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Concurrent Outbreak of Peste Des Petits Ruminants and Contagious Caprine Pleuropneumonia in Goats in Jarar and Doollo Zones, Somali Region, Ethiopia : A Case Report

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A R T I C L E I N F O

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A B S T R A C T

In Somali Region of Ethiopia, known for its large pastoralist community, faces ongoing challenges with livestock diseases that threaten food security and economic stability. Peste des Petits Ruminants (PPR) and Contagious Caprine Pleuropneumonia (CCPP) are among the most common diseases affecting small ruminants, such as goats. These diseases are characterized by high morbidity and mortality, especially in young and unvaccinated animals. Contagious caprine pleuropneumonia (CCPP) is one of the highly infectious and serious respiratory diseases of goats clinically characterized by coughing, respiratory distress, and very high morbidity and mortality rates. In February, 2025, an outbreak of both PPR and CCPP occurred simultaneously in the Jarar and Doollo Zones, prompting an urgent response from local veterinary services. Thus, the laboratory confirmed the presence of both PPR and CCPP in the affected goats, with 9 infected caprine testing positives for PPR and other 10 infected caprine showed positive test for CCPP disease. Similarly, mass vaccination campaigns for both PPR and CCPP were initiated in the affected zones to prevent further spread.

INTRODUCTION

Ethiopia possesses one of the largest goat populations in the continent that serves multiple functions to communities that herd them. The total goat population in Ethiopia is estimated at 52.5 million and in Somali Regional State of Ethiopia is well known for its large number of small ruminants, about 16.4 million goats [1]. In pastoral and agro-pastoral areas like Jarar and Doollo zones, goats are important components of the production system which benefits smallholder farmers in generating cash income as well as milk. Despite their potential in the area, the productivity of goat remains quite low [2].

Peste des petits ruminant (PPR) is an acute, extremely contagious and economically important Tran's boundary viral disease of small ruminants which is categorized by OIE as a notifiable disease. The disease is characterized clinically by severe pyrexia, oculonasal discharge, necrotizing and erosive stomatitis, enteritis and pneumonia [3]. It is caused by the peste des petits ruminants virus (PPRV). The virus belongs to the Paramyxoviridae family and the Morbillivirus genus, which contains Rinderpest Virus (RPV), Canine Distemper Virus (CD), and Phocine Distemper Virus (PDV), which plague cattle, dogs, and seals, respectively [4].

Contagious caprine pleuropneumonia (CCPP) is one of the highly infectious and serious respiratory diseases of goats clinically characterized by coughing, respiratory distress, and very high morbidity and mortality rates , the disease is caused by the smallest fastidious bacteria, member of the Mycoplasma genus-usually Mycoplasma capricolum subspecies capripneumoniae (Mccp); taxonomically grouped as one of the members of the Mycoplasma mycoides cluster [5].

In Somali Region of Ethiopia, known for its large pastoralist community, faces ongoing challenges with livestock diseases that threaten food security and economic stability. Peste des Petits Ruminants (PPR) and Contagious Caprine Pleuropneumonia (CCPP) are among the most common diseases affecting small ruminants, such as goats and sheep. These diseases are characterized by high morbidity and mortality, especially in young and unvaccinated animals. In February, 2025, an outbreak of both PPR and CCPP occurred simultaneously in the Jarar and Doollo Zones, prompting an urgent response from local veterinary services.

METHODOLOGY

The methodology for investigating and managing the concurrent outbreak of Peste des Petits Ruminants (PPR) and Contagious Caprine Pleuropneumonia (CCPP) in goats at Ararso and Dig Districts of Jarar Zone and Warder, Bokh and Galadi Districts of Dollo Zone in the Somali Regional of Ethiopia, involved several stages, including outbreak investigation, clinical observation, laboratory diagnostics, treatment, and control measures. Hence, the below describes the appropriate steps followed during the investigation and management of the outbreak at study areas accordingly.

Outbreak Investigation

The first step involved identifying and investigating the outbreak in the affected zones. The investigation was conducted by a collective team composed of veterinary laboratory officers from both Jigjiga and Kabridahar Regional veterinary laboratories in collaboration with the Somali Regional State Pastoral Development Bureau. The outbreak was reported by the farmers and pastoralists, prompting a response from the veterinary team.

Identification of Affected Areas: Affected zones, including the Jarar and Doollo Zones, were mapped based on reports from local farmers and field observations.

