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Source: Journal of Wildlife Diseases, 29(4) : 602-603

Published By: Wildlife Disease Association

URL: <https://doi.org/10.7589/0090-3558-29.4.602>

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Leptospirosis Serology in Korean Wild Animals

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ABSTRACT: A study was undertaken on wild animals to determine the seroprevalence of animal leptospirosis in Korea. Using the serum microagglutination test for 19 serogroups, it was shown that two of 26 rats (*Rattus rattus*) had antibodies to *Leptospira canicola*. When data for domestic animals were included, the most prevalent (nearly 50%) serogroup was *Leptospira canicola*.

Key words: Korea, leptospirosis, serology, wildlife, *Leptospira* spp.

Leptospirosis is a complex disease affecting most birds and mammals (Feigin and Anderson, 1975) and occurs throughout the world. During the last decade, leptospirosis has been recognized as one of the important and probably the most prevalent zoonotic diseases in Korea (Lee et al., 1984; Cho et al., 1984; Chang and Park, 1988).

Although all mammals can be infected with one or more serovars of *Leptospira interrogans*, the incidence and prevalence of various serotypes differ considerably depending on the country and even varying from district to district and from season to season. Wild and domestic animals are important reservoirs of leptospiral serotypes.

Our objective was to determine the prevalence of antibodies to 19 *Leptospira* spp. in some common Korean mammals and birds.

Serum samples were collected from 125 animals, seven species of mammals and three species of birds, from throughout South Korea (Table 1). Some of the animals were live-trapped while others were killed by authorized shooting. Some zoo animals were sampled. After the blood was collected, the animals were identified by species and number.

Serum samples were tested by a microagglutination (MA) test (Chang and Park, 1988) using 19 representative strains

of *Leptospira interrogans* as antigens: *L. icterohaemorrhagiae*, *L. canicola*, *L. tarassovi*, *L. hardjo*, *L. pyrogenes*, *L. japonica*, *L. australis*, *L. grippityphosa*, *L. autumnalis*, *L. shermani*, *L. bataviae*, *L. ballum*, *L. pomona*, *L. hebdomadis*, *L. cynopteri*, *L. sejroe*, *L. mwogolo*, *L. panama*, *L. celledoni*. All sera causing agglutination or lysis of 50 percent or more organisms at a dilution of 1:80 were considered as positive in the MA test. A four-fold rise in titer of convalescent sera also was considered positive.

Two of 26 rats (*Rattus rattus*) were positive for antibodies to *Leptospira canicola* (Table 1). No other animals tested had detectable levels of antibodies.

Leptospirosis is an important zoonotic disease affecting most domestic and wild animals. The predominant serogroup among 19 representative strains tested was *Leptospira canicola* (48.2%). It is notable

TABLE 1. Prevalence of *Leptospira* spp. antibodies among Korean mammals and birds.

Animal species (common name)	Number tested	Number positive
<i>Nesolagus netscheri</i> (rabbit) ^a	51	0
<i>Rattus rattus</i> ^b	26	2 ^c
<i>Capreolus capreolus</i> (roe deer) ^d	2	0
<i>Canis lupus</i> (wolf) ^a	2	0
<i>Etmoneus koreanus</i> (hedge hog) ^a	9	0
<i>Cavia aperea porcellus</i> (guinea pig) ^d	2	0
<i>Sciurus vulgaris</i> (squirrel) ^a	4	0
<i>Phasianus colchicus</i> (pheasant) ^a	5	0
<i>Columba palumbus</i> (pigeon) ^a	5	0
<i>Mycotis myotis</i> (bat) ^d	17	0
<i>Alceis atthis</i> (kingfisher) ^a	2	0

^a Free-living.

^b Free-living, mostly close to homes.

^c The two positive rats had antibodies to *Leptospira canicola*.

^d Zoo animals.

that seroprevalence of *Leptospira interrogans* from the Korean wild rats was 14.9% in the epidemics of 1985 and 1986, but the rate steeply fell to 1.6% in the nonepidemic years (Chang and Park, 1988) and was 7.7% at the time of our study in 1991. Also the severe epidemics of human leptospirosis in 1975, 1984 and 1985 occurred after massive floods preceding the harvesting season in Korea (Ro and Yuk, 1976; Kim and Lee, 1985).

Many wild animal species serve as carriers and persistently shed the organisms in the urine. Rats were the only wild animals with *Leptospira* antibodies in our study. Thus during the flood season in Korea special attention should be paid to wild rats in the control of such epidemics.

The financial support from San Hak Research Foundation of Korea is gratefully acknowledged. The authors are also grateful to Professor Deoki Tripathy, University of Illinois, for valuable suggestions.

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Received for publication 28 October 1991.