

Helminthes Parasites of Chicken (Gallus Domesticus) In Damaturu Metropolis (A Case Study of Locally Sold Chicken in Damaturu Main-Market)

Muhammad Inuwa Adamu¹, Abba Haruna Adamu², Ibrahim Adamu Godowoli³,
Najibullah Bakari Ado⁴ and Kyari Alhaji Goni.⁵

^{1,2,3,4&5}Department of Science Laboratory Technology,
School of Science and Technology,
The Federal Polytechnic Damaturu.

Corresponding Authour: muhdadamugashua@gmail.com, +2348033892071

Abstract

This project work examined the prevalence of Helminthes parasites of chicken (Gallus domesticus) in Damaturu metropolis. A total number of 50 intestinal samples were collected from Damaturu Main Market which comprises of 25 gastro-intestinal tracts of male chickens and 25 gastro-intestinal tract of female chickens, where 26 chickens were found to be infected, out of these, 14 males were found to be infected representing (28%) and 12 female chickens were found to be infected representing (24%). The investigation revealed that seven (7) species of Helminthes parasites were recovered and recorded accordingly, these include Raillietina echinobothrids (20%), Raillietina cestocollis(8%), Hymenolepis Carioca (4%), Hymenolepis diminuta (8%), solium (4%), ascaridia galli (4%) and the least cotugnia (4%) respectively. Finally, recommendations have been made on the improved management and veterinary hygiene of these chickens in a hygienic way.

1.0 INTRODUCTION

Helminthes also commonly known as parasitic worms are large multicellular organisms, which when mature can generally be seen with the naked eye. They are often referred to as intestinal worms, even though not all Helminthes lives in the intestines. For example schistosomes are not intestinal

worms, but rather reside in blood vessels (Bhatt, *et al.*, 2012).

There is no clear consensus on the taxonomy of Helminthes, it is more of a commonly used term to describe contain worms with superficial similarities. These are flatworms (*Platyhelminthes*), namely cestode (tapeworm) and trematodes (liver flukes), and round worms or (nematode) all these are

Helminthes Parasites of Chicken (Gallus Domesticus) In Damaturu Metropolis (A Case Study of Locally Sold Chicken in Damaturu Main-Market)

parasitic worms and also Annelida, which are grouped as an ectoparasite like the leeches (Bhatt, *et al.*, 2012).

Many, but not all, of the worms referred to as Helminthes belongs to the group of intestinal parasites. An infection by a helminthes is known as helminthiasis. The same naming convention applies to all Helminthes whereby the ending "asis" (or in veterinary science the ending "osis") at the end of the name of the worm is added to signify the infection with that particular worms, for example, Ascaris is the name of a particular helminth and ascariasis is the name of the infectious disease caused by *Helminthes*. (Matta 2010)

Helminthes are worm-like organisms living in and feeding on living hosts, receiving nourishment and protection while disrupting their host's nutrient absorption, causing weakness and disease. Those that live inside the digestive tract are called intestinal parasites. They can live inside humans and other animals in their adult form, Helminthes cannot multiply in hundreds. Helminthes are able to survive in their mammalian hosts for many years due to their ability to manipulate the immune defense by secreting immunomodulatory products. Helminthes ova (or eggs) have a strong shell that protects the eggs against a range of environmental conditions (Vijayakumar and Nadakal 2011). *Helminthes* are group of organisms which share a similar form but are not necessarily related as part of evaluation. *Helminthes* include members of the following taxa; monogeneans, cestodes (tape worm),

nematode (roundworm), and trematodes (flukes). The number of different *Helminthes* is vast, it is estimated to be around one million species. The *nematodes* are the most diverse of all the *Helminthes* with the highest number of species. There may be as many as 300,000 species of parasites affecting vertebrates, and as many as 300 affecting humans alone. (Bhatt *et al.*, 2012).

Characteristics that are common for all *Helminthes* include:

Life cycle:

- a) The life span of adult worms varies tremendously from one species to another but is generally in the range of 1 to 8 years. This life span of several years is a result of their ability to manipulate the immune defense of their hosts by secreting immunodulatory products.
- b) *Helminthes* can be either hermaphrodite (i.e. can have both sexes in the same organisms), like tapeworms and the flukes (except the blood fluke which is not a hermaphrodite), or have their sexes differentiated, like the round worms.

Eggs:

- a) All *Helminthes* produce eggs (also called ova) for production.
- b) *Helminthes* eggs have a strong shell that protects them against a range of environmental conditions. This shell consists of three layers a lipoidal inner layer a chitinous middle years and outer proteinic layer.
- c) Generally thousand or even hundreds of thousands of eggs are produced each time

Helminthes Parasites of Chicken (Gallus Domesticus) In Damaturu Metropolis (A Case Study of Locally Sold Chicken in Damaturu Main-Market)

the female worm deposits its eggs, a process called oviposition.

