Seroprevalence of Peste Des Petits ruminants in goats of Assam, India

M Islam, D CPathak, S Das, T Rahman, S Sarma, J Hussain, A Sultana, M Medhi and SB Gogoi

Abstract
Peste des petits ruminants is an economically important, acute and highly contagious transboundary viral disease of small ruminants having high morbidity and mortality rate. The present study was conducted to measure the seroprevalence of Peste des petits ruminants in goats of Assam by Competitive-ELISA. A total of 456 serum samples were collected from clinically suspected and apparently health goats from different districts of Assam and PPR viral antibody could be detected in 209 samples by c ELISA test (1.36% affected goats and 73% from apparently healthy goats) with overall prevalence rate is 45.83% (74.31% affected and 26.73% from apparently healthy goats). From the research findings it could be inferred that PPR is an emerging disease that attributed greater PPRV antibody positivity in clinical samples from goats.

Keywords: Transboundary, C-ELISA, PPR, Assam, Emerging

1. Introduction
Peste des petits ruminants is an economically important, acute and highly contagious transboundary viral disease of small ruminants having high morbidity and mortality rate [1]. The disease is caused by Peste des petits ruminant’s virus (PPRV) under the genus morbilli virus in the family of Paramyxoviridae [2] but genetically grouped into four distinct lineages (I, II, III, and IV) based on partial sequence analysis of Fusion (F) gene [3]. The disease was first reported in West Africa in the year 1940 [4], In India, the disease was first reported for the first time in Arasur village of Tamil Nadu [5]. Since the first record of the occurrence, PPR was thought to be restricted to South India till 1993 [6]. After which the epidemic of PPR swept across a large number of small ruminants to North India [7]. Since then several outbreaks have been recorded in different states of India like Uttar Pradesh [8], Punjab [9], Gujarat [10], Madhya Pradesh [11] and in Assam [12]. Now the disease has become endemic to all over India and is spreading with greater magnitude in every year causing severe economic losses throughout the country. The disease is characterized by pyrexia, ocular and nasal discharges, necrotic stomatitis, catarrhal inflammation of the ocular and nasal mucosa, enteritis, diarrhoea and bronchopneumonia followed by either death or recovery from the disease [11]. Even though the disease has been reported from Assam but the epidemiology of PPR has been fairly studied. The current study was performed to generate the baseline data on sero-epidemiology of PPRV antibody in goats of Assam with an aim to help in the implementation of proper disease control programme.

2. Materials and Methods
2.1 Study area and sample collection
During the present study, 5 ml of blood were collected from clinically suspected cases of PPR in goats during outbreaks of the disease (n=183) and also apparently healthy animals collected randomly from that particular locality and also collected from apparently healthy goats (n=273) from different parts of the Assam where there is no history of PPR outbreaks recorded between 2014 to 2015. Blood samples were collected from jugular vein in vacutainer and were allow clotting by keeping at room temperature for two to three hours. Serum which was usually oozed out within half an hour to two hours was collected by sterile pasture pipette then transferred in to small sterile screw caped plastic vials (1.8ml, Tarsons) labeled properly and stored at -20°C without adding any preservatives till further use.

Correspondence
M Islam
Department of Veterinary Pathology, College of Veterinary Science, Assam Agricultural University, Khanapara, Ghy-22, Assam, India
All the collected serum samples were tested for detection of Peste des petits ruminants’ viral antibody. The plan of work was approved by Institutional Animal Ethics Committee (IAEC) of College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India. IEAC approval No. 770/ac/CPCSEA/FVSc/AAU/IAEC/14-15/261 dated 20/6/2014.

