A simplified objective method for quantification of peste des petits ruminants virus or neutralizing antibody

G. Dhinakar Raj *, K. Nachimuthu, A. Mahalinga Nainar

Department of Animal Biotechnology, Madras Veterinary College, Chennai 600 007, India

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Abstract

A simplified and standardized assay based on haemagglutination of infected culture supernatants was developed to detect peste des petits ruminants (PPR) virus growth in vero cells and to quantify PPR neutralizing antibody. Virus titres estimated by visual reading of cytopathic effects as a criterion were compared with those estimated by haemagglutination of infected supernatants and no statistically significant differences were seen between them. During quantification of PPR antibodies, the titres based on haemagglutination of supernatants on day 5 post-infection had a high sensitivity, specificity and agreement in qualitative comparison with those determined by visual examination of cytopathic effects. In quantitative comparison, the correlation coefficient between serum neutralization titres estimated by visual examination of cytopathic effects or haemagglutination of supernatants was 0.96, when haemagglutination was done on day 5 post-infection. The virus and serum neutralization titres can thus be estimated objectively using the haemagglutination of supernatants as criterion to measure endpoints. The haemagglutination–inhibition titres also correlated well with serum neutralization titres with a coefficient of 0.78. Thus the haemagglutination–inhibition test appears to be a suitable alternative to the serum neutralization test for quantification of PPR neutralizing antibody. © 2000 Published by Elsevier Science B.V.

Keywords: Serum neutralization; Haemagglutination; Haemagglutination inhibition; Cytopathic effect

1. Introduction

Virus quantification is conventionally carried out by the presence or absence of specific cytopathic effects in a suitable culture system. Virus specific neutralizing antibody is measured by the ability of the serum to neutralize the cytopathic effects induced by the virus. The screening of cell cultures for determining the presence of virus induced cytopathic effects needs skilled personnel and a trained eye, and it is subjective especially for viruses that do not produce pathognomonic changes in cell cultures.

Peste des petits ruminants (PPR) is a contagious disease affecting sheep and goats. It was first reported in India in 1989 (Shaila et al., 1989). Since then it has been reported from all over the country (Kulkarni et al., 1996; Nanda et al., 1996). This virus needs to be differentiated from its closely related counterpart, rinderpest virus.