



EPIDEMIOLOGY OF ARBOVIRUSES IN SRI LANKA.

BY

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SUMMARY.

This dissertation includes studies on the epidemiology of Japanese encephalitis, California serogroup viruses, Alphaviruses, Chandipura virus (Rhabdoviridae), Bhanja and Batai viruses. Seroepidemiological studies, both cross sectional and longitudinal, were carried out on human and animal sera. The serological technique used was the plaque reduction neutralization test (PRNT). Limited studies on virus isolation from field caught mosquitoes were used to supplement the seroepidemiological data.

Techniques used for isolation of virus from field caught mosquitoes viz. inoculation of suckling mice, vertebrate and mosquito cell culture; and a microplate modification of PRNT were optimized.

Japanese Encephalitis (JE): Serological studies on domestic animals showed that pigs were the most sensitive indicator of JE activity. Therefore, pigs were used as indicators of JE in cross sectional and longitudinal studies in different agro-climatological areas of the country. The main conclusions were that porcine JE seropositivity decreases with increasing altitude, and there is little JE activity in the wet zone highlands (> 3000 ft) of Sri Lanka. The highest human antibody prevalence was found in the Dry Zone areas. Human seropositivity did not correlate in a linear manner with pig seropositivity. Although Kandy has a significant (47%) porcine JE infection rate,

human infection is uncommon. The 'spillover' of infection to domestic animal species viz. cattle and goat decreases with increasing altitude and does not correlate with porcine seropositivity. It is concluded that pig husbandry in the wet zone highlands would probably not be a human JE risk.

Porcine infection in the Mahaweli C, Anuradhapura and Welisara (low elevation areas) occurred in a focussed and synchronous manner. In contrast, porcine infection in Kandy was asynchronous and covered a period of six months. The period of maximal JE activity in the dry zone was the "Maha" cultivation season, whereas in the wet zone (Welisara; Kandy) it was the Yala season. JE virus was isolated from field caught Culex pseudovishnui mosquitoes in the Kandy area.

California serogroup viruses:

The prevalence of antibody to California serogroup viruses, viz. Lumbo (LUM), Snow Shoe Hare (SSH), and Trivittatus (TVT) were studied in man and animals in different parts of the country. Serological evidence in man and animals for a LUM related virus was obtained in many parts of the island. In addition infection of man and animals by SSH and Melao related viruses was likely. The role of these viruses in human encephalitis deserves further study.

Alphaviruses:

A Sagiya related virus was isolated from Culex fuscocephala and Culex tritaeniorhynchus mosquitoes collected in Anuradhapura. Antibody prevalence to the local isolate shows low

seroprevalence in man and animal in many parts of the country, with the exception of pigs. Chikungunya and Sindbis virus activity was not detectable.

Chandipura:

Serological evidence for Chandipura virus infection was obtained in man and animals for the first time in Sri Lanka. The highest seroprevalence was seen in cattle.

Batai and Bhanja viruses:

An extension of serological studies was conducted in man and animals to Bhanja virus. Serological evidence of infection in man is recorded.

A study of Batai virus was carried out on human sera and one human seroconversion associated with febrile illness was documented for the first time with this virus.

Seven arboviruses were isolated from field caught mosquitoes during the present study. In addition to JE and Sagiya (refer above), Arkonam virus was isolated from Sri Lanka for the first time. The mosquito vector was Cx.fuscocephala. Three other isolates remain unidentified, and have been sent to a reference laboratory for study.