

Isolation of *Leptospira grippotyphosa* from a Western Harvest Mouse in Iowa

Authors: DIESCH, S. L., McCULLOCH, W. F., and BRAUN, J. L.

Source: Bulletin of the Wildlife Disease Association, 2(2) : 15-17

Published By: Wildlife Disease Association

URL: <https://doi.org/10.7589/0090-3558-2.2.15>

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.

Isolation of *Leptospira grippotyphosa* from a Western Harvest Mouse in Iowa

S. L. DIESCH, W. F. McCULLOCH, AND J. L. BRAUN

*Institute of Agricultural Medicine, Comparative Medicine Section
College of Medicine, University of Iowa, Iowa City, Iowa*

Received for publication 29 September 1965

This paper reports the natural occurrence of *Leptospira grippotyphosa* in a Western Harvest Mouse (*Reithrodontomys megaltis*) and a new host-serotype relationship in the United States (personal communication, M. M. Galton, 1965). The mouse was trapped during wildlife studies in Linn County, Iowa following a 1964 outbreak of human leptospirosis (unpublished data, Institute of Agricultural Medicine).

In the continental United States *L. grippotyphosa* has been isolated from raccoons (*Procyon lotor*) (McKeever, et al., 1958; Galton, et al., 1959; Gorman, McKeever, and Grimes, 1962), opossums (*Didelphis marsupialis*) (Roth, 1964), gray fox (*Urocyon cinereogargensis*) and red fox (*Vulpes fulva*) (Galton, et al., 1959), striped skunks (*Mephitis mephitis*) (Gorman, McKeever, and Grimes, 1962; Roth, et al., 1963), and from voles (*Microtus pennsylvanicus*) and a stream in Pennsylvania (Clark, et al., 1962). Recently, *L. grippotyphosa* has been isolated from a cow in Illinois (Hanson, Ellinghausen, and Marlowe, 1964).

According to Badudieri (1958), in the river valleys of Central and Eastern Europe the common vole

(*Microtus arvalis*) is a common carrier of *L. grippotyphosa*. In Europe and Israel other rodents have been found to be carriers of this serotype.

The adult harvest mouse was found dead in a box mouse trap near a farm stream on October 7, 1964. Blood and urine were not available for laboratory studies. No gross lesions were visible at necropsy. The kidneys were removed aseptically and placed in a sterilized petri dish. One kidney was ground in a mortar with a pestle and diluted to a 10% suspension with Stuart's liquid medium containing 11% rabbit serum. The suspension was examined by darkfield microscopy for leptospire; none were observed. Four additional 10 fold dilutions were prepared using methods described by Galton, et al. (1962), and 2-3 drops from each dilution were inoculated into 2 tubes of Fletcher's semisolid medium (Difeo) containing 11% rabbit serum (Galton, et al., 1962). Two tubes each containing 5 ml. of bovine-albumin Tween 80 semisolid medium (Ellinghausen and McCullough, 1965b) were also inoculated. All cultures were incubated at 28-30°C and examined periodically for lep-

tospores by darkfield microscopy for a period of 60 days. One tube of Fletcher's semisolid medium which had been inoculated with 1:-100,000 kidney suspension contained leptospores on the 27th day. Contamination was not a problem.

Subcultures of the isolate were propagated with difficulty in Fletcher's semisolid and albumin Tween 80 semisolid media. Subcultures were also propagated in Stuart's liquid medium for use in the microscopic agglutination lysis test. The subsequent antigen was standardized to a nephelometer scale reading of 25-30 (Ellinghausen and McCullough, 1965a). The following 14 rabbit

antisera were tested against the isolate: *L. ballum*, *L. canicola*, *L. icterohaemorrhagiae*, *L. bataviae*, *L. grippotyphosa*, *L. pyrogenes*, *L. autumnalis*, *L. pomona*, *L. sejroe*, *L. australis*, *L. hyos*, *L. mini georgia*, *L. biflexa*, and *L. kremastos*. The isolate reacted only against *L. grippotyphosa* antiserum. A subculture was sent to the Communicable Disease Center, National Leptospirosis Reference Laboratory, Veterinary Public Health Section, Atlanta, Georgia for definitive identification. The isolate has been identified as *Leptospira grippotyphosa* (personal communication, M. M. Galton, 1965).

ACKNOWLEDGMENT

This study was supported by Public Health Service Grant CC-00071, Communicable Disease Center, Atlanta, Georgia.

