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SHORT COMMUNICATION

Expression and characterization of the non-structural protein V of small ruminant morbillivirus

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Abstract Peste-des-petits ruminants is a transboundary viral disease of small ruminants caused by small ruminant morbillivirus (SRMV). In the present study, the full-length V gene of SRMV was constructed through site-directed mutagenesis from the P gene transcripts of the vaccine virus (Sungri/96 India) and expressed in a prokaryotic expression system. In animals, the seroconversion against this protein occurs from 14-days and is getting produced from 48 h in cell culture. An indirect ELISA developed using this protein has a relative sensitivity and relative specificity of 77.73% and 73.775%, respectively as compared to c-ELISA. In this ELISA, it was observed that most of the convalescent animals elicited higher level of antibodies than vaccinated animals.

Keywords Peste-des-petits-ruminants · Small ruminant morbillivirus · V protein · Seroconversion · Indirect ELISA

Peste-des-petits-ruminants (PPR) being a devastating viral disease of small ruminants causes havoc in the developing nations of Asia, Africa and Middle East. The disease is targeted for global eradication in 2030 by FAO and OIE [16]. The etiological agent, small ruminant morbillivirus (SRMV-formerly, peste-des-petits-ruminants virus) belongs to the genus *Morbillivirus* of the family *Paramyxoviridae*. Although, the SRMV is classified into four distinct lineages (I–IV) they are serologically indistinguishable. Many African countries report the presence of more than one lineage, whereas only lineage IV has been circulating across Asia [2, 13, 16]. The SRMV codes for six structural—N, P, M, F, H and L, and two non-structural proteins—C and V [1, 11]. The V protein of SRMV is produced by addition of one non-template "G" residue at a specific editing site of some fraction of P mRNA, which results in production of V protein with an N-terminus identical to the P protein with a different cysteine-rich C-terminus [8, 11]. The V protein is reported to block the IFN production [3, 5].

In India, the PPR is enzootic and occurs throughout the country in all seasons. However, the intensive use of live attenuated PPR vaccine and MAb based ELISAs developed in our laboratory in the ongoing PPR control program resulted in significant reduction of the disease incidence [12, 13]. As the PPR vaccine is live, the animal mounts strong antibody response which mimics the natural infection. This creates difficulties for serological differentiation of the infected animals from the vaccinated (DIVA) one. Developing DIVA enabled i.e. positively or negatively marked vaccine and a companion diagnostic assay will help the control program to a greater extent. Researchers have attempted to develop DIVA enabled vaccine and diagnostics using various techniques like reverse genetics, vectored vaccines or mAb resistant mutant with varying degree of success [6, 7, 9, 10, 14, 15]. Here we report the development of indirect ELISA using recombinant V protein and its reactivity with convalescent and vaccinated sera.

The PPR vaccine virus (Sungri/96) was propagated in Vero cells; viral RNA and cDNA was prepared [12]. For

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