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## Outbreak of Peste Des Petits Ruminants in West African Dwarf Goats in Eruwa, Southwestern Nigeria.

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### SUMMARY

In Nigeria, goats play a significant socio-economic role in the life of rural people. Recently, there had been report of high mortality of goats especially the kids under one year with none of such among sheep reared together in Eruwa, Southwestern Nigeria. An investigation was conducted to ascertain the cause of the deaths. Clinical, pathological and serological findings were described. Serum samples of forty-two animals from affected goats of varied ages were tested for the presence of PPR antibodies by competitive enzyme linked immunosorbent assay (cELISA). Post mortem examination of three of the carcasses and histopathology of the lungs, segments of the oral mucosa and intestine were also done. The clinical findings observed include loss of appetite, oculo-nasal mucopurulent discharges, dyspnoea, profuse diarrhea and death, the findings led to the tentative diagnosis of PPR. Serum samples from fifteen out of twenty affected, 10 out of 10 recovered and 7 apparently healthy goats were tested positive for the presence of PPR antibodies using cELISA. It was also observed that PPRV antibodies were more in goats below one and half years. However, no PPR antibodies were detected in sheep reared together with the goats. At histopathology, there were thickening of the alveolar septa walls with mononuclear cells and presence of varying numbers of macrophages and characteristic giant cells within the alveoli. This is apparently another documented case of PPR after thirty one years of the first report in this

community. This showed that obvious concerted efforts in the control of the disease should be harnessed. Enhanced awareness and sensitization campaign among the stockowners towards adoption of annual vaccination of goats before the onset of rain was recommended.

**KEY WORDS:** Peste des petits ruminants, outbreak, WAD goats, Serology, cELISA, Nigeria.

### INTRODUCTION

Peste des petits ruminant (PPR) is a highly contagious and infectious viral disease of domestic and wild small ruminants. PPR was first described in Cote d'Ivoire in West Africa (Gargadennec and Lalanne, 1942). The disease entity was first recognized in Ivory Coast in 1940 (Gargadennec and Lalanne, 1942) and was reported to be clinically, immunological and pathologically related to rinderpest of cattle (Mornet *et al.*, 1956). The disease was once thought to be restricted to West Africa, but is now known to exist in most of the West, Central and East Africa, reaching eastwards through Western and South Asia. In Nigeria, the disease was first described as a stomatitis and pneumo-enteritis complex and named 'Kata' locally (Isoun and Mann, 1972). Nduaka and Ihemalandu (1973) reported the same condition in West African Dwarf goats in Eastern Nigeria while Durtuel and Eid

(1973) reported the presence of a similar disease in goats in the Sokoto province of North Western Nigeria. In south western Nigeria, Abegunde *et al.*(1980) reported the isolation of PPR virus from goats in Eruwa near Oyo and ever since this isolation, the report of this disease from this derived savanna had been scanty.

Although the acceptable method of control of the disease had been by vaccination of small ruminants in endemic areas using homologous PPR vaccine but despite this approach, the disease is still a problem. Various investigations have been conducted on the type of pneumonia (Obi *et al.*, 1983, Emikpe *et al.*, 2010) and the antigen distribution in tissues of goats infected with PPR virus (Brown *et al.*, 1991, Kumar *et al.*, 2004), with very little information on the status of the disease especially in area that it has earlier reported thirty one years ago. In this paper, an outbreak of PPR in goats was investigated in Eruwa, Ibarapa rural community of Oyo state, southwestern Nigeria.

## **MATERIALS AND METHODS**

### **Outbreak description**

Between June-August 2010, several cases of goats with loss of appetite, oculo-nasal mucopurulent discharges, dyspnoea, projectile diarrhea and death were reported at Eruwa Veterinary Field Station, a field unit of Faculty of Veterinary Medicine, University of Ibadan. Some of the reported cases were treated symptomatically immediately after the commencement of the clinical signs with no significant response to treatment observed. PPR was suspected based on the clinical signs observed hence the need for a confirmatory diagnosis.

### **Clinico-pathological examination**

The affected animals showed projectile diarrhea, pneumonic stance, oral erosions

on the tongue, labial aspects and the hard palate. Post mortem of the freshly dead animals were done. Samples from the pneumonic lungs, segments of the oral mucosa and intestine were collected in 10% buffered formalin, routinely processed and stained with haematoxylin and eosin for histological examination using x 40 of the light microscope.

### **Blood sample collection and laboratory confirmation**

A total of 42 serum samples were collected from the affected, recovered and apparently healthy goats and sheep reared together (20, 10, 07 and 05 respectively) for laboratory diagnosis. Competitive Enzyme linked Immunosorbent Assay (c ELISA) for detection of antibodies to PPR was carried out at the National Veterinary Research Institute, Vom, Nigeria as described by Anderson *et al.*, (1991).

