

Tick-borne Viruses in Thailand

1. Tentative Identification of Langat Virus

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OBJECTIVE: To identify a group B arbovirus (T-1674) isolated from ticks in Khao Yai National Park.

BACKGROUND: Three unidentified viruses have been isolated from ticks collected in Thailand (1). One of the viruses, T-1674, was shown to pass through a 200 nm filter. Growth was inhibited by either exposure to ether or pH 3.0 but not by a DNA inhibitor, 5-Bromo 2' deoxyuridine. In LLC-MK₂ cells, T-1674 produced plaques of varying size. Complement fixation (CF), hemagglutination inhibition (HI) and plaque reduction neutralization tests (PRNT) indicated T-1674 was antigenically related to the group B arboviruses. Tick-borne group B arboviruses have not been previously identified in Thailand. Since some members of this group cause severe encephalitis in man, identification of T-1674 was given first priority.

DESCRIPTION: Identification of T-1674 was accomplished by comparing its antigenicity to that of nine other group B arboviruses including a prototype strain of Langat, TP-21.

Hyperimmune mouse ascitic fluid (HMAF) was used in all serological tests. HMAF was made to T-1674 and the prototype Langat TP-21 (2). Additional HMAF to TP-21 was kindly provided by Dr. Hazel Wallace (Arbovirus Research Unit, University of Malaya, Kuala Lumpur, Malaysia).

CF and HI antigen was prepared by sucrose acetone extraction of suckling mouse brain (SMB) (3). Hemagglutin activity was optimal at pH 6.7 (range 6.4-7.0) at 22°C. PRNT using a constant amount of virus and dilutions of HMAF were used to determine the dilutions of antibody giving 50% plaque reduction (4).

PROGRESS: Low passage seed virus sent to the Yale Arbovirus Research Unit, New Haven, Conn., was tentatively identified as Langat virus by comparative CF testing (5). Similar testing in this laboratory supported this conclusion (Table 1). In addition, PRNT showed T-1674 was neutralized only by Langat antibody (Table 2). Although the Langat HMAF gave two to four fold higher antibody titers to TP-21 than to T-1674, it is concluded that there is sufficient similarity to consider T-1674 to be a new strain of Langat virus.

SUMMARY: Identification tests of a group B tick-borne virus (T-1674) from Khao Yai National Park suggest it is a new strain of Langat virus. Conclusive identification awaits interpretation of the results by the Yale Arbovirus Research Unit.

REFERENCES:

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Table 1. Comparative Reciprocal CF Antibody Titers to Four Units of Antigen

Antigen	Hyperimmune Mouse Ascitic Fluid*									
	T-1674	Langat	Dengue 1	Dengue 2	Dengue 3	Dengue 4	Japanese Encephalitis	Wesselsbron	Tembusu	West Nile
T-1674	32	256	2	<2	<2	<2	4	<2	<2	<2
Langat (TP 21)	32	256								
Dengue 1	<2		512							
Dengue 2	<2			1024						
Dengue 3	<2				512					
Dengue 4	<2					512				
Japanese Encephalitis	<2						512			
Wesselsbron	<2							256		
Tembusu	<2								64	

* HMAF were not absorbed with normal mouse brain.

Table 2. Comparative Reciprocal PRNT Antibody Titers to 95 Pfu of Virus

Virus	Hyperimmune Mouse Ascitic Fluid							
	T-1674	Langat (TP21)	Langat (University of Malaysia)	Dengue 2	Japanese Encephalitis	Wesselsbron	Tembusu	West Nile
T-1674	100	600	500	<10	<10	<10	<10	<10
Langat (TP21)	110	2000	1000					