	-	Ld	-	Ld	Od
Genus Dicrocoelium Dujardin, 1845								
24.D.lanceatum Stiles, Hassall, 1896	-	Ld	Ld	Ld	Ld	Ld	Ld	Ld,Od
Genus Hasstlesia Orloff, Erschoff, Badanin, 1934								
25.H.ovis (Orloff, Erschoff, Badanin, 1934) Gvosdev, Soboleva, 1973	-	-	-	-	-	Ld	Ld	Od
Subordo Paramphistomatata Skrjabin, Schulz, 1937								
Familia Paramphistomatidae Fischoeder, 1901								
Genus Paramphistomum Fischoeder, 1901								
26.P.ichikawai (Fukui, 1922)	-	-	-	-	-	-	-	Od
Genus Liorchis Veichko, 1960								
27.L.scotiae (Wilmott, 1950) Veichko, 1960	-	-	-	-	-	-	-	Od
Familia Gastrothylacidae Stiles, Goldberger, 1910								
Genus Gastrothylax Poirier, 1883								
28.G.crumenifer (Creplin, 1847)	-	-	-	-	-	-	-	Od
Phylum Plathelminthes Schneider, 1873								
Classis Cestoidea Rudolphi, 1808								
Subclassis Cestoda Gegenbauer, 1859								
Ordo Cyclophyllidae Braun, 1900								
Subordo Taeniata Skrjabin, Schulz, 1937								
Familia Taeniidae Ludwig, 1886								
Subfamilia Taeniinae Abuladze, 1960								
Genus Taenia Linnaeus, 1758								
29.T.hydatigena (Pallas, 1766), larvae	Ld	-	Ld	Ld	Ld	Ld	Ld	Ld,Od
30.Taenia ovis Gobbold,	-	-	-	-	-	-	-	Od

1869 larvae								
Genus Multiceps Goeze, 1782								
31.M.multiceps (Leske, 1780), larvae	-	-	-	Ld	Ld	Ld	Ld	Od
Genus Echinococcus Rudolphi, 1801								

Continuation of table

1	2	3	4	5	6	7	8	9
32.E.granulosus (Batsch, 1786), larvae	Ld	-	-	-	Ld	-	Ld	Ld,Od
Subordo Anoplocephalata Skrjabin, 1933								
Superfamilia Anoplocephaloidea Spassky, 1949								
Familia Anoplocephalidae Cholodkowsky, 1902								
Subfamilia Moniezinae Spassky, 1951								
Genus Moniezia Blanchard, 1891								
33.M.expansa (Rudolphi, 1810) Blanchard, 1891	-	-	Ld	-	-	Ld	Ld	Ld,Od
34.M.benedeni (Moniez, 1879) Blanchard, 1891	-	-	-	Ld	-	-	Ld	Ld,Od
Familia Avitellinidae Spassky, 1951								
Subfamilia Thysanieziinae Skrjabin, Schulz, 1937								
Genus Thysaniezia Skrjabin, 1926								
35.T.giardi (Moniez, 1879)	-	-	-	-	-	Ld	Ld	Od
Phylum Nemathelminthes Schneider, 1873								
Classis Nematoda Rudolphi, 1808								
Subclassis Plasmidia Chitwood, Chitwood, 1933								
Subordo Spirurata Railliet, 1914								
Familia Histiocephalidae Skrjabin, 1941								
Genus Parabronema Baylis, 1921								
36.P.skrjabini Rassowska, 1924	-	-	Ld	Ld	-	-	Ld	Od
Subordo Oxyurata Skrjabin, 1923								
Familia Syphaccidae Skrjabin, Schikhobalova, 1951								
Genus Skrjabinema Werestschagin, 1926								
37.S.ovis (Skrjabin, 1915) Werestschagin, 1926	-	-	-	Ld	-	Ld	Ld	Ld,Od
Subordo Strongylata Railliet, Henry, 1913								
Superfamilia Strongyloidea Wainland, 1858								
Familia Strongylidae Baird, 1853								
Subfamilia Chabertinae Popova, 1952								
Genus Chabertia Railliet, Henry, 1909								
38.Ch.ovina (Pabricine, 1788)	-	Ld	Ld	Ld	Ld	Ld	Ld	Ld,Od
Familia Ancylostomatidae Looss, 1905								
Genus Bunostomum Railliet, 1902								
39.B.trigonocephalum (Rudolphi, 1802)	-	-	-	-	-	-	Ld	Od
Superfamilia Trichostrongyloidea Cram, 1927								

