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DOG AS DEFINITIVE HOST OF SARCOSPORIDIA INFECTING ROE DEER

We have found that sarcosporidiosis is a very frequent disease of roe deer (Blažek K. et al., Vet. medicina 21: 75—80, 1976) and that it is produced by two types of sarcocysts. Both light and electron microscopical examinations revealed that these two types markedly differ from one another: they are either thin-walled or possessing a thick wall with distinct radial striations (Blažek K. et al., Folia parasit. (Praha), in press, Schramlová J., Blažek K., Z. Parasitenk., in press). Since the definitive hosts in which sarcosporidia of roe deer complete their life-cycle were not known, attempts were made to transfer sarcocysts from roe deer (*Capreolus capreolus*) to dog (*Canis familiaris*) and cat (*Felis domestica*). Preliminary results are reported in the present paper.

MATERIAL AND METHODS

The sarcocysts were obtained from a shot old roe deer. The presence of sarcosporidia in its muscles was revealed by the detection of merozoites in a mixed sample of musculature after pepsin digestion in a native preparation and by detection of cysts in quickly made histological sections. Only thin-walled sarcocysts were found. Two three-year-old beagle dogs were used for infection experiments and one dog of the same race and age was used as control. The dogs were fed with cooked food (oak flakes, barley or oat groats, pressed scraps of meat and tinned meat) and did not receive any raw meat. Repeated examinations of their faeces for the presence of sporocysts carried out before the experiment were negative. Only a light infection with *Trichocephalus* sp. was found. Besides the dogs, also two adult cats were used in the experiments and one as control. The examinations of their faeces were also negative.

The experimental dogs were fed for two days with raw ground musculature of the roe deer in doses of 1 kg/day each. The cats were fed with the same food also for two days in doses of 100 g/day each. In these days the animals received no other food. (Later the cats were again fed with biscuits and milk.)

From day 2 onwards after infection, samples of faeces of both experimental and control animals were examined using flotation method after Breza. Dog faeces were examined every day, cat faeces at each defaecation which did not occur every day.

RESULTS

No sporocysts were found in the faeces of experimental cats examined from day 2 to day 24 after infection. The experiment was therefore concluded as negative.

From day 11 onwards, the faeces of both experimental dogs contained typical sporocysts conforming both in measurements and morphology to the sporocysts of sarcosporidia. They measured 15.3×10.0 μm and were sporulated, with 4 sporozoites and granulated residual body. Mostly single sporocysts were excreted (Fig. 2), but at the beginning, two sporocysts joined by a very fine, hardly discernible membrane (Fig. 1) were often found. During the first two days

