

EXPERIMENTAL TRANSMISSION OF *Eimeria confusa* JOSEPH 1969 TO THE FOX SQUIRREL *

Author: JOSEPH, THOMAS

Source: Journal of Wildlife Diseases, 11(3) : 402-403

Published By: Wildlife Disease Association

URL: <https://doi.org/10.7589/0090-3558-11.3.402>

The BioOne Digital Library (<https://bioone.org/>) provides worldwide distribution for more than 580 journals and eBooks from BioOne's community of over 150 nonprofit societies, research institutions, and university presses in the biological, ecological, and environmental sciences. The BioOne Digital Library encompasses the flagship aggregation BioOne Complete (<https://bioone.org/subscribe>), the BioOne Complete Archive (<https://bioone.org/archive>), and the BioOne eBooks program offerings ESA eBook Collection (<https://bioone.org/esa-ebooks>) and CSIRO Publishing BioSelect Collection (<https://bioone.org/csiro-ebooks>).

Your use of this PDF, the BioOne Digital Library, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Digital Library content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne is an innovative nonprofit that sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

EXPERIMENTAL TRANSMISSION OF *Eimeria confusa* JOSEPH 1969 TO THE FOX SQUIRREL*

THOMAS JOSEPH, Department of Biology, Indiana University at South Bend,
South Bend, Indiana, 46615 U.S.A.

Abstract: *Eimeria confusa* Joseph, 1969 from the gray squirrel *Sciurus carolinensis* was transmitted to the fox squirrel *Sciurus niger rufiventer*. This is the first report of the successful cross-transmission of a gray squirrel coccidium to the fox squirrel.

INTRODUCTION

Joseph¹ described *Eimeria confusa* from the gray squirrel *Sciurus carolinensis* in Massachusetts, USA. Lee and Dorney² described the same species and another eimerian from the gray squirrel in Ontario, Canada. Joseph³ reported the occurrence of *E. ontarioensis* in the fox squirrel *Sciurus niger rufiventer* in Indiana. The present paper reports the successful transmission of the gray squirrel coccidium, *E. confusa*, to the fox squirrel.

MATERIALS AND METHODS

Fox squirrels were live-trapped from St. Joseph's County, Indiana, using live traps. They were kept in 60 x 60 x 60 cm wire cages and fed a variety of foods such as acorns, sunflower seeds, apples and laboratory chow. Earlier attempts to keep fox squirrels in captivity were unsuccessful. They often die off during their first week of stay in the animal room. This problem was overcome by keeping the squirrels out on the lawn during day time and removing them indoors in the evening during their first 2 weeks in captivity. With this procedure the animals adjusted to the animal room.

Feces from the squirrels were examined daily for 2 weeks before infecting them with *E. confusa*. The inoculum was prepared as follows: *E. confusa* oocysts stored in 2.5% potassium dichromate solution were washed free of the dichromate. The suspension of oocysts was mixed with peanut butter and fed to the squirrel.

All fox squirrels were naturally infected with thin-walled eimerians, probably *E. ascotensis* and *E. lancasterensis*. It was not possible to free the squirrels of their natural infection with these two species.

RESULTS AND DISCUSSION

All three fox squirrels inoculated with *E. confusa* became infected, with a prepatent period of 8 days. Only one of the squirrels, younger than others as determined by size and tooth development, was visibly ill during the prepatent period. It did not eat or drink on the 5th and 6th days postinfection. All animals passed larger fecal pellets with some mucus during the earlier part of the prepatent period. The patent period was 12 days in the young squirrel while in others it lasted for about 3 weeks.

Although eight different eimerians have been described from the gray squirrel,

* This study was supported by grants from the Society of the Sigma Xi, the Indiana Academy of Science and the Office of Research and Advanced Studies, Indiana University.

the infectivity of most of them to other squirrels has not been studied. Möller⁷ successfully transmitted *E. moelleri* (syn., *E. sciurorum* Galli-Valerio, 1922 of Möller, 1923) from the North American gray squirrel to the European squirrel, probably *Sciurus vulgaris*. Pellerdy⁸ attempted unsuccessfully to transmit *Eimeria mira* from *S. vulgaris* to *Spermophilus citellus*. Lee and Dorney⁵ and Joseph² reported that *E. confusa* could not be transmitted to the red squirrel, *Tamiasciurus hudsonicus*. Joseph⁴ observed that most eimerians reported from the gray squirrel

also occur in the fox squirrel. He did not find *E. confusa* in any of the 33 fox squirrels from northern Indiana. Eimerians from rodent hosts are known to have a high degree of host specificity. According to Levine and Ivens⁶ who summarized the results of cross-transmission studies of rodent coccidia, *Eimeria* spp. were transmissible between host species in the same genus in eight out of nine cases. The results of the present study are thus in accord with what is known regarding host specificity of rodent eimerians.

Acknowledgements

The author wishes to thank Dr. Norman D. Levine of the University of Illinois for his helpful suggestions and critical review of this manuscript. The fox squirrels used in the study were trapped by my colleague Dr. Victor Riemenschneider.

LITERATURE CITED

1. JOSEPH, T. 1969. The coccidia of the gray squirrel *Sciurus carolinensis* with descriptions of two new species. Diss. Abstr. Int. 30: 2961-B.
2. JOSEPH, T. 1972. *Eimeria lancasterensis* Joseph, 1969 and *E. confusa* Joseph, 1969 from the gray squirrel *Sciurus carolinensis*. J. Protozool. 19: 143-150.
3. JOSEPH, T. 1973. Occurrence of *Eimeria ontarioensis* Lee & Dorney, 1971 in the fox squirrel *Sciurus niger rufiventer* in Indiana. J. Parasit. 59: 584-585.
4. JOSEPH, T. 1973. Eimerians occurring in or infective to both the fox squirrel *Sciurus niger rufiventer* and the gray squirrel *S. carolinensis*. J. Protozool. 20: 509.
5. LEE, B. L. and R. S. DORNEY. 1971. *Eimeria ontarioensis* n. sp., *E. confusa* Joseph, 1969 and *Eimeria* sp. (Protozoa: Eimeriidae) from the Ontario gray squirrel *Sciurus carolinensis*. J. Protozool. 18: 587-592.
6. LEVINE, N. D. and V. IVENS. 1965. The coccidian parasites (Protozoa, Sporozoa) of Rodents. III. Biol. Monogr. 33. The University of Illinois Press, Urbana.
7. MÖLLER, J. 1923. Kokzidien bei den Säugetieren des Zoologischen Gartens Zu Berlin. Inaug. Diss., Berlin, 23 pp. (Dissertation Nr. 928 der Tierärztlichen Hochschule, Berlin).
8. PELLERDY, L. 1954. Contribution to the knowledge of the coccidia of the common squirrel (*Sciurus vulgaris*). Acta. Vet. Acad. Sci. Hung. 4: 475-480.

Received for publication 28 January 1975