Familia Trichostrongylidae Leiper, 1912								
Subfamilia Trichostrongylinae Leiper, 1908								
Genus Trichostrongylus Looss, 1905								
40.T.axei (Cobbold, 1879) Railliet, Henry, 1909	-	-	-	-	-	Ld	Ld	Ld,Od

Continuation of table

1	2	3	4	5	6	7	8	9
41.T.capricola Ransom, 1911	-	-	-	-	-	Ld	Ld	Od
42.T.colubriformis (Giles, 1822) Ransom, 1911	-	-	Ld	Ld	Ld	Ld	Ld	Ld,Od
43.T.probolurus (Railliet, 1896) Looss, 1905	-	-	Ld	Ld	Ld	Ld	Ld	Od
Subfamilia Ostertaginae Lopez-Neyra, 1947								
Tribus Ostertagiini Skrjabin, Schulz, 1937								
Genus Ostertagiella Andreeva, 1957								
44.O.circumcincta (Stadelmann, 1894) Andreeva, 1957	-	-	Ld	Ld	-	Ld	Ld	Ld,Od
45.O.kegeni Anreeva, 1957	-	-	-	-	-	-	+	Od
46.O.occidentalis (Ransom, 1907) Andreeva, 1957	-	-	Ld	Ld	-	Ld	Ld	Ld,Od
47.O.orloffi (Sankin, 1930) Andreeva, 1957	-	-	-	Ld	Ld	Ld	Ld	Od
48.O.trifida (Guills,Marotel, Panisset, 1911) Anreeva, 1957	-	-	-	Ld	-	Ld	Ld	Ld,Od
49.O.trifurcata (Ransom, 1907) Andreeva, 1957	-	-	Ld	Ld	-	Ld	Ld	Ld,Od
Genus Marshallagia (Orloff, 1933) Travassos, 1937								
50.M.marshalli (Ransom, 1907) Orloff, 1933	-	-	Ld	Ld	-	Ld	Ld	Ld,Od
51.M.mongolica Schumakovitsch, 1938	-	-	-	Ld	-	Ld	Ld	Od
Genus Telodorsagia Andreeva, Satubaldin, 1954								
52.T.davtiani Andreeva, Satubaldin, 1954	-	-	-	-	-	Ld	Ld	Od
Subfamilia Haemonchinae Skrjabin, Schulz, 1952								
Genus Haemonchus Cobbold, 1898								
53.H.contortus (Rudolphi, 1803) Cobbold, 1898	-	-	Ld	Ld	-	Ld	Ld	Od
Subfamilia Nematodirinae Skrjabin, Orloff, 1934								
Genus Nematodirus Ransom, 1907								
54.N.andreevi Satubaldin, 1954	-	-	-	-	-	Ld	-	Od

55.N.archari Sokolova, 1948	-	-	-	Ld	-	Ld	Ld	Ld,Od
56.N.dogieli Sokolova, 1948	-	-	-	Ld	-	Ld	-	Ld,Od
57.N.filicollis (Rudolphi, 1802) Ransom, 1907	-	-	-	-	-	Ld	Ld	Ld,Od

