International Journal of Agriculture Research & Life Science
Volume 1, Number 1, June 2020
http://www.cedtechjournals.org

GASTROINTESTINAL PARASITES COMMONLY ASSOCIATED WITH LOCAL CHICKEN (*Galus galus)* IN KAFIN HAUSA TOWN, JIGAWA STATE, NIGERIA

Hamman, A. A[1] and Ahmed, U. A[2]
[1]Department of Biological Science, Sule Lamido University, Kafin Hausa, Jigawa State, Nigeria.
[2]Department of Biological Science, Federal University, Gashua, Yobe State, Nigeria
Email: doctoruaa@gmail.com, aishahammanabba@gmail.com.
Corresponding author: Ahmed, U. A

ABSTRACT

Chicken is one of the most intensively reared of the domesticated species and one of most developed and profitable animal production enterprise. However, chicken production is hindered by many problems among which parasitic diseases are most important. In this present study, a total of five (5) parasites species were identified, among which two are nematodes (*Ascaridia galli* and *Capillaria species.*), two are cestodes (*Rallietinea species* and *Davinea proglottina*) and one is *Eimeria species.* The percentage of the parasites identified obtained showed that *D. Proglottina* has the highest percentage (49.38%), followed by *Capillaria species* (24.38%), follows by *A. Galli* (13.90%), *Rallietinea species* follows by (8.02%) and *Eimeria oocyst* has the lowest percentage (4.32%). The majority of the species identified in this study have been reported as potentially pathogenic for poultry, inducing ulcerations and nodule formations and varying degrees of enteritis leading to diarrhoea, anorexia, depression, emaciation and death if untreated. Moreover, the result of this study showed that 64 samples out of 100 are infected with at least one parasite, and thus, it was concluded that gastrointestinal parasites especially helminthes are commonly attacking local chicken in Kafin Hausa area of North-western Nigeria and may have consequent effect on productivity.

Keywords: *Ascaridia galli*, Chicken, Gastrointestinal, Kafin Hausa, Parasites

INTRODUCTION

Chicken is one of the most intensively reared of the domesticated species and one of most developed and profitable animal production enterprise (Baker, 2008). It's importance in natural and economics of developing

countries and its role in improving the nutritional status and income of many small farmers have recognised by various scholars and rural development agencies in the last two decades (Ashour, 2004).However, chicken production is hindered by many problem among which infectious diseases are most important (Permin and Hansen,1998; Ruff,1993).

The presence of a few parasites does not usually cause a problem. However, large numbers can have a devastating effect on growth, egg productions and over-roll health parasitism has been attributed to cause of reduced growth, egg production, emaciation and anaemia as well as mortality (Saif *et al.,* 2008; Oherri and Okwum, 2013). These authors reported that mortality causing viral infection of chickens. The concentration of parasite eggs in the chickens environmental is one the factors which plays a major role in determining the severity of the infection (Martynova, 2008). Chicken picks up the parasite's egg directly from contaminating feed, water or litter or by eating snails, earthworms, or other insects (intermediate host) which can carry the eggs. Clinical signs of parasitism are unless, poor growth and feed conversion, decreased egg production and even death in severe infection. Furthermore, parasite can make the flock less resistant to disease and excavate existing diseases conditions. Daloul and Lillehoj (2009), reported that parasitic infection or their concurrent infections result in immune suppression, especially in response of all the intestinal worms, large round warms (*Ascaridia galli*) probably inflicts the most damaged with young birds being more severely affected. A mild infection is often not notice but large numbers of worms, however, infected with feed absorption causing poor growth and production. In severe infection, there can be actual intestinal blockage by worms, causing death. Roundworms are passed from bird to bird by direct ingesting the parasite egg in faecal contaminated feed, water or litter or by eating grasshoppers or earthworms carrying the parasite.

Disease is among the major constraints of poultry production (Hunduma *et al*., 2010). Gastrointestinal parasites are parasites that infect the gastro intestinal tract of an organism, some types of helminth and protozoa are classified as intestinal parasites that cause infection. These infections can damage or sicken the host (chicken or other animals) (Katoch *et al*., 2012).

Poultry coccidiosis caused by the protozoan *Eimmeria*, is a common disease in poultry, generates economic losses due to morbidity, mortality and reduced body weight. It is probably the most common disease in modern poultry production, where confinement rearing is practiced (Lorenzoni, 2010; Amare *et al*., 2012; Kassa, 2005).

