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Translation by Virginia Ivens of Coccidia of sheep and goats of western Kazakhstan by S. K. Svanbaev in Works of the Institute of Zoology, Academy of Sciences, Kazakh SSR 7: 252-257 (1957)

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Svanbaev, S. K. and Ivens, Virginia, "Translation by Virginia Ivens of Coccidia of sheep and goats of western Kazakhstan by S. K. Svanbaev in Works of the Institute of Zoology, Academy of Sciences, Kazakh SSR 7: 252-257 (1957)" (1957). *H. W. Manter Laboratory Library Materials*. 51.

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COLLEGE OF VETERINARY MEDICINE
UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS

TRANSLATION NO. 1

Translated from Russian by Virginia Ivens

Svanbaev, S. K.

1957. Coccidia of sheep and goats of Western Kazakhstan. Works of the Institute of Zoology Acad. Sci. Kazakh SSR 7:252-257, figs.

Transliteration:

K voprosu o faune i morfologii koktsidii ovets i koz zapadnogo Kazakhstana. Trudy Instituta Zoologii Akad. Nauk Kazakh SSR, tom VII, 252-257.

Protozoan diseases of agricultural animals in the U. S. S. R. have been studied extensively but not in an equal degree. Blood parasite diseases, for example, have been studied a great deal, while coccidiosis has received very little attention.

Coccidiosis is wide-spread among sheep and goats, especially the young animals, in which it causes emaciation, stunting and even death. For a long time, Russian and foreign authors have written about the danger of coccidiosis in sheep and goats. According to Spiegl (1892), MacFadyean (1896), Lerche (1920), Kitt (1922), Hutyra and Marek (1935) and Palimpsestov (1948), mortality in lambs from coccidiosis is 10% to 90%. This indicates that the coccidia and the disease they cause need to be studied in detail.

In Kazakhstan coccidiosis of sheep was first found in the Ural region by V. L. Yakimov, S. A. Amanzhulov, Arbuzov, and Zhuravlev in 1928 and by Zasukhin in 1930; in the Kustanai region

by Ivanova-Gobzem in 1935; in the Alma-Ata region by Orlov in 1940 and Musina in 1949.

Coccidiosis of goats was found in the Ural region by Zasukhin in 1930 and by Yakimov, Amanzhulov, and Rastegaeva in 1930.

According to the above authors, there are in Kazakhstan at the present time six species of coccidia in sheep and goats: Eimeria arloingi, E. ninae kohl-jakimovi, E. galouzoï, E. intricata, E. faurei, and E. parva. However, their morphological characteristics, infective ability in relation to the age of the host, geographic distribution in Kazakhstan, and other problems have not been described thoroughly by these authors.

In 1953 we examined the sheep and goats of the local, coarse stock in the Taipaksk region of Western Kazakhstan for coccidia. We studied the morphology of the oocysts, their geographic distribution, and their ability to infect hosts of different ages.

We took feces directly from the rectum, mixed it thoroughly in a petri dish with a 2% solution of potassium bichromate, incubated it at 20° to 25° C, and examined it daily to determine the species of Eimeria present and their sporulation time. The material was cultivated according to the method of Darling and examined with a MBI-1 microscope having an ocular 7, an objective 40, and a tube length 160 mm.

We examined 302 sheep from the Mikoyan and Dzhabul collective farms. In 234 (77.5%) of the sheep (Table 1) we found six species of coccidia: E. faurei, E. galouzoï, E. arloingi, E. ninae kohl-jakimovi, E. parva, and E. intricata.

The data in Table 1 show that the infection with E. faurei was almost the same in lambs one to 6 months of age, and adults. E. galouzi was more common in adults (34.6%) than in lambs (26.3%). E. arloingi was more common in lambs (61.4%) than in adults (46.3%). E. ninae kohl-jakimovi was more common in lambs (59.6%) than in adults (46.8%). E. parva was more common in lambs (13.2%) than in adults (5.9%). Infections with E. intricata were insignificant (4.3%), and we found this species only in adults. These data show that the species of coccidia found in sheep depend to a considerable degree on the age of the host.