Continuation of table

1	2	3	4	5	6	7	8	9
58.N.helvetianus May, 1920	-	-	-	-	Ld	Ld	Ld	Od
59.N.oiratianus Rajewskaja, 1929	-	Ld	Ld	Ld	-	Ld	Ld	Ld,Od
60.N.schulzi Satubaldin, 1954	-	-	-	-	-	-	Ld	Od
61.N.spathiger (Railliet, 1896) Railliet, Henry, 1909	-	Ld	Ld	Ld	-	Ld	Ld	Ld,Od
Genus Nematodirella Yorke, Maplestone, 1926								
62.N.longissimespiculata (Romanovitsch, 1915) Skrajbin, Schikhobalova, 1952	-	-	-	-	-	Ld	Ld	Ld,Od
Familia Dictyocaulidae Skrjabin, 1941								
Genus Dictyocaulus Railliet, Henry, 1907								
63.D.filaria (Rudolphi, 1809) Railliet, Henry, 1907	-	-	-	Ld	Ld	Ld	Ld	Ld,Od
Familia Protostrongylidae Leiper, 1926								
Genus Protostrongylus Kamensky, 1905								
64.P.davtiani (Savina, 1940) Davtian, 1949	-	-	-	Ld	-	Ld	Ld	Ld,Od
65.P.hobmaieri (Schulz, Orlow, Kutass, 1933) Cameron, 1934	-	-	-	Ld	-	Ld	Ld	Ld,Od
66.P.kochi (Schulz, Orlow, Kutass, 1933) Chitwood, Chitwood, 1938	-	-	-	-	-	Ld	Ld	Od
67.P.raillietti (Schulz, Orlow, Kutass, 1933) Cameron, 1934	-	-	-	Ld	-	Ld	Ld	Ld,Od
68.P.skrjabini (Boev, 1936) Dikmans, 1945	-	-	-	Ld	-	Ld	Ld	Ld,Od
Genus Cystocaulus Schulz, Orlow, Kutass, 1933								
69.C.nigrescens (Jerke, 1911) Schulz, Orlow, Kutass, 1933	-	-	-	Ld	-	Ld	Ld	Ld,Od
Genus Bicaulus Schulz, Boev, 1940								
70.B.schulzi (Boev, Wolf, 1938) Schulz,	-	-	-	-	-	Ld	Ld	Ld,Od

Boev, 1940								
Suborda Rhabditata Chitwood, 1933								
Familia Strongyloididae Chitwood, Chitwood, 1934								
Genus Strongyloides Grassi, 1879								
71.S.papillosus (Wedl., 1856)	-	-	-	-	-	-	-	Od

Continuation of table

1	2	3	4	5	6	7	8	9
Suborda Trichocephalata Skrjabin, Schulz, 1928								
Familia Trichocephalidae Baird, 1853								
Genus Trichocephalus Schrank, 1788								
72.T.ovis Abildgaard, 1795	-	-	-	Ld	-	-	-	Od
73.T.skrjabini (Backakow, 1924)	-	Ld	Ld	Ld	Ld	Ld	Ld	Ld,Od
Familia Capillariidae Neveu-Lemaire, 1936								
Genus Capillaria Zeder, 1800								
74.Capillaria sp.	-	Ld	-	Ld	Ld	-	-	Od
Phylum Arthropoda Siebold, Stannius, 1848								
Classis Linnaeus, 1758								
Ordo Diptera Linnaeus, 1758								
Superfamilia Oestroidea Leach, 1815								
Familia Oestridae Leach, 1815								
Subfamilia Oestrinae Leach, 1815								
Genus Oestrus Linnaeus, 1758								
75.Oestrus ovis L., 1758	-	-	-	-	-	-	-	Od
Note. Od-own data, Ld-literary data, Am-argali-merino sheep, Fo-local rough-haired sheep, Bt- cattle, Ss-wild boars, Ch- goat, Cs-roe deer, Ce-maral, Op-argali.								

Discussion

Thus, when breeding a new breed of sheep with the participation of different animal species, their fauna of parasites is formed from parasites present in this biocenosis or natural focus. Thus, a new breed of animals is included in the cycle of invasion in the biocenosis.

It is likely that in the following years a number of new species of parasites will be registered in the argali-merino sheep, the owners of which are currently roe deer (Spilocaulus austriacus, Trichostrongylus vitrinus), maral (Oesophagostomum venulosum, Setaria altaica, Capillaria bovis), argali (Marshallagia schumakovitschi, Nematodirus abnormalis, Ostertagia ostertagi, Spiculocaulus leucarti), cattle (Cooperia oncophora, Oesophagostomum spp.), goats (Nematodirus andreevi).

The process of formation of fauna of parasites in animals or the formation of animals as hosts of parasites is complex and lengthy, during which mutual morphobiochemical adaptation of parasites and the host occurs [12, 23]. However, in modern conditions, under the influence of human activity, this process can accelerate [12]. Thus, when creating new breeds of animals

obtained by crossing closely related species, the process of formation of parasitofauna accelerates. During the formation of the breed for more than 20 years, argali-merino sheep had 28 species of parasites [11]. Noting such a relatively small number of them, the author [11] believed that hybrids have increased resistance to helminths. This opinion turned out to be erroneous, since currently 63 species of parasites have already been registered in argali-merino sheep. That is, in sixty years, the argali-merino sheep have become the owners of another 35 species.