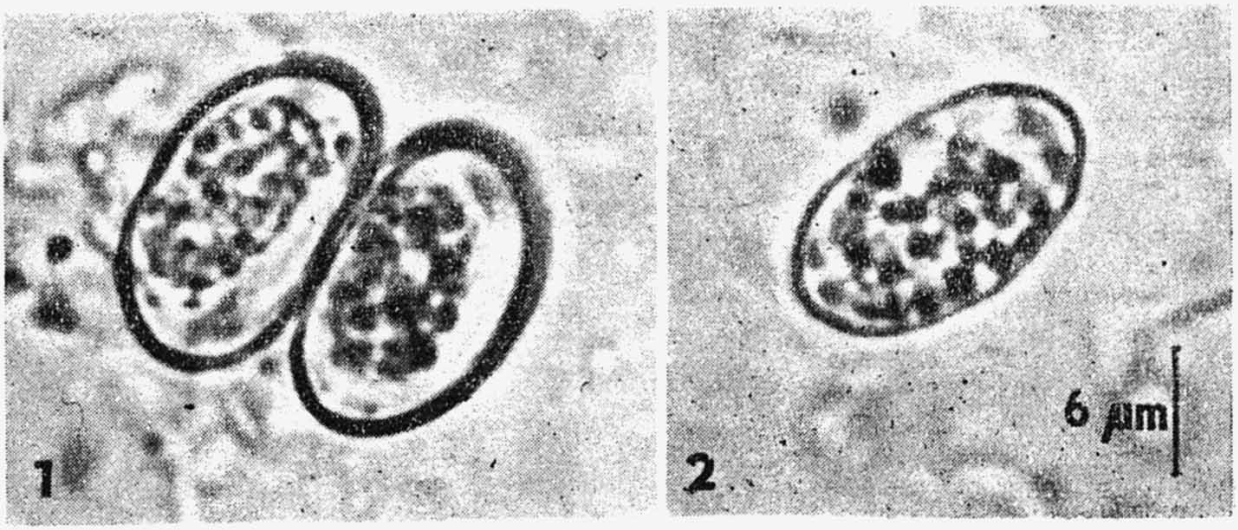

Fig. 1. Oocyst with two sporocysts from faeces of experimental dog. Native preparation, on day 11 after infection.
Fig. 2. Single sporocyst from faeces of dog. Native preparation, on day 11 after infection.

there occurred also sporocysts whose sporulation into sporozoites was imperfect. In samples from the 11th day only few sporocysts were found, but their number markedly increased in the following days so that on days 13—15 after infection there occurred already large number of sporocysts: in one field up to 25 sporocysts, in a drop of flotation liquid under cover glass of 24 × 24 mm there were 600—800 sporocysts, one sixth of them in pairs (oocysts). The number of sporocysts in the samples varied on individual days, but on days 17—25 after infection there were always 300—400 sporocysts in a drop of flotation liquid under cover glass of 24 × 24 mm. On days 27 and 28 after infection the same amount of flotation liquid contained 197 sporocysts, but on day 40 after infection, one of the dogs excreted again a large number of sporocysts and this increased number was found still during following four days. From day 27 after infection only sporocysts but no oocysts were found.

At the time when this report was written (i.e., 46 days after infection), both experimental dogs still excreted the sporocysts.

Examinations of faeces of the control dog were negative during the whole period.

DISCUSSION

While studying the ultrastructure of sarcosporidia of roe deer, we have pointed out the similarity of the thin-walled cysts with cattle and sheep sarcosporidia, the definitive host of which is dog (Schramlová J., Blažek K., Z. Parasitenk., in press). From the structure of sarcocysts of roe deer, as well as from the facts known from the studies of sarcosporidia of some domestic animals (Heydorn O., Rommel M., Berl. Münch. Tierärst. Wschr. 85: 121—123, 1972, Bergmann V., Kinder E., Mh. Vet. Med. 30: 772—774, 945—947, 1975, Heydorn O. et al., Z. Parasitenk. 48: 73—82, 1975, Mehlhorn A. et al., Protistologica 12: 451—467, 1976) it was reasoned about the definitive host of thin-walled sarcosporidia of roe deer. The present experiment confirmed the hypothesis that the definitive hosts of this type or species of sarcosporidia of roe deer are the beasts of prey of the family Canidae. However, it is probable that an important role in the maintenance and distribution of roe deer sarcosporidia is played by the fox (*Vulpes vulpes*), though of some significance in the epizootology of roe deer sarcosporidiosis may be also the roaming dogs which are accustomed to hunting. The specific determination of thin-walled sarcosporidia utilizing dog (and probably also other Canidae) as definitive host cannot be made at present. The roe deer has been reported to be infected by *Sarcocystis sibirica* and *S. capreoli* (Kalyakin V. N., Zasukhin D. N., Folia parasit. (Praha) 22: 289—307, 1975) and erroneously also by *S. gracilis* (Fiebiger J., Tierische Parasiten, 1947) which was described by Rátz from *Cervus elaphus* (Babudieri B., Arch. Protistenk. 76: 421—580, 1932). This determination will be possible only after comparison of the morphology of the sarcosporidia found by us with the original descriptions of species reported from roe deer and named by other authors, and after transmission experiments.

CONCLUSION

It was determined that the dog and probably also other Canidae are definitive hosts of thin-walled sarcosporidia infecting roe deer. Sporocysts of the size 15 × 10 μm were found in the faeces of dogs from day 11 after feeding the animals with musculature of the infected roe deer.

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