- d) The frequency of egg deposition from an adult *Helminthes* is generally daily, or up to six times per day for some *Taenia* species.
- e) Adult trematodes lay smaller numbers of eggs compared to cestodes or *nematodes*. However, the egg develops into a Miracidia from which thousands of cercarie, swimming larvae develop. This means that one egg may produce thousands of adult worms.
- f) *Helminthes* eggs remain viable for 1-2 months in crops and many months in soil, fresh water and sewage, or even for several years in feces, fecal sludge (historically called night soil) and sewage sludge a period that is much longer compared to other kinds of microorganisms.

Larvae:

- a) Larvae hatch from these eggs (If the eggs are viable), inside or outside the hosts, depending on the type of *Helminthes* Life cycle of *Helminthes* differ in this and other specific aspects. Eggs that are no longer viable do not produce any larvae.
- b) The larvae maturing in the host take from about two weeks up to four months depending on the *Helminthes* species (Gadzama, 2016).

AIM AND OBJECTIVES

The aim and objectives of this work is to

- i. Investigate the prevalence of *Helminthiasis* in chickens (*Gallus domesticus*) slaughtered in Damaturu Main Market.
- ii. Identify the *Helminthes* parasites.
- iii. Asses the losses incurred as a result of *Helminthes* infection

2.0 MATERIALS AND METHODS

Materials: - The following materials were used

Apparatus

- i. Petri- dishes
- ii. Dissecting set
- iii. Beakers
- iv. Microscope
- v. Microscope slide
- vi. Dropper
- vii. Conical flasks
- viii. Coverslip
- ix. 1-litre volumetric flasks
- x. Surgical gloves
- xi. Cotton wool
- xii. Specimen's bottles

Reagents

- i. Distilled water
- ii. Normal saline
- iii. 10% *formaldehyde*

Helminthes Parasites of Chicken (Gallus Domesticus) In Damaturu Metropolis (A Case Study of Locally Sold Chicken in Damaturu Main-Market)

Biological Specimen

- i. Gastro-intestinal tract of chickens (*Gallus domesticus*).

Sampling

A total of 50 gastro-intestinal tracts of chickens (*Gallus domesticus*), 25 males and 25 females were collected from Damaturu main market at the rate of 10 samples per week.

Laboratory Examination

Each gastro-intestinal tracts was opened and examined separately and the content were kept in separate petri-dishes. The contents were repeatedly washed with water to cover embedded worms.

Counting

The parasite(s) in each gastro-intestinal tract were counted and recorded accordingly.

Preservation

The parasite(s) found in each gastro-intestinal tract were collected after counting, washed in distilled water and immediately dropped into formaldehyde, which fixed them in an extended state.

Identification

The parasite(s) that were preserved were identified using the keys described by (Troncy, 2013; Soulsby *et al.*, 2019).

3.0 RESULT AND DISCUSSION

Diversity of *Helminthes*

A total number of (50) intestinal samples were examined out of which (26) were found to be infected. The most common *Helminthes* identified were cestodes species, as indicated in the table below.

Table 1: *Helminthes* cestodes species

Date	No. of Chickens	Male	Female	No. of infected Chickens	No. of Uninfected Chickens	% of infected
10-11/7/2017	10	05	05	04	06	40%
12-13/7/2017	10	05	05	06	04	60%
14-17/7/2017	10	05	05	05	05	50%
18-19/7/2017	10	05	05	05	05	50%
20-21/7/2017	10	05	05	06	04	60%
TOTAL	50	25	25	26	24	

Helminthes Parasites of Chicken (Gallus Domesticus) In Damaturu Metropolis (A Case Study of Locally Sold Chicken in Damaturu Main-Market)

Table 1: showing the incidence of intestinal Helminthes found in male and female chickens

Date	No. of Male Chickens Observed	No. of infected Male	No. of Uninfected Male	Percentage of infected %	No. of Female Chickens Observed	No. of infected Female	No. of Uninfected Female	Percentage of infected %
10-11/7/2017	05	03	02	60%	05	01	04	20%
12-13/7/2017	05	02	03	40%	05	04	01	80%
14-17/7/2017	05	05	00	100%	05	00	05	0%
18-19/7/2017	05	02	03	40%	05	03	02	60%
20-21/7/2017	05	02	03	40%	05	04	01	80%
TOTAL	25	14	11		25	12	13	

Helminthes Parasites of Chicken (Gallus Domesticus) In Damaturu Metropolis (A Case Study of Locally Sold Chicken in Damaturu Main-Market)

Table 2: Showing the Helminthes Parasites Species Found in Chickens

S/N	<i>Helminthes</i> parasite species	No. of <i>Helminthes</i> parasites found in chickens	Percentage % of <i>Helminthes</i> found
1	<i>Raillietina echinobothrids</i>	10	20%
	<i>Raillietina cestocollus</i>	4	8%
3	<i>Hymenolepsis diminuta</i>	4	8%
4	<i>Hymenolepsis carioca</i>	2	4%
5	<i>Taenia solium</i>	2	4%
6	<i>Ascaridia galli</i>	2	4%
7	<i>Cotugnia diagonopora</i>	2	4%

4.0 DISCUSSION

A total number of 50 gastro-intestinal tracts of chicken (*Gallus domesticus*) were collected from Damaturu main market, out of these (26) chickens were found to be infected which represents (52%). The gastro-intestinal tracts comprises of 25 male chicken's intestine and 25 female chickens intestines. Out of which the males were found to have the higher rate of infections with (28%) and the least with females (12%).

