

EPIDEMIOLOGICAL STUDIES ON LEPTOSPIROSIS IN
NORTH EAST THAILAND

Principal Investigators : Robert R. Graham, CPT, VC
Richard E. Whitmire, LTC, VC
Pranee Hansukjariya, B.Sc.

Associate Investigator : Prachak Poomvises, DVM, Ph.D

OBJECTIVES :

1. To determine the Sero-varieties by serology & isolation of leptospira seen in domestic and sylvatic mammals in Northeast Thailand.
2. To determine the serovarieties by serology and isolation of leptospira in humans in Northeast Thailand.
3. To determine the ecological conditions which favor leptospiral transmission from animal to man.

BACKGROUND : Leptospirosis has become one of the world's most widespread contemporary zoonoses. Clinical symptoms from this disease range from severe illness such as Weil's Syndrome in man and Stuttgart's disease in canids to a very mild subclinical disease. A large percentage of leptospirosis produces mild to moderately severe disease which is usually lumped into the category of "Pyrexia of Unknown Origin" (PUO). Leptospirosis has been incriminated as a significant causal agent in a number of studies of PUO's ^{1,2,3,4,7,8}. There has been a renewed interest in the past few years, primarily in tropical regions, in determining serovarieties prevalent in various countries, more detailed epidemiology concerning zoonotic interactions, vectors and their efficiencies in transmission, and pathogenicity of various strains in humans. Because of this interest many new serovarieties have been added to the already large list and confusion with misidentification of many serovarieties found in earlier studies has been cleared up. Several recent studies have shown that leptospirosis is a common enzootic infection in the Sylvatic environment ^{4,5,8,10,11,14}. Many new vectors have been identified which help explain certain epidemics where water borne infections were unlikely.

Thailand provides an unique opportunity for the epidemiological study of leptospirosis, in that the disease appears to be widespread in both the human and animal populations. We are starting our studies in Northeast Thailand because this area has a large number of water buffalo and cattle. These animals are constantly exposed in ideal circumstances to environments which favor leptospiral transmission. We will be doing this study in cooperation with Chulalongkorn Veterinary School during their farm survey project.

METHODS : This project was designed to be done in two steps over an eight month period. The areas to be studied were in Changwad's Khon Kaen and Yasothorn.

Step One : The staff and Veterinary students from Chulalongkorn University conducted a farm survey from March 19 to March 29 in Changwad Khon Kaen and from April 1 to April 10 in Yasothorn. Their study involved visiting 10 villages per day in each of those Changwads. The students were divided into 10 teams and each team spent the entire day in the village. Chulalongkorn Veterinary students bled water buffalo and cattle for several of their projects and an extra clot tube was taken during the bleeding for use in this study. Attempts were made to take 10% of the adult ungulate population from each village. The serum was separated at the base camp in the evening and stored on wet ice.

Serum that was collected will be assayed for leptospirosis antibodies by using live antigens with the Microscopic Agglutination Test (MAT). The antigens used are listed in table 1. All sera will be screened initially and those positive will be titrated out.

Those villages which have the highest numbers of positive animals and which have cooperative populations will be selected for further epidemiologic study.

Step Two : The most promising villages will be revisited toward the end of December. The exact time will be dictated by Chulalongkorn University's schedule. This will be after the rice has been planted and with the abundance of water, leptospiral infections should be at a maximum. The following procedures will be done.

1. Traps will be set up in and around the villages for collection of small mammals. All animals trapped will be bled and then euthanized. One kidney will be cultured in Polysorbate 80 media for leptospira and the other kidney will be fixed in formaldehyde and then processed for silver strains specific for leptospira.
2. Soil and water samples will be collected from various sites within the villages. Water pH and temperature will be determined at the site.
3. Porcine and canine populations will also be bled for further leptospiral serology at AFRIMS.
4. If the villagers are cooperative blood from as many of the people as possible will be collected for serological characterization.

RESULT : A total of 1,478 serum samples were collected from 193 villages. Due to the difficulty in bleeding the cattle only 110 samples were collected from them, the remainder were from water buffalo.

Delays in receiving several necessary items needed to do both serology and isolation work, have made it impossible to begin any serologic studies. Because of this delay, completion of serologic studies in time for the coming rainy season and further epidemiological studies in those areas will not be possible and will have to be postponed until the following year.

Table 1. Leptospiral Serovarieties Used in the Microagglutination Test

<u>Serogroup</u>	<u>Serovariety</u>	<u>Strain</u>
Icterohaemorrhagiae	<i>Icterohaemorrhagiae</i>	RGA
Javanica	<i>Javanica</i>	Veldrat Batavia 46
Celledoni	<i>Celledoni</i>	Celledoni
Canicola	<i>Schuffneri</i>	Vleermuis 90 C
Ballum	<i>Ballum</i>	Mus 127
Pyrogenes	<i>Zanoni</i>	Zanoni
	<i>Robinsoni</i>	Robinson
Cynopteri	<i>Cynopteri</i>	3522 C
Autumnalis	<i>Bangkinang</i>	Banĳinang I
	<i>Louisiana</i>	LSU 1945
	<i>Djasiman</i>	Djasiman
Australis	<i>Lora</i>	Lora
Pomona	<i>Pomona</i>	Pomona
Grippotyphosa	<i>Grippotyphosa</i>	Noskva V
Hebdomadia	<i>Hebdomadis</i>	Hebdomadis
	<i>Tabaquite</i>	TVRL 34056
	<i>Hardjo</i>	Hardjoprajitno
Bataviae	<i>Bataviae</i>	Van Tienen
Tarassovi	<i>Tarassovi</i>	Perepelicin
Panama	<i>Panama</i>	CZ214K
Shermani	<i>Shermani</i>	LT821

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