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Author: HUDKINS-VIVION, G.

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POSSIBLE SPECIES DIFFERENCES BETWEEN SARCOCYSTIS FROM MULE DEER AND CATTLE[1]

G. HUDKINS-VIVION, Department of Veterinary Medicine, Oregon State University, Corvallis, Oregon 97331, USA

T. P. KISTNER, Department of Veterinary Medicine, Oregon State University, Corvallis, Oregon 97331, USA

R. FAYER, Animal Parasitology Institute, U.S. Department of Agriculture, Agricultural Research Service, Beltsville, Maryland 20705, USA

Abstract: In preliminary studies with *Sarcocystis* from bovine (*Bos taurus*) and mule deer (*Odocoileus hemionus hemionus*), a coccidia-free laboratory dog (*Canis familiaris*) and captive coyote (*Canis latrans*) were fed flesh from a local *Sarcocystis*-infected bovine and later fed flesh from an infected mule deer from Eastern Oregon. Sporocysts were passed in the feces of both canine hosts 10-15 days after ingestion of infected meat. There was a statistical difference in the size of sporocysts derived from bovine and deer. It was concluded that the *Sarcocystis* from bovine and mule deer probably constitute distinct species with a life cycle dependent on the respective ruminant host and a canine host.

The Oregon State Wildlife Commission initiated a study late in 1968 of mule deer on Steens Mountain, Harney County, Oregon to investigate the causes for declining deer populations. The disease-related aspects of fawn mortality have constituted a portion of the overall studies. In the course of these investigations, large numbers of *Sarcocystis* sp. were found in the musculature of most fawns collected in March, 1974 and April, 1975. The significance of this finding is currently under investigation.

Recent research has demonstrated that *Sarcocystis* sp. in some ruminants has a life cycle similar to that of coccidial protozoans, with alternation of hosts.[1,2,3,5] Sexual cycles occur in the intestine of a carnivore, with subsequent production of sporulated sporocysts in the feces. When sporocysts are ingested by a specific ruminant, asexual cycles occur in the endothelial lining of blood vessels; the progeny of these generations subsequently produce the typical cysts in the musculature.[2,3,4,5]

In preparation for work with *Sarcocystis* of deer, *Sarcocystis*-infected flesh from a local bovine was fed to a laboratory dog and a captive coyote maintained in modified Horsfall isolation kennels. Both animals had been fed dry dog food, and were coccidia-free at the time of feeding.

On post-infection days 11 and 15, respectively, individual sporulated sporocysts containing four sporozoites and a granular residuum were first found in fecal flotations prepared with Sheather's sugar solution. As these animals were fed bovine flesh for three consecutive days and fecal examinations were not conducted daily, the length of the prepatent and patent periods were not accurately determined. Sporocysts averaged 16.3 x 10.7

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μm (N=20) for the dog and coyote. Mean sporocysts size in the dog feces was 16.3 x 10.6 μm (range 15.0 x 9.2 μm to 17.3 x 11.5 μm), while those in the coyote feces were 16.2 x 10.8 μm (range 13.8 x 9.2 μm to 18.4 x 12.7 μm).

Sporocysts were not found in the feces from either animal examined 30, 40, 50, and 60 days post-infection. Sixty days after feeding flesh from the infected bovine, the same dog and coyote were fed *Sarcocystis*-infected flesh from a Steens Mountain fawn for one day.

Sporocysts were found in their feces on post-infection days 13 and 10, respectively. The length of the patent period again was not determined. The sporocysts resembled those recovered following feeding of the infected bovine flesh in that they occurred singly and contained a granular residuum and four sporozoites. The sporocysts differed markedly in size, however, with an average of 14.4 x 9.3 μm (N=20). Mean sporocyst size in the dog feces was 14.5 x 9.2 μm (range 13.8 x 9.2 μm to 16.1 x 9.2 μm), while those in the coyote feces were 14.2 x 9.4 μm (range 13.8 x 9.2 μm to 16.1 x 11.5 μm).

The average sporocyst size from the dog and coyote fed infected bovine flesh differed significantly from the average sporocyst size from the same animals fed infected deer flesh ($P = .01$).

These studies indicate that a species of *Sarcocystis* from mule deer has a life cycle similar to that of other species of *Sarcocystis* of ruminants.[1,2,3,5] Sporocysts recovered from a dog and coyote fed infected deer muscle, however, were found to differ significantly in size from sporocysts recovered when the same animals were fed infected bovine. Since two species of carnivores were used as hosts and measurements agreed between the sporocysts recovered from each when fed either bovine or deer, variation in the size of the sporocysts cannot be attributed to modification by the carnivore host, but must be attributed to inherent differences in the particular *Sarcocystis* sp. infecting cattle and deer. Probably, the parasites represent two distinct species.

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