

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

H. W. Manter Laboratory Library Materials

1934

Translation by Joseph Szanto of Kotla'n, Sa'ndor and Pospesch, La'szlo'. 1934. A ha'zinyul coccidiosisnak ismerete'hez. Egyu'j *Eimeria*-faj (*Eimeria piriformis* sp. n.) ha'zinyulbo'l [= Coccidiosis of domestic rabbit: A new *Eimeria* species (*Eimeria piriformis* sp. n.)]. *A'llatorvosi Lapok* 57(15): 215-217

Sandor Kotlan
University of Budapest

Laszlo Pospesch
University of Budapest

Joseph Szanto
University of Illinois

Follow this and additional works at: <https://digitalcommons.unl.edu/manterlibrary>

 Part of the [Parasitology Commons](#)

Kotlan, Sandor; Pospesch, Laszlo; and Szanto, Joseph, "Translation by Joseph Szanto of Kotla'n, Sa'ndor and Pospesch, La'szlo'. 1934. A ha'zinyul coccidiosisnak ismerete'hez. Egyu'j *Eimeria*-faj (*Eimeria piriformis* sp. n.) ha'zinyulbo'l [= Coccidiosis of domestic rabbit: A new *Eimeria* species (*Eimeria piriformis* sp. n.)]. *A'llatorvosi Lapok* 57(15): 215-217" (1934). *H. W. Manter Laboratory Library Materials*. 55. <https://digitalcommons.unl.edu/manterlibrary/55>

This Article is brought to you for free and open access by DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in H. W. Manter Laboratory Library Materials by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

COLLEGE OF VETERINARY MEDICINE
UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS

TRANSLATION NO. 5

Translated from Hungarian by Joseph Szanto

Kotlán, Sándor and Pospech, László

1934. A házinyul coccidiosisának ismeretéhez. Egy új Eimeria-faj (*Eimeria piriformis* sp. n.) házinyulból. [Coccidiosis of domestic rabbit. A new Eimeria species (*Eimeria piriformis* sp. n.)] Állatorvosi Lapok 57(15):215-217.

Although it was already established by R. Leuckart in 1876 that liver and intestinal coccidiosis of the domestic rabbit were caused by more than one species of Eimeria, our knowledge is still incomplete. It was not certain for a long time whether *Eimeria stidai* (Lindemann, 1863) was able to invade the intestine as well as the bile ducts. It was also uncertain whether intestinal coccidia which differed in shape and in size belonged to one or more species of Eimeria.

Closer examination of the coccidia of domestic animals pointed out, that in order to determine the separateness of a particular species, consideration of its biological behavior is as important as that of its morphology. Since these have been applied, the descriptions of species have become more accurate.

It became obvious that coccidiosis of the domestic rabbit was caused not only by *Eimeria stidai* (Lind., 1863) and *Eimeria perforans* (Leuckart, 1876) but by other species as well. This was first pointed out by Waworontu (1924), but he was still confused by the variation in shape and in size of these coccidia. The species he called *E. stidai* was actually an intestinal one (*E. magna*). Later, Pérard (1925) and Kessel and Jankiewicz (1931) worked on this problem. According to their comparative examinations, the following Eimeria species could be found in the rabbit: *E. stidai* (Lind.) in the bile ducts; and *E. perforans* (Leuk.), *E. media* (Kessel and Jank.), and the recently described *E. exigua* (Yakimoff, 1934) in the intestine.

During our examinations in 1932, we found coccidia in the feces of a rabbit which differed from all the previously described species. The oocysts were elongated pear shaped, the outline at the small end being almost straight or sometimes indented. Since then, we have seen this type of oocysts several times. The question whether it was a new species or only the variety of an already known species was solved by experimental infection.

Experiment No. 1

Eimeria piriformis oocysts were found in the feces of a doe in large numbers on April 14, 1934. The oocysts measured as follows:

26 x 17 μ	27 x 19 μ	29 x 19 μ	31 x 17 μ
26 x 18 μ	28 x 19 μ	30 x 19 μ	31 x 18 μ
27 x 17 μ	28 x 17 μ	30 x 18 μ	31 x 21 μ
27 x 18 μ	28 x 18 μ	30 x 20 μ	32 x 20 μ

We infected a 2-month old rabbit with this fecal material which also contained some other *Eimeria* species (*E. magna*, *E. media*, *E. irresidua*, *E. perforans*, etc.) on April 17. Only a few coccidia (*E. perforans*, *E. media* and *E. magna*) were found in the feces of the infected rabbit on the day of infection.

Coccidia were found in the feces in variable numbers on April 19, 23, 24 and 25. (On April 23, the 6th day after infection, *E. perforans* was present +++ as the result of the artificial infection.) However, piriform oocyst could not be found. Piriform oocysts were present in small numbers on the 9th day and in large numbers on the 10th day after infection. Their number was so high on the 11th day that in a glycerin flotation which was made of one fecal pellet the oocysts formed a layer 2 mm thick. The rabbit was autopsied on this day in order to determine the location of the coccidia in the intestine. Scrapings were taken from different parts of the intestine. Piriform oocysts could be found in the duodenum but they increased in number toward the posterior part of the gut. Direct examination of the cecal scrapings showed 10-20 oocysts per microscopic field.

