

Molecular characterization of fowl adenovirus isolate of Malaysia attenuated in chicken embryo liver cells and its pathogenicity and immunogenicity in chickens

ABSTRACT

Fowl adenovirus (FAdV) is the causative agent of inclusion body hepatitis (IBH) in chickens with significant economic losses due to high mortality and poor production. It was objectives of the study to attenuate and determine the molecular characteristic of FAdV isolate (UPM1137) of Malaysia passages in primary chicken embryo liver (CEL) cells. The cytopathic effect (CPE) was recorded and the present of the virus was detected by polymerase chain reaction (PCR). Nucleotide and amino acid changes were determined and a phylogenetic tree was constructed. The pathogenicity and immunogenicity of the virus at passage 35 (CEL35) with virus titre of $106.7\text{TCID}_{50}/\text{mL}$ was determined in day old specific pathogen free (SPF) chicks via oral or subcutaneous route of inoculation. The study demonstrated that the FAdV isolate was successfully propagated and attenuated in CEL cells up to 35th consecutive passages (CEL35) with delayed of CPE formation within 48 to 72 post inoculation (pi) from CEL20 onwards. The virus caused typical CPE with basophilic intranuclear inclusion bodies, refractile and clumping of cells. The virus is belong to serotype 8b with substitution of amino acid at position 44, 133 and 185 in L1 loop of hexon gene and in knob of fiber gene at position 348 and 360 at CEL35. It is non-pathogenic, but immunogenic in SPF chickens. It was concluded that the FAdV isolate was successfully attenuated in CEL cells with molecular changes in major capsid proteins which affect its infectivity in cell culture and SPF chickens.