Of the coccidia found in sheep, E. arloingi constitutes 52%, E. ninae kohl-jakimovi 51.7%, E. faurei 42.7%, E. galouzi 31.1%, E. parva 8.6%, and E. intricata 4.3%. The first three species are found much more often than the last three species.

In addition, 48 goats from the Dzhabul collective farm were examined. In 32 animals (66.7%) we found four species of coccidia: E. faurei, E. galouzi, E. arloingi, and E. ninae kohl-jakimovi (Table 1). The infections with E. faurei, E. galouzi, and E. arloingi were almost the same in sheep and goats. E. ninae-kohl-jakimovi was found more often in sheep than in goats (31.3%).

We found six of the 11 established species of coccidia in sheep and four in goats. This is the first time in Kazakhstan we have seen E. faurei and E. galouzi.

Up to now the available literature has not sufficiently described the morphology and sporulation of the oocysts of these species. Therefore, we are giving a detailed description of the oocysts we found.

Eimeria faurei Moussu and Marotel, 1905

This species was found in sheep and goats. The oocysts were oval or elongate-oval (figures 1-a, b). The wall was smooth, double-contoured, yellow-green, yellow-brown, or orange,brown, 1.0 to 1.5 microns thick. A micropyle, rarely with a cap, was present at one end. The oocyst size was 22.0 to 38.8 by 18.8 to 23.6 microns, with a mean of 29.5 by 21.7 microns. The form-index was 1:0.61 to 0.85, with a mean of 1:0.74.

The majority of the oocysts sporulated in three to four days. The sporocysts were oval or pear-shaped, 7.6 to 13.4 by 5.4 to 8.3 microns, with a mean of 10.3 by 6.8 microns. The sporozoites were comma-shaped, pear-shaped, or bean-shaped, 4.5 to 8.4 by 2.1 to 4.2 microns, with a mean of 6.2 by 3.2 microns. A residual body was absent in the oocyst and present in the sporocysts.

Eimeria galouzoï Jakimoff et Rastegaieff, 1930

Infection with this species was almost identical in sheep and goats. The oocysts were round, rarely short-oval, 16.4 to 26.3 by 16.1 to 26.3 microns, with a mean of 20.8 by 20.3 microns (figures 1-v, g), The form-index was 1:0.98. The wall was smooth, double-contoured, colorless, 0.8 to 1.2 microns thick. The micropyle and cap were absent. Sporulation time was five to six days. The sporocysts were oval, round, or egg-shaped, 6.5 to 10.9 by 5.3 to 7.6 microns, with a mean of 8.7 by 6.7 microns. The sporozoites were comma-shaped or pear-shaped, 4.5 to 7.1 by 2.5 to 4.1 microns, with a mean of 6.0 by 3.2 microns. A residual body, consisting of a granular mass, was present in the sporocysts.

Eimeria arloingi Marotel, 1905

This species was found both in sheep and goats. The oocysts were egg-shaped, rarely elongate-oval or oval, 24.8 to 38.7 by 18.2 to 24.5 microns, with a mean of 31.2 by 22.6 microns (figures 1-d, e). The form-index was 1:0.63 to 0.73, with a mean of 1:0.72. The wall was smooth, double-contoured, yellow-green or yellow-orange, 1.1 to 2.0 microns thick. A prominent micropyle was present at the narrow end of the oocyst. A micropylar cap, 2.4 to 5.7 microns wide at the base and 1.3 to 3.4 microns high, was present. Sporulation time was 3 to 4 days. The sporocysts were elongate-oval, oval or pear-shaped, 8.5 to 14.1 by 6.3 to 9.2 microns, with a mean of 11.9 by 8.0 microns. The sporozoites were pear-shaped or comma-shaped, 5.1 to 8.4 by 2.1 to 4.5 microns, with a mean of 7.0 by 3.2 microns. A residual body, consisting of a fine-grained mass, was present in the sporocysts.

