EVALUATION OF SERO-PREVALENCE OF PESTE DES PETITS RUMINANTS (PPR) IN GOATS

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ABSTRACT

A total of 100 serum samples of goats were screened to determine the sero-prevalence of peste des petits ruminants using PPR c-ELISA kit. Out of 100 serum samples tested, 13 were found positive for PPR antibodies yielding an overall seroprevalence of 13%. Out of 100 serum samples, 55 samples were from below one year age group animals and 45 were from adult age group goats. The adult goats showed higher seroprevalence of 17.77 per cent by c-ELISA as compared to below one year (9.09%) age group. Out of 100 serum samples, 30 samples were from male animals and 70 were from female animals. The male goats showed higher seroprevalence of 16.66 per cent by c-ELISA as compared to female goats (11.42%)

***Key words*:** Goats, peste des petits ruminants, sero-prevalence, c-ELISA

Introduction

The goat has tremendous strength to be projected as the future animal for rural prosperity under the changing agro-climatic conditions and depleting resources. Peste des petits ruminants (PPR) is an economically important viral disease of sheep and goats, first described by Gargadennec and Lalane (1942) from Ivory Coast in West Africa. The disease is highly contagious causing varying degree of morbidity, mortality and resulting in low productivity of susceptible animals (Radostits *et al.,* 2000). The disease is characterized by high fever, occular and nasal discharge, pneumonia, necrosis and ulceration of the mucous membrane and inflammation of gastro-intestinal tract leading to severe diarrhoea (Gibbs *et al.,* 1979). The predominant signs were severe diarrhoea, dyspnoea, mucopurulent discharge from eyes and nose, erosive rhinitis, necrotic ulcers in the mouth, on the dental pad, tongue, upper and lower lips, fever and depression (Chauhan *et al*., 2011). The causative agent of this economically important disease of small ruminants is a *Morbilli* virus, the peste des petits ruminants Virus (PPRV), under the family Paramyxoviridae of order Mononegavirales. Morbidity and mortality rates can be as high as 100 and 90 per cent in goats respectively (Abu-Elzien *et al.,* 1990).

In India, severity of the disease is more pronounced in goats than in sheep with a combined susceptible population of about 200 million (Dhar *et al.,* 2002) and is one of the major threats to the small ruminant population of the country.

Materials and Methods

A total of 100 blood samples of goats were collected and serum was separated. The serum samples were subjected to PPR c- ELISA test (Competitive ELISA kit for PPR antibody detection). The competitive ELISA test is based on the inhibition of binding of monoclonal antibody to antigen in the presence of PPR antibody present in field sera. This results in reduced colour development when anti-mouse antibody conjugated to HRPO is used for tracing the binding of monoclonal antibody. The competitive ELISA kit developed at IVRI, Mukteswar uses a monoclonal antibody (designated 4B11) directed against a neutralizing epitope of haemagglutinin (HA) protein of PPR virus. The performance (sensitivity and specificity) of the test has been compared with virus neutralization test, which is a gold standard for PPR antibody detection. The test is suitable for sero-surveillance and sero-monitoring of antibodies to PPR virus in small ruminants.

Results and Discussion

A total of 100 serum samples of goats were screened for PPR specific antibodies using PPR c-ELISA kit. Out of 100 serum samples tested, 20 were positive for PPR antibodies yielding an overall seroprevalence of 20%.

Out of 100 serum samples, 60 samples were from below one year age group animals and 40 were from adult age group goats. The adult goats showed higher seroprevalence of 37.5 per cent by c-ELISA as compared to below one year (8.33%) age group.

Out of 100 serum samples, 35 samples were from male animals and 65 were from female animals. The male goats showed higher seroprevalence of 28.57 per cent by c-ELISA as compared to female goats (15.38%).

Serological tests for monitoring the antibodies against PPRV must be both highly specific and sensitive to provide accurate results in field studies. Further, a diagnostic test to be used for serological surveys must be rapid and economic. c-ELISA kit for PPR antibodies, developed at IVRI, Mukteswar uses crude antigen and anti-H monoclonal antibodies raised against an attenuated PPR virus (Sungri isolate) from India (Sreenivasa *et al*., 2002) and could easily replace virus neutralization test for sero-surveillance and sero-monitoring of PPR as the test is rapid, simple and has a high sensitivity which is even higher in non vaccinated population (Singh *et al*., 2004). Hence, in the present study, seroprevalence of PPR was conducted by using the above mentioned c-ELISA kit.

Using the same test, Hinsu *et al.* (2001) recorded a higher seroprevalence of PPR (49.75%) in Gujarat state, however, they also included the samples from cattle and buffalo, and the samples

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Table 1: Age wise seroprevalence of PPR

S. No.	Age	Samples tested	Samples Positive	Per cent Positive
1.	Below one year	60	05	8.33
2.	Adults	40	15	37.5

Table 2: Sex wise seroprevalence of PPR

S. No.	Sex	Samples tested	Samples positive	% positive
1.	Male	35	10	28.57
2.	Female	65	10	15.38

were from one district only. The discrepancy observed in present study might be described to a relatively a larger area used for sampling. Similarly, significantly higher seroprevalence of PPR (50.00%) was observed by Lefevre *et al.* (1991) in Jordan and Ekue *et al.* (1992) observed 46.50% seroprevalence in Cameroon. Sharma *et al.* (2012) examined 1068 nasal swab samples for PPR virus antigen in goats and sheep and found 346 (32.39 %) sample positive for PPR virus antigen using PPR sandwich-ELISA kit. On the contrary, Krishna *et al.* (2001) using the serum neutralization test, observed a significantly lower (2.98%) seroprevalence of PPR in Andhra Pradesh of Southern India. Similarly, Tounkara *et al.* (1996) in Mali, Ozkul *et al.* (2002) and Tatar *et al.* (2002) in Turkey, also found a significantly lower seroprevalence of PPR.

Singh *et al.* (1996) reported 70 and 30 per cent attack rate and mortality rate, respectively, in migratory flock of sheep due to PPR in Kota region of Rajasthan. Using c-ELISA, Roger *et al.* (2001) reported a seroprevalence of 7.8 per cent for PPRV antibodies in Ethiopian camels. Using the same assay, Haroun *et al.* (2002) noticed that prevalence of PPRV antibodies in sheep, goat, cattle and camel was 51.9, 56.2, 11.4, and 14.0 per cent, respectively.

Bhaskar *et al.* (2011) reported seroprevalence of PPR in sheep and goats in Maharashtra state by using c-ELISA. The PPR seroprevalence of 62.56 per cent was recorded in sheep and 65.51 per cent in goats.

For PPR antibody detection, competitive ELISA is a better choice as it is sensitive, specific, reliable, and has a high diagnostic specificity (99.8%) and sensitivity (90.5%) (Sreenivasa *et al.*, 2006; Choi *et al.*, 2004; Brindha *et al.*, 2001).

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