**RESEARCH ARTICLE**

Rapid Detection based Prevalence of Canine Corona Virus (CCoV) and Canine Parvo Virus (CPV) Infection in Diarrheic Dogs in South Gujarat

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**Abstract**

The study was done on detection and prevalence of canine coronavirus (CCoV) and canine parvovirus (CPV) from the diarrhoeic dogs. Dogs presented with the diarrhoea and symptomatic illness, were tested for the CCoV and CPV infection. Diarrhoeic samples were directly processed for rapid diagnostic test using Immu-chromatography based lateral flow assay test (LFA). It is a fast, rapid and specific for the CCoV and CPV detection. Out of total 109 samples processed by the LFA, 05 (4.58 %) were found positive for CCoV and 37 (33.94%) were positive for CPV. None of the samples showed concomitant infection of both the viruses. Age-wise prevalence of CCoV was found to be 7.93 (5/63) % in ≤3 months age group, and no positive case was found in other age groups. Similarly, the age wise prevalence of CPV was found to be 41.26 (26/63), 25.00 (9/26) and 20.00 (2/10) % in ≤3 months, 3 to 6 months and 6 to 12 months of age group, respectively. The prevalence of CCoV and CPV was found more in young puppies.

**Keywords:** Canine coronavirus, Canine parvovirus, Lateral flow test kit, Diarrhea, Pups.


**Introduction**

Canine coronavirus (CCoV), a single-stranded RNA virus, and Canine parvovirus (CPV), a single-stranded DNA virus, are the major pathogens among the causative agents of canine viral enteritis (CVE) and cause severe diarrhoea in pups (Decaro et al., 2007; Sharma et al., 2018). CCoV cause viral diarrhoea due to its invade and destruction of mature cells on intestinal villi, resulting in disruption of absorptive surface area and malabsorption. Clinical signs generally include anorexia, vomiting and diarrhoea (Yoon et al., 2018). Most of the dogs recover within a week by intense regular treatment along with fluid therapy and mortality seldom occur. CCoV is rarely diagnosed in laboratory because it is self-limiting and less severe than other enteritis. CPV infection is common and generalized in unvaccinated pups and adults below one year of age. Young puppies are more prone to CPV infection in fact it is fatal for them (Desai et al., 2020). The prevalence of CCoV and CPV infection were reported to vary from 6.4 to 18.70 % and 19.73 to 72.92 %, respectively, from different parts of India (Deka et al., 2013). Serological and molecular based epidemiological detection of CCoV and CPV in dogs are suggestive its wide spread in canine population (Deka et al., 2013; Agnihotri et al., 2018). CCoV and CPV may be diagnosed by PCR, ELISA and virus isolation in different cell lines. These all techniques are costly, time consuming, required costly machines, well-established lab and need skill. Diagnosis need to be rapid, accurate and at the point of clinical case presentation. Hence, this study was done to find out the prevalence of diarrhoea causing viral agents namely CCoV and CPV by commercial rapid Immu-chromatography principle based lateral flow test in south Gujarat.

**Materials and Method**

Diarrhoeic samples collected from in and around Navsari district, and those received directly at Department of Veterinary Microbiology of the College in Navsari, Gujarat (India) (n=109) were used in this study for rapid detection...
of virus. Sterile swabs and containers were used to collect faecal materials and transferred to the laboratory with ice pack. Samples were noted with the age of dogs to calculate the prevalence of CCoV and CPV in area of south Gujarat for age groups ≤ 3 months, 3-6 months and 6-12 months.

Immuno-chromatography based lateral flow assay (LFA) tests kits procured from Bionote, Inc (Republic of Korea) were used in this study. Individual as well as double test based devices were used for detection as per the manufacturer’s manual. Illustration for interpretation of result used is depicted in Fig. 1 (Yoon et al., 2018). The results were analyzed by chi-square test to find out any significant difference between age groups.

**Results and Discussion**

In the present study, out of 109 diarrhoeic samples of dogs tested by employing rapid diagnostic LFA test kit, 05 were found to be positive for CCoV and 37 for CPV. None of the samples showed concomitant presence of both viral pathogens. The overall prevalence of CCoV and CPV was found 4.58 % and 33.94 %, respectively (Table 1, Fig. 2). Pandya et al. (2017) reported 37.70 % prevalence of CPV, while Sharma et al. (2018) reported 50 % prevalence of CPV by employing same LFA test. Agnihotri et al. (2017) reported overall prevalence of 8 % and 50 % for CCoV and CPV.

![Fig. 1: Illustrations of results on the basis of respective band appearance in LFA test. (C = Control and T = Test)](image)

![Fig. 2. Representative photographs of CCoV (A) and CPV (B) positive devices.](image)

<table>
<thead>
<tr>
<th>Age group</th>
<th>Samples</th>
<th>CCoV (% prevalence)</th>
<th>CPV (% prevalence)</th>
</tr>
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<tbody>
<tr>
<td>≤ 3 months</td>
<td>63</td>
<td>05 (7.93%)</td>
<td>26 (41.26 %)</td>
</tr>
<tr>
<td>&gt;3– ≤ 6 months</td>
<td>36</td>
<td>00</td>
<td>09 (25 %)</td>
</tr>
<tr>
<td>&gt;6– 12 months</td>
<td>10</td>
<td>00</td>
<td>02 (20 %)</td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
<td>05 (4.58 %)</td>
<td>37 (33.94 %)</td>
</tr>
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χ² test p>0.05
Rapid detection of CCoV and CPV infection in diarrheic dogs

The Indian Journal of Veterinary Sciences and Biotechnology, Volume 16 Issue 1 (July-September 2020)

(2003) reported 12.8 %

Acknowledgement

We thank the authorities of Navsari Agricultural University, Navsari for the facilities provided for this work.

References


