



Prevalence of *Cryptosporidium* Infection in a Rabbitry in Abeokuta, Nigeria

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SUMMARY

This study was conducted to determine the prevalence of *Cryptosporidium* infection in a colony of adult rabbits, of both sexes, intensively managed on a University's farm in Abeokuta, Ogun state, southwest Nigeria. This was achieved by assaying for *Cryptosporidium* coproantigens in stools of 27 adult rabbits by an enzyme-linked immunosorbent assay (ELISA). *Cryptosporidium* coproantigens were detected in 92.6% (25/27) of the rabbits with a higher prevalence, 95.0% (19/20), being recorded in does than the 85.7% (6/7) recorded in bucks. The results of this study showed that *Cryptosporidium* infection was highly prevalent in adult rabbits reared on the farm, thus highlighting the need for more prevalence studies to be carried out in rabbits in other parts of Nigeria.

Key words: *Cryptosporidium*, ELISA, Nigeria, Rabbits.

INTRODUCTION

Cryptosporidiosis is a faeco-orally transmitted gastrointestinal disease of various domestic and wild animals and humans caused by protozoan parasites of the genus *Cryptosporidium* (Diaz *et al.*, 2010). They are among the most common non-bacterial causes of self-limiting diarrhoea in immunocompetent hosts while the severity is increased in immunodeficient hosts and neonates (Diaz *et al.*, 2010; Maurya *et al.*, 2013).

Cryptosporidium species differ in their host range. While some species appear to be restricted to particular types of hosts others have broad host range, including man (Thompson *et al.*, 2008; Adriana *et al.*,

2010). The most common *Cryptosporidium* species in rabbits is *C. cuniculus* (formerly *Cryptosporidium* Rabbit genotype) which was identified in outbreaks of cryptosporidiosis in humans (Chalmers *et al.*, 2009; Puleston *et al.*, 2014), thus implying that the infection in lagomorphs may be of zoonotic significance.

Prevalence of *Cryptosporidium* infection in cattle (23.4%), sheep (28.7%), goats (37.5%) and pigs (31.1%) has been reported mainly in Southwestern Nigeria (Ayinmode and Fagbemi, 2010; Akinkuotu *et al.*, 2014a, b). There is however very limited information on cryptosporidiosis in rabbits in Nigeria. This study therefore aims to

determine the prevalence of *Cryptosporidium* infection in a colony of adult rabbits reared on FUNAAB's farm.

MATERIALS AND METHODS

Study Area and Period

This study was conducted in one colony of rabbits (herd size of 35) on the FUNAAB Teaching and Research Farm, Abeokuta, Ogun state, southwest Nigeria. Sampling was done in September, 2014.

Sample Collection

All the rabbits in the herd were >6 months of age and were apparently healthy. Faeces were collected from 27 randomly selected rabbits comprising 20 bucks and 7 does. The rabbits were housed individually in cages. Freshly voided faeces found in these cages were hand-picked, dropped into individual universal sample bottles and labelled appropriately. The stool samples were then transported to the laboratory in cold packs where they were immediately analysed.

Detection of *Cryptosporidium* coproantigens by Enzyme-Linked Immunosorbent Assay (ELISA)

The detection of *Cryptosporidium* spp. coproantigens in each sample was done using a commercially available ELISA kit (RIDASCREEN® *Cryptosporidium*; R-Biopharm AG, Germany). The procedure was carried out according to manufacturer's instructions.

Statistical Analysis

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 17 (IBM Corporation) on Windows. Fisher's exact test (McDonald, 2009) was used to compare the relationship in prevalence of *Cryptosporidium* spp. coproantigens between the sexes of rabbits at 5% level of significance.

RESULTS AND DISCUSSION

Cryptosporidium infection has been reported in various domestic animals including rabbits (Shiibashi *et al.*, 2006; Soltane *et al.*, 2007; Robinson and Chalmers, 2010; Shi *et al.*, 2010; Zhang *et al.*, 2012). This present work is the first report on the prevalence of *Cryptosporidium* infection in rabbits in Nigeria.

Cryptosporidium coproantigens were detected in 92.6% (25/27) of the samples. Infection was observed in both sexes of rabbits with the rate in does, 95.0% (19/20), being higher than the 85.7% (6/7) recorded in bucks. There was however no significant relationship or association ($p > 0.05$) between the prevalence of *Cryptosporidium* infection and sex. The difference in the infection rates between sexes of rabbits has not been well investigated. Higher infection rates in female animals may be associated with husbandry practices in herds and/or hormonal changes during pregnancy, parturition and lactation.

An overall 92.6% prevalence of cryptosporidiosis recorded in rabbits in this study was higher than the rates (0-20%) previously reported in several studies (Shiibashi *et al.*, 2006; Soltane *et al.*, 2007; Robinson and Chalmers, 2010; Shi *et al.*, 2010; Zhang *et al.*, 2012). Differences in techniques used for the detection of infection, management system and age of rabbits probably contributed to the observed variations in the prevalence observed.

The prevalence rate recorded in this study may also be due to the small sample and herd sizes used in our study. Comparison of the infection rates among the sexes may have also been limited by the small sample sizes of individual sexes.

This study implies that *Cryptosporidium* infection is highly present in asymptomatic adult rabbits reared on FUNAAB's farm which therefore suggests that non-diarrhoeic rabbits should be handled cautiously as they can be potential reservoir of the infection.

It also submits useful data for further studies on the prevalence and molecular characterization of *Cryptosporidium*

infecting rabbits in Nigeria thus providing the information on the public health significance of the parasite.

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