The commonest, of *Helminthes* parasite found in the chickens is *Raillietina echinobothrids*. *Raillietina echinobothrids* has the highest rate of species found with 10 infected chickens

representing (20%) followed by *Raillietina Cesticillus* (8/0), *Hymenolepsis diminuta* (8%), *Hymenolepsis carioca* (4%), *Taenia solium* (4%), *Ascaridia galli* (4%) and *cotugnia diagonopora* with (4%) respectively.

5.0 CONCLUSION

In conclusion *Helminthes* infection is a common cause of all kinds of damage, hence they inflict a degree of damage to the domestic chickens which includes reduced egg production, pathological changes in the heart, lung, liver, intestine, pancreas and intercostal and thoracic muscles in chicken with natural infection.

Helminthes Parasites of Chicken (Gallus Domesticus) In Damaturu Metropolis (A Case Study of Locally Sold Chicken in Damaturu Main-Market)

Also most chickens with high worm burdens appear to weigh less than those having low worm burden, therefore reduces the meat value or price of these chickens. In view of this, therefore, *helminthic* infection can cause serious damage to the domestic chicken (*Gallus domesticus*), reducing to the nutritional value of the eggs produced by chickens, and the meat derived from the chickens, therefore adequate measures should be taken to reduce and stop the prevalence of *helminthic* infections.

6.0 RECOMMENDATION

Since the mechanisms of transmission of *helminthiasis* are easily found in the environment and these vectors are commonly found around every environment organisms such as Ants, flies, Earthworm, termites and other varieties of insects and organisms. Therefore, there is need for improved management in addition to proper veterinary attention, so as to achieve meaningful productivity of the local breed of chicken. For profitable poultry production in the avoid-zone therefore, a chemoprophylactic cover may be essential in order to minimize weight loss and drop in eggs production.

A routine deworming programme may be essential for large-scale poultry production in the arid-zone, so as to minimize weight loss and drop in egg production due to *helminthiasis*.

Proper feeding and watering hygiene (use of feeders and waters) should not be neglected, particularly to control parasites with a direct life cycle. Also rearing on grating reduces contact between poultry and certain vermin (Woodlice, Termites and Earthworm).

REFERENCES

- Bayer, G. (2016) incidences of the *Helminthes* parasites of domestic fowls, Heineman, London, pp. 126.
- Bhatt, J., Ahmed, M. I. and Sinha, P. K. (2012). Oral Disease in the Tropics, Published by Oxford Medical Publications. New York Toronto: Pp. 125-126.
- Gadzama, E. N. (2016). Prevalence of Intestinal Parasite of Market Chickens in Borno State J. vet. vol. 1 No 2. Pp. 126-128.
- Matta, J. (2010)veterinary *helminthological* abstracts, *oxford medical Publication*. Pp 100-115.
- Mira, S. F. and Ralph, R. S. (2013): Manual of Tropical Veterinary, Parasitology Pp. 100-115.
- Ress, G. Dunn, A.W. and Fabiyi, J. P. (2017). Pathogenesis of Adult Cestodes *Helminthological* Abstracts. 36 Part I Review Article, Hinemann, London. Pp. 50-56.

Helminthes Parasites of Chicken (Gallus Domesticus) In Damaturu Metropolis (A Case Study of Locally Sold Chicken in Damaturu Main-Market)

Soulsby, E. J., Peregodov T.A and Ilyosor I.N
(2019). *Helminthes* Arthropods and
Protozoa of Domesticated Animals.
7th Edition, London Pp. 120-121.

Troncy, P. M. (2013). *Helminthes* of
Livestock and Poultry in Tropical
Africa, by' *Commonwealth
Agricultural Bureau* (C.A.B)s
London. Pp. 1 11-1 13.

Vijayakumar, N. K. and Nadakal, A. M.
(2011): Hematological Changes in
Domestic Fowl Infected with the
Cestode *Raillietina Tetragona*.
Veterinary Parasitology Journal,
Hinemann, London. Pp. 60-63

Helminthes Parasites of Chicken (Gallus Domesticus) In Damaturu Metropolis (A Case Study of Locally Sold Chicken in Damaturu Main-Market)