Eimeria ninae kohl-jakimovi Jakimoff et Rastegaieff, 1930

This species was found more often in sheep than in goats. The oocysts were oval, short-oval or egg-shaped, 17.4 to 28.9 by 15.3 to 21.8 microns, with a mean of 24.8 by 19.9 microns (figures 1-zh, z). The form-index was 1:0.75 to 0.88, with a mean of 1:0.80. The wall was smooth, double-contoured, colorless, yellowish, yellow-green, or yellow-brown, 1.0 to 1.5 microns thick. A micropyle and cap were absent. The majority of the oocysts sporulated in 2 to 3 days. The sporocysts were oval, round, or egg-shaped, 6.7 to 12.4 by 4.8 to 8.8 microns, with a mean of 10.0 by 6.2 microns. The sporozoites were comma-shaped or pear-shaped, 4.5 to 6.8 by 2.5 to 4.6 microns, with a

mean of 5.7 by 3.4 microns. A sporocyst residual body, finely granular and irregular in shape, was present.

Eimeria parva Kotlan, Mocsy and Vajda, 1929

This species was found only in sheep. The infection was greater in lambs than in adults. The oocysts were short-oval or round, 13.6 to 17.3 by 12.9 to 16.2 microns, with a mean of 15.3 by 14.5 microns (figures 1-1, k). The form-index was 1:0.94 to 0.95, with a mean of 1:0.95. The wall was smooth, transparent, double-contoured, 0.8 to 1.2 microns thick. A micropyle and cap were absent.

The majority of the oocysts sporulated in five to six days. The sporocysts were oval, short-oval, or round, 3.8 to 5.6 by 3.0 to 4.4 microns, with a mean of 4.6 by 3.5 microns. The sporozoites were comma-shaped or pear-shaped, 2.7 to 3.4 by 1.7 to 2.2 microns, with a mean of 3.0 by 1.9 microns. A residual body was absent in the oocyst and present in the sporocysts.

Eimeria intricata Spiegl, 1925

This species was rarely found and then only in adult sheep. The oocysts were ellipsoidal, elongate-oval or oval, 40.8 to 53.5 by 29.2 to 35.8 microns, with a mean of 49.5 by 31.9 microns (figures 1-1, m). The form-index was 1:0.67 to 0.71, with a mean of 1:0.64. The wall was yellow-brown or brown, 2.6 to 4.2 microns thick, and tri-contoured; the inner wall was transversely striated and the outer was rough. A prominent micropyle was present at one end of the oocyst. A micropylar cap was present, quite frequently pointed, 3.4 to 6.0 microns high and 8.8 to 14.8 microns wide.

Sporulation time was 7 to 9 days. The sporocysts were pear-shaped or egg-shaped, 14.4 to 18.5 by 8.1 to 11.6 microns, with a mean of 16.4 by 10.4 microns. The sporozoites were comma-shaped or pear-shaped, 9.7 to 11.6 by 3.0 to 4.8 microns, with a mean of 10.7 by 3.6 microns. A residual body was absent in the oocyst and present in the sporocysts.

LITERATURE

- Baskakov, V. P. and Yakimov, V. L., 1930. Koktsidioz ovets Tsentral'noĭ i Chernozemnoĭ oblasti SSSR (Coccidiosis of sheep in Central and Black Earth regions of the U.S.S.R.). Vestnik Mikrobiologii, Epidemiologii, i Parazitologii, Vol. 9, No. 4.
- Zasukhin, D. N., 1930. Koktsidioz i anaplazmoz ovets v Ural'skom okruge (Coccidiosis and anaplasmosis of sheep in the Ural region). Vestnik Mikrobiologii, Epidemiologii i Parazitologii, Vol. 9, No. 2.
- Zasukhin, D. N. and Tiflov, V. E., 1932. Koktsidioz ovets na Yugo-Vostoke RSFSR (Coccidiosis of sheep in south-east RSFSR). Vestnik Mikrobiologii, Epidemiologii i Parazitologii, Vol. 11, No. 4.
- Ivanova-Gobzem, P. S., 1935. K voprosu o koktsidiyakh domashnikh i dikikh zhivotnykh Severnogo Kazakhstana (On the problem of coccidia of domestic and wild animals of Northern Kazakhstan). In the book: Vrediteli sel'skokhozyaĭstvennykh zhivotnykh i bor'ba s nimi (The Pests of Agricultural Animals and the Fight against them). Izd. AN SSSR.

