

Coccidia oocyst from broiler chickens in Nigeria

par O. M. MAJARO

Department of Veterinary Microbiology and Parasitology,
University of Ibadan, Ibadan, Nigeria

RÉSUMÉ

Oocystes de coccidies chez les poulets de chair au Nigeria

Sept espèces d'*Eimeria* ont été mises en évidence et décrites par l'auteur chez les poulets de chair au Nigeria, dont l'âge variait entre 1 jour et 12 semaines. 200 échantillons de la litière de 24 fermes avicoles ont été examinés, dans ce sens, en 6 mois. 180 de ces échantillons, soit 75 p. 100, ont montré la présence de nombreux oocystes d'*Eimeria tenella*, *E. acervulina*, *E. necatrix*, *E. brunetti*, *E. maxima*, *E. mitis* et *E. mivati*.

Ce sont les 3 premiers cités qui sont les plus fréquents.

Si *E. tenella* parasite le plus souvent les poussins de 6 jours à 8 semaines alors que *E. maxima*, *E. brunetti* et *E. acervulina* sont fréquemment rencontrés chez les oiseaux âgés de 3 semaines et adultes, il n'a pas été possible de mettre en évidence une relation précise entre l'espèce d'*Eimeria* et l'âge des poulets.

L'auteur précise la durée de sporulation de leurs oocystes à la température constante 29 ± 1 °C.

INTRODUCTION

Indiscriminate use of anti-coccidia drugs by the poultry farmers had influenced the occurrence of different species of *Eimeria*, and the species which were considered of no significance have turned out to be important. The result of this indiscriminate use of drugs is manifested in the occurrence of various drug resistant strains of *Eimeria*. This is of much concern in the treatment and control of the disease.

The poultry farmers in Nigeria are aware of poultry coccidiosis but there is no available literature on the incidence of poultry coccidia in Nigeria when compared to that of ruminants despite the fact that poultry coccidiosis constitutes a problem to the profitability of poultry industry in Nigeria.

Several workers all over the world have described oocysts from chickens including (1, 4, 5,

6, 7, 8). Eight (8) valid species of coccidia of the genus *Eimeria* are known to occur naturally. There is no doubt that accurate diagnosis of the different species will provide a valuable information as regards the treatment and prevention of the disease. This is likely to guarantee healthy broilers and ensure maximum profitability to poultry producers and effective disease control.

This investigation was undertaken to determine the *Eimeria* species which infects broiler chickens in Nigeria and their percentage occurrence.

MATERIALS AND METHODS

This investigation was conducted between June and December 1979. 240 samples of litter from 24 broiler houses on 10 broiler farms were examined. Oocysts were recovered by using

Modified Direct Centrifugal Floatation (D.C.F.) techniques (8).

Oocysts floating free of distortion on the under surface of the cover-slip in a medium of saline were examined under microscope (X10 objective X10 ocular) and measured on the scale of ocular micrometer and the resulting readings transposed into microns (2).

Identification of the oocysts were based on the previous studies of (1, 4, 5, 7).

Sporulation times for different oocysts were determined by suspending the sediments recovered from each sample in 2.5 p. 100 potassium dichromate kept at room temperature $29 \pm 1^\circ\text{C}$.

RESULTS

A total of 240 samples of litter were examined from broiler chickens of ages varying from one day to 12 weeks. 185 samples (75 p. 100) were positive for oocysts of *Eimeria* species and mostly it was a mixed infection with two or more types of oocysts.

The 7 species and percentages of occurrence of *Eimeria* isolated are recorded in table I. The

TABLE I-Species and % Occurrence of *Eimeria* Oocysts occurring in Broiler chickens in Nigeria

Species	% of Occurrence
1. <i>Eimeria tenella</i>	25.82
2. <i>E. acervulina</i>	36.66
3. <i>E. necatrix</i>	14.47
4. <i>E. brunetti</i>	8.80
5. <i>E. maxima</i>	6.25
6. <i>E. mitis</i>	4.75
7. <i>E. mivati</i>	3.25

TABLE II-Sporulation times measured at room temperature ($29 \pm 1^\circ\text{C}$)

Species	Sporulation times (Hours)
1. <i>Eimeria tenella</i>	19 - 48
2. <i>E. acervulina</i>	18 - 22
3. <i>E. necatrix</i>	18 - 48
4. <i>E. brunetti</i>	20 - 36
5. <i>E. maxima</i>	32 - 48
6. <i>E. mitis</i>	18 - 48
7. <i>E. mivati</i>	12 - 28

various sizes of oocysts encountered are recorded in table II. Sporulation times of the 7 species of *Eimeria* isolated at room temperature are recorded in table III. *Eimeria tenella*, *E. acervulina*, *E. necatrix* and *E. brunetti* were most predominant followed by *E. maxima*, *E. mitis* and *E. mivati*. Most of the positive infections were accompanied by presence of helminth eggs.

