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SHORT COMMUNICATION

Prevalence of *Cryptosporidium* species in Some Domestic Animals in Umuagwo, Imo State, Nigeria.

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INTRODUCTION

Of the zoonotic diseases that threaten the health of animals and man and impinge on his economy is cryptosporidiosis of global occurrence (Scott et al., 1995; Ohaeri and Iwu, 2003). Cryptosporidiosis is a disease caused by small coccidian parasites that belong to the genus Cryptosporidium and inhabit the micro villous region of epithelial cells of both the respiratory and gastro-intestinal tract of vertebrates (Current and Snyder, 1988). It is characterized clinically by diarrhoea, even though the magnitude/severity varies. Unfortunately, there is no specific therapy for this disease and when the respiratory tract is implicated, different clinical symptoms such as air-sacculitis, conjunctivitis, coughing, nasal discharge and pneumonia may be produced in the affected vertebrates and mortality can occur (Current, 1997). Comparatively, the disease is more common in young animals because animals can develop immunity after a single infection (Tzipori, 1985; Radostits *et al.,* 1994). Although animals with strong immune system are not so vulnerable to an attack of the disease, the life of immune-deficient hosts is seriously threatened (Current, 1997).

Incidentally, cryptosporidiosis is a zoonosis and capable of causing severe clinical disease in immunologically compromised humans such as AIDS patients (Kelly 1998; Lule, 1998; Ohaeri and Iwu, 2003). In addition, it has been reported that Cryptosporidia pathogens even act with other entero-pathogens in a concerted manner to produce intestinal damage and diarrhoea in the victims (Angus, 1990). Recently, cryptosporidiosis has increasingly become of importance globally, especially in HIV/AIDS where it is associated with more chronic symptomatology. However, there is no report of its importance in domestic animals in the study area. Accordingly, this work sought to establish the prevalence and distribution of the parasite in some domestic animals in the area. Establishing the prevalence of a disease in an area in order to gather baseline information for its control is scientifically necessary.

KEY WORDS: Prevalence, Cryptosporidium, Domestic animals, Ziehl-Neelsen.

MATERIAL AND METHODS

The study area is the livestock unit of Michael Okpara College of Agricuture Umuagwo, now Imo State Polytechnic. Umuawgo, located in the South Western part of Imo State lies between longitudes $6^0 55^1$E and $6^0 60^1$E and latitude $5^0 10^1$N and $5^0 15^1$N of the equator. The area is a rainforest zone with dense vegetation among which are grasses and forage plants. Tree crops consist of oil palm and citrus.

Animals

A total number of 243 domestic animals were used in the study. These were 63 broilers, 59 goats, 41 pigs, 33 rabbits and 47 sheep. All the animals were kept in enclosed cages or houses.

Age-Grouping

The pattern of age-grouping used in this study was that employed and described by Ohaeri and Iwu (2003).

Faecal Sampling

Faecal samples were collected from all the animals into clean, dry screw-capped and well-labelled (to distinguish the animals) glass containers using the methods already described by Ohaeri (2001). The consistency of each faecal sample collected (whether normal, loose or diarrhoeic) was recorded. The samples were taken to the Animal Science Laboratory of Michael Okpara College of Agriculture Umuagwo for analysis.

Identification of Oocysts

Cryptosporidia oocysts were identified using the modified Ziehl-Neelsen method (WHO, 1991) in which air-dried smears on glass slides were fixed with methanol for two minutes and then stained with cold strong carbol fuchsin for 15 minutes, rinsed with water and decolourised with 1% acid alcohol for 15 seconds, rinsed with water and then counter-stained with 0.5% methylene blue

for 30 seconds, rinsed with water and air-dried. The stained slides were examined under a x 40 objective using x10 eye pieces of a binocular microscope. *Cryptosporidium* oocysts which stained red against a blue background and measured 4-6μm indicated a positive result.

Statistical Analysis

Chi square test (X^2)was employed in the analysis of data obtained and a probability, (P) value of less than 0.05 was considered significant.

