



## ISOLATION AND CHARACTERIZATION OF *ORIENTIA TSUTSUGAMUSHI* FROM RODENTS, CHIGGERS AND HUMANS IN SOME REGIONS OF THAILAND

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### Abstract

*Orientia tsutsugamushi*, an obligate intracellular gram-negative bacterium, is known to be the causative agent of scrub typhus, a vector-borne disease transmitted by infected chiggers, larval stage of trombiculid mites in the genus *Leptotrombidium*. Rodents, particularly rats, serve as principal reservoir hosts for *O. tsutsugamushi*. In this study *O. tsutsugamushi* were isolated from rodents, chiggers, and humans from 5 provinces of Thailand i.e. Phang Nga, Chonburi, Tak, Chiang Mai and Chiang Rai. *O. tsutsugamushi* were isolated from liver and spleen of rodents by consecutive multiplication in mice and irradiated L-929 cell culture. In addition, *O. tsutsugamushi* were isolated from chiggers and from the blood of scrub typhus patients. Nucleotide sequence of the 56-kDa protein gene of all the *O. tsutsugamushi* isolates obtained were determined and compared with standard sequences already deposited with GenBank. Dendrograms were constructed using neighbor-joining and maximum parsimony methods of PAUP 4.0b10 software. Moreover, *O. tsutsugamushi* from patients in the northern region of Thailand were also examined on the nucleotide sequence of the 56-kDa protein gene and evolutionary relationship with those *O. tsutsugamushi* in this study as well as those of Gilliam, Karp and Kato. Thirteen *O. tsutsugamushi* isolates were obtained from those rodents, 6 from chiggers and 4 from humans. Study on the nucleotide sequencing of 56-kDa protein gene and the evolutionary relationship of the 23 isolates indicated that they could be grouped into 5 different clusters. Study on the relationship between 44 *O. tsutsugamushi* from blood patients in the northern region and 23 isolates in this study as well as the prototype strains: Gilliam, Karp, and Kato indicated that many *O. tsutsugamushi* isolates from the patients were closely related to those isolated from the present study. Correlation study among the isolates showed that the local *O. tsutsugamushi* isolates from this study should be used to develop specific and sensitive diagnostic tool for scrub typhus as well as vaccine program in the future.

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