Conclusions

Thus, the analysis of the literature and our own research have shown that 75 species of parasites belonging to 5 types, 5 classes, 3 subclasses, 3 orders, 10 suborders, 4 superfamilies, 21 families, 11 subfamilies, 1 trive and 34 genus are parasitized in wild and domestic ungulates living in the Karkara-Kegen valley of the Almaty region.

During the formation of the breed for more than 20 years, argali-merino sheep had 28 species of parasites. Currently, 63 species of parasites have already been registered in argali-merino sheep. That is, in sixty years, the argali-merino sheep have become the owners of another 35 species.

The formation of argali-merino sheep as hosts of 63 species of parasites in a short time became possible thanks to genetic information obtained from the ancestors of argali and sheep.

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СОЛТҮСТІК ТЯНЬ-ШАНЬДАҒЫ АРҚАРМЕРИНОСТАРДЫҢ ПАРАЗИТТЕРІНІҢ ФАУНАСЫНЫҢ ҚАЛЫПТАСУЫНА БИОЦЕНОЗДЫҢ ӘСЕРІ

Сүлейменов Маратбек Жақсыбекұлы,
мал дәрігерлік ғылымдарының кандидаты, профессор,
Зоология институты, Алматы қ., Қазақстан
E-mail: maratbek.suleimenov@zool.kz

Беркінбай Омархан,
мал дәрігерлік ғылымдарының докторы, профессор,
Зоология институты, Алматы қ., Қазақстан

E-mail: berkinbay49@mail.ru

Омаров Байжан Баймұханбетұлы,
мал дәрігерлік ғылымдарының кандидаты,
Зоология институты, Алматы қ., Қазақстан
E-mail: baijan1957gmail.com

Жантелиева Лаура Оразакыновна,
ветеринариялық медицина бойынша философия докторы (PhD),
Зоология институты, Алматы қ., Қазақстан
E-mail: laura_18_87@mail.ru

Барбол Бекжан Ісенбайұлы,
PhD докторант, Зоология институты, Алматы қ., Қазақстан
E-mail: bekzhan.barbol@gmail.com

Джусупбекова Нургул Мадалиевна,
мал дәрігерлік ғылымдарының кандидатық,
Зоология институты, Алматы қ., Қазақстан
E-mail: nurgul.dzhusupbekova@mail.ru

Угур Услу
Проф. Др.Паразитологии бөлімі.
Селжүк университеті, медицилық факультет, Конья, Түркия
E-mail: uuslu@selcuk.edu.tr

Рао Закир Аббас
PhD, Проф., Паразитологии бөлімі,
Аграрлық университет, Файсалабад, Пәкістан
raouaf@hotmail.com

Түйін

Қазақстанның Алматы облысының Қарқара-Кеген алқабында әр түрлі жануарлардың қатысуымен қойлардың жаңа тұқымын өсіру кезінде олардың паразиттерінің түрлік құрамы осы биоценозда және де табиғи ошақта кездескен паразиттерден қалыптасты. Бұл аймақта паразиттердің 5 типке, 10 отряд тармағына, 21 тұқымдасқа, 34 туысқа жататын 75 түрі анықталған. 20 жылдан астам уақыт ішінде будандар паразиттердің 28 түріне ие болды: трематодалардың бір түрі (*Dicrocoelium lanceatum*), цестодалардың 4 түрі (*Taenia hydatigena, larvae; Echinococcus granulosus larvae; Moniezia expansa; M. benedeni*) және нематодалардың 23 түрі (*Skrjabinema ovis, Chabertia ovina, Trichostrongylus axei, Trichostrongylus colubriformis, Ostertagiella circumcincta, O.occidentalis, O. trifida, O. trifurcata, Marshallagia marshalli, Nematodirus archari, N.dogieli, N.filicollis, N.oiratianus, N.spathiger, Nematodirella longissimespiculata, Dictyocaulus filaria, Protostrongylus davtiani, P.hobmaieri,*

P.raillieti, P.skrjabini, Cystocaulus nigrescens, Bicaulus schulzi, Trichocephalus skrjabini). Кейінгі 60 жылда будандар тағы да 35 түр паразитке ие болды. Осылайша, жануарлардың жаңа тұқымы биоценозға инвазия элементтерінің айналымына енді. Кейбір паразиттер (бұрын осы биоценозда көрсетілмеген), архаомериностың ағзасынан нәжіспен сыртқы ортаға түсіп, осы биоценозда тіршілік ететін жануарлардың басқа да түрлерін өз айналымына қосып, жаңа ошақтар түзуде.