DISCUSSION

This survey was carried out among other things to determine whether the group of Coccidia oocysts previously described in literature as species really constitute recognizable entities in Nigeria. In case this was true, it is of economic importance to determine the prevalent species in broiler chickens in view of the rapid development of poultry industry in Nigeria and, most important, the disease coccidiosis as an entity.

Microscopically, some of the coccidia oocysts from the chickens were colourless (*E. tenella*, *E. necatrix*, *E. brunetti*, *E. mitis* and *E. mivati*) pale to yellowish brown (*E. maxima*). The shape of certain oocysts are broadly ovoidal (*E. tenella*, *E. mivati*); elongated ovoidal (*E. necatrix*); ovoidal (*E. brunetti*, *E. acervulina*); subspherica (*E. mitis*). Oocysts wall are smooth and transparent in all species except *E. maxima* which has roughened and tainted yellowish brown wall. Most of the oocysts isolated have no micropyle except *E. mivati*. With a few exceptions, the sizes of oocysts for most of the species are similar to those recorded by (1, 4) and most of them fell within the range recorded. The few observed variations may be due to strain differences and the total number of oocysts measured per specie.

The sporulation times for different *Eimeria* species encountered are similar to that recorded by EDGAR (3). *Eimeria tenella*, *E. necatrix* and *E. maxima* completed their sporulation after 48 hrs. *E. brunetti* completed after 22 hrs. Sporulation times was found helpful in differentiating certain species from the others especially where morphological intergradation occurs. In the order of importance and high percentage of occurrence, *Eimeria tenella*, *E. acervulina*, *E. necatrix* are most important in broiler chickens in Nigeria followed by *E. brunetti*, *E. maxima*, *E. mitis* and *E. mivati*.

E. tenella occurred mostly in young chickens ranging from 6 day-old to 8 weeks; while

E. maxima, *E. brunetti* and *E. acervulina* are frequently encountered in birds ranging from 3 weeks old to adults. Hence the occurrence of coccidia species in poultry birds are not strictly age specific. It is pertinent to mention that few coccidia oocysts were recovered in some poultry farms where the litters are changed monthly

and replaced with dry clean litters. More oocysts were recovered from most of the farms where the litters are neglected for a period of more than 3 months. This is expected since under suitable environment which is provided by accumulated litter, oocysts will sporulate and multiply in greater number.

SUMMARY

Seven (7) species of *Eimeria* from broiler chickens were recognized and described. 240 samples of litter from 24 broiler houses on 10 broiler farms were examined during a 6 month period. 180 samples (75 p. 100) were positive for oocysts. *Eimeria tenella*, *E. acervulina*, *E. necatrix* and *E. brunetti* predominated in the samples. Most of the positive infections are multiple consisting of two or more species. The *Eimeria* species found are not strictly related to age of the birds.

RESUMEN

Oocistos de coccidios en pollos en Nigeria

El autor evidenció y describió, en Nigeria, siete especies de *Eimeria*, en pollos cuya edad variaba entre 1 día y 12 semanas. Con este fin, se examinaron doscientos muestras de cama de paja de 24 granjas avícolas durante seis meses. 180 de las dichas muestras, es decir 75 p. 100, mostraron la presencia de numerosos oocistos de *Eimeria tenella*, *E. acervulina*, *E. necatrix*, *E. brunetti*, *E. maxima*, *E. mitis* y *E. mivati*.

Los más frecuentes son los tres primeros notados.

Si *E. tenella* parasita el más a menudo los polluelos de 6 días a 8 semanas de edad mientras que *E. maxima*, *E. brunetti* y *E. acervulina* son frecuentemente encontradas en las aves de 3 semanas y en los adultos, no fué posible evidenciar una relación precisa entre la especie de *Eimeria* y la edad de los polluelos.

El autor precisa la duración de esporulación de sus oocistos a la temperatura constante $29 \pm 1^\circ\text{C}$.

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