Molecular Characterization of *Leptospira* Species Isolated from Urban Rats in Peninsular Malaysia

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Leptospirosis is an emerging infectious disease with worldwide distribution. Recently, a dramatic increase of human cases was reported however information on the main host reservoir, the rat and serovars circulating among the population is limited. Therefore, the present study was undertaken to isolate *Leptospira* and characterise the serovars circulating in the urban rat populations from selected main cities in Peninsular Malaysia. Five urban cities were chosen as study sites to represent different geographical locations in Peninsular Malaysia with trapping commencing from October 2011 to February 2014. Microscopic agglutination test (MAT) and PCR was carried out to identify and determine the pathogenic status of the isolates while pulsed-field gel electrophoresis (PFGE) and random amplified polymorphic DNA (RAPD)-PCR to characterize the isolates. Three species were identified from 357 rats captured with *Rattus rattus* the dominant rat species (285, 80%) followed by *Rattus norgevicus* (53, 15%) and *Rattus exulans* (19, 5%). Only 11.0% were positive through culture and confirmed pathogenic *Leptospira* through molecular techniques. Two serogroups were distinguished in the population namely; *L. borgpetersenii* serogroup Javanica (n=16) and *L. interrogans* serogroup Bataviae (n=23). Pulsed-field gel electrophoresis (PFGE) distinguished the two serovars in the urban rat populations: *L. borgpetersenii* serovar Javanica (41 %), and *L. interrogans* serovar Bataviae (59 %). RAPD-PCR yielded 14 distinct patterns and was found to be more discriminative than PFGE.

Significant associations were shown between host infection with host-age and species. Despite, the low infection prevalence in the population, these finding still highlights risk of exposure to infection particularly coupled with other factors.