Кілт сөздер: цестода; нематода; бөгелек; паразиттер құрамы; Қарқара-Кеген; алқап; биоценоз.

ВЛИЯНИЕ БИОЦЕНОЗА НА ФОРМИРОВАНИЕ ФАУНЫ ПАРАЗИТОВ АРХАРОМЕРИНОСОВ НА СЕВЕРНОМ ТЯНЬ-ШАНЕ

Сулейменов Маратбек Жаксыбекович,
кандидат ветеринарных наук, профессор,
Институт зоологии, г. Алматы, Казахстан
E-mail: maratbek.suleimenov@zool.kz

Беркинбай Омархан,
доктор ветеринарных наук, профессор,
Институт зоологии, г. Алматы, Казахстан
E-mail: berkinbay49@mail.ru

Омаров Байжан Баймуханбетович,
кандидат ветеринарных наук,
Институт зоологии, г. Алматы, Казахстан
E-mail: baijan1957gmail.com

Жантелиева Лаура Оразакыновна,
доктор философии (PhD) по ветеринарной медицины,
Институт зоологии, г. Алматы, Казахстан
E-mail: laura_18_87@mail.ru

Барбол Бекжан Ісенбайұлы,
PhD докторант, Институт зоологии, г. Алматы, Казахстан
E-mail: bekzhan.barbol@gmail.com

Джусупбекова Нургул Мадалыевна,
кандидат ветеринарных наук,
Институт зоологии, г. Алматы, Казахстан
E-mail: nurgul.dzhusupbekova@mail.ru

Угур Услу
Проф. Др.Отдел паразитологии.
Сельчукский университет, медицинский факультет, Конья
E-mail:: uuslu@selcuk.edu.tr

Рао Закир Аббас
PhD, Проф., Отдел Паразитологии,
Аграрный университет, Файсалабад, Пакистан
raouaf@hotmail.com

Аннотация

В Каркара-Кегенской долине Алматинской области Казахстана при выведении новой породы овец с участием разных видов животных фауна паразитов формировался из паразитов, имеющихся в данном биоценозе или природном очаге. Данном регионе имелись 75 видов паразитов, принадежащих 5 типам, 10 подотрядам, 21 семействам, и 34 родам. В период формирования породы в течение более 20 лет у архаромериносов насчитывалось 28 вида паразитов: один вид трематод (*Dicrocoelium lanceatum*), 4 вида цестод (*Taenia hydatigena, larvae; Echinococcus granulosus larvae; Moniezia expansa; M. benedeni*) и 23 вида нематод (*Skrjabinema ovis, Chabertia ovina, Trichostrongylus axei, Trichostrongylus colubriformis, Ostertagiella circumcincta, O.occidentalis, O. trifida, O. trifurcata, Marshallagia marshalli, Nematodirus archari, N. dogieli, N. filicollis, N. oiratianus, N. spathiger, Nematodirella longissimespiculata, Dictyocaulus filaria, Protostrongylus davtiani, P. hobmaieri, P.raillieti, P. skrjabini, Cystocaulus nigrescens, Bicaulus schulzi, Trichocephalus skrjabini*). В последующие 60 лет гибриды дополнительно приобрели еще 35 видов. Тем самым, новая порода животных включается в циркуляции инвазионных элементов в биоценозе. Некоторые паразиты (ранее не отмеченные в этом биоценозе), находящиеся в организме архаромериносов, попадая во внешнюю среду с фекалиями, образуют новые очаги, вовлекая в циркуляцию других видов животных, обитающих в этом биоценозе.

Ключевые слова: цестода; нематода; овод; фауна паразитов; Каркара-Кегень; долина; биоценоз.