

Fauna of Coccidian Parasites of Cattles in Nakhchivan Autonomous Republic of Azerbaijan

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Abstract:

During the period of 2007-2012 in Nakhchivan Autonomous Republic and Babek, Culfa, Ordubad, Kengerliand Shahbuz cities including the villages in Nakhchivan province. In cows presence of 8 species of Eimeria is registered: E. zuernii, E. bovis, E. elipsodalis, E. cylindrica, E. auburnensis, E. canadensis, E. subsferica, E. smithi, in buffaloes 4 species- E.cylindrica, E, bovis,E. zuernii, E. subsferica. In sheep 7 species are registered: E. ahsata, E.bakuensis, E.granilosa, E. crandallis, E.ovis, E. faurei, E. intricata, in goats: E. absheronica, E.arloingiE.africensis, E. yolchiyevi, E, ninakohlyakimovae, E. tunisensis, in chickens5 species: E. tenella, E. necatrix, E. mutis, E. maxima, E. burnetti.

Key words: Nakhchivan, sarcocytosis, Eimeria, cows, sheep, goats, buffaloes, chickens

Introduction

Nakhchivan Autonomous Republic is an area of developed livestock farming. The high concentration of livestock population, keeping of domestic carnivores and presence of wild

carnivores in adjacent territories promotes circulation of pathogens helminthiasis.

Coccidia (Coccidia, Sporozoa, Apicomplexa) are the intracellular protozoan parasites of invertebrate and vertebrate animals with final, intermediate and additional hosts in life cycle.

For the first time in the territory of Azerbaijan the coccidian parasites were founded in village Zurnabad of Geygel (formerly Khanlar) province in 1925 [5].

Coccidiosis in animals causes reduction of productivity, increases mortality and expenses for treatment (especially in young animals). All researchers are well known eimeriosis and sarcosporidiosis in wild and domestic animals.

Coccidia is a well-studied protozoan pathogens group on a world scale. It has a complex life cycle with endogenous (sexual and asexual), and exogenous (intracellular and extracellular) stages. Each stage is determined by their morphological, functional, and biochemical features [1, 2, 3, 4, 6, 7, 12].

Currently the life cycles of many coccidian are studied in Azerbaijan. Since the 60th of the last century, group of local specialists studied the species from the genera *Eimeria* and *Isospora* in rodents and farm animals, their circulation in natural and man-made ecosystems [9, 10, 11].

In the territory of Nakhichevan Autonomous Republic the coccidian parasites of farm animals and poultry are studied insufficiently. Therefore, in this paper we consider issues related to the spread of coccidiosis of farm animals in the territory of Nakhichevan. The main purpose of our study was a complex study of intestinal tissue coccidia of farm animals in the territory of this province.

Materials and methods of research

The samples of feces and muscle tissue were collected from the

farm animals. The research on species composition of coccidian parasites in farm animals and their distribution in the territory of Nakhichevan were carrying out according to morphofunctional and metabolic characteristics of the developmental stages (oocysts, micro- and macrocysts).

The morphology of coccidian protozoan pathogens was studied by brightfield and electron microscopy. More than 1.500 head of animals, 7 species of domestic animals and birds were studied. Also more than 120 samples of soil, water, fodder from various household equipment were collected for detection of contamination by oocysts of coccidian parasites. For oocysts collecting the methods of centrifugation of samples in flotation liquids were applied.

The material for researches were exogenous stages of *Coccidia*—oocysts, extracted from the feces of domestic animals. Materials for identification of intestinal *Coccidia* associations collected from animals from the different ages in all seasons (2007-2010). Animal feces collected from the individual farms of Nakhchivan (Sharur, Julfa, Shahbuz, Babek and other areas) and in vicinity of the Nakhchivan city. Also materials were collected from the Southern part of the Nakhchivan Autonomous Republic.

Samples of feces from each animal kept in the 2.5 % solution of potassium dichromate. Laboratory investigation were carried out at the Laboratory of invertebrates of the Institute of Bioresources of Nakhchivan branch of the National Academy. For each type of hosts infected with coccidia, determined the prevalence of invasion (prevailing level of a condition within a defined population).

For the detection of tissue cysts of *Sarcocystis*, pieces of muscle tissue and organs were processed by the method of P.M. Kozelkina. Also the method for detection of larvae of trichina in muscles of domestic animals and birds in modification of A.M. Musaev (9) was used.

The stained samples were examined under a

brighfieldmicroscope. Also swabs and scrapings were prepared from the iris prints, esophageal , tongue , heart and skeletal muscles. These preparations were fixed with dry methanol. Thereafter, they were stained with azure eosin technique according to Romanovsky-Giemza.

Results of research and their discussion

During the study of farm animals for the presence of coccidian oocysts the 7 of the known species of animals were identified (Table 1).

