# Complete genome sequences of Korean/Y439-like low pathogenic avian influenza virus H9N2 isolated from chickens in Malaysia

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## ABSTRACT

**Introduction:** Low pathogenic avian influenza (LPAI) subtype H9N2 is a causative agent that has become an increasing concern due to its impact on poultry and potential public health risks. This H9N2 virus was isolated from chickens in Perak, Malaysia in 2015. **Objective:** To genetically characterize the entire genome of the LPAI H9N2 isolated from chickens in 2015. **Materials and Methods:** All eight influenza genes from the isolate were universally amplified using barcoded primers in a one-step RT-PCR and subsequently sequenced on the Oxford Nanopore MinION Mk1B platform. Nucleotide and amino acid sequences for each gene were compared with other published strains, and phylogenetic analyses were performed. **Results:** The isolate in our study possessed the HA (hemagglutinin) cleavage site motif of PARSKR/GLF with no contiguous multiple basic amino acids, implying that the virus is of low pathogenic strain. Phylogenetic analyses showed that all eight gene segments of the isolate were closely related to the Korean/ Y439-like lineage and had high similarities (95.2 - 99.1%) with the A/chicken/Korea/01310/2001 strain that was isolated in 2001. This virus was also used as a killed vaccine strain in Korea in 2007. No amino acid exchange (Q226L) at the HA receptor binding site indicates that the virus has a greater affinity for binding to the α2,3-linked sialic acid receptors present in avian. However, we observed that the internal genes of this isolate (PB2, PB1, PA, NS, and M) had several amino acid changes related to viral adaptation to mammals. **Conclusion:** In conclusion, the characterized Malaysian LPAI H9N2 is a Korean/ Y439-like virus with possible adaptation of the virus to mammals. These findings provide new insights into the measures that need to be taken as poultry carrying the H9N2 avian influenza virus are considered genetic incubators for the emergence of novel avian influenza viruses that pose a threat to humans.