

ISSN 1682-8356
ansinet.org/ijps



INTERNATIONAL JOURNAL OF
POULTRY SCIENCE

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308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorijps@gmail.com

Prevalence and Identification of Species of *Eimeria* Causing Coccidiosis in Poultry Within Vom, Plateau State, Nigeria

A. Muazu¹, A.A. Masdooq¹, J. Ngbede¹, A.E. Salihu¹, G. Haruna¹, A.K. Habu², M.N. Sati³ and H. Jamilu³
¹Bacterial Vaccine Production Division, ²Viral Vaccine Production Division, ³Poultry Production Division, National Veterinary Research Institute, Vom, Nigeria

Abstract: A survey for the prevalence of coccidiosis and identification of species found in Vom, Plateau state, Nigeria, was undertaken. A total of 300 samples made up of one hundred carcasses and two hundred faecal droppings from nine different poultry farms were investigated during the months of April to June. The prevalence of coccidial infection among adult bird was 36.7% and among the younger birds was 52.9%. The species of *Eimeria* identified included *E. tenella*, *E. maxima*, *E. necatrix* and *E. acervulina*.

Key words: Prevalence, *eimeria* spp, coccidiosis, poultry, vom

Introduction

Poultry refers to domestic birds such as chickens, turkeys, ducks, Guinea fowl, peasants, geese kept for meat or egg production. It is believed that the modern fowl probably originated from four wild species; the Ceylon jungle fowl (*Gallus varians*). It is likely that the *Gallus gallus* is the main ancestor, Williamson and Payne, 1978. Coccidiosis is a disease of fowl caused by a microscopic protozoan which lives and multiplies in the intestinal tract and causes tissue damage, Julie (1999). Coccidiosis in poultry is divided into ceacal and intestinal. Ceacal coccidiosis may produce bloody droppings and anaemia that is often followed by death. Intestinal coccidiosis is not as acute and is more chronic in nature. Lesions of the infection depend on the species of coccidia causing the problem, URL (1997). About 1800 *Eimeria* spp affect the intestinal mucosa of different animals and birds. In the domestic fowl *Gallus gallus*, 9 *Eimeria* spp are recognized: *E. brunette*, *E. maxima*, *E. necatrix* and *E. tenella* are highly pathogenic, *E. acervulina*, *E. mitis* and *E. mivati* are rather less pathogenic and *E. praecox* and *E. hagani* are regarded as the less pathogenic, Nematollahi *et al.* (2008). A further complication of coccidiosis in adult birds is that in some cases, the adult birds tolerate certain levels of infection if they are under good condition and feeding, but some as they are stressed they become clinically ill (Williamson and Payne, 1978). The aim of this study is to identify the specie of *Eimeria* responsible for coccidiosis based on age differences in Vom, Plateau state, Nigeria.

Materials and Methods

Sample collection: Nine poultry farms were visited for specimen collection. Fresh faecal droppings were collected in sterile universal bottles and carcasses were collected in polythene leather bags and transported to the laboratory immediately for processing.

Data collection: Information on temperature and humidity were taken from record kept at the farms. Information on the period of the year when the outbreak was noticed, age of birds affected, clinical signs observed, mortality rates, therapeutic and preventive measures taken were obtained.

Laboratory examination: Laboratory examination was by wet mount smears of the faecal droppings as described by Fleck and Moody (1993). Concentration technique was also used for counting of oocyst as described by Brown (1983). Post mortem examination was carried out after opening of the carcasses, and the intestine was removed aseptically, looked for the presence of lesions and the intestine was scraped and observed under the microscope using x 10 objective and x 40 objective, the method as described by Jordan (1999). Sporulation was performed in wet chamber at 24-26°C in a 2.5% aqueous solution of potassium dichromate (K₂Cr₂O₇).