Table 1 Coccidian oocysts of farm animals and poultry in Nakhchivan

Species of the host	Quantity of animals	Species of coccidia
Chicken	182/92 (50.55)	<i>E. tenella</i> , <i>E. acervulina</i> <i>E. mutis</i> , <i>E. praecox</i> , <i>E. maxima</i> , <i>E. brunneti</i> , <i>C. baileyi</i> , <i>C. meleagridis</i> , <i>S. horvathi</i> , <i>Sarcocystis sp</i>
Turkeys	35/8 (22.86)	<i>C. meleagridis</i>
Cows	746/ 173(23.22)	<i>E. zuernii</i> , <i>E. bovis</i> , <i>E. ellipsodalis</i> , <i>E. cylindrica</i> , <i>E. canadensis</i> , <i>Sarcocystis sp. C. parvum</i>
Buffaloes	275/53 (26.18)	<i>Sarcocystis sp.</i>
Sheeps	411/98 (23.84)	<i>C. parvum Sarcocystis sp.</i>
Goats	225/57 (25.33)	<i>C. parvum Sarcocystis sp.</i>
Dogs	9/1 (11.11)	<i>Sarcocystis sp.</i>

The table shows that all the farm animals and poultry in Nakhchivan AR identified as coccidia oocysts. The bird cryptosporidian species *C. baileyi* Current, Upton and Haynes 1986 and *C. meleagridis* Slavin were found. Also the oocysts of sarcosporidian parasites were found from the muscle tissues of animals and birds (Table 2).

Table 2 Detection of sarcosporidian macrocysts in domestic animals and birds

Organs	Cows	Sheep	Goats	Buffalo	HouseHens
Gullet	396/13(3.28)	837/117(13.97)	1832/395(21.56)	370/93(25.13)	84/3(3.57)
Heart	285/4(1.40)	522/26(2.68)	615/11(1.78)	212/8(3.77)	65/0
Tongue	315/0	50/0	62/1(1.61)	110/2(1.81)	—
Skeletal muscles	521/9(1.72)	920/29(3.15)	420/5(1.29)	437/22(4.80)	72/4(5.55)
Diaphragm	270/3(1.11)	470/11(2.34)	390/2(0.51)	422/ 19(4.50)	65/0

The table shows, that prevalence by macrocysts in hearts were varied from 1.40% in cows, 2.68% in sheeps, 1.76% in goats to 3.77% in buffaloes. In tongues of cows and sheeps macrocysts have not found. We can identify the macrocysts only from the tongues of buffaloes and goats by the prevalence 1.81 and 1.61%. Also in the diaphragm and skeletal muscles macrocysts were found rarely, EI at cows 1.72-1.11%, 3.15-2.34% in sheep, goats 1.29-0.51%, 4.80-4.50% in buffalo, EI at chickens was equal to 5.55-0.0%. Most often macrocysts were found on the gullet of domestic animals and birds. EI of cows is 3.28%, 13.97% in sheep, buffalo at 25.13%, 21.56% in goats, in chickens 3.57%.

Sarcocystis tissue cysts detected in muscles of sheep, goats, cows, buffaloes and poultry managed to diagnose by experimentally infected definitive hosts. We can find the following species of *Sarcocystis*: in the sheep — *S. tenella* (final host - a dog) and *S. gigantea* (final host - cat); in the goats — *S. capracanis* (final host - cat); in cattle — *S. cruzi* (final host - the dog) and *S. hirsute* (final host - cat); in buffalo *S. levinei* (final host - the dog) and *S. fusiformis* (final host - cat). In poultry, only one species of parasite — *S. horvathi* (final hosts, respectively, a dog and a cat) were found.



Fig.1. Macroscopic appearance of *S. horvathi* cysts in the breast muscles of chicken



Fig. 2. Macroscopic appearance of *S. capracaniscysts* in the esophagus of goats

First found tissue *cysts Sarcocystis* sp., at small and big cattle and chickens in Nakhchivan.

In cows presence of 8 species of *Eimeria* is registered: *E. zuernii*, *E. bovis*, *E. elipsodalis*, *E. cylindrica*, *E. auburnensis*, *E. canadensis*, *E. subsferica*, *E. smithi*, in buffaloes 4 species- *E. cylindrica*, *E. bovis*, *E. zuernii*, *E. subsferica*. In sheep 7 species are registered: *E. ahsata*, *E. bakuensis*, *E. granulosa*, *E. crandallii*, *E. ovis*, *E. faurei*, *E. intricata*, in goats: *E. absheronica*, *E. arloingi*, *E. africensis*, *E. yolchiyevi*, *E. ninakohlyakimovae*, *E. tunisensis*, in chickens 5 species: *E. tenella*, *E. necatrix*, *E. mutis*, *E. maxima*, *E. burnetti*.

The main requirement for the prevention of coccidiosis: it comply with sanitary and zoo hygienic rules, strict observance of norms of the maintenance of animals, timely cleaning and disinfection of premises and places pasture of animals, water availability, appropriate sanitary standards.

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