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

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Abstract:

Key words: Nakhchivan, sarcocitosis, 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, Apicortlexa) 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 found 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 Nakhchivancity. 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 PM 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
brightfield microscope. 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 Coccidianoocytes of farm animals and poultry in Nakhchivan

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

The table shows that all the farm animals and poultry in Nakhchivan AR identified as coccidiaoocytes. 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

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

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 identified the macrocysts only from the tongues of buffalos and goats by the prevalence 1.81 and EI -1.61). Also in the diaphragm and skeletal muscles macrocysts were founded 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 equaled 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, buffaloes 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. capracaenis* (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 founded.
First found tissue cysts Sarcocystissp, at small and big cattle and chickens in Nakhchivan.

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.

BIBLIOGRAPHY