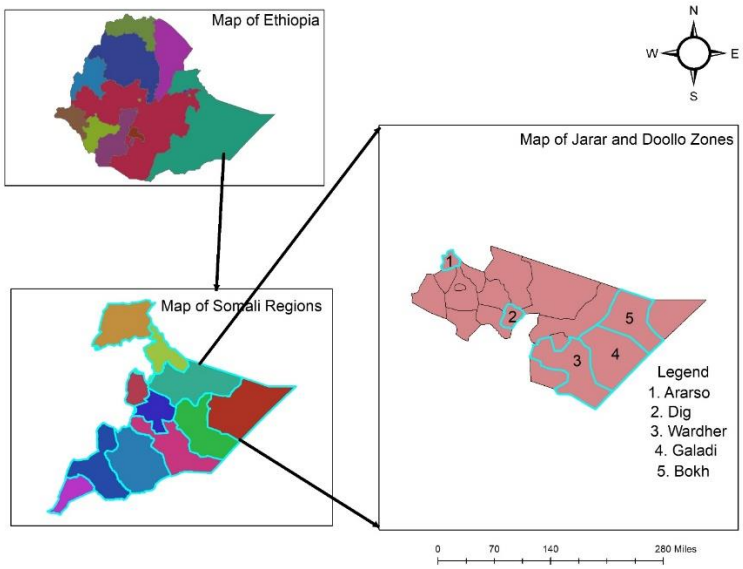

Figure 1. Map of the study areas.

Animal Surveys: Affected households in the zones were surveyed to determine the extent of the disease and identify the clinical signs of infection. Information was gathered through interviews with farmers, who provided details on the symptoms observed and the affected animals.

Clinical Observation:

Clinical examination was carried out on the animals' showing signs of disease. This included physical examination, observation of symptoms, and recording of details such as:

Clinical Signs of PPR:

High fever, nasal discharge (serous to mucopurulent), oral ulcers and lesions (especially in the mouth and around the eyes), diarrhea, and respiratory distress (coughing, labored breathing).

Clinical Signs of CCPP:

Respiratory signs such as coughing, nasal discharge, and labored breathing, pleural exudates, dehydration due to fever and respiratory difficulty, sudden deaths, particularly in young goats and rapid spread of the disease among affected herds.

Figure 2. A. Two PPR Infected goats severely depressed goats, sleepy and discharges from noise and mouth. B and C: infected goat with mouth lesions, completely obstruct, and thick cheesy from mouth. D: PPR Infected goat with severe profuse watery diarrhea

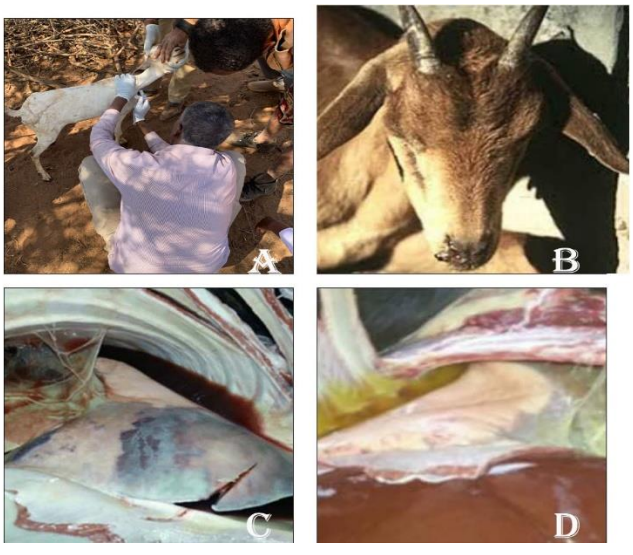

Figure 3: A: Expert collecting blood from CCPP suspected goat. B: Infected goat with severe depressed and dyspnea. C and D: Showed postmortem findings of lung abscess and pleural fibrosis of infected goat

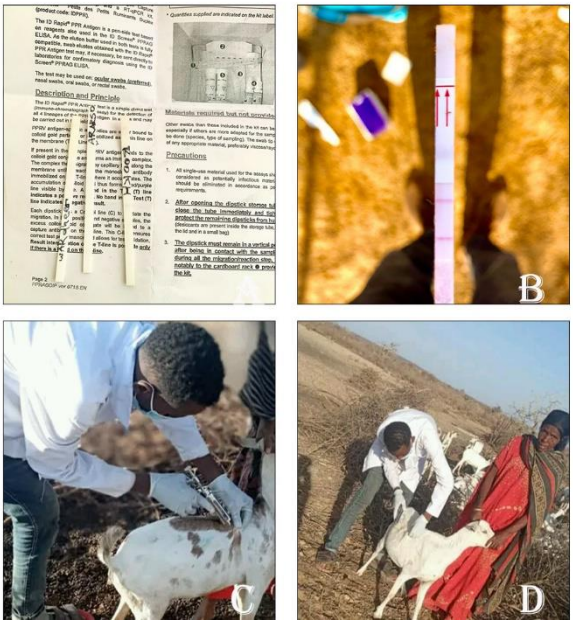

Figure 4: A & B: Shows positive tests of PPR infected goats from targeted areas. C and D: displays vaccination interventions made against PPR and CCPP from goats at targeted areas.

