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Leptospira interrogans IN THE *Ballum* SEROGROUP FROM A VOLE, *Microtus oeconomus* (PALLAS) IN ALASKA

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Abstract: A member of the *ballum* serogroup of *Leptospira interrogans* is reported from a northern vole, *Microtus oeconomus* (Pallas), from the Alaska Peninsula. This is the first record of a *ballum* serogroup member and the first isolation of a leptospire from an indigenous mammal in Alaska.

INTRODUCTION

Kidneys from 78 mammals collected in Alaska during the period July 1965-July 1966 were cultured for leptospires. A single isolation of an organism identified as a member of the *ballum* serogroup of *Leptospira interrogans* was made from a northern vole. The results of this study are reported in the present paper.

MATERIALS AND METHODS

Mammals were collected by personnel of the Zoonotic Disease Section of this Center, as follows: cinereous shrew, *Sorex cinereus* Kerr, 10; tundra shew, *S. arcticus* Kerr, 1; varying hare, *Lepus americanus* Erxleben, 2; ground squirrel, *Citellus parryi* (Richardson), 5; northern vole, *Microtus oeconomus* (Pallas), 51; and northern red-backed vole, *Clethrionomys rutilus* (Pallas), 9. The animals were collected at four localities: near the base of the Seward Peninsula (Niukluk and Fish Rivers); Lake Minchumina (south-central Alaska); Susitna River (Denali Highway); and Ugashik Lake (upper Alaska Peninsula).

The kidneys were removed aseptically in the field, and a small wedge of tissue was placed in 8 ml of Fletcher's medium containing 10% bovine serum, 100 μg/ml of 5-fluorouracil, and 100 μg/ml of 8-azaguanine in screw-top tubes. Each lot of medium had been tested with control cultures to confirm that it would support growth of leptospires. The inoculated tubes were protected from extremes in temperature and transported to the laboratory. There, the tissues were removed and ground in 3.5 ml of phosphate-buffered saline (pH 7.2), after which 4 tubes of 10-fold dilutions were prepared as described by Galton *et al.*[1] One tube of Fletcher's medium containing 5-fluorouracil was inoculated with 2 drops from each dilution, after which the tubes and the original culture were incubated in the dark at 20-21C. Samples were removed weekly over a period of at least a month for dark-field examination.

RESULTS

The leptospire was isolated from one of 36 northern voles collected by Dr. F. H. Fay at Ugashik Lake in October 1965. The organism was first observed in the original culture on the 28th day of incubation, after which it was subcultured in Fletcher's medium. The first three subcultures required 3 weeks before leptospires could be detected by dark-field examination; thereafter, good

*Deceased

growth was obtained after 5 days. In culture, the leptospires became atypical in that the terminal hooks were no longer discernible.

The leptospire was identified as a member of the *ballum* serogroup by means of cross-agglutination tests with a battery of rabbit antisera against diverse serotypes. Confirmation was kindly provided by Dr. O. H. V. Stahlheim, National Animal Disease Laboratory, Ames, and by Mrs. Mildred H. Galton, Veterinary Public Health Laboratory, Center for Disease Control, Atlanta. Titres obtained by the cross-agglutination test as performed by Mrs. Galton are shown in Table 1.

TABLE 1. Cross-agglutination Reaction of Isolate against Serotypes of **Leptospira.**

Serotype rabbit antisera[1]	Titre
ballum	1:10,000
canicola	1:100
icterohaemorrhagiae	1:10
autmnalis	1:10
hardjo	1:10

[1]Negative reactions against serotypes: *pomona, sejroe, grippotyphosa, georgia, bataviae, tarassovi, australis, pyrogenes, L. biflexa* (undetermined type)

DISCUSSION

This is the first record of a *ballum* serogroup leptospire from Alaska, and the first isolation of a leptospire from an indigenous mammal. The infected vole was trapped in an uninhabited region, where the possibility seems remote that the leptospire could have been introduced by man. This serogroup has been reported from mammals of various species, including arvicoline rodents, at lower latitudes in North America.[2,3]

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