

# THE ROLE OF RODENTS CIRCULATING PATHOGENIC LEPTOSPIRA IN URBAN CITIES IN PENINSULAR MALAYSIA

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## INTRODUCTION

Leptospirosis is an infectious disease affecting both humans and animals and considered one of the common zoonotic disease worldwide. It is caused by spirochetes from the genus of *Leptospira*. Rodents have unambiguously served as reservoir for leptospires by shedding them through urine for extended periods. However, in Malaysia is a paucity of information of this disease in the rat population, which is considered the principal maintenance host of *Leptospira* and may be one of the possible transmission sources of leptospirosis in this country.



## SIGNIFICANCE OF STUDY

This study will provide scientific proof for establishing the epidemiological link between human infections and the potential reservoirs. The results obtained will determine the main serovars of the *Leptospira* circulating among the urban rat population in Peninsular Malaysia, and the role of this natural carrier as shedder of the pathogenic leptospires.

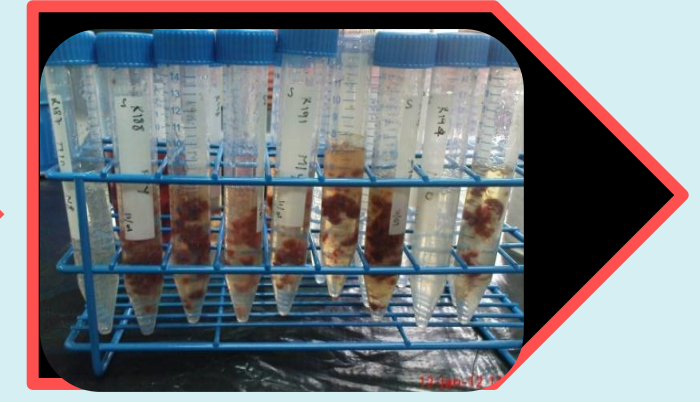
## METHODOLOGY



Rats



Blood, urine and kidney samples



EMJH medium



Dark field microscope



PCR: *secY* gene



Result

## OBJECTIVES

To determine the prevalence of leptospirosis in the urban rat population in five states in Peninsular Malaysia and to investigate the dominant serovars circulating among this population.

## RESULTS

### ❖ Samples collection

Table 1: Summary of the trapped rats (n=357) from five states in Peninsular Malaysia from October 2011 to February 2014.

State (City)	Rat Species			Age		Gender	
	RR	RN	RE	Adult	Juvenile	Male	Female
Selangor	32	26	4	44	18	21	41
Penang (Georgetown)	1	14	0	15	0	10	5
Pahang (Kuantan)	49	10	15	63	11	33	41
Malacca (Malacca city)	92	6	0	76	22	32	66
Perak (Ipoh)	108	0	0	67	41	45	63

RR: *Rattus rattus*; RN: *Rattus norvegicus*; RE: *Rattus exulans*

### ❖ Dark field microscope



Fig1: Images of *Leptospira* spp. observed under dark field microscope

11% (39 samples) were positive for the presence of *Leptospira* spp.

### ❖ PCR confirmation

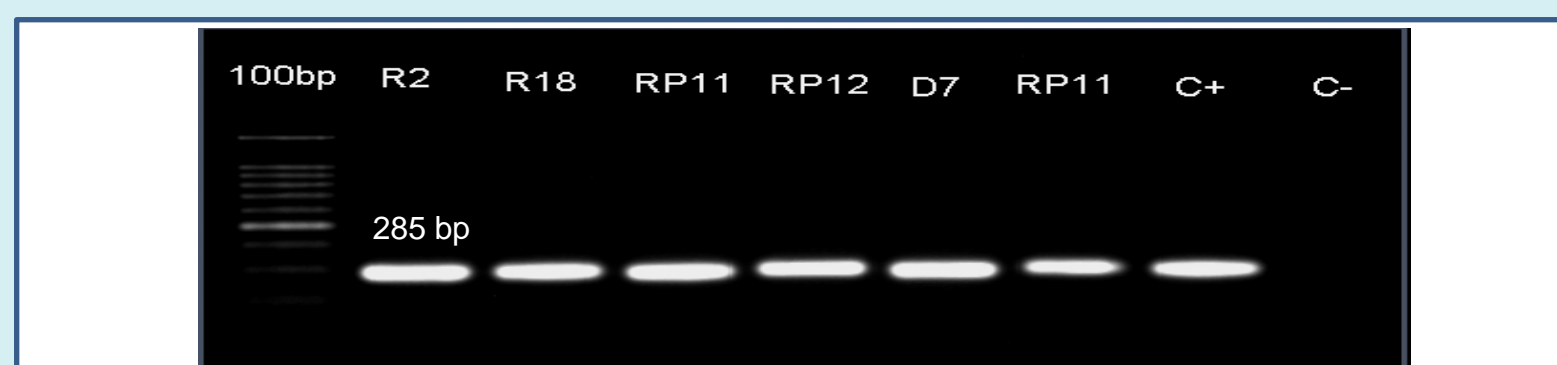


Fig 2: PCR confirmation for pathogenic *Leptospira* using (G1/G2) primers

*Leptospira* strains confirmed as pathogenic by using the primers G1/G2 (*secY* gene showed 99% sequence concordance with GenBank accession no. EU358040) (Fig 2)

## DISCUSSION

*Rattus rattus* and *Rattus norvegicus* were the two dominant urban rat species in the five states in Peninsular Malaysia.

Results showed the presence of pathogenic *Leptospira* circulated by urban rats however in low prevalence. Genus confirmation by PCR using the designed primers LG1/LG2 showed that all the 39 isolates gave the expected band sized 483 bp, indicating positive isolates were *Leptospira* species (99% similarity, accession no. KC662455, JQ988849).

All isolates were pathogenic species as shown by the band sized 285 bp amplified by the primers G1/G2 which targets *secY* genes (99% similarity, accession numbers: EU358040, DQ882852).

The serogroups of the 39 isolates were determined using 13 different antisera and based on microscopic agglutination test (MAT). Only 2 serogroups were identified; serogroup Bataviae 23 (59%) marginally higher than serogroup Javanica 16 (41 %) with both serogroups previously reported [5].

The persistence of these 2 serogroups circulating in the rat population indicates its role as a maintenance host in the transmission of *Leptospira*.

However, this still poses high risk of exposure to human in contact with this maintenance host especially considering that these reservoirs shed the pathogens over an extended period of time and in combination with other factors such as natural disasters.

## CONCLUSION

Pathogenic *Leptospira* spp. was detected in the urban rat population in low prevalence. Therefore is still a potential risk factor for the transmission of leptospirosis. Thus, appropriate precautions are needed to prevent the spreading of this disease in human population. Therefore, implementation of rodent control program and disease surveillance is crucial in order to reduce the possible risk of the disease transmission

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