Helminth infections are known to cause interference with host metabolism resulting in poor feed utilization and reduced growth rate as well as size and age at maturity and these have been described as common characteristics of village chickens (Permin and Hansen, 1998). However, parasitic infestations are usually conjoint. The concurrent infestations with two or more parasites, especially those with gastrointestinal predilection, heighten their role in early chick mortality and other productivity losses among the adults. This is particularly true of conjoint infestations with helminthes and coccidia whose combined effects on host could be devastating (Nnadi and George, 2010). As stated by Permin and Hansen (1998), improvement in veterinary services and setting-up of strategies, to prevent and control diseases; would be possible if descriptive data on prevalence of diseases, vaccinations, and treatments are available. As a result, the objective of the review was: to review and compile information related to gastrointestinal parasites (Nematodes, Cestodes and Eimmeria Species) of chickens. Nematodes are the most common and most important helminths species in poultry. More than 50 species have been described in poultry. Of these, the majority causes pathological damage to the host (Permin and Hansen, 1998).

Currently there is a paucity of information regarding the prevalence of intestinal parasite in chicken houses to check movement of these parasites. In addition, as cofactors in other chicken diseases, the knowledge of their prevalence is essential in understanding the risks factors of such diseases and the design of their appropriate control measures (Jordan, 1996) therefore, the objective of current study was to investigate the identification of gastrointestinal tract parasite of chickens.

MATERIALS AND METHOD

Study Area

Kafin Hausa is a Local Government Area in Jigawa State with administrative headquarter in the town of Kafin Hausa. Kafin Hausa Local Government Area falls within Jigawa North-East Senatorial District alongside Auyo, Birniwa, Guri, Hadejia, Kaugama, KiriKasama and

Malam Madori Local Government Areas. Kafin Hausa Local Government Area also forms a Federal Constituency alongside Hadejia and Kafin Hausa Local Government area covers an area of 1,380km² and a population of 271,058 at the 2006 census. The Local Government Area, to the East and South by Bauchi State, to the South-West by Kiyawa Local Government Area, and to the West by Jahun and Miga Local Government Areas .Consuming the intestine of chicken is common among the community specifically on the market days.

Sample Collection

Using sample bottle containing 10% formalin solution ten samples (The tract, from gullet to rectum, including the gizzard and paired cloaca of different chickens) were collected from the chicken sellers in Kafin Hausa market on weekly basis for ten weeks making a total of 100 samples.

Sample Analysis

The tract, from gullet to rectum, including the gizzard and paired cloaca, was cut open using a blade. The content and scrapings from the mucosa of each anatomical part was examined. When present, helminthes from each chicken collected was cleaned in saline, their numbers was counted, initially identified with the help of hand lens and identification key as they are observed microscopically and then preserved in 10% formalin as describe by Levin (1985) and Schmidt (1986).

Direct wet mount preparation was done by placing a drop of normal saline at the centre of clean grease free slide and about pea size of the faecal sample was emulsified in the normal saline. Cover slip was used to cover the preparation and observed under microscope using X10 objective lens. Floatation technique was also done using saturated sodium chloride. A small portion of the faecal sample was placed in a test tube and sodium chloride solution was poured in the tube. Applicator stick was used to emulsify the sample, later the tube was filled to the brim with more sodium chloride solution. Cover slip was placed at the top of the tube and allowed to stay for 15 minutes. The cover slip was taken and placed on a glass slide with the side that touches the preparation facing downward and was observed under microscope using X10 objective lens. This was done following the standard procedures for unicellular organism, cestodes and nematodes describe by Kaufmann (1996) and Barnek *et al.,* (1997).

RESULTS

The result of this study showed that 64 samples out of 100 were infected with at least one parasite. A total of 324 parasites were identified from 100 gastrointestinal tract samples of local chicken (*Gallus gallus*), in April, May, and June 2019. Table 4.5 and Table 4.6.The abundance of the parasites during the study months was shown in fig 4.1 and the percentage distribution was shown in fig. 4.2

Table 4.0: Summary of the parasites identified during the study period

Name of the parasite	Number identified	Percentage
Ascaridia galli	45	13.90%
Capillaria spp.	79	24.38%
Davainea proglottina	160	49.38%
Eimeria oocyst	14	4.32%
Rallietinea spp.	26	8.02%
Total	**324**	**100%**

Table 4.1: Parasites identified in April, 2019

Name of the parasite	Number identified
Ascaridia galli	24
Capillaria spp	35
Davainea proglottina	67
Eimeria oocyst	2
Rallietinea spp	7
Total	**135**

Table 4.2: Parasites identified in May, 2019

Name of the parasite	Number identified
Ascaridia galli	12
Capillaria spp	25
Davainea proglottina	73
Eimeria oocyst	12
Rallietinea spp	18
Total	**140**

