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Tang Kea Yin was born and raised in Kedah in 1997. She graduated from Universiti Putra Malaysia (UPM) with a Bachelor's Degree in Biomedical Sciences, with a CGPA 3.706. Throughout her university life, she was able to find opportunities that helped her in gaining knowledge, practical and soft skills. She was extremely passionate about molecular biology, microbiology and genetics, thus she picked her final year project related to leptospirosis, which allowed her to have an opportunity to integrate her passions and interest. As a degree student, she was positioned as an EXCO of Alumni and Leadership in Biomedical Science Club, and also awarded as The Best Presenter for her final year project presentation. In academic division, she was also granted with four times of UPM Dean's List Award (GPA > 3.50) for her outstanding academic performances. Currently, she is pursuing her master studies at National Yang-Ming University, Taiwan with a scholarship.

ABSTRACT

Molecular Detection of Leptospiral DNA in Human Samples using Loop Mediated Isothermal Amplification (lAMP) Targetting *Lipl32* Gene

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Leptospirosis is a worldwide zoonotic disease that had been recognised for decades, most commonly found in tropical and sub-tropical countries especially in urban environments of industrialised and developing countries, as well as in rural regions. Its nonspecific presentation in the early phase hampers clinical diagnosis leading to misdiagnosis as other infectious diseases, such as dengue fever, malaria, and scrub typhus. The non-specific clinical features of leptospirosis have made its diagnosis a challenging task and it is crucial to have an adequate diagnostic for this disease. Pathogenicity of Leptospira species is determined by an outer membrane lipoprotein known as *lipL32* that helps in the interaction between the bacteria and the host tissue. The *lipL32* gene was found to be present in all species from both pathogenic and intermediate strains but are absent in saprophytic strains, making it a specific gene target for diagnosing leptospirosis. Loop-mediated isothermal amplification (LAMP) is a potential candidate for developing a new diagnostic due to their high sensitivity and specificity, rapid assay time and simplicity. This study generally aims to assess LAMP assay targeting the *lipL32* gene for the detection of Leptospira in human clinical samples. LAMP reaction targeting the *lipL32* gene was performed using a set of four primers (F3, B3, FIP and BIP) under the optimized condition at 60°C for 70 minutes. In this study, 24 clinical blood samples of suspected leptospirosis patients were tested using the *lipL32* LAMP assay. The results from the *lipL32* LAMP were then compared with the results from *lipL32* qPCR assay and LAMP assay targeting the secY gene, performed in a previous study. Out of 24 samples tested, 16 samples (70.83%) were detected positive by *lipL32* LAMP; 11 samples (45 .8%) were detected positive by secY LAMP and none were detected positive by lipL32 gPCR. From the findings here, it is shown that LAMP assay targeting the *lipL32* gene have a higher detection rate compared to the other two assays. Interestingly, out of 11 positive samples detected by secY LAMP, two samples were tested as negative by *lipL32* LAMP. This could be indicative that the patients were infected with the saprophytic serovars of Leptospira instead of the pathogenic serovars. The LAMP assay targeting the *lipL32* was successfully demonstrated for the detection of Leptospira in suspected leptospirosis patients and has a higher detection rate than that in qPCR. Collectively, this warrants their further development and improvement as an alternative diagnostic method for leptospirosis.