

SHORT COMMUNICATION

Detection of Rickettsiae in Engorged Ticks from Small Mammals in Malaysia

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ABSTRACT

Rickettsiae are intracellular bacteria found in ectoparasites such as ticks, lice, fleas, mites and chiggers that can cause emerging infectious diseases throughout the world. There is lacking of information on their distribution and the tick vectors involved. The aim of this study is therefore to determine whether engorged ticks extracted from small mammals (Insectivora, Rodentia and Scandentia) from 15 locations of study areas have any potential health risks to the public. Forty-eight engorged ticks were tested for the presence of rickettsiae DNA using Polymerase Chain Reaction (PCR) targeting a fragment of the rickettsial gene citrate synthase gene (*gltA*). There was no DNA of rickettsiae detected from the ticks. Further investigations are needed in order to generate more comprehensive information on the potential distribution of rickettsial disease in different locations and habitats that can establish an epidemiological data of rickettsiae in Malaysia.

Keywords: Engorged ticks, health risk, Polymerase Chain Reaction (PCR), Rickettsiae

Rickettsial diseases have been considered as emerging zoonoses worldwide and it is important to study as they can cause severe or fatal diseases in vertebrate animals as well as in human (Azad & Beard, 1998; Costa *et al.*, 2002; Nadchatram, 2008; Sonenshine, 1993). Symptoms of the disease in human are rashes, fever for one to several weeks, headache, malaise, prostration and peripheral vasculitis (Sonenshine, 1993). The rickettsiae consist of a group of obligate intracellular, gram-negative, pleomorphic rod or coccoid-shaped bacteria that grow intracellularly as a symbiotic in ectoparasites such as mites, ticks and fleas (Raoult & Roux, 1997; Sonenshine, 1993). Transmission of rickettsiae to human or animals occurs via the infected ectoparasites, through exposure to an infected animal such as rodents and scandents, which are known as reservoir of diseases (Sonenshine, 1993; Brouqui *et al.*, 2004; Guedes *et al.*, 2005; Labruna *et al.*, 2007).

Rickettsial diseases have been reported in Malaysia since 1927 (Institute for Medical Research, 1951). Cases such as Q-fever, tick typhus, murine typhus, and scrub typhus were reported (Nadchatram, 2008; Tay *et al.*, 2002). Agents for Q-fever were found in three species of small mammals (*Sundamys muelleri*, *Maxomys rajah* and *Tupaia glis*) and three genera of ticks, namely, *Haemaphysalis*, *Dermacentor* and *Ixodes* (Institute for Medical Research, 1959; Nadchatram, 2008).

In 1958, six species of forest rodents and a species of tree shrew were sero-positive for tick typhus (Marchette, 1965). In that study, at least two genera and one species of ticks (*Haemaphysalis* spp. and *Ixodes granulatus*) were involved in the cycles of tick typhus (Marchette, 1965). Ticks of the genera *Ixodes*, *Dermacentor*, *Haemaphysalis* and a species, *I. granulatus* are capable of transmitting rickettsial agents in Malaysia (Nadchatram,

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