Table 4.3: Parasites identified in June, 2019

Name of the parasite	Number identified
Ascaridia galli	9
Capillaria spp	19
Davainea proglottina	20
Rallietinea spp	1
Total	**49**

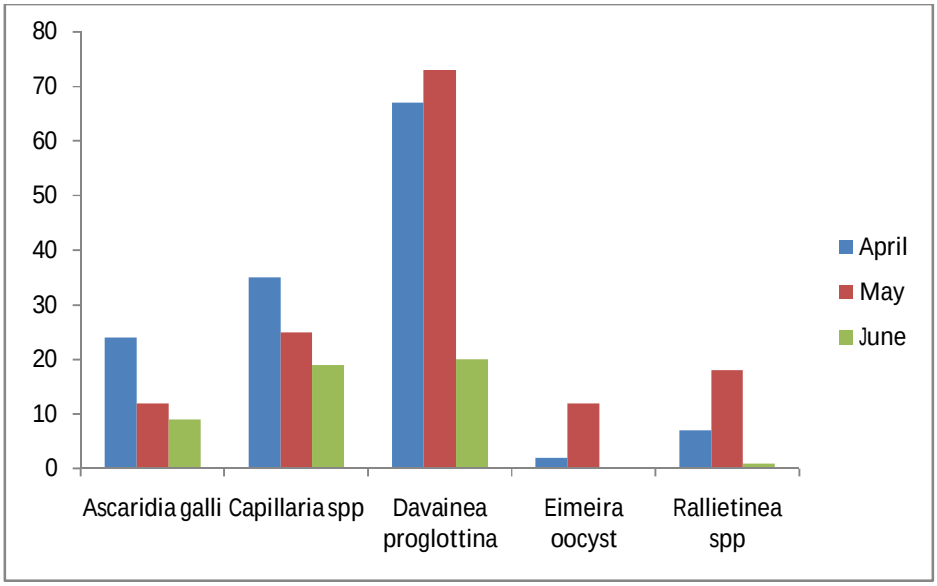

Fig. 4.1: Parasites identified during study months

Table 4.4: Chicken infected with one parasite only

Parasites	Number of infected
Capillaria spp	8
Davainea proglottina	22
Ascaridia galli	4
Eimeria oocyst	3
Rallietinea spp	2
Total	**39**

Table 4.5: Chicken co-infected with two parasites

Parasites	**Number of infected**
Ascaridia galli and capillaria spp.	3
D. proglottina and *Rallietinea spp*	3
Eimeria and *Rallieinea spp*	1
A. galli. and *Davainea proglottina*	8
Capillaria spp and *Davainea proglottina*	3
Davainea proglottina and *Eimeria*	1
Capillaria spp and Rallietinea spp	1
Total	**20**

Table 4.6: Chicken co-infected with three parasites

Parasites	**Number of infected**
A. galli., D. proglottina and *Capillaria spp.*	1
A. galli., D. proglottina. and *Rallietinea spp.*	1
Rallietina spp., D. proglottina. and *Capillaria spp.*	1
Rallietina spp., D.proglottuna. and *Eimeria oocyst*	2
Total	**5**

