

ANNUAL PROGRESS REPORT

SEATO Medic Study No. 9 Ecology of Arboviruses in Thailand. Avian and Mammalian Reservoirs of Arboviruses in Thailand

Project No. 3A 025601 A 811 Military Medical Research Program
S.E. Asia

Task OI: Military Medical Research Program
S.E. Asia

Subtask OI: Military Medical Research Program
SEASIA (Thailand)

Reporting Installation: US Army-SEATO Medical Research Laboratory
APO 146, San Francisco, California
Division of Medical Research Laboratories
Department of Virology

Period Covered by Report: 1 April 1963 to 31 March 1964

Principal Investigator: Major Scott B. Halstead, MC

Associate Investigator: Dr. Suchinda Udomsakdi

Reports Control Symbol: MEDDH-288

Security Classification: UNCLASSIFIED

ABSTRACT

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The objective is to determine the role of mammals and birds as amplifying hosts in the natural cycle of arthropod borne viruses through serologic study of birds, wild and domestic mammals migratory or resident in Thailand. Repeated samples to be made of each species studied throughout the year. Serum to be tested for antibody to viruses recovered in Thailand. To date this study has shown a very high incidence of HI antibody to Japanese encephalitis virus in May and June, 1962 in Blandford bulbul, tree sparrow, Magpie Robin and Fantail Flycatcher. Large domestic mammals, especially the pig, water buffalo and cattle have been found to be frequently positive for JEV antibody. Antibody to chikungunya virus has been detected in a few avian species and in large domestic animals, particularly the horse, pig and water buffalo.

BODY OF REPORT

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Objective: To determine the role of mammals and birds as amplifying hosts in the natural cycle of arthropod borne viruses in Thailand.

Description: Repeated serum samples are obtained from avian and mammalian species at frequent intervals during various seasons of the year and from various geographical and ecological habitats in Thailand. Where possible sera are stored for virus recovery. Sera are tested by various serologic methods against Thailand virus isolates and prototype viruses recovered in Southeast Asia and other areas of the world.

Progress: During 1962, sera from 1882 avians of 70 species were tested against chikungunya and Japanese encephalitis antigens by the HI test. These birds had been mist-netted in 15 sites within the city limits of Bangkok and Thonburi. All sera were kaolin treated and goose cell absorbed. The initial dilution of serum tested was 1:20. Results obtained with JE virus in 4 resident species are shown in Table 43. A rise in prevalence of HI antibody during April-June and again in October and November is apparent. A number of migratory species not shown are present in Bangkok during February to May. Some of these species were also found to have HI antibody for JE virus. Further collection of arthropods, avians and mammals are programmed for 1964. It is hoped to recover viruses from birds and arthropods to identify the source of the group B HI antibodies measured in 1962 and determine the coincidence of virus dissemination with the departure of migratory species.

HI and Nt tests of domestic and wild animals are summarized in Table 44. Prevalence of chikungunya infection in water buffalo, cattle, horses and pigs are confirmed by Nt. Recovery of chikungunya virus from Culex tritaeniorrhynchus in November 1962 and evidence of fairly wide-spread infection with this virus in large domestic animals is evidence that this disease has a zoonotic cycle.

Results obtained with dengue and JE HI antigens tested against animal sera requires comment. In serum from Bangkok humans, dengue or JE antigens may be used indiscriminantly with identical results. It is believed that the antibody measured has been generated from dengue virus infection. In animals exposed to JE or related agents, it can be seen (Table 44) that JE antigen produces significantly greater number of positives than does dengue virus. In animals the correlation of JE Nt and HI antibody is very high.

Summary and Conclusions: Evidence of marked transmission of JE virus (or related agents) to a large number of avian species and domestic animals has been obtained from serologic studies conducted in 1962-1963. The full spectrum of involvement of mammals and birds with arboviruses awaits an intensive virus isolation study which is planned for 1964. Serologic evidence of transmission of chikungunya virus to avians and domestic animals has also been obtained. Prevalence of antibody in these species is considerably lower than group B antibody.

Table 43. Accumulation of HI antibody to JEV in selected avian species, Bangkok, 1962.

Species	Mar.	Apr.	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan, 1963
Blandford Olive Bulbul	3/30	1/68	-	20/22	22/38	11/87	10/34	10/20	1/45	7/49	6/8
Fantail Flycatcher	0/11	1/15	-	10/27	3/13	0/10	1/3	2/6	2/10	0/8	0/1
Tree Sparrow	0/32	7/69	-	50/67	31/57	14/75	0/12	6/17	7/30	16/65	0/26
Magpie Robin	1/38	0/24	-	20/30	11/19	5/29	-	3/16	0/13	0/6	2/2

Table 44. Incidence of HI antibody in selected mammals resident in or near Bangkok, 1962.

	Chik	Dengue	JE
Water buffalo	16/71	11/71	55/59
Cattle	1/36	3/36	12/13
Calf	8/170	14/180	52/98
Horse	60/106	31/106	76/91
Pig	82/269	101/222	186/242
Dog	4/103	15/103	1/7
Cat	0/17	1/17	---
Monkey	3/59	13/59	14/59
Rabbit	1/19	1/19	---
Bats	2/86	0/15	9/86
<u>Mus musculus</u>	0/17	0/15	0/8
<u>Musk shrew</u>	0/10	0/10	2/7
<u>Rattus rattus</u>	0/21	0/21	0/8
<u>Rattus norwegicus</u>	0/38	0/21	1/38

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SEATO Medic Study No. 10 Growth of Dengue Viruses in Tissue Culture
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