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Serovar diversity of *Leptospira* sp. infecting wild rodents in Sarawak, Malaysia

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Abstract. Leptopsirosis is a zoonotic disease with global distribution and rodents, in particular rats, have been identified as the main reservoir host. A study was conducted to determine the prevalence of antibodies against *Leptospira* sp. in wild rodents caught in selected areas of Sibu, Sarikei and Kapit in Sarawak during the period of July 2011 to May 2014. In total, 241 sera samples were collected from rodents caught from these three administrative divisions in Sarawak. Ninety-eight rodents (40.7%) were positive with antibody titre ≥1:50 by microscopic agglutination test (MAT) against 13 out of 20 common local leptospiral serovars tested. Sera of rodents caught in Sibu, Kapit and Sarikei divisions were positive at 43.9%, 37.5% and 36.4%, respectively. The top five serovars detected were: Autumnalis (25.5%), Tarassovi (23.5%), Bataviae (15.3%), Hebdomadis (8.2%) and Celledoni (7.2%). The main species of rodent positive for antibodies against *Leptopsira* sp. were *Sundamys muelleri* (50.0%), *Rattus rattus* (37.5%), *Callociurus notatus* (35.6%) and *Rattus exulans* (32.6%). This study indicates that leptospiral antibodies are prevalent amongst wild rodents in central Sarawak, which could be translated as high leptospiral carriage. The close interaction that exists between the local community and the environment could potentially propagate the transmission of *Leptospira* sp. to human in these areas. This study also provided essential information about local circulating *Leptospira* serovars, which could be useful for eventual prevention measures in disease transmission.

INTRODUCTION

Leptospirosis is a zoonotic disease that affects both animals and human. The causative organism, *Leptospira* sp. is maintained in wild and domestic animals. Small mammals are the most important reservoirs, and rodents, especially rats are often implicated in the maintenance and spread of the infection to humans through direct or indirect transmission (Adler, 2015).

Leptospira sp. is maintained through chronic renal infection of the animal hosts and infections are generally acquired during infancy. These infected hosts are able to excrete live leptospires via their urine into the environment throughout their life (Bharti *et al.*, 2003). Shed leptospires are able to survive in the environment, thus facilitating indirect transmission to humans (Haake & Levett, 2015, Tangkanakul *et al.*, 2000). In Malaysia, the wet and warm climate can sustain the survival of the shed leptospires for several days (Khairani *et al.*, 2004).

Rodent species such as *Rattus norvegicus*, *Rattus tiomanicus* and *Rattus rattus* have been identified as *Leptopsira* sp. carriers in Malaysia (Mohamed Hassan *et al.*, 2010 & 2012, Benacer *et al.*, 2013). The prevalence of antibodies against *Leptospira* sp. in rodents and their serovar distribution varied widely and are influenced by many