Results

Out of the three hundred specimens collected, that is one hundred carcasses and two hundred faecal droppings, 90 faecal droppings were positive for oocyst of coccidiosis and 30 carcasses were positive for different spp of *Eimeria*. Infection rate is higher among the younger birds (Table 1). The different *Eimeria* species identified in this study are shown in Table 2, the highest prevalence is *E. tenella*.

Discussion

In this study, the prevalence of *Eimeria* spp in poultry farms in Vom was 52.9% in young chickens (3-4 weeks) while in adults 36.6% (6 weeks and above). This rate is higher compared to result of other survey in Nigeria that Fabiyi, 1984 reported 30%. These results are in

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Table 1: April-June prevalence of coccidial infection

Farms	No. Faecal droppings examined	Age		Intensity of infection according to age/percentage	
		Young	Adult	Young	Adult
A	50	34	16	17 (50.0)	13 (81.25)
B	24	10	14	5 (50)	8 (57)
C	19	10	9	8 (80)	1 (11.1)
D	14	3	11	3 (100)	0 (0)
E	15	9	6	4 (44.4)	3 (50)
F	18	8	10	3 (37.5)	0 (0.00)
G	30	14	16	10 (71.4)	3 (18.25)
H	18	8	10	0 (0.00)	5 (50.0)
I	12	6	6	4 (66.7)	3 (50.0)
Total	200	102	98	54 (52)	36 (36.7)

Number in parenthesis are percentages. Young (3-4 weeks) and Adult(6 weeks and above).

Table 2: Different *Eimeria* species identified and their percentage intensity

Farm	No of carcasses	<i>E. tenella</i> %	<i>E. Maxima</i> %	<i>E. necatrix</i> %	<i>E. acervulina</i> %
A	15	0 (0.0)	1 (3.3)	0 (0.0)	2 (6.7)
B	20	3 (10.0)	1 (3.3)	2 (6.7)	0 (0.0)
C	3	1 (3.3)	0 (0.0)	0 (0.0)	0 (0.0)
D	10	0 (0.0)	2 (6.7)	0 (0.0)	1 (3.3)
E	14	1 (3.3)	2 (6.7)	0 (0.0)	0 (0.0)
F	23	2 (6.7)	3 (10.0)	1 (3.3)	1 (3.3)
G	5	3 (10.0)	0 (0.0)	0 (0.0)	2 (6.7)
H	7	0 (0.0)	1 (3.3)	0 (0.0)	0 (0.0)
I	3	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	100	10	9	5	6

agreement with the report of M.S.D. International (1982) which stated that coccidiosis has been identified in all parts of the world as a deadly disease of flocks, with resultant economic losses. *Coccidia* prevalence has been reported in all flocks world-wide. This finding support other finding in Nigeria, Majaro, 1983 stated that infection with specie of *Eimeria* in poultry has been shown to be due to *E. tenella*, *E. necatrix*, *E. brunette* and *E. acervulina*. The result obtained in this work associated with the four species of *Eimeria* support the statement of Beate and Martin (1999) which stated that the species of *E. acervulina*, *E. maxima* and *E. tenella* are considered to be the most important to poultry industry.

The results obtained support the report of Julie (1999) that all ages of poultry are susceptible to infection, but usually resolves itself around 6-8 weeks of age. The result obtained infected birds association with age in this study also support the findings of Kaschula (1961) and Soulsby (1973) that younger birds are more susceptible to infection than older birds. Though there is a marked difference in the percentage of infected birds as regards to age, it cannot be considered significant because of the relatively different number of samples collected. The coccidial species that were found in the order of prevalence were *E. necatrix* and *E. acervulina*. In conclusion the species of *Eimeria* identified in this study are not the only specie causing the infection in the state, they may be other species in another area of the state or zone of the country therefore we suggest the researchers to go around the country for sampling.

Acknowledgement

The authors acknowledge the Executive Director, National Veterinary Research Institute, Vom for granting the permission to publish this article.

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