

*Brief communication*

FURTHER STUDIES ON LEPTOSPIROSIS IN SMALL  
RODENTS AND SHREWS IN FINLAND

A REPORT ON INVESTIGATIONS MADE IN 1963—64

In previous investigations on small mammals in Finland (*Rislakki & al.* 1954, *Rislakki & Salminen* 1955, *Salminen* 1956), the *Leptospira icterohaemorrhagiae*-frequency in rats (*Rattus norvegicus*) was rather high (43.1 %). *Leptospira*-positive cases were also found in house mice (*L. sejroei* 23.3 %), harvest mice (*L. bataviae* 9.0 %), yellow necked field mice (*L. poi* 12.5 %), common voles (*L. sejroei* and *L. bataviae* together 12.1 %), field voles (*L. sejroei* and *L. bataviae* together 10.7 %) and in common shrews (*L. poi* 1.2 %). Specimens of other species sent in for investigation (Norway rat, common red backed vole, large tooth backed vole, northern red backed vole, root vole, water vole, wood lemming, Laxmann's shrew, lesser shrew and water shrew) gave negative results.

In the following studies all positive cases — with the exception of one — were found in the densely populated areas in southern Finland. Samples from the central part of Finland as well as from Lapland all gave negative results.

MATERIAL AND METHODS

The experiment involved a total of 57 rats, all of which belonged to the species *Rattus norvegicus*. These were caught alive in Helsinki. Other small rodents and shrews, with the exception of 30 house mice, were caught in central Finland at the Evo Forest Institute and at the State Game Reserve Institute, Lammi, for intestinal parasitological studies carried out by Dr. Freeman\*). The house mice were caught in the outbuildings of the Agricultural Research Center, Helsinki.

The procedures were: a) sera of the rats were tested for antibodies against *L. icterohaemorrhagiae* and sera of the house mice for antibodies against *L. sejroei*; sera of the other small mammals

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could not be tested due to decay, b) cultivation from the kidneys in Korthoff's medium and c) histological examination of the kidneys using Levaditi's silver-impregnation method.

## RESULTS

A. *Rats*. In addition to the *Leptospira* tests the rats were checked for *Trypanosoma lewisi* and *Trichina*. The results are presented in Table 1.

Table 1. Results from tests regarding the occurrence of *Leptospira*, *Trypanosoma* and *Trichina* in rats.

Sex	Number of rats	Average weight g	Leptospira positive				Leptospira negative	Trypanosoma lewisi	Trichina (number of rats 42)
			serol. (L. icterohaemorrhag.)	cultiv.	histol.	total			
♂	30	250	11	3	9	14	16	15	1
♀	27	230	9	1	13	15	12	10	3
Total	57	240	20	4	22	29 (50.9 %)	28	25 (44.0 %)	4 (9.5 %)

The three *Leptospira* testing methods complement each other. Attention should be given to the poor outcome of the cultivations, which may be due to the rather poor quality of the culture medium used.

B. *Other small rodents and shrews*. Of the 141 small mammals, 30 were house mice (*Mus musculus*), 41 yellow necked field mice (*Apodemus flavicollis*), 56 red backed voles (*Clethrionomys glareolus*), four field voles (*Microtus agrestis*), one common shrew (*Sorex araneus*), one water shrew (*Neomys fodiens*) and one harvest mouse (*Micromys minutus*).

The results obtained from these animals were interpreted as being negative notwithstanding the fact that the examinations were incomplete.

## DISCUSSION

The results from the rats are comparable to those previously obtained in Finland (Rislakki & Salminen 1955).

The negative results obtained from other small rodents and shrews cannot be considered fully reliable, but it is our opinion

that these at least suggest that if an infection was present its frequency must have been very low.

It would seem that the Levaditi's silver-impregnation method is not as reliable in tests concerning other small mammals as in tests with rats. This is the opinion e.g. of *Borg-Petersen & Fennestad* (1964) and *Borg-Petersen* (1966), who in investigations of bats used Done's improved silver-impregnation method.

The results of this study strongly emphasize the importance of histological examinations and their careful technical execution in *Leptospira* research.

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(Received February 5, 1970).