Experiment No. 2

This time, an old doe was infected with piriform oocysts on April 30, 1934. Very few oocysts (*E. perforans*, *E. magna*, etc.) were found in the feces on the day of infection. The other purpose besides the first one was to see whether an older rabbit could be infected successfully.

Piriform oocysts were present in the feces on the third day after infection. Since all the oocysts were unsporulated, an intercurrent infection was suspected. However, further examinations (May 5, 7 and 8) did not show any piriform oocysts. The explanation is that part of the oocysts fed to the rabbit were passed out later than usual (the rabbit was suffering from constipation). Piriform oocysts were present in the feces in fair numbers on the 9th day and in large numbers on the 10th day. However, the number of oocysts was relatively smaller than in the young rabbit. The number of the oocysts was still increasing on the 11th day, but it decreased gradually from May 12 to 14.

Both of the experiments confirmed our opinion based on the morphology of the oocysts. In our opinion, these oocysts are not identical with those of any of the described *Eimeria* species. Therefore, we name this species *Eimeria piriformis* sp. n. because of their pear shape. We give the following description until we have a chance to study schizogony and gametogony better.

Eimeria piriformis sp. n.: This is an intestinal species. The oocysts can already be found in the anterior part of the intestine. They are first present in the feces 9 days after infection; but most of them are passed on the 10-11th day. They are oval, yellowish-brown; the anterior end narrows

so that the oocysts look like elongated pears. They measure 26-32 x 17-21 μ ; 28-30 μ is the most frequent. The average is 29 x 18 μ . In general, those oocysts which are passed on the first days are smaller (23-24 x 16 μ) than the ones which are passed later. However, average size can be seen among the smaller ones.

The micropyle is conspicuous. The sporont is globular, finely granulated, 14.3-15.7 μ in diameter. The sporoblasts are first globular, later triangular and finally spindle-shape. The sporozoites are formed soon, as the granules become larger in the sporoblasts. The sporocysts are 10.5-13.0 μ long, depending on the degree of development. An oocyst residuum is absent. The sporocyst residuum varies in size, has rough granules and is usually centrally located in the sporocyst. The sporozoites surround the sporocyst residuum. A polar granule is absent.

We checked sporulation as follows: The oocysts were collected by glycerin flotation, washed and placed into Petri dishes in 2.5% potassium bichromate solution. The fluid level was 8 mm high. The oocysts were examined after 24 and 48 hours. To determine the degree of sporulation, we used the sporulation index, which is the sum of points of 100 oocysts. Zero points refer to oocysts with a globular sporont at the moment when they are passed out of the body. Sporulation has not yet started. Oocysts which have an indistinct sporont with large granules are assigned 1 point. If the sporont is divided it is assigned 2 points. When the sporoblast are spindle-shape the number of points of the oocyst is 3. The oocyst has 4 points if the sporozoites are formed, sporulation is completed and it is ready for infection.

After 24 hours the sporulation index was 234. Most of the oocysts (48%) had reached the 3rd stage, a smaller portion (40%) were in the 2nd stage, and only a few (12%) were in stages 0 and/or 1. None of them were in the 4th, infective stage.

After 48 hours the sporulation index was 376, which is very close to the maximum (400). Sporulation was almost complete. Most of the oocysts (81%) were in the 4th stage, 17% in the 3rd stage and only 2% were in stages 0 and/or 1.

During the examinations of native rabbits we found the following species: Eimeria perforans, the most frequent, almost never absent (Fig. 1, No. 3-4), Eimeria media (Fig. 1, No. 9-10), also a frequent, wide-spread intestinal coccidium, Eimeria magna (Fig. 1, No. 11-12) one of the largest species, also common, and Eimeria exigua (Fig. 1, No. 1-2) which is rarely found.

As for Eimeria stidai, it seems to be more rare than we thought. Our studies of its occurrence and life-cycle are in progress.

- - - - -

Figure legend (photomicrographs): Oocysts of Eimeria species in rabbit.
1-2 E. exigua, 3-4 E. perforans, 5-8 E. piriformis sp. n.,
9-10 E. media, 11-12 E. magna. -- 1000 x.

LITERATURE CITED

Kessel and Jankiewicz, (1931), Species differentiation of the coccidia of the domestic rabbit based on a study of the oocysts. Amer. Jour. Hyg. 14:304-324.

Pérard, (1925), Recherches sur les coccidies et les coccidioses du lapin. III. Étude de la multiplication endogène. (Identification d'une 3e espèce de coccidie du lapin: *Eimeria magna* n. sp.) Ann. Inst. Past. 39:592-661.

Waworontu, (1924), Diss. Utrecht.

Yakimoff, (1934), Zentralbl. f. Bakt. I. abt. orig.