2.2 Serological testing by Competitive- ELISA:
All the collected serum samples were analyzed for the presence of PPRV antibody against the nucleoprotein of PPRV using monoclonal antibody based C-ELISA test kit developed in France (ID Screen PPR competition, Montpellier) following as per protocol given along with the kit. As per protocol of the test the c- ELISA plate was read at 450 nm in ELISA reader (TECAN) and the OD was recorded. The interpretation of the test result was calculated based on competition percentage. The competition percentage= (optical density of test sample/ optical density of negative control X 100). The sample with competition percentage ≤ 30% were considered positive for the presence of PPRV antibodies, greater than 35% (≥35%) and less than 45% (≤ 45%) were considered doubtful and greater than 45% (≥ 45%) were considered as negative.

2.3 Statistical analysis
Prevalence rate was calculated based on the formula. Apparent Prevalence rate= (number of seropositive animals/total number tested X 100). The true seroprevalence rate was calculated by adjusting with apparent prevalence with sensitivity and specificity of the c-ELISA employed in the study, which is having high relative specificity (98.4%) and sensitivity (92.4%) for detection of PPRV antibody in convalescent sera when compared with virus neutralization test as a gold standard.

3. Results and Discussion
All the collected serum samples (n=456) were screened for the presence of PPR viral antibody by using c ELISA kit. Based on the competition percentage, out of all the samples only 209 numbers of samples showed positive for the presence of PPR viral antibody (136 from affected goats and 73 from apparently healthy goats) which indicated percent prevalence of 45.83% (74.31% affected and 26.73% from apparently healthy goats). The details of the c ELISA test are presented in Table 1. The present findings corroborated with the findings of Singh et al [6] who recorded 33% of overall seroprevalence of PPR in India by c- ELISA. Chauhan et al. [13] also reported an overall prevalence rate of PPR in goats as 46.01% (with a range from 42.30% - 52.94%) and Bhaskar et al. [14] reported seroprevalence of PPR in sheep and goats as 62.56% and 65.51% respectively in different district of Maharashtra. Similar findings were also recorded by Sannat et al. [15] and Selvaraju et al. [16] (2013) with the overall prevalence rate of 46.26% and 39.92% respectively in Tamil Nadu. Present findings were also compared with the findings recorded in other countries like in Bangladesh, where Banik et al. [17] recorded 25% ; in Sudan, Saeed et al. [18] were recorded 55.5% ; in Iran, Nargesi et al. [19] recorded 50%; in Pakistan, Jalees et al. [20] recorded 51.5% respectively.

Table 1: Details of the Serum Samples Collected From Affected and Apparently Healthy Goats Screened For PPR Virus Antibody By C Elisa

<table>
<thead>
<tr>
<th>Sl no.</th>
<th>Name of the Districts</th>
<th>No. of serum samples collected</th>
<th>Positive in c-ELISA Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Affected goats</td>
<td>Apparently healthy goats</td>
</tr>
<tr>
<td>1</td>
<td>Kamrup (M)</td>
<td>123</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Dhubri</td>
<td>8</td>
<td>56</td>
</tr>
<tr>
<td>3</td>
<td>Kamrup (R)</td>
<td>3</td>
<td>55</td>
</tr>
<tr>
<td>4</td>
<td>Darang</td>
<td>44</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>Nalbari</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Barpeta</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Jorhat</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>Goalpara</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>Karbi Anglong</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>Lakhimpur</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>11</td>
<td>Dhemaji</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>Bongaigaon</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>13</td>
<td>Hailakandi</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>14</td>
<td>Cachar</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>15</td>
<td>Karimganj</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>183</td>
<td>273</td>
</tr>
</tbody>
</table>

Prevalence percent 74.31% 26.73% 45.83%

4. Conclusion
From the present research findings it could be inferred that PPR is an emerging disease that attributed greater PPR positivity in clinical samples from goats to the facts that most of the suspected samples were from regions which had larger goat population.

5. Acknowledgements
The authors are thankful to the Head of the department of Pathology, Microbiology and Dean College of Veterinary science, AAU, Khanapara, Guwahati-22, Assam, India, for providing necessary facilities to conduct the present research work. We also acknowledge the field veterinarians from the study area for their co-operation in this study.

6. Reference
3. Shaila MS, Shamaki D, Forsyth MA, Diallo A, Goatley


