

## Microhabitat factors influenced the prevalence of pathogenic *Leptospira* spp. in small mammal host

### ABSTRACT

Leptospirosis, a widespread zoonotic disease, is a public health problem, especially in major urban centres, and is mainly reported to be associated with rats. In Malaysia, focus has been primarily given to the *Leptospira* prevalence in rodents per se, but there is lack of information on the microhabitat structure of the outbreak areas. We aimed to determine the diversity of small mammal species, microhabitat types, and their prevalence of pathogenic *Leptospira* spp. in the outbreak areas, which were categorized as urban, semi-urban, and recreational forests. Sampling involved deploying 100 to 300 live traps at each study site. Kidney samples were extracted from selected individuals, for screening of pathogenic *Leptospira* spp. by PCR. Out of 537 individuals from 15 small mammal species captured, 4 species were recorded from urban, 13 from semi-urban, and 11 from recreational forest sites. From 389 individuals screened, 58 were tested positive for pathogenic *Leptospira*. Recreational forests recorded the highest prevalence with 19.4% ( $n = 93$ ), followed by urban, 16.6% ( $n = 163$ ) and semi-urban sites with 9.8% ( $n = 133$ ). Seven rodent species were tested positive for pathogenic *Leptospira* from all areas. *R. norvegicus* was found to harbour the highest prevalence (66.7%) in urban, *R. rattus* (53.8%) in semi-urban, whereby *M. whiteheadi* (44.4%) in recreational forest sites. Microhabitat analysis revealed that rubbish quantity contributed especially strongly to a high prevalence of *Leptospira*. This study contributes to understanding of the host and microhabitat preferences of *Leptospira*, which is important in controlling the spread of this disease in human's landscapes.

**Keyword:** Leptospirosis; Microhabitat; Prevalence; Recreational forest; Rodents; Urban