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TRANSMISSION OF *Sarcocystis leporum* FROM A COTTONTAIL RABBIT TO DOMESTIC CATS[□]

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Abstract: Muscle tissue containing grossly visible cysts of *Sarcocystis leporum* from a cottontail rabbit (*Sylvilagus floridanus*) was fed to laboratory cats. Sporocysts averaging 13.2 x 9.7 μ m were detected in the feces 14 days post-infection and were found until 69 days post-infection.

INTRODUCTION

Protozoans of the genus *Sarcocystis* infect a variety of domestic or wild mammals and birds, and recent studies have revealed the coccidian nature of the life cycle of mammalian *Sarcocystis*.⁵ The life history of ruminant *Sarcocystis* has been elucidated most completely.^{2-4,6,8} Although sarcosporidia occur rather commonly in rabbits,¹⁰ the host for the sexual cycle of this rabbit parasite remains unknown. We report herein the transmission of *Sarcocystis leporum* from cottontail rabbits (*Sylvilagus floridanus*) to domestic cats.

MATERIALS AND METHODS

Sporocysts were visible grossly in the musculature of a wild cottontail rabbit from Virginia which was submitted for study. Approximately 80 g of muscle tissue containing cysts was fed to each of two coccidia-free, laboratory-reared 6-month old cats. A litter mate of each cat served as an uninoculated control. Cats were housed individually within the laboratory animal care facility where they were supplied water and commercially prepared dry cat food *ad libitum*. Experimental animals were housed with a semiclosed colony of cats in individual cages, and care was taken to prevent contamination of food or litter. Feces was collected daily from the litter boxes, placed in small plastic bags and appro-

priately labeled. Fecal flotations were performed daily for 72 days on pooled feces from control cats and individual fecal collections from inoculated cats using a saturated solution of sodium nitrate. Thorough postmortem examinations were done on infected cats, and appropriate tissues for subsequent histopathologic study were preserved in 10% neutral buffered formalin. Multiple samples were taken at 5 cm intervals from the small intestine. Tissues were processed according to standard procedures, cut at 7 μ m, and stained with Delafield's hematoxylin and eosin.

RESULTS AND DISCUSSION

Sporocysts from rabbit muscle were 243 μ m (N=10) in diameter upon histologic examination, and were similar to those reported previously from this host.¹

Fully-developed sporocysts were first detected in the feces of cats fed rabbit muscle 14 days post infection (p.i.). On p.i. day 15, one of the cats fed rabbit muscle died of unknown causes. The second cat fed rabbit muscle shed sporocysts intermittently until time of euthanasia on p.i. day 73. No sporocysts were detected on p.i. days 21 and 39 nor in 10 of the last 15 days of the experiment. Oocysts conforming to the description of *Isospora felis* were detected in the pooled feces of control cats 34 days after the experiment was initiated. Cats fed

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rabbit muscle were free of *Isospora* oocysts until p.i. 64.

Sporocysts were small, $13.2 \times 9.7 \mu\text{m}$ (range = $13.2 \times 8.8 \mu\text{m}$ to $13.2 \times 11.0 \mu\text{m}$, $N=15$), ellipsoidal, thin walled and contained four sporozoites. A granular residuum was located at one end. No stiedae body was distinguishable.

The number of sporocysts shed in the feces was small, and an average of 5 sporocysts per gram of feces per day was detected. A maximum of 26 sporocysts per gram of feces was recorded on p.i. day 31.

Histologic examination of intestine did not reveal sexual stages of *Sarcocystis*. This failure probably can be attributed to the presence of low numbers of parasites within the intestinal mucosa and the long time interval since original infection.

Although domestic cats served as definitive hosts for *S. leporum*, sporocyst production was low suggesting that these animals may be rather poor hosts for *S. leporum*. Fayer *et al.*⁴ demonstrated that carnivores other than dog (*Canis familiaris*) or coyote (*Canis latrans*), viz., foxes (*Vulpes vulpes*) and raccoons (*Procyon lotor*), also may serve as definitive hosts for *S. fusiformis*. Considering the heavy infection of sarcosporidia encountered in the rabbit described herein and its close association with raccoons, as evidenced by infection with *Baylisascaris procyonis*,^{7,9} raccoons also should be experimentally inoculated with *S. leporum* to determine their involvement in the epizootiology of *S. leporum* infections in rabbits. This study further demonstrates the coccidial nature of *Sarcocystis* and the herbivore-carnivore cycle of another species of this genus.

Addendum added after receipt of proof.

Since this paper was accepted for publication, a cottontail rabbit heavily infected with *Sarcocystis leporum* was received from the same area in Virginia. Muscle tissue was fed to a captive raccoon, and 14 days after feeding, large numbers of sporocysts $12.8 \times 9.1 \mu\text{m}$ (range = $11.1 \times 8.9 \mu\text{m}$ to $14.4 \times 11.1 \mu\text{m}$, $N = 30$) were detected in the feces.

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