

## **Molecular characterization of pathogenic *Leptospira* sp. in small mammals captured from the human leptospirosis suspected areas of Selangor state, Malaysia**

### **ABSTRACT**

Leptospirosis is caused by the spirochetal bacterium *Leptospira* of which rodents are considered the most important reservoir. This study aims to determine and characterize virulent *Leptospira* species among rodents and small mammals found in human settlements and recreational spots within the Hulu Langat and Gombak districts of Selangor, Malaysia; regions that frequently report probable human leptospirosis cases. Molecular analysis revealed an overall *Leptospira* detection rate of 14.3% among the 266 small mammals captured, and the human settlements were found to have the highest number of isolates (15.1%), followed by recreational sites (14.5%). The molecular characterization conducted based on the lipL32, secY genes and MLST revealed that the strains belonged to four different species, including; *Leptospira interrogans* (29; 76.3%; ST50, ST238, ST243), *L. kirschneri* (5; 13.15%; ST110), *L. borgpetersenii* (3; 8%; ST143) and *L. weilii* (1; 2.63%; ST242). The study revealed genotypes of circulating strains among small mammals in Malaysia, which include *Leptospira* locus ST110 *L. kirschneri*, ST 50 *L. interrogans*, ST143 *L. borgpetersenii* and ST242 *L. weilii*. Among the small mammals studied, 17/105 (16.2%) *Rattus norvegicus*, 7/59 (11.9%) of *Rattus rattus*, 5/24 (20.8%) of *Maxomys whiteheadi*, 4/18 (22.2%) of *Sundamys muelleri*, 2/22 (9%), *Tupaia gliss*, 2/16 (12.5%) *Rattus tiomanicus* and 1/4 (25%) of *Suncus murinus* carried pathogenic leptospire. The data from the present study may imply that, in addition to rodents, other small mammals also serve as maintenance hosts for *Leptospira*. Hence, much remains unknown about *Leptospira* maintenance hosts, and there is need for further investigation to ascertain the prevailing serovars of pathogenic *Leptospira* in Malaysia. This will assist in the development of efficient diagnostic assays with improved microscopic agglutination test (MAT) panels, and in the implementation of suitable prevention and control measures.

**Keyword:** *Leptospira*; Leptospirosis; Malaysia; Rodents; Small mammals; *L. interrogans*; *L. kirschneri*; *L. borgpetersenii*; *L. weilii*; Recreational forest