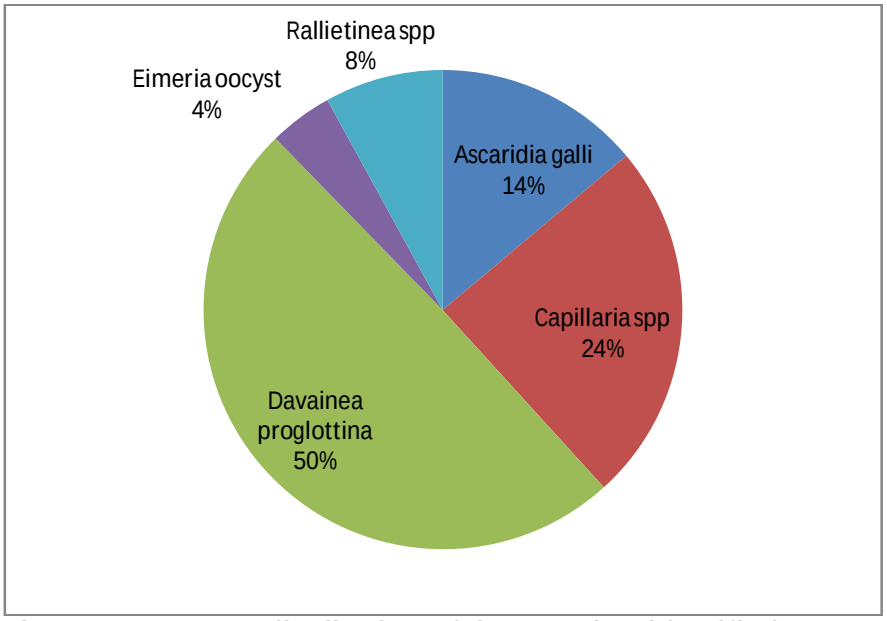

Fig4.2: Percentage distribution of the parasites identified

DISCUSSION

A total of five (5) parasites species were identified, among which two are nematodes (*Ascaridia galli* and *Capillaria spp.*), two are cestodes (*Rallietinea sps* and *Davinea proglottina*) and one is *Eimeria spp* (Table 4.0).This result was closely in line with the findings of Junaidu *et al.*(2014) were they reported six parasites identified. *Davainea proglottina* was found to be highest with 160 (49.38%) number identified during the study period. The lowest parasite identified was *Eimeria spp* with only 14 (4.32%) identified. 45(13.90%) *Ascaridia galli* were identified, 79 (24.38%) *Capillaria spp* and 26(8.02%) were also identified. The results of the present study identified *A. galli* as the most prevalent nematode species in the local chickens with a prevalence rate of 13.9%. This finding agrees in part with several studies (Fakae and Nwalusi 2001; Nnadi and George 2010; Matur *et al.,* 2010; Ngongeh *et al*., 2012) in Nigeria which identified *A. galli* as the most prevalent nematode in chickens.

In April 2019, a total of 135 parasites were recorded. 24 *Ascaridia galli*, 35 *Capillaria spp*, 67 *Davainea proglottina*, 2 *Eimeria oocyst* and 7 *Rallietinea spp* (table 4.1). 12 *Ascaridia galli,* 25*Capillaria spp,* 73 *Davainea proglottina,* 12 *Eimeria oocyst* and 18 *Rallietinea spp* were recorded in May 2019 (table 4.2). In June 2019, 9 *Ascaridia galli*, 19

Capillaria sps, 20 *Davainea proglottina* and 1 *Rallietinea sps* (table 4.3). The result shows that *Davainea proglottina* was to be highest in May 2019, whereas *Eimeria spp* was lowest in June 2019 as no any was recorded in the month (Fig. 4.1).

Among the 100 samples examined, 39 samples were infected with only one type of parasite among which 4 samples were infected with *Ascaridia galli,* 22 were infected with *Davainea proglottina*, 8 samples were infected with *Capillaria sps* and 2 samples were infected with *Rallietinea sps*(table 4.4). In addition, 20 samples were co-infected with two parasites among which 3 were infected with *Ascaridia galli* and *Capillaria spp*, 3 samples were infected with *D. proglottina* and *Rallietinea sps*, 1 sample was infected with *Eimeria oocyst* and *Rallietinea sps*, 8 samples were infected with *A. Galli* and *D. proglottina*, 3 samples were infected with *Capilaria sps* and *D. proglottina*, 1 sample was infected with *D. Proglottina* and *Eimeria oocyst* and lastly 1 sample was infected with *Capilaria spp* and *Rallietinea sps* (table 4.5). Furthermore, 5 samples were co-infected with 3 parasites among which 1 sample was infected with *A. galli*, *D. proglottina* and *Capillaria spp*, 1 sample was infected with *A. galli*, *D. proglottina* and *Rallietinea spp*, 1 sample was also infected with *Rallietinea spp*, *D. Proglottina* and *Capillaria spp* and then lastly 2 samples were infected with *Rallitinea spp*, *D. Proglottina* and *Eimeria oocyst* (table 4.6). These make a total of 64 samples that were infected with parasites one, two or three whereas 24 samples were not infected with either of the parasites.
The percentage of the parasites identified obtained shows that *D. Proglottina* has the highest percentage (49.38%), followed by *Capillaria spp*(24.38%), follows by *A. Galli* (13.90%) *Rallietinea spp* follows with 8.02% and *Eimeria oocyst* has the lowest percentage (4.32%) (Figure 4.2)

CONCLUSION

The majority of the species identified in this study have been reported as potentially pathogenic for the chicken examined, inducing ulcerations and nodule formations and varying degrees of enteritis leading to diarrhoea, anorexia, depression, emaciation and death if untreated. And, such parasitized chicken can be sources of infections to more chicken. The result of this study shows that 64 samples out of 100 are infected with at least one parasite, and thus, it was concluded that gastrointestinal parasite especially helminthes are common among local chicken in Kafin Hausa area of North-western Nigeria and may have consequent effect on productivity.