## **RESULTS**

Clinical examinations of the affected goats (n=20) revealed oculo-nasal mucopurulent discharges (Fig.1), oral erosion with pseudomembraneous exudates (Fig.2) and severe diarrhea (Fig.3). At postmortem, the lungs of the carcasses revealed patchy consolidation affecting the apical lobe of more of the right lung and in some the accessory lobes and caudal lobes were affected. The consolidation was more in goats less than a year and the bucks had a higher pulmonary consolidation. Based on these findings, PPR was suspected. At histopathology, lesions were characterized by thickening of the alveolar septa walls, with mononuclear cells and presence of varying numbers of macrophages within the alveolar lumina with characteristic syncytial cell formation (giant cells) (Fig.4). Peribronchial and bronchiolar proliferation of lymphocytes was also observed. In the intestine, there was villous

atrophy and matting while the lamina propria of the intestine was infiltrated with lymphocytes, giant cells and the submucosal glands were necrotic. There was also erosions of the oral mucosa with neutrophilic infiltration of the submucosa.



Figure 1



Figure 2



Figure 3

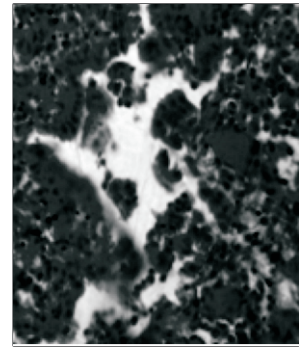


Figure 4

The goats showed oculonasal mucopurulent discharges (Fig.1), oral and labial erosion with pseudomembranous exudates (Fig.2), severe soiling of the perineum with diarrheic faeces (Fig.3) and the photomicrograph showing thickening of the alveolar septa walls, with mononuclear cells and presence of varying numbers of macrophages and giant cells within the alveoli mag X 400 H&E (Fig.4).

Table 1 showed that the serum samples from affected, recovered and apparently healthy goats were positive for the presence of PPR antibodies using competitive Enzyme linked Immunosorbent Assay (c ELISA). However, no PPR antibodies were detected in apparently healthy sheep (n=5) reared together with the affected goats.

**Table 1: Results of samples tested for PPR antibodies by c ELISA.**

SERUM SAMPLES			
Sampled animals	Tested	Positive	%
Affected goats	20	15	75
Recovered goats	10	10	100
Apparently healthy goats	07	07	100
Apparently healthy sheep	05	0	0

## DISCUSSIONS

This investigation further revealed the endemicity of PPR in Eruwa, Ibarapa rural community, a derived savanna zone of Oyo state even after the first report over 31 years ago (Abegunde *et al.*, 1980). This outbreak which was based on the clinical features, characteristic histopathological changes in

the lung and intestine showed the endemicity of the disease and that efforts towards the control of the disease in the area are not adequate evident by no record of PPR vaccination in the area in the last decade.

Cases of patchy pneumonia as observed in this outbreak are more in the very young to

young adult animals as PPRV antibodies were more in the serum samples collected from the goats below one and half years which reveal the susceptibility of these groups to pneumonia especially the devastating effect of PPR virus (Obi *et al.*, 1983, Obi 1984 Mellado *et al.*, 1991). That young animals suffer more may also be due to stress associated with early weaning or absence of maternally derived antibodies and unrestricted movement which they are frequently subjected to (Emikpe and Akpavie, 2010). In this study also, sheep was not affected which further corroborated the report of Jagun *et al.* (2011) that sheep are less susceptible to lineage 1 PPR virus. This investigation further revealed that PPR is more prevalent in the rainy season, this further corroborated the reports of other workers (Obi *et al.*, 1983, Mellado *et al.*, 1991) and is in contrast with the report of Okoli (2003) who reported higher incidence of PPR during the dry months of December and January and he attributed the spread to the dusty and dry hamattan wind that characterizes this period of the year which has been said to enhance the spread of PPR (Al-Tarazi and Daghall, 1997).

Although rinderpest in large ruminants shares same clinical symptoms with PPR, the presenting clinical features and lesions were quite suggestive of PPR virus infection while the results of c ELISA using PPR specific monoclonal antibodies further suggests a recent exposure to PPR. In conclusion, this study further suggests that Peste des petits ruminant (PPR) is endemic especially in this derived savanna area, and the need for more concerted effort on the control measures especially the need for awareness and sensitization campaign among subsistence small ruminant stockowners in the rural areas towards adoption of annual vaccination of their animals much more before the onset

of rain.

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