RESULTS AND DISCUSSION

Out of a total number of 243 domestic animals (79 males and 164 females) investigated for *Cryptosporidium* infection, 19 (7.8%) tested positive. These were broilers 2 (3.2%) goats 3 (5.1%), pigs 9 (22.0%), rabbits 1 (3.0%) and sheep 4 (8.5%) [Table I]. The difference in infection rates according to these animal groups was statistically significant (X^2=17.902, df =4, P<0.05). The overall prevalence of the study (7.8%) indicates low endemicity, even though possibilities of development of chronic infections are not ruled out. This observation corroborates the findings of Ohaeri and Iwu (2003) who did a similar study though in a different Eastern State of Nigeria.

Of 19 infected animals, 8 (42.1%) were males while 11 (57.9%) were females. Associations were not identified between infection and sex of the animals (X^2 = 0.8912, df =1, P>0.05) (Table II). This simply suggests that *Cryptosporidium* infection is not sex-dependent and that seems also supported by literature (Radostits *et al*., 1994).

Furthermore, significant difference (X^2 = 31.506, df=4, P< 0.05) occurred in prevalence of infection among the various age groups studied [< 3 months: 13 (25.5%); 3-6 months: 5 (7.2%); 6-9 months: 1(2.9%); 9-12 months: 0 (0.0%) and >12 months: 0 (0.0%)] (Table III). That higher prevalence was recorded in the younger animals reaching its peak in those below three months of age and decreased progressively with advancing age may strongly suggest that older animals acquired immunity after a single infection (Tzipori, 1985; Angus 1990 and Ohaeri and Iwu, 2003).

Significant observations made on the consistency of faecal samples of the animals showed that all samples from the adults were of normal consistency indicating the absence of any overt clinical problem associated with the infection while approximately 65% of infected animals below three months of age had either loose or diarrhoeic faeces. This indicates that diarrhoea in young animals might be caused by cryptosporidiosis.

TABLE I: Distribution of *Cryptosporidium* in domestic animals in Umuagwo, Imo State, Nigeria.

Type of Animals*	No Tested	No Infected	% Infected	No not Infected	% Not Infected
Broiler	63	2	3.2	61	96.8
Goat	59	3	5.1	56	94.9
Pig	41	9	22.0	32	78.0
Rabbit	33	1	3.0	32	97.0
Sheep	47	4	8.5	43	91.5
Total	243	19	7.8	224	92.2

*X^2 = 17.902 (significant: df=4, P< 0.05).

TABLE III: Age and prevalence of *Cryptosporidium* infection in domestic animals in Umuagwo, Imo State, Nigeria.

Type of Animals/ Age*	< 3 Months		3-6Months		6-9Months		9-12Months		> 12 Months	
	No Tested	No Infected	No Tested	No Infected	No Tested	No Infected	No Tested	No Infected	No Tested	No Infected
Broiler	13	2	30	1	0	0	0	0	0	0
Goat	11	2	19	1	19	0	21	0	3	0
Pig	11	5	4	2	12	1	16		10	0
Rabbit	7	1	15	0	6	0	11	0	2	0
Sheep	9	3	9	1	4	0	9	0	1	0
Total	51	13	77	5	41	1	58	0	16	0
% Infected in each Age Group		25.5		7.2		2.9		0.0		0.0

*X^2 = 31.506 (Significant: df=4, P< 0.05).

TABLE II: Sex and prevalence of *Cryptosporidium* infection in domestic animals in Umuagwo, Imo State, Nigeria.

Type of Animals/ Sex*	Male			Female		
	No Tested	No Infected	% Infected	No Tested	No Infected	% Infected
Broiler	24	1	4.2	39	1	2.6
Goat	17	2	11.8	42	1	2.4
Pig	12	3	25.0	29	6	20.7
Rabbit	15	0	0	18	1	5.6
Sheep	11	2	18.2	36	2	5.6
Total	79	8	10.1	164	11	6.7

*X^2 = 0.8912 (Not Significant: df= 1, P> 0.05)

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