

A Serological Survey for Canine Leptospirosis in British Columbia

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A preliminary study was undertaken to determine the serological incidence of canine leptospirosis in British Columbia. Although many surveys have been conducted in the United States on canine populations, no comparable surveys have been made to date in Canada (4, 8, 11, 13, 14, 16). However, studies have been conducted on the role of wildlife as sources of leptospiral organisms in various parts of Canada (1, 10, 12). In one of these studies it was found that five of 20 canine samples taken from dogs in Vancouver with clinical symptoms resembling leptospirosis had significantly elevated antibody titres against *Leptospira canicola* (10). Reports of isolations of leptospire from clinically affected dogs are spotted throughout the literature (3, 12).

From May to September 1968, 137 canine serum samples were collected from hospital patients and boarders at three veterinary hospitals in British Columbia. These included 77 samples obtained from the veterinary hospital in Cranbrook, which services a 60 mile radius, plus 60 samples from the metropolitan Vancouver and surrounding area. Most of the samples were taken from healthy dogs. No samples were obtained from the pound.

All samples were stored at -20°C until tested. Each serum was screened for the presence of leptospiral agglutinins by the macroscopic slide agglutination test of Galton *et al* (7), using commercially available pooled antigens¹. In this preliminary study, only pool #1 containing the antigens *L. ballum*, *L. canicola*, and *L. icterohaemorrhagiae* was used. Agglutination was recorded as positive, doubtful or negative. All positive and doubtful sera were titrated against *L. canicola* and *L. icterohaemorrhagiae* individual antigens. Commercial

leptospiral antiserum² was used as a positive serum control, normal canine serum as a negative serum control, and saline as an antigen control for each test.

A comparative interpretation of the macroscopic slide agglutination test and the microscopic test titres suggested by Galton *et al* (7) is given in Table I. Although some workers believe that the two techniques cannot be compared (6), it is used here merely as a guide to assist with interpretation of the Difco code.

Of the 137 canine sera tested, eight were positive and seven were suspicious (Table II). All eight positive sera reacted to *L. canicola* antigen and two of these showed cross reaction with *L. icterohaemorrhagiae* antigen. All the seropositive samples were taken from healthy dogs of both sexes and all were over one year of age, with a mean of 7.5 years.

Seropositive dogs were encountered four times more frequently in metropolitan Vancouver (10%) than in Cranbrook (2.6%) (Table III). In the Vancouver area, six of 60 were seropositive, in comparison with two of 77 in Cranbrook.

These results suggest that leptospirosis is enzootic in the canine population of British Columbia. The higher incidence of seropositive dogs in coastal metropolitan Vancouver, as opposed to the rural area surrounding Cranbrook, which is about 500 miles inland, may be expected for the following reasons. The closer dog to dog association in the more densely populated city, the more moderate climate on the Pacific coast, and the greater amount of rainfall all favour the spread of leptospiral organisms. The results obtained compare favourably with results obtained in the United States for the Pacific and Moun-

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TABLE I Interpretation of the Macroscopic Slide Agglutination Test

Difco Code	Negative		Suspicious			Positive				
	1	2	3	4	5	6	7	8	9 ^a	
Actual Macroscopic Dilutions	1:6.5	1:11.9	1:18.8	1:32.5	1:60	1:119	1:188	1:325	1:600	
Comparable Microscopic Dilutions	1:16	1:32	— 1:128	1:256	1:512	1:1024	1:2048	1:4096	1:8192	

^aSerum is undiluted in 1; diluted 1:5 in 2-4; and diluted 1:50 in 6-9

tain areas, for their percentages ranging between 7.7%–9.0% for the mountains and 10%–16.9% for the Pacific (2, 16).

The results obtained here are subject to controversy due to the method used. The macroscopic slide agglutination test (ST) was used in this survey because of its simplicity of operation, and speed of obtaining results. The microscopic agglutination test (MT) is the standard test for serological identification of leptospirosis to date. Some variation has been found in the percentages of positive reactors in animal sera between the ST and MT (5, 6, 7, 15). Most of the reports and therefore the discrepancies have occurred with bovine sera (5, 15). The ST has been used effectively as a preliminary screening technique and it is generally accepted as a useful tool for this purpose (4, 5, 6, 7, 11, 15).

It was noted here, as stated by Solozano (15), that certain lots of *L. canicola* antigen auto-agglutinated, as detected by control saline and antigen mixture and nor-

mal serum plus antigen mixture. Only antigens which reacted normally with the controls were used.

Agglutinins to *L. autumnalis*, *L. ballum*, *L. bataviae*, *L. grippotyphosa*, *L. pomona*, *L. pyrogenes*, and *L. sejroe* have been found in canine sera in addition to *L. canicola* and *L. icterohaemorrhagiae* (1, 2, 4, 16). For this preliminary study, it was decided to first determine the prevalence of antibodies to the most common antigens, which account for approximately 85% of the isolates from recent general surveys (2, 16).

The incidence of healthy dogs which contract leptospiral organisms and become shedders exceeds those which succumb to clinical symptoms (9). It is important, therefore, to obtain a general serological picture of the incidence of canine leptospirosis. Since these results suggest significant evidence of leptospiral antibodies in canine sera in British Columbia, further serological studies and isolation attempts are indicated.

TABLE II. Leptospiral Titre Distribution of Reactive Sera

Antigen	Negative		Suspicious			Positive			
	1	2	3	4	5	6	7	8	9
<i>L. canicola</i>	5	11	7	4	3				1
<i>L. icterohaemorrhagiae</i>	1	12	2	1	1				

TABLE III. Area Distribution of Seropositive Samples

Area	No. Collected	No. Positive	% Positive
Cranbrook	77	2	2.6
Vancouver	60	6	10
Total	137	8	5.8

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