LITERATURE CITED

- BABUDIERI, B., 1958. Animal reservoirs of leptospores. *Ann. New York Acad. of Sci.* 70: 393-413.
- CLARK, L. G., J. I. KRESSE, R. R. MARSHAK, and C. J. HOLLISTER. 1962. *Leptospira grippotyphosa* infection in cattle and wildlife in Pennsylvania. *J. Amer. Vet. Med. Assoc.* 141:710-712.
- ELLINGHAUSEN, H. C., JR., and W. G. McCULLOUGH. 1965a. Nutrition of *Leptospira pomona* and growth of 13 other serotypes: A serum free medium employing oleic albumin complex. *Am. J. Vet. Res.* 26:39-44.
- ELLINGHAUSEN, H. C., JR., and W. G. McCULLOUGH. 1965b. Nutrition of *Leptospira pomona* and growth of 13 other serotypes: Fractionation of oleic albumin complex and a medium of bovine albumin and polysorbate 80. *Am. J. Vet. Res.* 26:45-51.
- GALTON, M. M., NELL HIRSCHBERGH, R. W. MENGES, M. P. HINES, and ROBERT HABERMANN. 1959. An investigation of possible wild animal hosts of leptospores in the area of the "Fort Bragg Fever" outbreaks. *Am. J. Pub. Health* 49:1343-1348.
- GALTON, M. M., R. W. MENGES, E. B. SHOTTS, JR., A. J. NAHMIAS, and C. W. HEATH, JR. 1962. Leptospirosis. Public Health Service Publication No. 951. 1-70.
- GORMAN, G. W., S. McKEEVER, and R. D. GRIMES. 1962. Leptospirosis in wild animals from Southwestern Georgia. *Am. J. Trop. Med. and Hyg.* 11:518-524.

- HANSON, L. E., H. C. ELLINGHAUSEN, and RACHEL MARLOWE. 1964. Isolation of *Leptospira grippotyphosa* from a cow following an abortion. Proc. of the Soc. for Exp. Biol. and Med. 117:495-497.
- McKEEVER, S., G. W. GORMAN, J. F. CHAPMAN, M. M. GALTON, and D. K. POWERS. 1958. Incidence of leptospirosis in wild animals from Southwestern Georgia with a report of new hosts for six serotypes of leptospire. Am. J. Trop. Med. and Hyg. 7:645-655.
- ROTH, E. E. 1964. Leptospirosis in wildlife in the United States. Sci. Proc. of 101st Annual Meeting of Amer. Vet. Med. Assoc. 211-218.
- ROTH, E. E., W. V. ADAMS, G. E. SANFORD, B. GREER, K. NEWMAN, M. MOORE, P. MAYEUX, and D. LINDER. 1963. The bacteriologic and serologic incidence of leptospirosis among striped skunks in Louisiana. Zoonoses Res. 2:13-19.

ABSTRACTS OF WILDLIFE DISEASE ARTICLES

Preliminary Study of an Infectious Hepatitis in Pheasants. M. N. Rosen, B. F. Hunter, and O. A. Brunetti. Avian Diseases, 9:382-393 (1965).

Authors' summary: A highly infectious pheasant disease, previously unreported, occurred in California during 1963 and 1964. The mortality ranged from 40 to 95% in pheasant chicks between five and ten days of age. The salient pathological features were a hypertrophied liver with congestion and focal necrosis; catarrhal enteritis in many and post-mortem ocular opacity in a few chicks. An inclusion-like body was observed in the hepatic parenchymal cells. Attempts to induce pathology in embryos and tissue cultures with filtrates of liver suspension failed. Ducklings, turkey poults, chicken chicks, chukar partridges and new born swiss mice were refractory to infestation, but pheasants uniformly succumbed to injection of filtrates as well as to direct contact. The chukar partridge was incriminated as a carrier of the disease. Antibiotics, sulfonamides, and attempts to induce immunity with sera from contact birds as a means of controlling the disease gave negative results. There are indications that this is a specific viral hepatitis of pheasants.

Epizootologic Studies on Filarioids of the Raccoon. C. M. Herman and D. L. Price. Jour. Wildlife Management. 29: 694-698 (1965).

Filarioid worms (*Dirofilaria immitis*, *D. tenuis*, *Dipetalonema procyonis* and *D. illececllyni*) were discovered in raccoons (*Procyon lotor*) in Maryland . . . Data on incidence of *D. illececllyni* were analyzed on basis of host distribution within these areas to indicate type of habitat in which one might seek the vector. It was concluded that exposure takes place in the spring of the year. The arthropod found associated most often with the raccoon in spring was *Ixodes texanus*. Larvae of this tick which were fed on infected raccoons presented no evidence of development of the microfilariae. Feeding experiments were also conducted with mosquitoes . . . Although microfilariae remained alive and active in the gut contents of all mosquitoes for 2 days, only in *Aedes aegypti* did they enter the hemocoel, but no developmental changes were noted and all microfilariae were dead by the eighth day . . . It appeared unlikely that exposure of the raccoons took place in the den or that the filarioids were transmitted by an ectoparasite commonly found in raccoon dens . . .