Sample Collection Diagnostic Techniques

Nasal swabs were collected from suspected animals to detect antigen (Ag) against PPR virus, while blood samples (Serum) were collected to perform serological testing for CCPP identification. A total of 160 infected goats were sampled for both nasal discharges and blood serum from study areas. Then after, *Penside* test for PPR virus was performed to detect antigen in the nasal discharges of infected caprine to detect active PPR infection. While, the collected serum samples from infected animals were transported to Jigjiga Regional Veterinary laboratory for further investigations effectively. In addition, serological test of Enzyme-linked immunosorbent assays (ELISA) was performed to detect antibodies in the serum of infected caprine against CCPP.

LABORATORY RESULTS

To confirm the diagnosis of PPR and CCPP, samples were collected from the affected animals for laboratory testing. Thus, the laboratory confirmed the presence of both PPR and CCPP in the affected goats, with 9 infected caprine testing positives for PPR and other 10 infected caprine showed positive test for CCPP disease. As shown below (table .1) describes the number of infected goats with its respective disease in terms of district level accordingly.

No	Zone	Districts	Species	Sampled animals	Laboratory results (+/-)			
					PPR	%	*CCPP*	%
1.	Jarar	Ararso	Caprine	30	+(3)		-(0)	
		Dig	Caprine	60	-(0)		+(5)	
2.	Dollo	Warder	Caprine	15	+3		-(0)	
		Bokh	Caprine	20	+3		-(0)	
		Galadi	Caprine	35	-(0)		+(5)	
Total				**160**	**+(9)**		**+(10)**	

Table 1. Laboratory Results

Mortality and Morbidity: A significant number of goats in both the Jarar and Doollo Zones exhibited high mortality and morbidity due to the concurrent outbreak of PPR and CCPP. Initial estimates suggest that over 25% of the affected goats died during the first week of the outbreak.

Impact on Local Communities: The outbreak caused a considerable loss in livestock, which is the primary livelihood for pastoralists in these affected zones of Somali region, Ethiopia. Additionally, the economic impact on farmers, who rely on goats for milk, meat, and income, was substantial.

Disease Outbreak Treatment and Control Measures

The affected animals were administered with antibiotics such as oxytetracycline 20% and Penistripe to limit secondary infections and supportive care to alleviate symptoms. Similarly, mass vaccination campaigns for both PPR and CCPP were initiated in the affected zones to prevent further spread. However, the vaccine for CCPP is less widely available, and the campaign relied on available stock from government sources. In addition, local farmers and pastoralists were actively involved in the management and control of the outbreak through education campaigns and awareness programs, while, veterinarians advised pastoralists on importance of animal movement restrictions to limit the transportation of potentially infected animals.

DISCUSSION

PPR is a highly contagious and deadly viral disease in goats. The disease is usually seen in adults (1 to 5 years) which is similar to our case report, Similarly, a study concluded that the clinical manifestation such as high fever, oculonasal discharges, pneumonia, stomatitis, and inflammation of gastrointestinal tract leading to severe diarrhoea followed by death or recovery. Contagious caprine pleuropneumonia (CCPP) is a severe disease of goats with high morbidity and mortality and occurs in many countries in Africa and Asia , In Ethiopia, the circulation of CCPP has been suspected for a long period, especially in remote regions those are bordering to the known infected countries with Mycoplasma capricolum subspecies capripneumoniae like Kenya and Sudan In 1990 outbreak of CCPP occurred in Ogaden in eastern Ethiopia and in east Shoa province

CONCLUSION AND RECOMMENDATIONS

The detection of PPR Ag in the nasal discharge of infected caprine provide strong evidence of active PPR infection, also the detection of CCPP antibodies in the serum of infected caprine shows clearly active for CCPP infection, Therefore, the highly contagious nature of PPR and CCPP, there is a significant risk of diseases transmission within and between districts. To successfully control the spread of PPR, immediate intervention measures is mandatory, like vaccinations campaigns, isolation of sick and healthy animals and treatment of infected animals are imperative. Based on the above conclusion the following recommendations are forwarded:

1. Strengthen disease surveillance systems in pastoral regions.

2. Improve the distribution and administration of vaccines to remote areas.

3. Increase awareness and education programs for pastoralists on disease prevention and control.

4. Enhance veterinary infrastructure and resources in affected zones.

5. Develop a contingency plan for future outbreaks to ensure a more rapid and efficient respons

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Author's Contribution

The study's concept and design, manuscript drafting, data analysis, result interpretation, and final manuscript draft preparation. completed laboratory work, data collection, manuscript revision, and final paper approval after critical editing. The final manuscript was read and approved for publication by all authors.

Competing interest

The authors declare that there is no conflict of interest.

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