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Author: WICHT, ROBERT J.

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TRANSMISSION OF *Sarcocystis rileyi* TO THE STRIPED SKUNK *(Mephitis mephitis)*

ROBERT J. WICHT, Wild Animal Disease Center, Department of Pathology, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Ft. Collins, Colorado 80523, USA.

Abstract: Musculature containing grossly visible cysts of *Sarcocystis rileyi* from northern shoveler *(Anas clypeata)* ducks was fed to the striped skunk *(Mephitis mephitis)*. Skunks used were determined to be *Sarcocystis* free, the challenged skunk became infected and shed both sporulated oocysts and free sporocysts in the feces. The prepatent period was 15 days and the patent period 50 days. Oocysts were fully sporulated when shed and contained two sporocysts, free sporocysts averaged 9×13.5 μm (N=50). Each sporocyst contained four sporozoites and a granular residuum.

INTRODUCTION

Sarcocystis commonly infects the myocardial and skeletal musculature in a variety of domestic and wild birds, mammals and reptiles.[2,7] Research has revealed a life cycle similar to that of other coccidian protozoans, but with alternation of the schizogonous and sporogonous stages between predator and prey.[5] Although *Sarcocystis rileyi* cysts have been found commonly in waterfowl since its discovery in 1869, a main definitive host has remained unknown.[8]

The limited literature on *S. rileyi* has dealt mainly with either the morphology of the muscle cysts or the prevalence of cysts in waterfowl.[1,3,4,6] Although both macroscopic and microscopic cysts have been found in waterfowl musculature the significance of this remains speculative.

Reported herein is the transmission of *Sarcocystis rileyi* to the striped skunk *(Mephitis mephitis)* when fed infected musculature from the northern shoveler *(Anas clypeata)*.

MATERIALS AND METHODS

Northern shoveler duck carcasses acquired from Rice University were refrigerated and shipped in insulated containers to the Wild Animal Disease Center (WADC). Upon arrival at the WADC, infected musculature was trimmed from the carcasses. Representative pieces of muscle were fixed in 10% neutral buffered formalin and prepared for histological examination. Fresh musculature containing at least 200 grossly visible cysts was fed to a striped skunk to determine infectivity. Another *Sarcocystis*-free striped skunk served as an uninoculated control. The skunks were housed individually within the animal care facility where they were supplied water and dry pelleted feed except when infected waterfowl muscle was fed. Feces of both skunks were examined three times a week (Monday, Wednesday and Friday) for at least 21 days prior to feeding the infected duck flesh. Both skunks were free of *Sarcocystis* oocysts and sporocysts during the entire 21 day pre-inoculation period. Total feces were collected daily beginning on the day of feeding infected waterfowl muscle and continued for 72 days. Individual fecal floatations for each day from each animal were performed in zinc sulphate (s.p. 1.18) to determine the presence of oocysts and sporocysts.

RESULTS AND DISCUSSION

Sarcocysts in the duck muscle were visible grossly and were similar to those reported previously from waterfowl.[1,9]

Fully-developed sporocysts were first detected in the feces of the skunk fed infected duck muscle on day 16 post inoculation (p.i.), and patency continued for 50 days. The uninoculated control skunk remained negative for *Sarcocystis* oocysts and sporocysts during the entire experiment.

Oocysts were ellipsoidal, very thin walled, contained two sporocysts and averaged 16.0 × 13.5 μm (range = 17.0 × 14.0 μm to 14.5 × 11.0 μm, N=25). Free sporocysts were ellipsoidal, thin walled, contained four sporozoites and averaged 9 × 13.5 μm (range = 9 × 14.0 μm to 8.0 × 11.0 μm, N=50). A granular residuum was located toward one end. No steidae body was found. Although the sporocysts were not quantified, subjective evaluation indicated the greatest number were passed on day 22 p.i.

Skunks served as a definitive host for *S. rileyi,* sporocyst production was good, and suggests that it is a main host for waterfowl *Sarcocystis*. Work currently in progress on the pathologic conditions produced in the hosts and host specificity as it relates to other species of waterfowl will provide a broad basis for future work on avian *Sarcocystis* species.

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