RECOMMENDATIONS

Base on the result obtained from this study it was recommended that an epidemiologically structured worm control programme be put in place to minimize parasites infestation and its effects in order to maximize the potentials of local chickens and backyard poultry. There should be public awareness about the dangers of eating gastrointestinal tract organs specifically the intestines.

REFERENCES

Amare, A., Netsanet, W., and Negussie, H. (2012).Coccidiosis Prevailing in Parent Stocks: A Comparative Study between Growers and Adult Layers in Kombolcha Poultry Breeding and Multiplication Center, Ethiopia. *Global Veterinaria,* 8: (3), 285-291.

Ashour, A. A. (2004). "Scanning electron microscopy of *Ascaridia galli*. *J.E.S. Parasitology,* 24: 2, 349–55.

Baker, D. G. (2008).Parasites of Lab. Animals; 2nd edn; Blackwell Publishers; Pp. 236–237.

Hunduma, D., Regassa, C., Fufa, D., Endale, B., and Samson, L. (2010).Major Constraints and Health Management of Village Poultry Production in Rift Valley of Oromia, Ethiopia. IDOSI Publications. *American-Eurasian Journal Agriculture and Environmental Science*, 9: 5, 529-533.

Jordan, F.T., W., and Pattison, M. (1996). Parasitic Diseases: Poultry Diseases; 4th Edition; W.B. Saunders Company Ltd. Printed in Great Britain by the University Press, Cambridge; Pp: 261.289.

Junaidu HI, Luka SA, Mijinyawa A. (2014). Prevalence of Gastrointestinal Helminth Parasites of the Domestic Fowl (*Gallus gallus domesticus*) Slaughtered in Giwa Market, Giwa Local Government, Area, Kaduna State, Nigeria. J Nat Sci Res 4(19):120–125

Kassa, B. (2005). Standard Veterinary Laboratory Diagnostic Manual: Ethiopian Agricultural Research Organization National Animal Health Research Center; Volume III: Parasitology.

Katoch, R., Anish, Yadav, R., Godara, J.K., Khajuria, S., Borkataki, S., Sodhi, S. (2012). Prevalence and impact of gastrointestinal

helminthes on body weight gain in backyard chickens in subtropical and humid zone of Jammu, India. *J Parasit Dis,* 36: 1, 49–52.

Kaufmann, H. (1996). Parasitic Infections of Domestic Animals: A Diagnostic Manual. Birkhauser Verlag, Basel; Pp. 353–354.

Lorenzoni, G. (2010). Poultry Diseases Influenced by Gastrointestinal Health, Traditional Treatments and Innovative Solutions. First published 2010, Nottingham University

Martynova VanKley, A., Syvyk, A., Teplova, I., Hume, M., and Nalian, A. (2008).Rapid Detection of Avian *Eimeriaspecies* Using Denaturing Gradient Gel Electrophoresis; *Poultry Science,* 87: 1707–1713.

Nnadi, P.A., and George, S.O. (2010). A Cross-Sectional Survey on Parasites of Chickens in Selected Villages in the Sub humid Zones of South-Eastern Nigeria: *Journal of Parasitology Research*, 14: 6, 18-24.

Ohaeri, C.C., and Okwum, C. (2013).Helminth Parasites of Domestic Fowls in Ikwuano, Abia State Nigeria; *Journal of Natural Sciences Research*, 3: 11; (ISSN 2224-3186 (2225-0921).

Permin, A. and Hansen, J.W. (1998). Diagnostic Methods: Epidemiology, Diagnosis and Control of Poultry Parasites. FAO Animal health manual, No 4. Food and Agriculture Organization of the United Nations, Rome, Italy; Pp. 33-118.

Ruff, M. D., Calneck, B. W., Barnes, H. I., Beard, C. W., Reid, W. M., Yonder, Jr. H. W. (1993). Nematodes and Acanthocephalans: Diseases of Poultry; 3rd edition, Ames, Iowa State University Press; Pp. 731-763.

Saif, M., Fadly, M., Glisson, R., McDougald, R., Nolan, K., and Swayne, E. (2008): Diseases of poultry; 12th edition, Blackwell Publishing Professional 2121 State Avenue, Ames, Iowa 50014, USA, Pp. 1067-1080.

Ziela, M. (1999).A Comparative Study of Gastrointestinal Nematode Infections in Traditional and Commercial Chickens and Effects of

Anthelminthic Treatment on Production. *International Journal of Poultry Science,* 7: 12, 67-73.