- Musina, F. Kh., 1949. Fauna, vozrastnaya i sezonnaya dinamika koktsidiy ovets i epizootologicheskie faktory, sposobstvuyushchie koktsidiozu ovets (Fauna, age and seasonal dynamics of coccidia of sheep and epizootological factors conducive to coccidiosis of sheep). Trudy Alma-Atinskogo zooveterinarnogo instituta, Vol. 6.
- Nikol'skiy, S. N., 1929. K voprosu o geograficheskom rasprostraneni koktsidiozov krupnogo rogatogo skota i ovets v SSSR (On the problem of geographical distribution of coccidiosis of big-horned cattle and sheep in the USSR). Trudy Leningradskogo gosudarstvennogo instituta.
- Orlov, N. P., 1947. Koktsidioz sel'skokhozyaystvennykh zhiivotnykh Kazakhstana (Coccidiosis of agricultural animals of Kazakhstan). In the book: Paraziticheskie prosteyshe Kazakhstana (Parasitic Protozoa of Kazakhstan). Vol. 2.
- Orlov, N. P., 1956. Koktsidiozy sel'skokhozyaystvennykh zhiivotnykh (Coccidiosis of agricultural animals). Sel'khozgiz, Moscow.
- Palimpsestov, M. A., Pavlenko, A. F., 1948. Epizootologiya koktsidioza ovets v stepnykh zonakh (Epizootology of sheep coccidiosis in the steppe zones.) Trudy Chkalovskoy oblasti veterinarnoy opytnoy stantsii. Vol. 2.
- Yakimov, V. L. and Galuzo, I. G., 1925. K voprosu o koktsidiyakh zhiivotnykh v Rossii (On the problem of coccidia of animals in Russia). Vestnik sovremennoy veterinarii.
- Yakimov, V. L., Galuzo, I. G., Rastegaeva, E. F., Mitskevich, V. Yu., and Tolstova, A. N., 1927. Kishechnyy koktsidioz koz v SSSR (Intestinal coccidiosis of goats in the U. S. S. R.). Vestnik sovremennoy veterinarii, No. 19.

Yakimov, V. L., Galuzo, I. G., Rastegaeva, E. F., Mitskevich, Y. Yu.

i Tolstova, A. N., 1927. Kishechnyĭ koktsidioz ovets v SSSR
(Intestinal coccidiosis of sheep in the U.S.S.R.). Vestnik
sovremennoĭ veterinarii, No. 2.

Yakimov, V. L., Amanzhulov, S. A. and Rastegaeva, E. F., 1930.

Koktsidioz koz v Ural'ske (Coccidiosis of goats in the Ural).
Vestnik mikrobiologii, Epidemiologii, i Parazitologii, Vol. 9,
No. 4.

Yakimov, V. L., 1931. Bolezni domashnikh zhivotnykh, vyzyvaemye

prosteĭshimi (Diseases of domestic animals caused by protozoa).
Sel'khozgiz.

Table 1

Infection of Sheep and Goats with Coccidia in Western Kazakhstan

Kind and age of animals	No. examined	No. infected	% infected	Infection						
				Eimeria faurei	E. gal-cuzoi	E. ar-loingi	E. niniae kohl.-ja-kimovi	E. parva	E. intricata	
Sheep	1									
Lambs up to 6 months of age	114	94	82.5	48 (42.1%)	30 (26.3%)	70 (61.4%)	68 (59.6%)	15 (13.2%)		-
Adults	188	140	74.5	81 (43.1%)	65 (34.6%)	87 (46.3%)	88 (46.8%)	11 (5.9%)		8 (4.3%)
Total Lambs and adults	302	234	77.5	129 (42.7%)	95 (31.1%)	157 (52.0%)	156 (51.7%)	26 (8.6%)		8 (4.3%)
Goats										
Adults	48	32	66.7	19 (39.6%)	13 (27.1%)	25 (52.1%)	15 (31.3%)			-

FIGURE LEGEND

Figure 1. Various stages of development of the oocysts: a, b, Eimeria faurei Moussu and Marotel, 1905; v, g Eimeria galouzoi Jakimoff and Rastegaieff, 1930; d, e Eimeria arloingi Marotel, 1905; zh, z Eimeria ninse kohl-jakimovi Jakimoff and Rastegaieff, 1930; i, k Eimeria parva Kotlan, Mocsy and Vajda, 1929; l, m Eimeria intricata Spiegl, 1925.